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Relationships Of Self-Efficacy, Exercise, Social Support To Strain And Burnout In University Faculty

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Relationships Of Self-Efficacy, Exercise, Social Support To Strain And Burnout In University Faculty

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ABSTRACT

The purpose of this study was to examine the relationships between occupational self-efficacy, exercise behaviors, and social support with strain and burnout in faculty. Previous studies have shown each variable is associated with reduced strain. The Demand-Control-Supports Theory by Karasek and Theorell (1990) asserts when an individual is in a work situation characterized by high demands, low control, and low social support they will tend to have strain symptoms. Burnout is another psychological strain symptom common in the teaching profession. The current study used the three different variables mentioned and determined their relationships to reported strain and burnout.

A survey was electronically distributed to the entire faculty at the University of California, Irvine. The faculty voluntarily responded by submitting the answers to a website hosted by SurveyMonkey.com. The survey was composed of the *Job Content Questionnaire* (JCQ) by Karasek (1997), to measure physical and psychological strain, social support, job demands, and perceived control. The job demands and perceived control were compared to the three independent variables in the study. The *Maslach Burnout Inventory- Educators Survey* (MBI-ES) by Maslach and Jackson (1983) was used to measure burnout in faculty. The *Measures Of Self-Efficacy In Academic Tasks* (MSEAT) by Landino and Owen (1988) was used to determine occupational self-efficacy, and the self-created Exercise and Leisure Activity Survey (ELAS) measured exercise and leisure behaviors.

Results from a path model showed Academic Self-Efficacy had a significant relationship to Burnout, Social Support was related to Strain, and Strain was highly related to Burnout. There were several interesting interrelationships amongst the variables, especially with the JCQ and MBI. The MBI total was related to each of its constituent parts, Emotional Exhaustion (EE),

Depersonalization (DP), and Personal Accomplishment (PA). However, the MBI Total was also related to Job Demands, Job Control, and Strain. Academic Self-Efficacy was related to MBI-PA, Job Demands, and Job Control. Strain was related to Social Support and MBI total, MBI-EE and MBI-DP, as well as Job Control. The demographic factors did not reveal any novel relationships. The three variables in the study did not predict strain as well as the JCQ variables. This study, like previous ones, did not find exercise and leisure predicted strain; however, social support and self-efficacy were related to either strain or burnout. A longitudinal study with actual interventions in exercise, social support, and self-efficacy in a more diverse population would likely reveal some interesting strain reducing practices.

CHAPTER 1: INTRODUCTION

Statement of the Problem

The negative psychological experiences many people have on the job are classified as occupational stress factors. The actual symptoms developing from this psychological stress are known, collectively, as occupational strain. Occupational strain is a problem affecting millions of Americans each year, both physically and psychologically. The impacts of stress-related issues were very costly both to institutions and to individuals in the 1990s and continue to be costly today. One in three Americans reports great stress daily or on many days of the week, according to a survey taken in 1992 (Kerber, 1994). This figure is up 20% from results of a survey taken just 10 years earlier.

In 1996, 75% of workers experienced "great stress" at least one day a week and one third stated it occurred more than twice a week (National Institute of Safety and Health (NIOSH), 2000). Similar results were found in 1996 in European countries as well. Fifty-seven percent of the European people questioned felt that work affected their health. The most frequent problems mentioned were musculoskeletal problems (30%) and stress (28%).

A survey by Northwestern National Life Insurance found 40% of U.S. workers reported their job as "very or extremely stressful" and one-fourth viewed their jobs as the top stressor in their life (Northwestern National Life Insurance Company, 1992). Another study reported 78% of employees complained that their primary source of stress was from work, and only 35% felt their work gave them any pleasure or satisfaction (D'Arcy, Masius, & Bowles, 1996).The psychological effects of stress on individuals are similar to the physical effects in terms of onset and incidences. Mental stress accounted for 11% of worker's absences in 1996, which was twice that of the previous year (Greenberg & Canzoneri, 1996).

Several health factors seem to suffer when an individual perceives their job to be stressful across time. One of the leading theories relating job characteristics, to an individual's health symptoms or their occupational strain is the Demand- Control-Supports Theory (Landsbergis, 1988). In the late 1980s and early 1990's, over 40 studies on job strain and heart disease and 20 studies on job strain and heart disease risk factors have been published which provide strong evidence that job strain is a risk for heart disease (Schnall, Landsbergis, & Baker, 1994).

Research studies have shown that persistent high job demands in those who have high stress responsiveness will lead to high blood pressure (Steptoe, Roy, Evans & Snashall, 1995). In addition, when individuals had perceptions of low control in their job, they had higher systolic and diastolic blood pressures and higher heart rates. They concluded it was differences in the exposure to uncontrollable situations rather than differences in reactivity to uncontrollable situations that contributed to the elevation in cardiovascular risk that is associated with job control (Steptoe, 2001). Besides the physical health problems, a stressful job may also decrease psychological and socio-emotional qualities. Data shows that stress on the job for fathers may also affect the quality of communication for their children and subsequently the relationship quality (Crouter, 1999).

Faculty Strain

In general, teaching at a university has been a profession that experiences significant occupational strain and burnout (Chan, 1998; Maslach & Leiter, 1997). In addition, faculty stress has been shown to have a significant impact on intent to leave academia (Agago, 1996). Although university faculty seemed to be satisfied with working conditions and environment in the mid-1980s (Eble & McKeachie, 1985), many factors in today's universities are causing dysfunctional stress for faculty. The roles and responsibilities of university faculty changed

significantly in the past 10 to 15 years. Faculty in universities throughout America are facing increased stress due to (a) role diversity and ambiguity, (b) high self-expectations, (c) excessive time constraints, (d) contending with the rapidly expanding knowledge bases and technology, (e) reforms with school budgets and tenure, and (f) new competition from distance learning and adult-specific programs (Sanderson, 2000; Lindholm, Astin, Sax, & Korn, 2003).

Although the 1999 Higher Education Research Initiative (HERI) report showed that faculty were more satisfied with many aspects of their careers than they were in previous years, overall stress levels have not decreased. Stress levels may have actually increased in regards to some issues, especially those related to personal health and time pressures (Sanderson, 2000; Sax, Astin, Korn, & Gilmartin, 1999). A recent faculty poll found faculty are more satisfied with their jobs (77% in 2001-2002, compared to 75% in 1998, and 69% in 1989), although they report greater work-related stress (Lindholm, Astin, Sax, & Korn, 2003). The stress increase came from committee work and faculty meetings. The data suggests there is increased pressure on institutional reform and intensified faculty involvement in higher education. In summary, faculty strain and burnout can (a) negatively affect the learning atmosphere, (b) interfere with educational goals, and (c) increase the likelihood of faculty leaving the profession.

While a majority of the studies show differences in strain depending on the gender, rank, time at the university, race, and even discipline taught, some have found interaction effects and coping differences within various subgroups (Lease, 1999; Richard & Krieshok, 1989; Saks, 1994; Schonfeld, 2001). While some studies have observed the effects of academic or professional self-efficacy and social support on strain and sometimes burnout (Landino & Owen, 1988; Lease, 1999; Schonfeld, 2001; van Dick & Wagner, 2001), no studies have yet observed

how self-efficacy, social support, and exercise or leisure behaviors affect strain and burnout in university faculty.

Costs of Strain

The most recent financial figures from the NIOSH show that employees who report that they are stressed incur healthcare costs that are 46% higher, an average of more than $600 more per person, than employees who are not stressed (USA Today, 2006). In 1999, the cost of stress-related disorders soared to $120 billion in North America and Europe, and $60 billion of that was for mental disorders (deVries & Wilkerson, 2003). Estimates of the cost of job stress vary greatly with the national news media estimating $150 billion per year and the National Science Foundation Study finding costs totaling $100 billion per year (Karasek and Theorell, 1990). Using rough estimates of total job stress morbidity and mortality, along with predicted reductions in attributable risks in low skill discretion jobs, and increased social support, it is estimated that 16% of the direct health care costs or $80 billion per year in the United States may be saved if appropriate prevention measures were implemented (Quick,Quick, Nelson, & Hurrell, 1997) .

Exercise or physical activity alone, not to mention other leisure time activities, has been associated with significant health care cost savings. Wang, McDonald, Champagne, and Edington (2004) found significant differences in employees' annual health care expenses when they compared those who were active 1-2 times per week (x/wk) and those +3x/wk compared to those who were sedentary. They found a $250 difference across all weight categories and a $450 annual difference in the obese sub-population. Wang et al. estimated a maximum savings of 1.5% of the total health care costs could be realized by getting those who are sedentary to exercise 1-2 x/wk. In another study, even greater cost savings were found when the exercise volume comparison was greater.

In a study of older adults (50 and over) the differences in health care costs were examined in a two-year 2393 member cohort study. After controlling for several confounding factors, the results showed a $2,202 annualized difference between those who were sedentary and those who were exercising 3 or more times per week (Martinson, Crain, Pronk, O'Connor, & Maciosek, 2003). The exact difference in annual health care cost was made compared to the actual aerobic capacity. By analyzing the amount of money spent in inpatient and outpatient services and relating it the METS or metabolic equivalent units that an individual was able to obtain, the researchers found a 5.4% savings for per 1 MET.

Prevention of Strain

The fact that stress in the American workplace is both prevalent and devastating physically, as well as fiscally, is well established (Quick,Quick, Nelson, & Hurrell, 1997). The fact that much of the physical and mental health problems associated with job strain is preventable is also well established. What treatments are effective in countering this stress epidemic is not well established. Experts in the field have grouped preventative measures into three levels. The primary level is managing and coping with stressors or stressor-directed. General recommendations to employers in the 1990 NIOSH report for primary level stress prevention included: a) work load and pace (demand) should be adjusted according to the capabilities of the workers, b) work schedules should be adjusted, c) the job future should be clearly communicated in terms of advancement and job security, d) the social environment should be conducive to personal interactions and emotional support, and e) the job content should be designed to be meaningful and stimulating to the worker (Sauter, Murphy, Hurrell, 1990). Secondary prevention measures involve modifying responses to inevitable demands or response-directed, and tertiary prevention concerns methods for healing the wounds or symptom-

directed (Quick, Quick, Nelson & Hurrell, 1997). A proactive strain reduction program will try to identify problematic stress situations and correct them before the individuals who are affected actually need expensive remedies. A study at McDonnell Douglas showed financial savings, reduced health claims, and lower absentee rates for those who went through employee-assistance programs (Landy, Quick, & Kasl, 1994).

Self-efficacy beliefs are "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura, p.391, 1977). Empirical evidence supports the claim that self-efficacy beliefs affect the way one thinks about a given task, how well they motivate themselves, persevere in the face of adversities, and their vulnerability to stress and depression (Bandura, 1977). Graham and Weiner (1996) stated that self-efficacy was a more consistent predictor of behavioral outcomes than other motivational constructs, especially in the fields of psychology and education. Bandura (1997) states that emotional states are directly tied to anticipated success or failure and negative affective reactions can themselves lower self-efficacy perceptions, which triggers additional stress and agitation, which ensures inadequate performance, thus causing further stress and negative emotions.

Several studies have shown that self-efficacy is a moderator of job strain (Jimmieson, 2000; Jex, Buzzell, Primeau, & Bliese, 2001; Jex & Gudanowski, 1992; Schaubroeck, Jones, & Xie, 2001) and burnout (Salanova, Peiro, & Schaufeli, 2002) when job control is present. Saks (1994) found that academic self-efficacy in newcomers to a job affected the training method that would be most effective and the stress associated with training. In a study by vanDick and Wagner (2001), results showed global social support and self-efficacy moderated or buffered the relationship of stressors and strain. Ways to raise self-efficacy beliefs is to have previous success, observe relevant models, have positive social persuasions (collective efficacy) and

improve physical (somatic) and emotional well-being. Another way to empower employees is to give them the ability to choose methods to accomplish tasks and freely learn new techniques (Leach, Wall, Jackson, 2003).

Some studies have revealed solid evidence to demonstrate that a properly designed and implemented health and fitness program improves physical and mental health, provides fiscal benefits from reduced absenteeism, turnover, medical or legal expenses, and promotes increased productivity (Kerber, 1994; Horowitz et al., 1985). Aerobic exercise has even been associated with enhanced positive effects such as increased sense of control and work satisfaction, as well as lower depression, and anxiety, and fewer sick days (Justice, 1988). Exercise using both aerobic and weight training has been shown to both improve the quality of life measures which includes mental health, vitality, general health, as well as reduced strain symptoms such as depression, mental stress, bodily pain and physical functioning (Atlantis, Chow, Kirby, & Singh, 2004). Exercise is also associated with other health behaviors such as lack of smoking, sleep time, social support, and lack of depression (Callaghan, 2004).

Hundreds of studies and over 30 meta-analytic reviews have concluded that exercise a) aids in the treatment of mental health and b) improves mental well-being in the general population. These studies have shown the potential for exercise as a therapy for clinical and sub-clinical depression or anxiety, and its ability to improve the quality of life from enhanced self-esteem, self-image, improved mood states, reduced state and trait anxiety, resilience to stress, or improved sleep (Fox, 2000).

Workers who reported poor social support, excessive demands, and low decisional capacity also reported more heart disease, mental fatigue, digestive system diseases, and lower back pain than other subjects (Johanson, 1986). Some studies have also shown that social and

organizational support moderate the effects of job stress directly (Johnson & Hall, 1988; Landsbergis, Schnall, Deitz, Friedman, & Pickering, 1992). Searle, Bright, and Bochner (1999) examined the role of social support in differing levels of demands and job control. Results showed that high social support reduced stress directly rather than as a buffer to high strain. Even though it did not improve task performance significantly, it did reduce stress and the performance rating from the worker. In a follow-up study (Searle, Bright, and Bochner, 2001) the researchers performed three different studies. Across the three studies they found mixed results. There was no main effect of social support to reduce strain or increase performance. However, social support did increase arousal, satisfaction, and perceived performance.

In the past, research found that social support only acts to buffer against high strain conditions (Cohen & Willis, 1985). A more recent study demonstrated social support to be more strongly associated with well-being rather than strain. In general, this study found variables related to psychological demand to be more strongly related to strain, whereas variables related to job content were more closely related to well-being (Veldhoven, DeJonge, Broersen, Kompier, Meijman, 2002).

In summary, strong arguments can be made for moderating effects of self-efficacy, exercise behaviors, and social support on strain as well as their reciprocal enhancement of each other. To date, no study has used these three variables in simultaneously to determine their relationship to strain and burnout in university faculty or any population.

Purpose of the Study

The primary purpose of this study was to investigate the relationship of occupational self-efficacy, social support, and exercise behaviors to occupational strain and burnout in urban university faculty. A survey comprised of items extracted from recognized instruments to

measure these variables was distributed to university faculty. Within this primary purpose are several sub-purposes that sought to determine:

1) the degree of interrelationship among self-efficacy, exercise behaviors, and social support.

2) If a combination of self-efficacy, exercise behaviors, and social support can predict faculty strain.

3) If a combination of self-efficacy, exercise behaviors, and social support can predict faculty burnout.

4) If the relationship between the independent variables and faculty strain or burnout is modified by any demographic or vocational variables.

5) If self-efficacy, exercise, and social support predict burnout using faculty strain as an intervening variable.

6) If the model proposed in this study predicts strain in faculty better than the Demand Control Supports model predicts faculty strain.

Research Questions

1) Are occupational self-efficacy, exercise behaviors, or social support in university faculty related to each other?

2) Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty strain?

3) Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty burnout?

4) Do selected demographic and academic variables modify faculty strain or burnout?

5) Do self-efficacy, exercise, and social support predict burnout using faculty strain as an intervening variable?

6) Will a combination of occupational self-efficacy, exercise behaviors, and social support be better correlated to faculty strain than job psychological demands, job control, and social support (DCS)?

Rationale and Theoretical Framework

The theoretical framework of this study is based upon the *demand-control-supports model* (DCS Model) (Karasek and Theorell, 1990). This model is an extension of the original "job strain" model, which was developed by Karasek in 1979. The original model proposed that job strain was highest in jobs described by high psychological demands and low job control (Karasek, 1979). Two hypotheses were inherent in this model: 1) the additive hypothesis where job strain in increased as either high job demands or low job control is increased, and 2) the interaction or buffer hypothesis which states job control moderates the relationship between job demands and job strain. The second hypothesis specifically states that a high strain job (high demand, low control) will cause physical and psychological strain, a decreased capacity to learn, and that high-demand, high-control jobs known as "active jobs", will produce well-being, learning and personal growth.

The main premise of the DCS model is that someone's perceived psychological demands which include the quantity of work, the mental requirements, and time constraints put on the worker, along with his or her job control, are critical determinants of the amount of psychological strain and subsequent health problems one expresses from his job. In this model, *job control* is described by the combination of skill discretion and decision authority. This

implies a person not only possesses the ability to choose how to perform a job but the authority or control to utilize those abilities.

Several articles have commented on the powerful influence of the Job Demand-Control model (JD-C); for example "the demands-control model has provided the underlying theoretical basis for most large scale studies of the last ten years" (Fox, Dwyer, & Ganster, 1993, p. 290). Another review stated in the area of work stress and heart disease, studies using the job strain (Demands-Control) or the DCS Model represent by far the largest group using a common conceptual model (Kristensen, 1996).

As mentioned, many studies have provided strong evidence for the link between job strain and heart disease and high blood pressure. Of the 14 studies performed on the JD-C model and heart disease, 12 showed a clear association. Of the eight longitudinal cohort studies, 7 showed strong positive associations (Landsbergis, P.A., Schurman, S.J., Israel, B.A., et al., 1993). Of the eight studies on ambulatory blood pressure (taken during daily activities), 5 showed positive associations (Landsbergis, P.A., Schurman, S.J., Israel, B.A., et al., 1993).

A social support variable was added after the powerful findings in a study by Johnson and Hall (1988) on the capacity of social support to buffer against strain. The extended (DCS) model proposes that interactions between perceived demands, perceived control, and social support from either coworkers or supervisors will determine the amount of strain produced from the job (Karasek & Theorell, 1990). One study found the joint action of high demands and lack of control on cardiovascular disease prevalence was important in blue collar workers; whereas, the combined action of lack of control and lack of support was more important in women and white collar workers (Johnson & Hall, 1988). Evidence supports the beneficial effects of social support on physical health (House, Landis, & Umberson, 1988; and its ability to reduce or buffer

psychological distress (Cohen, 1988; Cohen & Willis, 1985). Much more recent studies have included the changing marketplace and examined the influences of "perception of job insecurity" and "world market competition" on job strain as predicted by the Job Content Questionnaire (Pelfrene et al., 2003).

Weaknesses in the DCS Model

Despite its widespread popularity, there are several problems with the original model developed by Karasek (1979). Researchers have shown that the DCS model does not always apply to technical or educational settings (de Rijk, LeBanc, Schaufeli, & DeJonge, 1998; Wall, Jackson, Mullarkey & Parker, 1996). According to Fox, Dwyer, & Ganster, (1993), the *Demand-Control Model* lacked consistent predictive capacity. One review even stated, "The evidence for an interactive effect of control with job stressors is relatively weak" (Ganster & Fuselier, 1989, p. 262). Another review by Van Der Doef and Maes (1999) stated that support for the JD-C is inconclusive, especially as far as the buffer hypothesis is concerned. The review revealed of the 31 studies examining the buffer hypothesis only 15 showed positive support . They found little support for the interactional effects of demands and control, and even the main effects were only supported in correlational studies and not longitudinal.

Many methodological concerns surround the 34 studies done on job strain including the influences of gender, race, and socioeconomic status. A study found a higher proportion of African American workers in the "high strain" group. Thus, the increased hypertension found in this group may be the result of work strain (Light, Turner, & Hinderliter, 1992). Little evidence supports the relationship between socioeconomic status (SES) and strain. Only four studies made this comparison in blue-collar with less education or female clerical workers had stronger associations with strain. Lower SES have been shown to have higher rates of heart disease and

heart disease risk factors. Job strain may interact with financial strain as well as the increased exposure to toxic chemicals and job hazards (Marmot & Theorell, 1988; Siegrist, Junge, Cremer, & Seidel, 1990). The exposure to hazardous or toxic conditions has been added to the current version of the Job Content Questionnaire (JCQ-17).

A recent study by Spalding, Lyon, Steel & Hatfield (2004) argued that aerobic training blunts the stress-induced cardiovascular reactivity, which is noted by high blood pressures-systolic and diastolic, as well as heart rate and rate-pressure product. These data confirmed earlier findings by Holmes and Roth (1988) and deGeus, van Doornen (1993). Stress could be associated with high blood pressure in the short term in stress-sensitive individuals however.

Few studies have tested the *active learning hypothesis* by Karasek and Theorell (1990) and almost all have focused on employee strain and ill-health (Parker & Sprigg, 1999). Along with the *active learning hypothesis*, it was proposed that people in "active" positions would be more active in their leisure time. This hypothesis is also met with mixed results. In a study on British and German managers, no relationship was found between work and leisure activities nor did exercise reduce adverse health effects of stress (Kirkcaldy & Cooper, 1993). A study by Wu and Porell (2000) also found evidence countering the Karasek and Theorell hypothesis. They found blue-collar workers actually engaged in more vigorous exercise than the white-collar workers. There is little support of the JD-C interaction effect for burnout prediction (DeRijk, LeBlanc, Schaufeli, and deJonge, 1998; Jimmieson, 2000; Landsbergis, Schnall, Warren, Pickering, & Schwartz, 1994).

Moderators of the Job Demand- Control Relationship

Several factors have been shown to modify the relationship between job control and demands. As mentioned, social support was so powerful that the newer model included it.

Several recent reviews have shown support for adding self-efficacy to the JD-C to better predict strain (Jimmieson, 2000; Jex, Buzzell, Primeau, & Bliese, 2001; Jex & Gudanowski, 1992; Schaubroeck, Jones, & Xie, 2001; Schaubroeck & Merritt,1997).

Schaubroeck and Merritt (1997) asserted that the original demand-control model assumed workers had high self-efficacy. It has been shown that possessing job control is not always a beneficial factor to strain moderation. For some individuals having control or the ability to make decisions is a burden when to others it may be a blessing. Litt (1988) conveyed that self-efficacy is an important factor in strain prediction because it affects an individual's ability and willingness to utilize decisional control. He stated, "judgments of self-efficacy may be such that having control is not useful or may even have a negative effect. Control may benefit only those who are confident that they can use it, and that it will be effective" (Litt, p. 253). He believed perceptions of control in a situation and estimates of self-efficacy to use that control to an advantage will interact to determine how a person will appraise the situation and express distress. He also believed that people who have high self-efficacy have better psychological outcomes than people with low self-efficacy in high demand, high control situations. This theory was verified in a later study that found similar results. Strain was measured by upper respiratory illness and immune function and job demands were measured with the JCQ-17 (Schaubroeck, Jones, Xie, 2001).

Studies that are more recent are using multiple levels of variables for groups and individuals. These studies found significant effects for support related variables- collective efficacy, and leadership climate to reduce strain (Bliese & Jex, 1999; Bliese & Castro, 2000). DeJonge, van Bruekelen, Landerweerd, & Nijhuis (1999) were able to find variance in a group variable that was not found with an individual variable.

There were several instances pointed out in the Karasek and Theorell book *Healthy Work* (1990) where physical activity countered or buffered against strain symptoms. A study by Theorell, Karasek and Eneroth (1990) found that job strain was associated with a drop in plasma testosterone, an anabolic hormone, and that this drop was much more evident in men who did not have physical activity on their jobs. They also cite an old study from Pyorälä et. al, (1971) which demonstrated regenerative effects of exercise which included the reversal of hormonal and metabolic effects of mental strain. Evidence for activity either on or off the job to reduce job strain is still weak and results mixed. A study by Manning and Fuslier (1999) showed there is a good deal of complexity when dealing with coping mechanisms to strain, hardiness, exercise and social support. Main effects were found for both the personality trait of hardiness and exercise to lower health care costs and number of insurance claims filed. However, those who exercised used the company's health care more. Even though health care use was the lowest in people possessing all three stress resistors, the reverse was not supported. Hardiness in the absence of exercise or social support was actually associated with the highest health care costs. In fact, health care use was the highest for those with hardiness and exercise attributes. Thus, the factors associated with stress resistance, may reduce health care use but not costs or number of claims.

Theorell (2001) believes the lack of findings in various studies were due to the following factors in those studies: 1) long follow-up periods, 2) indirect "aggregated" job conditions, 3) older study populations, 4) study groups with little variation in decision latitude, and 5) samples with coronary heart disease preceding the examination.

Theoretical Basis of this Study

The DCS model views individuals as active participants in their stress perception and coping capacities. This view is based in the Lazarus and Folkman (1984) model of stress, which

is a widely accepted person-environment model. The DCS model and its measurement device (the Job Content Questionnaire) was chosen as a basic framework for this study because it: (a) is based on the largest database of occupational strain and can provide values specifically for educators, (b) focuses on common features of the work environment that can trigger physical problems, (c) is interactive between environment and individual with a focus on 'job control' or decisional latitude as a determinant of strain, (d) includes social support as a coping mechanism, and (e) uses objective data on health factors as an indication of strain.

Research has shown that social support, occupational self-efficacy, and certain other job characteristics such as physical activity have moderating effects on strain development and its prediction (Kristensen, 1995; Theorell, Karasek & Eneroth, 1990; Schaubroeck & Merritt, 1997). It is believed each independent variable in this study is discrete and has an additive effect on the prediction of strain in faculty members. The current proposed study expands on use of self-efficacy in the Schaubroeck and Merritt (1997) study by using social support, which was also a recent addition to the model of Karasek and Theorell (1990).

The current study also extends findings from Jimmieson (2000) and Salanova, Peiro, and Schaufeli (2002) on the moderating effect of self-efficacy on the JD-C relationship and use of depersonalization scale of the Maslach Burnout Inventory and from the burnout as an outcome variable, respectively. This study will also clarify an earlier study by Schonfeld, (2001) that examined the positive effects of social support on depressive symptoms, self-esteem, job satisfaction and motivation to teach. Schonfeld did not find any significant effect from professional efficacy, locus of control or occupational coping. Karasek (1981) found those who had high demands- high control jobs also spent more time in active leisure activities than the others. Demerouti, Bakker, DeJonge, Janssen & Schaufeli (2001) reported that job involvement,

and self-efficacy varied with job control but not demands and that personal accomplishment (a subscale of the MBI) was highest for high demands and high control. Thus, some clarity on these interrelationships is still needed.

Many coping mechanisms such as job control and social support are well recognized for reducing negative stress symptoms or are anti-pathogenic. Exercise behaviors and self-efficacy have been shown to actually improve one's physical and mental health often and are known as salutogenic, or contributing to a healthy condition.

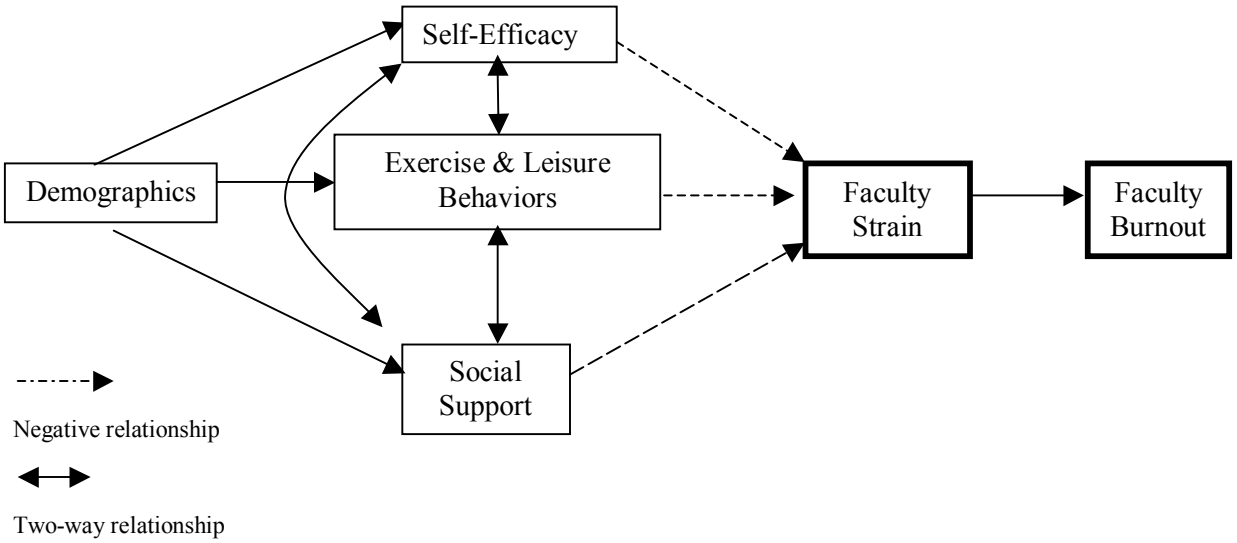


Figure 1: Theoretical Model of Study. Demographics influence self-efficacy, exercise & leisure behaviors, and social support, which are negatively associated with faculty strain. Faculty burnout is mediated by the strain symptoms.

The model used to examine faculty strain in this study addresses the issues relevant to post-secondary educators (figure 1). How the three moderator variables (self-efficacy, exercise/leisure behaviors, and social support) are correlated to faculty strain and burnout is the primary focus. Relationships of independent variables to each other and how demographic variables alter the relationships between independent and dependent variables are of secondary importance. Determining if the main three factors have similar effects in university faculty

compared to the general population and how faculty of different demographic characteristics eliminate or counter their strain in urban settings will not be examined in this paper, but may be areas of interest for future studies.

New Design Addresses Criticisms. One theoretical criticism of the Demands-Control model is that decisional latitude (job control) really consists of two sub-dimensions called a) skill discretion and b) decision authority, and these factors are not always correlated (Kristensen, 1995). Self-efficacy is inclusive of both skill discretion and decision authority; therefore, the correlation between them would affect the amount of self-efficacy expressed.

A methodological criticism was that many studies using the Demand-Control Model were based on large, representative samples with broad occupational categories and no specific job descriptions (Kristensen, 1995). This study will examine only faculty positions at only one type of institution. Although faculty who teach more may express different stresses than those who do more research, it is assumed that psychological demands will be similar across the population with differences depending on demographic and academic factors.

Definition of Terms

1. Stressor: any given physical or mental entity, which elicits a significant response or stress reaction (Henry & Stephens, 1994).

2. Stress: a disequillibrium of a system as a whole, in particular of the system's control capabilities. Biologic control systems include the brain, the heart muscle, and the psychoendocrine systems and also occur with cognitive function and interpersonal levels. (Karasek & Theorell, 1990, p.87). Stress itself will not be measured in this study but the physical manifestations of it (strain and burnout) will be measured.

3. Teacher Stress- "the experience by a teacher of unpleasant emotions such as tension, frustration, anxiety, anger and depression, resulting from aspects of his or her work as a teacher (Kyriacou, 1997, p. 156)."

4. Strain: is an overload condition experienced by an organism's control system when it attempts to maintain integrated functioning in the face of too many environmental challenges (Karasek & Theorell, 1990, p.87). The presence of a psychological or physical problem caused by the accumulation of stress that has not been coped with. Strain will be measured using the *"physical symptoms"* portion of the Job Content Questionnaire.

5. Burnout: a syndrome characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment occurring among individuals who do 'people work' of some kind. Burnout will be measured with the Maslach Burnout Inventory-Teachers' Edition (Maslach & Jackson, 1986).

6. Self-efficacy: "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet a given situational demand (Wood & Bandura, p. 408, 1989)." Two expectancies which influence self-efficacy are Outcome expectation, which is the belief that certain behaviors will lead to certain outcomes and self-efficacy expectation, the belief that one can successfully perform the behavior (Maddux, Sherer, & Rodgers, 1982).

7. Academic Self-efficacy: an estimate of confidence in one's ability to perform various tasks classified as research, service, and teaching in a university setting. (Landino and Owen, 1988, p.1) Academic self-efficacy will be measured using the Measures of Self-Efficacy for Academic Tasks by Landino and Owen.

8. Social support: a relationship with one or more other persons which is characterized by relatively frequent interactions, strong and positive feelings, and especially perceived ability and willingness to lend emotional and/or instrumental assistance in times of need. Social support will be measured with the Social Support sub-section of the Job Content Questionnaire.

9. Exercise: a sub-set of physical activities defined as planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness (Pate et al., 1995). Exercise will be measured with the *Exercise and Leisure Activities Survey* created for this study.

10. Physical fitness: a set of attributes that people have or achieve that relates to the ability to perform physical activity (Roth & Holmes, 1985, p. 164).

11. Demands-control-supports model: an occupational strain model based on the interactions of an individual's psychological job demands, the decisional latitude or control over one's actions, and the social support experienced on the job (Karasek & Theorell, 1990). The Demands-control-supports score will be measured with the Job Content Questionnaire.

12. Person-environment fit model of stress: a theory stating the individual's background and capability should be matched with the demands of the environment. The greater the mismatch the greater the likelihood of stress-related symptoms. (French, 1974).

Limitations and Delimitations

This study is limited in scope due to its sampling specificity, its cross-sectional- or single time point-design, survey method of data collection and correlational analysis technique. The study is not generalizable beyond the University of Californa, Irvine. Although universities in the Southern California share many common characteristics, they were not included in the sampling pool. This study is cross-sectional and does not involve data collected across the academic year; no adjustments are made for time of the year or socio-economic conditions. Data were collected by surveys completed by the participants. Thus, the potential for subject bias exists. This study is also limited to analyzing exercise behaviors by structured activity and non-structured activity not including daily living activity. Finally, this study is uses a correlational analysis of the data, which associates variations in one variable with variations in another. Therefore, no causal relationships may be inferred.

The delimitations in this study include four main areas. First, only tenure track faculty were sampled. Secondly, only faculty at the University of California, Irvine were selected. Third, the study was delimited to teaching faculty. Finally, the study is delimited to a four-year university in an upscale, large suburban environment with a small percentage of the student body from rural areas or living on campus. Other delimitations may include the time of year the study was conducted, and the Southern Californian location of the university.

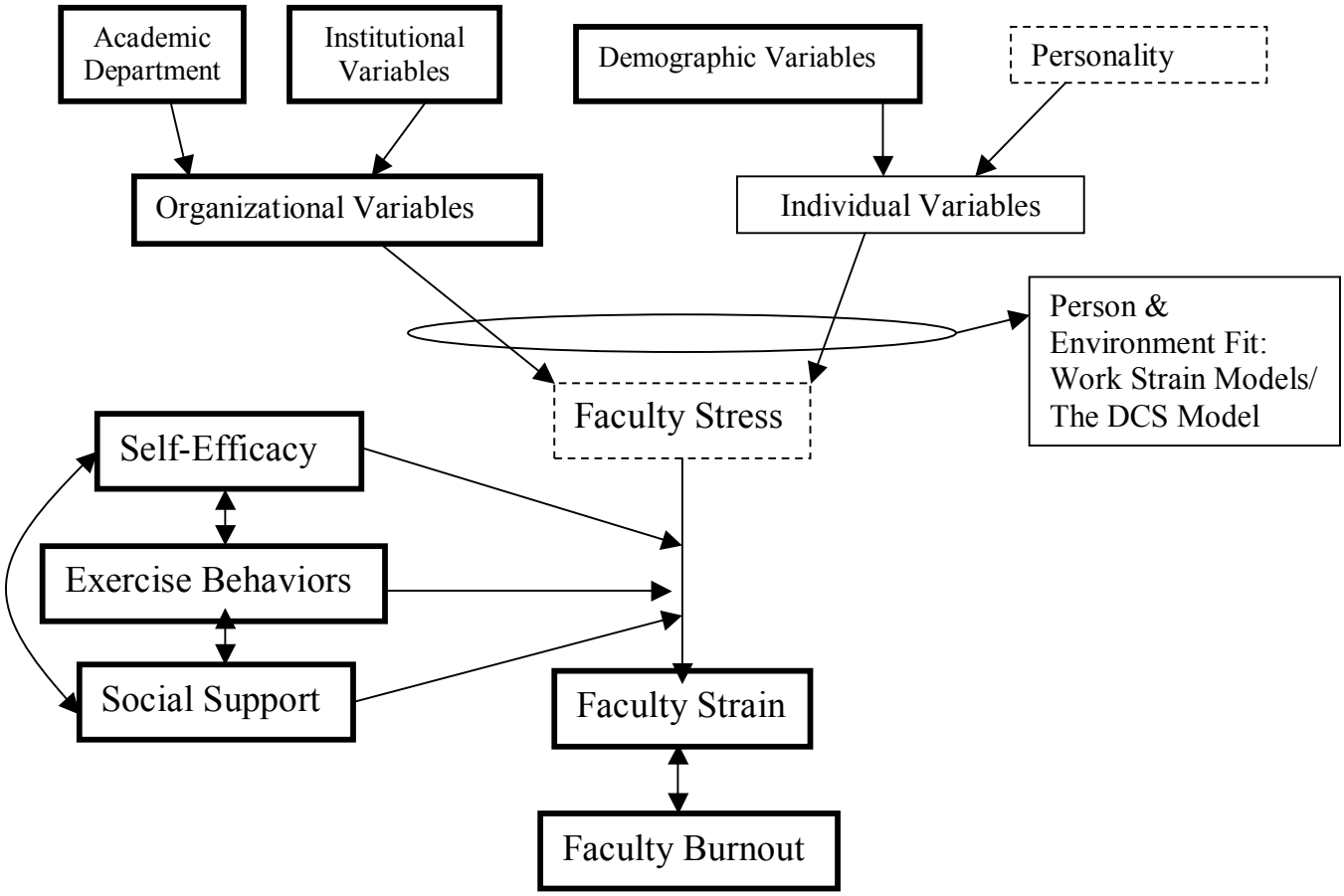


Figure 2: Overview of the Literature Review. The organizational and individual variables are collectively considered as demographic variables. Personality traits were not measured and are therefore represented with a broken line. The interaction of the person and environment determines the stress an individual experiences and the independent variables ability to counter the stress from developing into strain and then burnout is shown in the lower portion of the figure. Strain and Burnout represent the result of accumulated, uncoped with stress reactions.

The literature will review:

1. Institutional and Academic (Organizational) variables in University Faculty
2. Demographic, Personality (Individual) variables.
3. Person & Environment Fit models- Demand-Control-Supports model.
4. Relationships of self-efficacy, exercise behaviors, and social support on faculty strain and burnout.
5. The interrelationships of the independent variables to each other.
6. How stress, strain, and burnout are related to each other

CHAPTER 2: LITERATURE REVIEW

The purpose of this study is to examine traits that might effectively counter job strain in urban faculty. By correlating self-efficacy, social support, and exercise to various aspects within the work strain model, a greater understanding of psychological strain and burnout in a sub-set of university faculty may be revealed.

The literature review will be divided into five main sections: a) an introduction to stress, strain, and burnout in general, b) background on the Demand-Control-Supports (DCS) theory and how it relates to the current model in predicting strain, c) faculty strain, which includes the organizational and individual factors involved, d) a discussion of how the main independent variables counter faculty strain and burnout and e) an examination of how the independent variables are related to each other.

Section I: Overview of the Dependent Variables

A Multi-dimensional Approach to Predicting Strain

Understanding how the definitions of stress, strain, and burnout are used in this study is critically important. In general, stress is an individual's perception of some phenomenon that elicits a reaction in the body. Strain is the physical manifestation, either physiological or psychological, which results from continued stress reactions. Burnout is a psychological strain symptom, which is common in teaching and other human service professions.

The classic definition of stress, as developed by Hans Seyle (1956), described the reaction occurring from a perceived mismatch between the demands of a situation and the individual's ability to meet those demands. Being challenged too much or too little represents a stressful situation. McGrath (1976) and French, Caplan, and Van Harrison (1982) expanded the

original stimulus-response models of Seyle, by introducing the Person-Environment Fit Model (P-E Fit). This model proposes that stress arises from the mismatch of a person's needs with the demands of the environment. The Lazarus and Folkman (1984) model, known as a transactional model of stress, views the individual as an active participant who could cope with or counter imposing stresses such that: a) an individual's perception will in turn influence b) the emotional experience, and the individual then can choose c) to cope with the stressors or d) endure the chronic symptoms known as strain. Research later adapted these concepts into the workplace and included an individual's coping capacities to the perceived work demand, as well as specific stressors in the environment including other individuals (Gmelch, 1993). This study uses the transactional or person-environment fit model of strain development as it applies to the workplace.

When an individual's needs and the resources or opportunities in a worker's environment are matched, the strain is minimized or absent. The worker's needs by definition must include a sense of decisional latitude (control) about a work process, and support from peers and administrators or superiors. Demands of the task can vary greatly with no effect on the individual, but either too little or too much demand is likely to produce stress. The match of the person-environment is not a constant, but rather a dynamic between a changing environment and the evolving person. Some workers will have perceived control and enlist support while others may feel totally out of control and isolated in the same situations. In addition, some people have a higher "need for control" than others or may have a higher self-efficacy for their work tasks than their coworkers. These factors as well as learning or "active coping", can influence the strain expressed (Karasek & Theorell, 1990).

The two dependent variables in this study are strain and burnout. Conceptually, burnout will be viewed as an advanced state of strain. As researchers have learned more about the multiple interactions causing stress and strain, they have shifted their focus to the multiple interactions between the person and environment. This section will first discuss the definitions of stress, strain, and burnout and discuss how the independent variables are related to each contrast. The exact definitions of stress, strain and burnout vary depending on the source. Therefore, a brief description of the variables will be given.

Strain Development and Coping Mechanisms

Each of the three independent variables of this study has been previously shown to have direct and indirect effects on the stressors, the stressor's effect on strain, and the development of, or resistance to, strain or burnout. House's (1981) paradigm of stress views strain as a four-step process. The steps or stages include: (a) stressors (objective social conditions), (b) perceived stress, (c) short-term responses to stress, and (d) enduring health outcomes (physiological, cognitive/affective, and behavioral), which is referred to as "strain" in this study. In this paradigm, conditioning variables could affect or interact with each of those stages and the interactions between them. House (1974) conceptualized "coping" as an interaction of short-term responses on stressors, and "defenses" as an interaction of short-term responses on perceived stress.

House (1981) conceptualized how social support may have both a main effect on the stressors or health outcomes or a *buffering effect* on the interaction between them. House proposed three major ways that strain could be reduced: (a) removal of the stressors (i.e., someone could change jobs or have someone else at work who causes stress to be removed), (b) enhancing the non-work aspects of the individual's life (i.e., someone could take a vacation, go

through stress reducing therapy, or exercise), and (c) buffering the effects of stressors that produce strain (i.e., someone not responding the same way to a stressor so that it does not cause a stress response). He used the analogy of staying out of the sun, using skin treatments and vitamins, and using a sunscreen for each strategy, respectively. Although the physiological variables are not directly measured in this study, they provide a direct link between stressors and strain.

When the individual perceives stress, various stress hormones are released to cause various bodily responses. When these responses are continued a system will fatigue or breakdown. When a given stressor does not cause a stress reaction or strain symptoms, it has been "buffered" or "coped with." It is proposed that each of the independent variables in this study act upon all three of House's (1981) levels and upon the interactions between them.

Stress versus Strain versus Burnout

Stress. A stress response is the actual reaction of the body or mind to some external demand or force known as a stressor. By this definition, a stress may be positive (eustress) or negative (distress) to the organism. That is, a stress reaction may actually be in response to a pleasant stimulus, such as crying for joy, or yelling with enthusiasm, as well as an unpleasant one, such as crying in pain or sadness, and yelling with anger or fear. A stressor is therefore any given physical or mental entity that elicits a significant response or stress reaction and therefore may contribute to a work-related stress experience. This study will use the term 'stress' to denote distress or a negative bodily reaction (Seyle, 1956).

A particular entity may be perceived as a stressor by one person and not by another. Individuals can deal with or cope with a given stressor through some physical action or can adjust their psychological perception such that it is not harmful or does not induce a stress

response (Seyle, 1956). A given stressor will not affect all individuals equally, not only because of the "match" to the environment, but also because of the perception of the stimulus. For some, a given demand may not be perceived as threatening, whereas to another it may be perceived as overwhelming. Likewise, someone may be able to better cope with a given stressor due to inherent personality traits or cognitive techniques they have acquired (Lazarus & Folkman, 1984). Furthermore, the psycho-physiological reaction to a stressor may be more severe in some people, causing more severe health decrements. Variations in perception and reaction occurs in three different stages when a stressful stimulus elicits a physiological response:

- The perception of the stressor (which is influenced by the P:E match)
- The coping response to the stressor
- The lasting physiological or psychological reaction to stressors- known as strain.

The way one copes with job stressors can be through direct means- eliminating the stressor or mismatch of person and environment, or by indirect means- by reducing the physiological or psychological reaction which the person experiences (Lazarus & Folkman, 1984). These are sometimes referred to as problem-based or emotion-based coping. Sometimes both means are not available or utilized by the individual and chronic strain symptoms ensue.

Strain. This study will use the distinctions between stress and strain as developed by Karasek and Theorell (1990). Strain is the actual harmful reaction of some bodily system to repeated, uncoped with, detrimental stress reactions. Strains can be the physical or emotional manifestations of work related stress. Thus, a strain can be measured or observed and it is not beneficial to the individual's well being. For strain to be present, stress reactions must first be perceived, then they must exceed the coping mechanisms, and finally must accumulate in sufficient quantities to elicit a physiological reaction (strain symptom) such as high blood

pressure, heart disease, ulcers, headaches or as a mental reaction such as anxiety, depression, or burnout. The next section will discuss the burnout construct and its development as an advanced strain symptom.

Burnout: The construct and its development

Burnout is referred to as a condition exemplified by a withdrawn or apathetic condition. Thus, burnout is not distinct from strain but rather is a symptom of its continued presence. It occurs due to chronic strain experienced in one's occupation and the subsequent psychological or sociological pathologies caused from its prolonged presence. It has been previously shown that certain organizational and personal characteristics and levels of physical condition, which are not coping mechanisms, may retard or buffer against the negative health outcomes of burnout being expressed. Despite the particular definition, Maslach and Leiter (1997) found five common elements in burnout definitions across the literature:

1. A predominance of dysphoric symptoms such as mental or emotional exhaustion, fatigue, and depression.
2. An accent on mental and behavioral symptoms rather than physical symptoms.
3. Symptoms are usually work related.
4. The symptoms manifest themselves in "normal" persons who did not previously suffer from psychopathologies.
5. Decreased effectiveness and work performance occur because of negative attitudes and behaviors.

Most of the research on burnout characterizes it in terms of its similarities to other well-studied phenomena, the various dimensions of it, and how those dimensions differ with the occupational environment and individual characteristics. Some researchers have proposed that

the dimensions of depersonalization, emotional exhaustion, and perceived lack of accomplishment actually represent chronological stages. Similar to other research, the dimensions of depersonalization, personal accomplishment, and emotional exhaustion were considered least to most severe, respectively (Goliembewski, 1986). Burnout is particularly severe in human services professions, involves multiple dimensions, and affects mental health; thus it will be used in this study as a measure of psychological strain. Burnout is commonly described and measured by three dimensions in the Maslach Burnout Inventory (Maslach & Jackson, 1986). The dimensions include: (a) the cognitive withdrawal component of Depersonalization, (b) the psycho-physical component of Perceived Lack of Personal Accomplishment, and (c) socio-emotional component of Emotional Exhaustion. Although the three dimensions show some overlap, repeated statistical tests and path models have demonstrated that each is distinct (Maslach & Jackson, 1986; Golembiewski & Munzenrider, 1993).

Development of burnout. Burnout is considered a direct indication of occupational strain. Burnout is not distinct from strain but rather is a symptom of its continued presence. Freudenberger (1974) placed the phenomenon of burnout within the social context, and characterized it as individuals paying a "high cost" for "high achievement." Burnout has been described many ways since Freudenberger's original definition. The most widely accepted definition, developed from research by Maslach and Jackson (1986), is "a multi-dimensional syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that occurs among individuals who do *people work* of some kind" (p.1). Burnout is also conceptualized as a work-related syndrome that develops from a significant gap between expectations and actual successful professional performance (Farber, 1991).

Do Strain Symptoms or Burnout Come First? The premise in the model of this study proposes that continued strain symptoms eventually lead to burnout. Some investigators believe it could be that people who are less capable of tolerating stressors become burnout and then strain symptoms will present (Melamed et al., 1999). Blue-collar workers free from cardiovascular disease were examined to determine how burnout related to somatic and physiological hyperarrousal. The workers who displayed chronic burnout symptoms had higher levels of tension at work, post work irritability, sleep disturbances, and higher cortisol levels. Together these values do indicate a hyperarrousal state, which contributes to cardiovascular disease risk (Melamed, 1999). There are physiological correlates to burnout besides the well-documented psychological symptoms. Besides the people with higher burnout reporting higher job strain, less social support, and higher levels of anxiety and depression, and sleep impairments, the subjects had higher levels of Tumor Necrosis Factor- alpha and hemoglobin A1C which is indicative of enhanced inflammatory responses and oxidative stress (Grossi, Perski, Evengard, Blomkvist & Orth-Gomer, 2003).

The concept of burnout is being addressed separately from strain due to its unique measurement, and its specific appropriateness for the population being examined in this study. Although burnout can be described in terms of advanced stages of strain, it actually has statistical relationships to several concepts addressed thus far, namely self-efficacy, health status, perceived demand, and lack of social support (Blix, Cruise, Mitchell, and Blix,1994; de Rijk et al., 1998; Maslach & Jackson, 1986).

Burnout: An Advanced Stage of Psychological Strain. The negative response, or outward expression of strain, may take many forms from outward anger and hostility, or frustration and fear, to inwardly expressed physiological symptoms such as illness or heart disease (Karasek &

Theorell, 1990). Strain can be manifested as many physiological diseases or conditions such as immunosuppression, atherosclerosis, and hypertension, as well as psychological symptoms such as burnout, depression, and anxiety or behavioral dysfunctions, such as eating or drinking problems. In summary, burnout is a well-researched, thoroughly documented, phenomenon that persists in strained workers, such as university faculty, who are usually involved in helping people. The next section will discuss relationships of the independent variables to strain, the DCS theory, and to burnout.

Relationships of Demands-Control-Supports Model and Burnout

Occupational burnout results from the interaction of several entities involved with the DCS model including: dedication to a job, particular job demands, job control, self-efficacy, autonomy, and support from family, peers, students, and administrators. When control is afforded to the self-efficacious worker it is labeled an *active job situation*, and job demands can be quite significant without any resulting stress or burnout. Thus, a dual relationship may exist with demands and burnout (Karasek & Theorell, 1992).

Symptoms associated with burnout include low energy and depression; feelings of lack of control, and helplessness; lower motivation to engage in work; cynicism; and negative attitudes toward self, work, and others (Pines, Aronson, & Kafry, 1981). Friedman (1996) suggested that burnout progresses along two tracks: a cognitive pathway, which involves sensations of professional lack of accomplishment; and an emotional pathway, which involves sensations of overload, and emotional exhaustion.

Glass and McKnight (1996) developed a conceptual framework by linking control, burnout, and depression. The association was improved only after they combined the job specific traits of autonomy and participation in decision-making. They proposed that if one

consistently encounters conditions with no control or the lack of decisional control on the job, the person will become emotionally drained and develop depressive symptoms that could eventually become burnout. Landsbergis, Schnall, Dietz, and Friedman (1992) also found working men who had high demands and low control had significantly more burnout and job strain. However, those with social support expressed less strain (Landsbergis, 1988). Applying the transactional approach and relationships of stressors, stress responses, strain, and burnout to the workplace variables and the worker is the focus of the next section.

Section 2: Occupational Strain Models

Occupational stress or strain models are used to understand how aspects of work or its environmental demands affect an individual's psychology and physiology, and thus explain or predict the stressors and onset of strain. Some of the main components of these theories include workplace- demands, physical and mental control, rewards, and support. As discussed in the previous section, stress stimuli or stressors are commonly divided into factors outside the individual (organizational or environmental characteristics) and those within the individual (e.g. personal attributes, demographics, capacity for adaptation). There are many interactive models of occupational stress or strain, however this study will focus on the Demand-Control model (Karasek, 1979). This model integrates the person and environment fit to occupational characteristics and to strain symptoms.

The Work Strain Model

One theoretical framework of this study is based in the original *demands-control-* (DC) (Karasek, 1979) or more recently developed *demand-control-supports model* (DCS Model) or *work strain model* developed by Karasek and Theorell (1990). Their model was designed to

predict the accumulated effects of stressors and coping on the individual, specifically in the workplace. In their model, they propose that strain symptoms develop from a perceived lack of fit between the person and the job environment (Blau, 1980; Karasek, 1979). The lack of fit is between the psychological demands and the amount of personal control or decisional latitude one has on the job. Karasek, Russell, and Theorell (1982) initially found in several studies that when psychological work demands were high, and the decisional latitude was low, more individuals developed health problems. The ability to use one's skills, and authority to decide which job skills or strategies to use are the two components of job control or decisional latitude (Karasek & Theorell, 1990).

The DCS Model was chosen for this study because of several key features it possesses. The model is 1) multidimensional, 2) proposes that active learning is a stress coping mechanism, that perceived behavioral control (defined as decisional latitude) is the primary determinant of occupational strain development under conditions of high psychological demand and 3) it uses physical, emotional or behavioral problems as "hard evidence" of strain manifestations (Karasek, 1981; Karasek & Theorell, 1990). Figure 3 shows interrelationships between the Work Strain Model and the model used in this study. Coping mechanisms such as exercise, self-efficacy, or social support may act to both reduce the initial perception of stress as well as buffer against stress leading to strain symptoms. The dashed arrows that intersect the horizontal arrow between the boxes represent "buffering" effects. This study will not measure the buffering effects of the variables. Any differences in correlations will be attributed to both direct and indirect effects.

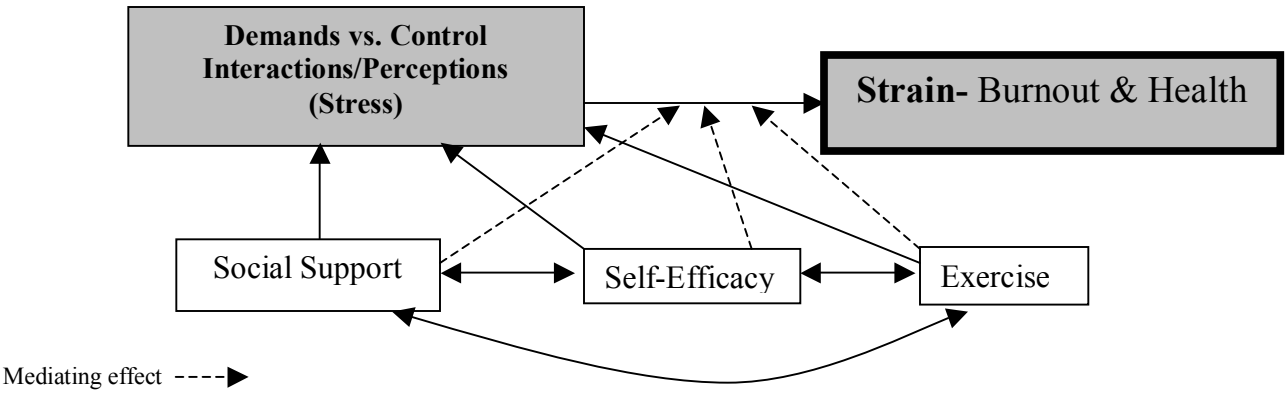


Figure 3: How Demand Control Theory fits in. Interactions between the three independent variables and job demands or job decisional control and the subsequent expression of strain in poor health or mental burnout.

Social support is part of the current model and the DCS model and decisional latitude or Job Control is very similar to self-efficacy in the central concepts. However, exercise behaviors are unique, in that the particular combination of exercise with self-efficacy and social support has not been examined. Many studies have examined exercise behaviors affect on attenuating strain symptoms and burnout. Some studies have even examined exercise and social support on strain or exercise and self-efficacy on strain (Manning& Fusiler, 1999).

Stress Resistance or Coping Skills

As previously mentioned, *strain* occurs when the chronic stress stimuli from work exceed the stress resistance or coping skills within that individual and this results in an actual negative physical or mental change. In the *Demands-Control-Supports (DCS) Model* or *Work Strain Model*, an individual has an active role in determining the effects of stressors. *Stress resistance* refers to those characteristics within an individual that counter or decrease the expression of a "negative outcome." Rewards, support, active learning, and physical action are commonly recognized stress resistance or coping mechanisms. Karasek and Theorell (1990) found that both social support and certain types of physical activity have significant moderating or buffering

effects on occupational strain development. Their current model associates physical problems, including health status and incidence of cardiovascular disease to psychological work demands, decisional latitude, and social support experienced or perceived by the worker.

Weaknesses in the Model

Although the DCS theory is widely used and was substantiated in early studies on large heterogeneous populations (Karasek, 1979, 1981, Theorell, 2001), several studies have been performed where it did not predict strain symptoms very well and support for it was inconclusive (Jones & Fletcher, 1996; Pieper, LaCroix & Karasek, 1989). Several studies have been performed to improve upon certain factors in the DCS that were not well controlled (Schaubroeck & Merritt, 1997; deRijk, LeBlanc, Schaufeli & deJonge, 1998). Recently, Kuper and Marmot (2003) studied a very large population across a mean follow-up period of 11 years. They found that people who were in the high strain condition (high job demands, and low decision latitude) were at the highest risk for heart disease. They did not find social support to affect this relationship and low decisional latitude was less consistent. In contrast, another very large and recent study in China found psychological job demands were not correlated to strain scores (Cheng, Luh & Guo, 2003). Cheng et al. concluded that their test closely corresponded to the Job Content Questionnaire and the lowest job satisfaction was found in high demand, low control, and low social support conditions. These many studies not supporting the model suggest the need for further research.

Another study closely related to this observed what would influence the acquisition of new knowledge or facilitate active learning. The study was testing the demand control model's theory on high demand and high control leading to active learning. The results showed high training motivation was associated with low task constraints and this was associated with

supervisor social support and positive self-efficacy beliefs (Carter, 2003). A previous study to Carter found self-efficacy moderated the effect between training method and anxiety. Tutorial method training was negatively related to anxiety in new comers with high self-efficacy and positively associated with anxiety in those with low efficacy (Gist, 1989).

A different study testing the active learning hypothesis found that the low strain condition or low demands and high control actually facilitated learning and self-efficacy better than the proposed high-demand and high-control. The longitudinal study also found that when jobs were transitioned from a low strain to a high strain condition, a strong deterioration of learning and self-efficacy occurred (Taris, Kompier, Delange, Schaufeli, & Schreurs, 2003). Thus, regardless of what demand and control condition maximized learning, self-efficacy was closely associated with learning and reduced strain. These authors concluded, "it seems fair to conclude that the evidence for Karasek and Theorell's (1990) active learning hypothesis is actually quite weak (p.6)". Another study by Kirkcaldy and Cooper (1993) found that exercise did not serve as a buffer in the stress-health linkage in British and German managers.

Section 3: Occupational Stress And Strain in Faculty

This first portion of this section deals with individual and organizational factors, which can affect faculty strain. Because each of these factors has different effects on faculty strain versus burnout, the two areas will be dealt with separately.

Overview of Faculty Strain

It is commonly believed that the university professor is protected from stress by the "ivory towers". However, demands placed on faculty in terms of their main duties (research, teaching, and service) as well as their diverse interactions with students, other faculty, and administration can cause great stress for even well-adapted faculty. Recent studies convey that

some aspects of being a faculty member are changing in the 21st century, with new stresses appearing such as caring for family, competition from online universities, and part-time faculty. However, some previously prevalent stresses such as university support and student-teacher relationships are becoming less common (Sax, Astin, Korn, & Gilmartin, 1999; Sanderson, Phua, & Herda, 2000). Faculty who are experiencing more stress than they can cope with are likely to withdraw from student-professor interactions, be less accessible to students and be less involved in the departmental decision making and committee work (Lease, 1999).

Eble and McKeachie (1985) found that 90% of the faculty studied were moderately to well satisfied with their roles in the profession. At Indiana University, it was reported that a good morale and little depression existed among the faculty surveyed (Sorcinelli, 1985). However, this state of low occupational stress found in the early and mid 1980s has been refuted by others, and vocational stress in faculty seems to be increasing over time (Sanderson, Phua, & Herda, 2000). Schuester and Bowen (1985) found more than half the faculty in American universities were actively seeking positions in other institutions and one third were considering changing careers. Their report suggested that, in the 15 years since America's faculty experienced its most robust state of health, there have been changes in working conditions and compensation that are eroding morale and jeopardizing the quality of education (Schuester & Bowen. 1985).

Other reports from the late 1980's and early 90's also state that both the perceptions and consequences of vocational stress in university faculty are prevalent in academia throughout the country. A survey of about 2,000 faculty from 17 colleges showed that 62% had severe or moderate job stress. It was reported that 40% of college faculty indicated a desire to leave the profession in the next five years (Cox, Kuk, & Leiter, 1989). This high stress and lack of work-

life balance is still quite prevalent but many faculty in New Zealand have learned to adapt (Houston, Meyer, & Paewai, 2006).

A faculty's discipline, race, and marital status impact the experiences of stress and strain (Gmelch, 1993; Smith & Witt, 1993; Smith, Anderson, & Lovrich, 1995). Alikah (1992) and the HERI studies conducted from the late 1980's to the late 1990's found that differences in stress in large urban universities depended on many factors including discipline taught, years of service, rank, gender, and salary. Other studies found stress increased in the first five years of a faculty member's appointment; that social support, administrative assistance, and collegiality were all important to maintain job satisfaction; and those qualities were especially lacking in this group (Olsen, 1993; Sorcinelli, 1985).

Many large studies focused on faculty job satisfaction rather than job stress due to a more permanent nature and the positive orientation of it. Although job satisfaction closely approximates strain and is closely related to the goals of administrators (Sax, Astin, Korn, & Gilmartin, 1999; Sanderson, Phua & Herda, 2000) it is influenced by many factors outside the control of studies and varies greatly (Schonfeld, 2001).

Organizational Variables Causing Occupational Stress in Faculty

This portion of the review will cover studies on organizational characteristics that cause stress in a majority of faculty members in the United States. Then it will examine individual differences in faculty stress perceptions and how interactions with specific environmental characteristics may augment occupational stresses that eventually cause strain or burnout.

Stimuli outside of the individual's direct physical and psychological control that elicits stress reactions are commonly referred to as environmental stressors. *Organizational variables* usually refer to a sub-set of environmental factors that pertain to occupational establishments.

Factors outside the individual such as academic discipline, departmental culture, institutional recognition and policies, resource allocations, institutional involvement, interpersonal relationships, occupational roles, and technological demands are considered organizational variables and have definite associations with stress and strain (Blackburn, Horowitz, Edington, & Klos, 1988).

Academic Discipline Affects on Faculty Stress. A study by Brown et al. (1986) used the Biglan classification system to determine if particular disciplines play a role in faculty stress. The Biglan system has three categories, each with two variables: hard vs. soft science, pure or applied science, and life vs. nonlife science. Faculty in pure-life science such as biology reported less role overload stress than faculty in pure-nonlife sciences such as chemistry; however, applied-life faculty, such as those in allied health fields had more role-overload stress than applied non-life (engineering) faculty. The stress of needing to secure financial support for one's research seems to be particularly prevalent in hard, life, pure, and hard, nonlife, Thus, the academic discipline itself or department one is a member of may play a significant role in the faculty stress experienced. Agago (1996) also found teaching-oriented faculty had more stress in time constraints and departmental influence categories versus research-oriented faculty who had more stress with professional identity. Both types had significant stress from reward and recognition and student interactions.

Corcoran and Clark (1984) found one's perceived scholarly reputation, based on publications, presentations at professional meetings, doctoral students, and research grants positively affect one's job satisfaction. Schultz and Chung (1988) conducted an interactional study on research productivity and job satisfaction on university faculty in a variety of

disciplines. They showed research productivity was not significantly related to job satisfaction, but institutional pride was correlated with pay.

Institutional Recognition: Monetary Rewards, Administration, and Colleagues. Recognition for performance has a direct bearing on subsequent motivation to perform a given action (Gmelch, Wilke, & Lovrich, 1986). Inadequate recognition was shown to be a major factor in faculty stress in the 1980's (Sorcinelli, 1985) and although improved, remained a stress factor in the 1990's. Of the five distinct dimensions found on the 45-item Faculty Stress Index (Gmelch, Lovrich, & Wilke, 1986), reward and recognition accounted for the most (55%) variance.

Studies in the 1980's as well as the late 1990's found inadequate organizational resources and low salaries to be major sources of stress (Hunter, Ventimigial, & Crow, 1980; Sax, Astin, Korn, & Gilmartin, 1999; Sanderson, Phua, & Herda, 2000). Bowen and Schuester (1985) found that low wages and deteriorating working conditions were causing the best teachers to leave the profession. Limited resources can also be stressful because of the need to secure financial support for research (Gmelch, Lovrich, & Wilke, 1984). In order to receive promotions, faculty must publish. In order to publish, faculty must perform research. In order to perform research, faculty often need grants. In order to receive grants, faculty must spend a great deal of time and effort applying for the grants, which are very competitive, as well as conducting and writing up their research. The *American Faculty Poll* show 62% of faculty throughout the nation felt that having institutional support for scholarly inquiry is very important but only 12% feel "very satisfied" with this support (Sanderson, 2000). A more recent survey found 61% were satisfied with their opportunity for scholarly pursuit, which is significantly up from 45% found in 1989 (Lindholm et al., 2003).

A lack of professional recognition as demonstrated by the ability to make academic and policy decisions was a major source of stress in the 80's, and recognition is still quite low. Gmelch, Wilke, and Lovrich (1986) found the departmental influence exercised by a faculty member caused significant faculty stress. In the late 1990's, faculty satisfaction with administration shifted from 52% in 1989 to 60% in 2002 (Lindholm et. al, 2003). While the shift is small, it is continuous and clearly demonstrates dissatisfaction with administration has shifted (Lindholm, 2003; Sax, et.al, 1999). Results of HERI surveys from 1989 compared with 1999, show faculty now have more positive attitudes toward their jobs, their colleagues, and their institutions. Likewise, increases were seen in faculty commitments and respect toward students, each other, and their perception of the institutional commitment toward the faculty as a whole (Astin, Korn, & Dey, 1991; Sax, Astin, Korn, & Gilmartin, 1999).

Faculty Interactions with Colleagues and Students. Social support from an individual standpoint is one of the independent variables in this study and will be dealt with in greater detail later in this chapter. In the mid 1980's, the interactions that faculty had with students, and that faculty had with department heads, was ranked as unsatisfactory in a survey by many due to under-preparation of students and a lack of mutual respect and trust from colleagues (Jacobson, 1985; Seldin, 1985). In contrast, the 2002 HERI study found increased faculty satisfaction with student preparation, with 44% of the faculty satisfied in 1999 compared to 38% in 1989, and it continued to improve up to 2002 (Sax, et.al, 1999; Lindholm et al., 2003).

Faculty members are still not totally satisfied with monetary support but are satisfied with institutional and colleague support. The gap between monetary and departmental recognition for research and recognition for teaching continues to exist. However, the level of autonomy, collegiality, and general institutional support are on the rise and stress from those factors is

declining. The next section will examine factors that are mediated primarily at the individual level, or involve inherently individual traits.

Individual Variables causing Occupational Stress in Faculty

Organizational variables and the work environment can significantly impact burnout, and job performance, and even lead to illness in teachers. However, strain is always expressed at the level of the individual. Personality traits, demographic characteristics, cognitive appraisals of the stressor, perceived control over stressors, as well as the ability to cope and enlist support systems, will all moderate one's expression of strain no matter what the organizational and cultural circumstances in the workplace. Factors outside the institution such as how people perceive the support they receive and their general outlook on life seem to strongly impact the way they perceive workplace stresses (Marcy, 1996).

The current study parallels another study that looked at self-efficacy and social support as moderator variables to the predicted strain, which occurs from high psychological demands and low job control. In a study by vanDick and Wagner (2001), they used the Lazarus model (person-environment fit model), which looks at the individual as an active component, who can adapt or cope with stressors, and they adapted it to educational settings. They used known factors for teacher stress such as role ambiguity, role conflict, mobbing and workload and measured their effect on absenteeism and burnout. They found those factors produced negative affect with diverse psychological (e.g. job dissatisfaction), physiological (e.g. high blood pressure), and behavioral (e.g. absenteeism) correlates. The results showed that individual teachers could influence this process where self-efficacy and perceived principal support moderated or buffered against the strain that developed from stressors.

Impacts of Spillover Stress. When professional life impacts one's personal or non-work life or vice versa, it is known as "spillover." Sorcinelli and Near (1989) examined the effect of spillover stressors according to gender and rank, how they all impacted overall job satisfaction and life satisfaction, and how policies impact these relationships. They found that job and life satisfaction had a high correlation implying that academics, work, and life are highly interrelated for faculty. This spillover was slightly lower for male faculty and the direction of the spillover (positive or negative impact) was significant for both genders, with negative spillover being higher in the females. A recent study on faculty stress by Lee and Phillips (2006) found interactive effects of being married with or without children, and effect of household duties. They found married or partnered with children actually had less job stress, and a significant relationship between household duties, being a parent, and teaching load stress. Finally the more independent a faculty felt, the lower their stress from research was.

Gryzwacz (2000) showed significant life-enhancing effects for positive spillover. Positive spillover was associated with better physical health, mental health, more positive well-being, and fewer chronic disease conditions. Marcy (1996) also found that general affect or one's feeling about life, significantly affected perceptions of occupational stress, and all coping mechanisms were enhanced by increased general affect. Lim (1996) also found this positive spillover effect in the form of support from coworkers or family. Support from other workers buffered against job dissatisfaction, and that looking for another job and support from family and friends buffered against life dissatisfaction with job insecurity. Personal and professional life stress should be recognized as inseparable in faculty in higher education and those who are happier use more coping mechanisms.

Stress Issues related to a Lack of Time: Faculty Work Demands. Lack of time may be considered either an organizational or individual stress factor. It represents a set of institutional demands that are too large and too diverse for faculty to control, which is known as *role overload*. The demands placed on faculty members are especially problematic due to the high self-expectations of faculty. Many faculty members will devote more time than expected to a given task in order to meet their own high standards. Therefore, a lack of time may actually represent a lack of control or efficacy in that individual as well as excessive duties placed on them.

The top three stressors in today's faculty are time pressures, lack of personal time, and household responsibilities (Sax, Astin, Korn, & Gilmartin, 1999). Gmelch (1996) looked at the problem of time management in university faculty and found not only that most were ill-equipped in time management techniques but also, as Sorcinelli and Near (1989) showed, faculty in different countries do not balance their lives with non-work dimensions. The highest rated stressor across all countries was lack of time. A study of nursing school faculty also found the "too much to do in too little time" was the top chronic work-related stress (Goldenberg & Wadell, 1990) or second greatest dimension of faculty stress (Gmelch, Wilke, & Lovrich, 1986).

Gender Effects on Faculty Stress. Even though women are still in the minority among higher education faculty, their relative proportion is increasing. The proportion of women faculty rose from 29% in 1989 to 36% in 1999, representing a 25% relative increase. The increase in the past four years has only been 2% (38% of total) (Lindholm et al, 2003). Study results have been somewhat inconsistent on the particular effects of gender on overall stress but in the past women faculty generally experienced more stress than men (Brown et al.,1986; Gmelch, Wilke,

Lovrich, 1986). This finding remains in more recent surveys as well (Blackburn & Lawrence, 1995; Hagedorn, 2001; Sax, Astin, Arredondo, & Korn, 1996).

Witt and Lovrich (1988) found male and female faculty members seem to experience stress differently in different areas of the workplace. Female faculty had more stress from research and less from teaching. This same gender specific trend was recently found in a study by Hagedorn, 2001, and in another by Lindholm et al, 2003. Thus, these authors concluded it is important to provide support to certain faculty groups in certain aspects of their careers.

Matuszek, Nelson, and Quick (1995) believed gender differences in occupational stress are due to unequal working conditions in the home and workplace. They found females spent twice as much time performing household activities and therefore suffered more from role overload; however, they suffered less from major stress related illness than men. This is supported by by Sax, Astin, Korn, and Gilmartin (1999) who reported that women continue to be more stressed than men, due to extra-vocational matters. A previous version of this study three years earlier showed both vocational and extra-vocational stress was greater in women and has increased more in women since the 1989 study. The 1999 HERI study found women were more likely than men to report stress from managing children and a household (81% to 66%) and spent more than 17 per week hours tending to those duties (31% to 15%). Therefore, it is not surprising to find that 24.8% of women, compared to only 4.3% of men, interrupted career for health or family. Also, it is not surprising to see greater stress levels in women due to a lack of personal time (88% to 75%) (Sax, Astin, Arredondo, & Korn, 1996). In addition, women more likely to consider leaving academe for another job and less likely to be satisfied with their job security (68% compared to 78%). Top stressors in both genders were: 1) time pressures, 2) lack of personal time, 3) household responsibilities, 4) teaching load, 5) students, and 6) colleagues.

Household responsibilities were actually a greater stress for men (5% to 3%), whereas women felt more stress from childcare, children's problems, and care of an elderly parent (Sax, Astin, Korn, & Gilmartin, 1999).

Many of the differences between men and women in stress and pay could be equated to variations in rank, type of institution, and research productivity. The 1999 HERI study reported that women are underrepresented in prestigious institutions, and over represented in two- and four-year colleges. The trends in research productivity for men versus women faculty have not changed in the past four years for those in the high research productivity category (Lindholm et al., 2003). Women earned approximately 81 cents to the dollar compared with men; however, when equated to academic rank, women earned between 91 and 95 cents to the dollar (Sax, Astin, Korn, & Gilmartin, 1999).

Brown et al. (1986) found that although women had greater stress, they had better social support systems and coping skills, and therefore did not experience greater strain. Doyle and Hind (1998) confirmed the finding that women faculty are more likely to express or "talk about" their problems as a means of coping. This strategy can be noticed by women reporting more stress in all areas of faculty duties, yet lower rates of burnout.

In contrast, Landino and Owen (1988) found being female was associated with participating in fewer networks, feeling less mentored, and not feeling rewarded by their departments. These factors, along with producing fewer articles, were also indirectly associated with decreased research self-efficacy and subsequently lower rank. Landino and Owen did mention that females in departments with few cohorts or role models experienced these negative factors, whereas those in departments with several female faculty did not experience more stress.

To summarize this section, women seem to be experiencing stress from less pay, subtle discrimination, and household or extra-vocational duties. Women are in lower level universities, hold lower level positions, and perform less research. These discrepancies for women seem to be changing; however, the need to perform extra-vocational activities is not.

Ethnicity Effects on Faculty Stress. The increase found in women hired as faculty in the 1990's, does not hold true for minority faculty. Caucasians still make up about 90% of the faculty, which reflects the few minority doctoral degrees awarded (12% of all doctoral degrees). Smith and Witt (1993) examined stress in African American faculty to determine differences between racial groups. They looked at stress in 2,095 faculty and found blacks to have more stress from research and service activities but not more in the teaching category. They found non-teaching sources of stress such as committee meetings, and student advisement were higher for black faculty.

Thompson and Dey (1998) used the 1989 HERI survey from UCLA to determine sources of stress in African American faculty. Four main stress factors emerged in the analysis: 1) time constraints, 2) home responsibilities, 3) governance activities, and 4) promotion concerns. African American women faculty had greater levels of stress than men in all areas, particularly time constraints and promotion concerns. Stress caused job dissatisfaction and the more stress African American faculty experienced from promotional concerns, the less satisfied they were with professional and social relationships and their overall jobs. The investigators stated that society's low status assigned to African Americans combined with their under-representation in higher education, as well as stress from a lack of resources to meet demands, negatively influenced the desire of blacks to become faculty members (Thompson & Dey).

Age and Years in Rank Effects on Faculty Stress. The 1996 HERI study showed lower stress levels with increasing age across all categories. This is in agreement with an early study by Blau (1981) who demonstrated a strong negative relationship between length of service and job strains. In the HERI study, the greatest differences in age-related stresses (comparing under 35 to 65 and over) were associated with research or publishing demands (61% to 20%), personal finances (75% to 36%), teaching load (75% to 37%), the review/ promotion process (66 to 31%) and students (72% to 47%).

Vocational stresses seem to shift with age, as stress associated with faculty meetings, committee work, and colleagues was highest in the middle-aged groups and lower in older aged groups (Sax, Astin, Arredondo, & Korn, 1996). Oddly enough, stress factors such as inadequate rewards and research, departmental influence, and student interactions did not decline with age (Gmelch, Lovrich, & Wilke, 1986; Seldin, 1987). Stress levels for physical health and care of an elderly parent increased with age, except for the over -65 group, whose parents had likely died (Sax, Astin, Arredondo, & Korn).

Age is most often related to experience. A "newcomer" is someone who has recently been hired into a university (Lease, 1999). Although newcomers are most often younger faculty, the term is not age-specific. Common stressors experienced by young faculty are conflicting demands and lack of balance between leisure and work. Young faculty are presented with many obligations in their personal lives such as being a spouse, parent, child of aging parents, and involved citizen. When faculty carry stresses from one portion of their lives into another portion (e.g. from work to home) it it known as "spillover". This is common (50% prevalence) in faculty and seems to decrease with time and rank (Sorcinelli & Near, 1989). It was found that time constraints were the predominant source of stress among new and junior faculty. Olsen (1993)

found that faculty job satisfaction significantly decreased, and there was a borderline increase in stress in between the first and third years of a faculty's career. There was a significant correlation between job dissatisfaction and stress levels reported for both first and third year faculty. Data showed colleague support decreased the most in the intervening two years while autonomy, challenge, and accomplishment increased.

Effects of rank on stress, strain and subsequent health. Richard and Krieshok (1989) found differences in stress and strain for rank and sex interactions but no differences for either category alone. The difference between an assistant and associate professor, was significant across all five types of stress. Although male assistant professors experienced higher levels of strain than females, the male full professors experienced less strain than the female full professor. In addition, male faculty seem to exercise less and had lower personal care scores than female.

Differential effects of rank (tenured versus untenured) affect relationships among research burnout, reward and job satisfaction. Gmelch, Wilke, and Lovrich (1986) reported that each dimension of faculty stress was statistically different between tenured and untenured faculty. In summary, faculty rank, independent of age or number of years in a given rank, influences faculty strain and burnout due to privileges, additional responsibilities, and job security issues that accompany higher rank.

Interactional Effects of Stress and Demographics in Urban Universities

A dissertation study by Alikah (1992) was very similar in scope to this study. Alikah observed the effect of demographic and institutional variables (salary level, sex, academic rank, university type, age group, marital status, and level of classes taught) on standardized stress scales of faculty in large urban universities in Texas. Alikah used the nine indexes of stress from

the Faculty Stress Index (FSI) developed by Gmelch (1982) to get the dependent variables. These included: service, research, teaching, reward/recognition, time constraints, departmental influence, professional identity, student interaction, and total instrument. influenced stress responses in full-time faculty in three with enrollments of at least 10,000.

Dependent variables included service, research, teaching, reward/recognition, time constraints, departmental influence, professional identity, student interaction and the total instrument. The faculty were categorized according to eight (independent) demographic variables: salary level, sex, rank, university, age group, marital status, tenure status, and level of class taught. Results of Alikah's study showed that stress among faculty by demographic variables for the three traditional duties varied most on research, followed by service, then on the teaching scales. Lower levels of stress were seen in older, lower ranking, lower salaried, and faculty teaching only one type of class. Females, middle aged groups, and the assistant professor group had higher levels of stress. The reward, recognition, and departmental influence scales showed the fewest differences and research and professional identity scales had the most significantly different stress. Because Alikah did not compare urban to suburban schools, the location effect was not directly studied.

University Faculty Burnout

Burnout is a malady that is common among people in helping professions. It also tends to occur in people with a high level of drive or expectations of themselves. Thus, K-12 and university faculty are prime targets of burnout and strain especially with the highly competitive conditions found in university settings in the 21st century. Studies have shown a strong relationship between work stress and burnout in many occupations (Prosser et. al, 1997;

Westman & Eden, 1996). Most of the studies have found burnout is a product of work demands (Zohar, 1997).

Burnout has had a major impact on the educational system. Personal accounts from teachers and helping professionals led to the original burnout construct. Recognition of low morale as a serious problem in teaching has become more evident in the last 20 to 30 years. As early as the 1960s, reports of burnout in the human services professions began to appear. As the reported incidences increased in the 1980s, researchers began to question the sources of burnout in faculty (Seldin, 1987).

Effects of Social Support and Academic Discipline on Burnout

Because emotional and physical withdrawal is a key component of burnout, social support is one of the key factors in its prevention. A supportive boss and colleagues make work situations less exhausting, reduce work tension, make situations less cognitively threatening, and this support may increase feelings of personal accomplishment by adding fulfillment and motivation enhancement. Given this relationship, Neumann and Neumann (1991) investigated the determinants and correlates of faculty burnout in research universities using the Maslach Burnout Inventory (MBI). The researchers investigated discipline, organizational commitment, and research publication factors. They found indicators of emotional exhaustion were strongest for hard sciences vs. soft and more for pure vs. applied sciences. Emotional exhaustion was also strongly related to organizational commitment and recently published articles. The researchers believed that support mechanisms may be more effective in preventing burnout in disciplines where faculty are faced with high certainty in experimental outcomes, and that emotional exhaustion is more common in disciplines in which faculty have with more articles published.

In a similar study Singh, Mishra, and Kim (1998) used intrinsic and extrinsic rewards and mismatches between perceived efforts and rewards to examine research-related burnout in higher education faculty. The investigators surveyed 328 faculty on their intrinsic motivation to perform research and their perceived lack of rewards from doing research. It was assumed that a lack of rewards would not be as important to untenured professors because gaining tenure was the primary reward to be gained. The relationship between research-related burnout and job dissatisfaction was indeed critical to non-tenured faculty, as burnout may lead to denial of tenure status. The tenured faculty may have put energies toward other endeavors, if their interest in research had waned. Results showed intrinsic motivation and perceived lack of research-related rewards explained 81% of the variance in burnout for untenured faculty and 74% for tenured faculty. Research-related burnout led to lower job satisfaction in untenured faculty, whereas tenured faculty did not have this issue (Singh, Mishra, & Kim, 1998).

A study by Kim-Wan (1991) showed marital status, professional rank, and teaching experience were predictive of burnout in that those who were single, of graduate status, and had less than five years teaching experience were more burned out. Personal accomplishment was also predicted by coworker support and opportunity for nurturance. Thus, a teacher, when supported by colleagues and students, and recognized for abilities and merits, will not suffer from burnout as often. Pollicino (1996) showed that academic climate has a significant effect on faculty satisfaction. He also found self-efficacy was related to collegiality or social support, and decisional latitude. Thus, collegiality or the psychological support given from peers or institution will reduce strain and burnout, and will increase self-efficacy and job satisfaction.

In the studies mentioned, factors related to burnout seem to parallel those of strain and they seem to be reciprocally related to self-efficacy and social support. Both organizational and

personal factors can affect strain and burnout. Faculty who are female; non-white; younger; newcomers; of lower rank; and those in institutions with less collegiality, administrative support, and higher research expectations have higher stress and are more likely to have strain symptoms including burnout.

Section 4: How Independent Variables Relate To Dependent Variables

Exercise Effects on Reducing Strain

Exercise, like the other terms, can be interpreted quite broadly. In this study, "exercise behaviors" will represent any activity an individual performs to enhance or maintain a state of physical or mental performance. Based on the abundance of literature, this study considers participation in regular exercise or active leisure activities as a stress coping technique and individuals who exercise regularly are likely to have perceived control over their health status. Activity that is under a person's control tends to enhance his or her sense of efficacy. Exercise or intentional physical activities may thus serve to enhance the perception of self-efficacy. Therefore, physical activities that someone actively seeks out to reduce stress and not negatively affect health will also be examined. These types of activities are therefore referred to as "exercise behaviors" in this study.

Several studies have shown the strong effects yoga has to improve bodily pains such as carpal tunnel syndrome or other repetitive stress injuries (Garfinkel et al. 1998; Lassater, 2001). It has also been shown to enhance morale and communication skills at work and overall feelings of wellness (Payne, 2000; Taylor, 2001). A recent study observed men with previous coronary artery disease for a year to investigate the benefits of yoga and moderate aerobic exercise and dietary and risk control versus an American Heart Association step I diet and risk control program. The yoga group was significantly improved for angina episodes, exercise capacity,

decreased body weight, and blood lipid profiles when checked a year later. Angiography showed significantly less lesion progression as well (Manchanda et al., 2000).

In another study, the use of progressive muscle relaxation training served to not only lower the salivary cortisol levels but it significantly lowered heart rate, state anxiety, and perceived stress (Pawlow, 2002). Tai Chi Chuan has also been shown to help many health related factors. Data showed significant decreases in blood pressure, total cholesterol, and anxiety and increases in HDL cholesterol (Tsai, Wang, Chan, Lin, Wang, Tomilison, Hsie, Yang, & Liu, 2003). Thus, like structured exercise, yoga and Tai Chi Chuan may have positive health consequences.

Exercise reduces strain in several ways. Exercise appears to counter strain in several ways including: a**)** improving general well-being and mood, direct physiological changes, resulting in stronger (better functioning) and more resilient systems, b**)** psychological changes often noted by enhanced mood, positive affect, general well-being, and decreased anxiety and depression., c**)** psychosocial changes resulting in improved positive self-image and self-esteem, which changes the perceptions of a given stimuli to be considered a challenge rather than a stressor and, d) psychoneuroendocrine changes, resulting in diminished physiological reactions to a stressor and enhanced immune reactions Therefore, exercise is a multifaceted and comprehensive strain moderator and these complexities will be discussed.

Previous studies reveal exercise can reduce stress responsivity, which is the physiological response to a given stressor (Roth & Holmes, 1985). Some researchers have reported that attentional focus may be shifted away from stressful times toward more stress-releasing foci during exercise (Jaret, 1995). Still other researchers believe self-mastery and self-efficacy are enhanced (Simons, McGowan, Epstein, Kupfer, & Robertson, 1985) and subsequent stress is

actively dealt with and diminished. In addition, when one has a low perception of mastery of a given task, it is often accompanied by a tendency to deny the importance of a problem (Knox, 1988). Furthermore, exercise participation has been linked to other behaviors and attributes which increase one's state of well-being and diminish strain symptoms. Likewise, those who have workplace stress are less likely to find time to exercise which of course may cause further stress and continue the negative cycle (Payne, 2002). Another study found those who had negative mental health also tended to have a perceived worsening of health, perceived illness, increased anxiety regarding health, increased alcohol and smoking related behavior, decreased physical exercise, increased in stress and more difficulty dealing with stress. Type A behavior was also related to the number of stress factors and health practices in males but not females (Irie, Miyata, Nagata, et al., 1997).

Exercise as a Strain Modifier: General Well-Being and Mood

The term "general well-being" refers to a multi-dimensional state of optimal functioning within an individual. Dimensions of well-being include: the cardiovascular system, immune system, mood state, mental disease state, and psychosocial dispositions. According to the current American College of Sports Medicine (ACSM) *Guidelines for Exercise Testing and Prescription*, *5th edition*, (Williams & Wilkens, 1995) exercise has been reported to reduce both the psychological and physiological reactions to stress. A large amount of data suggest exercise enhances mood and feelings of well-being as well as reduces the negative reactions to stress. In a study by Hahn, Teutsch, Paffenbarger, and Marks (1990), exercise reduced the incidence of anxiety and depression, enhanced feelings of well-being, and enhanced the performance of work.

The exact mechanisms by which exercise improves mood are still unresolved. There have been several studies supporting the positive effect of aerobic exercise on mood during and after

an exercise session (Steptoe & Cox, 1988). There have also been reports of exercise improving recovery after negative life events (Kobasa, Maddi, Puccetti, & Zola, 1985; Roth & Holmes, 1987). Aldana, Sutton, Jacobson, and Quirk (1996) found in their population-based study using over 32,000 people, that those who performed a certain level of activity (225 Calories/day) during leisure-time activities were 62% and 85% times less likely to experience moderate or high perceived stress, respectively. Thus, even after they statistically controlled for confounding variables, working adults who do more leisure time activity are less likely to experience stress. The results of this study were supported by an investigation (Rosengren, Tibbin, & Wilhelmsen, 1991) that found 37% of the subjects who reported low activity reported high stress. Both studies clearly showed a strong tendency for those who remain sedentary to have an increased incidence of stress and depression.

Psychological benefits of exercise. Characterizing the relationship between exercise and employee responses to work stressors is a difficult task due to the number of constructs that need to be related to variability in responses among individuals. Three main modalities have been used to examine the stress reducing effects of exercise (Landers, 1994) which include: 1) chronic exercisers and sedentary people giving self-reports of life stress or stress symptomology, 2) the reactions of chronic exercisers and sedentary groups to an acute psychosocial stressor, and 3) effects of an acute bout of exercise on psychosocial stressors.

Exercise may cause long and short-term psychological enhancement, which is responsible for both psychological well-being and the motivation to continue exercising. Folkins and Sime (1981) showed psychological benefits included reduced anxiety, elevated mood, resistance to psychological strain, and reduced anxiety in the presence of a stressor. In addition, work-site fitness programs have been associated with improved self-concept as well as reduced anxiety,

depression, absenteeism, and employee turnover (Norvell & Belles, 1993) as well as enhanced self-motivation, optimism, positive affect and health locus of control (Dishman, Ickes & Morgan, 1981). A more recent study expanded these findings showing a combination of aerobic and resistance training improved both mental health and quality of life measures in a group of employees in a randomized controlled 24-week study. Several measures were used in the study including: mental health, vitality, general health, bodily pain, physical functioning, depression and stress. Thus, exercise in a multi-modal fashion improved many strain-related symptoms (Atlantis, Chow, Kirby, and Singh, 2004). Several studies have also shown decreased anxiety and depression, enhanced feelings of well-being, and enhanced performance at work in more physically fit individuals (Hahn, Teutsch, Paffenbarger, & Marks, 1990; King, Taylor, Haskell, & DeBusk, 1989). There is still more need for research, however. A study by Kirkcaldy and Cooper (1993) found that exercise did not serve as a buffer in the stress-health linkage in British and German managers. Results showed no difference in occupational stress profiles between exercisers and non-exercisers.

Exercise as a Strain Modifier: Effects on Physical Health

Exercise is suggested to act as a buffering effect such that a given stressor has a reduced stress response and a given stress response results in fewer and less severe strain symptoms. Brown and Siegel (1988) and Roth and Holmes (1985) found a buffering or protective effect of activity levels on strain symptoms such as sickness and doctors' visits, as well as an enhancement of self-esteem and lower depression and life stress scores. Those who had low scores on aerobic capacity made significantly more visits to health centers during periods of psychological distress, whereas those scoring high on the fitness test were unaffected by psychological distress. Even after controlling for type of job, those who expended more energy

in leisure time were less likely to have moderate or high-perceived stress. Brooke and Long (1987) also found increases in the ability to cope with psychosocial stressors were linked to physical fitness.

A perceived increase in self-efficacy and self-schemata also develops with exercise training, which also offers a buffering effect against strain symptoms such as increased sickness (Long & Haney, 1988; Rudolph & McAuley, 1995). Karasek and Theorell (1990) stated, "…regular exercise as well as daily relaxation exercises, clearly self-controlled activities, can lower baseline levels of heart rate and blood pressure and possibly increase tolerance to stress-which is further evidence that regenerative activity may take place during both active and relaxed states " (p.109). However, there seems to be an optimal amount of exercise. Training that is too intensive may increase susceptibility to illness from the production of immuno-suppressant stress hormones and elevated circulating cytokines (Fitzgerald, 1988; Smith, 2000). This overtraining phenomenon has been found in several studies and it demonstrates too much of a good thing, isn't a good thing (Mackinnon, 1994). Thus, finding out how much, how hard, how often and what type of exercise to do to maximize strain reduction will be discussed.

Quantifying Exercise Effects on Psychological Benefits

Petruzello, Landers, Hatfield, Kubitz, and Salazar (1991) found the longer the conditioning regime, the better the psychological improvement. They also found a training period of at least 10 weeks was necessary for significant reductions in trait anxiety. Studies have demonstrated a reduced anxiety response to stress in more highly fit human subjects, despite no differences in subjective responses (Crews & Landers, 1987; Holmes & Roth, 1985). A review of exercise studies found that there was no relationship between exercise intensity, the condition of the individual and the stress reduction effect of exercise. The review did state that rhythmic

exercise such as walking or jogging tended to be better for stress reduction, and that endorphin effect was rare to non-existent in most exercisers. It also stated the deep breathing may induce relaxation but the increase in body temperature was not a factor for strain reduction (Jaret, 1995).

The psychological benefits of regular exercise in treating depressed patients (Klein, Greist, & Gurmann, et al., 1985) as well as improved well-being in normal patients (Taylor, 1989) have been widely documented. Ross and Hayes (1988) utilized a large general population sample (n= 401), and statistically controlled for socioeconomic status, age, overweight, and education. They found exercise to be associated with improved psychological well-being, including decreased depression, anxiety, and malaise. The level of exercise necessary to elicit an effect was moderate and often non-aerobic in nature.

Resistance Exercise is also Psychologically Beneficial. The effects of varying levels of strength training in sedentary senior citizens (age 60-84) upon physiological (strength and VO2max, cardiovascular reactivity), and psychological parameters (physical self-efficacy, mental well-being), were evaluated after 12 weeks with 3 sessions per week. All experimental groups improved strength, body composition, physical self-efficacy, mental well being, and lowered their blood pressures, with no change in VO_2max. Thus, weight training promoted overall quality of life, mental well-being, and confidence in the elderly (Tsutsumi, 1997).

The intensity of the resistance training seems to be associated with positive mental states. Very high intensity exercise combined with "muscle building nutrition" was highly effective in improving overall self-esteem and countering depression. Follow-ups at four- and eight-weeks post-training demonstrated the lasting positive mental effects of an intense weight training program (Pendola, 1995). In summary, both endurance and resistance exercise not only reduce stress directly by reducing physiological symptoms, but they also reduce or buffer against the

physical and mental illnesses normally associated with excess stress or strain as well as improve mental health (Taylor, Sallis, & Needle, 1985).

Exercise as a eustress. Several of the experts in the field are beginning to examine the other side of the stress picture, namely eustress or what was referred to earlier as salutogenic responses. Considering Hans Seyle's original definition of distress and eustress (1975), stress can also be the impetus to accomplish a given task or an exciting exhilarating force. Thus, stressors should be identified as leading people to both higher levels of health and to deleterious outcomes. Meier (1994) contended that researchers are not paying enough attention to the positive aspects of stress and that a lack of good stress may be more harmful than some distress. Competition or intense sports are good for providing intrigue and facilitating exhilaration. According to Meier, distress or a lack of good stress can be linked to deleterious health effects (strain) and exercise participation is associated with decreased levels of strain. Exercise may provide a positive psychological stimulus that acts to reduce negative effects of harmful stress.

Exercise and Job Stress or Satisfaction in Faculty

Although it has been shown that exercise can reduce stress and strain in the general population, the concern of this study is on the effects exercise has on faculty. Several studies have shown exercise behaviors do, in fact, improve health and well-being in faculty as well (Grant, 1991; Horowitz, 1985; Siggia, 1996). Horowitz (1985) found that a wellness program for faculty and staff, which included exercise, lifestyle literature and progressive muscle relaxation, performed 3 times a week for 12 weeks, had beneficial affects on body cathexis, symptoms, and job satisfaction. The positive moderator and strain symptoms experienced by those in the wellness program are associated with reduced morbidity and mortality costs and improved quality of life. From the results in a survey by college faculty in Canada, recommends

included that regular workshops on stress management, relaxation, biofeedback, cognitive restructuring be held, to encourage a regular fitness and wellness program (Grant, 1991). A study in the U.S. showed that those who had a higher level of perceived physical fitness also indicated higher job satisfaction and lower job-related stress. Overall, faculty seemed to feel well-conditioned and low levels of job-stress (Siggia, 1996).

Self-Efficacy Effects On Reducing Strain

Self-efficacy is being incorporated in this study to better describe the perceived control and competence one has in his/her job and how those factors mediate the expression of strain symptoms including burnout. Self-efficacy, like exercise, seems to be higher when lower strain conditions are present, especially when job control is high. Several characteristics are associated with people who do not readily develop strain symptoms. The common element of these people is their perceived personal control, or the perceived capacity to execute a given action to accomplish a desired outcome. Karasek and Theorell (1990) have proposed that people in high demand and high control jobs will develop the capacity to actively learn a new technique which lower the stress of the work task and builds one's self-efficacy for work tasks, which further causes one to engage in new learning and continue the cycle. This theory parallels the self-efficacy concept from Bandura (1977).

In behavioral science, the term self-efficacy refers to the perception persons have about their ability to accomplish a given task well enough to achieve a given goal, which is meaningful to the individual. Bandura originally described self-efficacy as "an individual's belief that he is capable of engaging in or executing a behavior to produce the desired outcome" (Bandura, 1977, p.193). Self-efficacy is not a global trait; rather, it is specific to a given talent or attribute and in

a specific context. However, it can have transference to related areas and can be manipulated in adults (Gist & Mitchell, 1992).

Self-efficacy has been shown to both reduce the perception of a given stressor as a threat and the amount of sickness and health problems in a given occupation. In social cognitive theory (Bandura, 1986), self-efficacy directly influences the perception of controllability and resulting stress reaction to a specific situation. The primary difference between perceived control and self-efficacy is the belief that one can mobilize the motivation, cognitive resources, and courses of action needed to effectively meet the demands of the situation. Simply having control or decisional latitude does not mean one will use it effectively to reach an intended goal. It is analogous to being a registered voter with the opportunity to vote how you want (decisional latitude), but you do not believe you can either get to the polls (elicit action) or your candidate will win (intended goal) so you end up not voting.

Self-Efficacy Effects on Physiological Responses. The actual physiological reaction to stresses or fear is reduced or nullified by self-efficacy. Bandura, Reese, and Adams (1982) found autonomic arousal as measured by heart rate and blood pressure was not significantly raised when efficacy was high but it was raised when efficacy was only moderate. Likewise, Bandura , Taylor, Williams, Mefford, and Barchas (1985) examined three different stress hormones in response to varying levels of self-efficacy in different tasks. They found no increase in high efficacy tasks and significant elevations in moderate self-efficacy conditions and subjects declined to perform the low efficacy conditions due to extensive fear.

Self –Efficacy as a Strain Modifier: Occupational Strain and Burnout

Fisher (1984) reviewed several studies showing lower control in difficult situations may reduce the stressfulness experienced by people with low self-efficacy because it enables them to

make situational attributions for failures and thereby protect self-esteem. Wortman and Dunkel-Schetler (1979) showed possessing high self-efficacy may be harmful when the individual lacks control over outcomes. People with high self-efficacy become frustrated when efficacy beliefs are challenged by the uncontrollability of a situation. Self-efficacy, like exercise, seems to have a buffering effect against occupational circumstances causing stress, and certain negative effects which stress tends to elicit. Studies support anxiety and stress buffering effects of self-efficacy (Singh, Clements, Fitarone-Singh, 1996; Jex, & Gudanowski, 1992; VanYperen, 1998; Matsui & Onglatco, 1992).

The Demand-Control Model by Karasek (1979) assumes jobholders inherently have a high level of self-efficacy, as those with high job demands and high decisional freedom will not suffer job strain but rather have an "active" job. Research performed by the Harvard School of Public Health on 21,290 nurses in the United States showed those with the highest demands and the least control over their work environments had the greatest problems with their health. Those women with lower demands and more control had the best overall health. In addition, those with low social support had even lower health status than their supported counterparts (Cheng, Kawachi, Coakley, Schwartz, & Colditz, 2000).

Schaubroeck and Merritt (1997) believed the addition of self-efficacy would significantly improve the capacity of the Demand-Control model to predict strain and the results of their study showed this to be the case. Only after these researchers extended the demands-control model by Karasek (1979) by including of self-efficacy was statistical significance for the model achieved. For those high in self-efficacy, the predictions of the demands-control model and subsequent effects on blood pressure were matched. In fact, conditions with low control and high demands were especially stressful for these people because they will tend to blame themselves for failure.

However, those low in self-efficacy felt the strain, as measured by high blood pressure, when the demands were high and the control was high. Therefore adding a self-efficacy variable improved upon the accuracy of the demand-control model. This theory extended by measuring upper respiratory illness and immune function and relating it to job demands (Schaubroeck, Jones, Xie, 2001).

Matsui and Onglatco (1992) also found that self-efficacy moderated the relationship of stress and strain. The study investigated how role overload (high demands) and role insufficiency (low demands) affected office workers with differing self-efficacies. They found that those with low self-efficacy had greater strain when role overload and responsibility were present, and workers with high self-efficacy felt greater interpersonal and physical strain when role insufficiency existed. Using a more inclusive variable (self-efficacy) and interactional approach that includes interpersonal, environmental, and situational components increases the accuracy of strain prediction.

Self-efficacy as a Unifying Concept of Burnout

In trying to better describe the theory underlying the origin of burnout, Cherniss (1989, 1993) found the concept of self-efficacy to be a good candidate for developing a "unifying conception" of the burnout characteristics. Work by Cherniss (1993) supports the view that organizational self-efficacy, especially in the early part of one's career, is particularly important in combating burnout. He found that a worker's feelings of competence greatly affected their feelings about their work, both in a positive and negative direction. Those who could personally impact their work settings were almost immune to burnout, while those who did not were soon frustrated with their work and became detached.

A longitudinal examination of Cherniss's burnout model was performed by Burke and Greenglass (1995) on school educators using path analysis. They measured: 1) work setting characteristics, 2) social support, 3) sources of stress, 4) negative attitude change, and 5) the MBI at the onset and after one year. The antecedents for work setting stress were significantly correlated with negative attitude change and the MBI. The inclusion of certain variables (reduced work goals, decreased personal responsibility for outcomes, decreased idealism, work alienation, and self interest) aided in predicting burnout.

The link between self-efficacy and stress is demonstrated in work by Bandura (1989). Stressful situations seem less threatening when people believe they can successfully cope with them. Self-efficacy, like burnout, is influenced by the environment, and the person-environment interface, and burnout is context specific and cannot be generalized globally. Leiter (1992) also found burnout was the result of a crisis in self-efficacy. He found that those using control-oriented coping techniques tended to have less emotional exhaustion. Eastman (1996) developed a "Wellness Approach" toward avoiding faculty burnout. He proposed a comprehensive plan, which includes maintaining a balance between spiritual, social, emotional, intellectual, and physical well-being. It also included managing time, space, people, and health with weekly schedules and classroom organization.

Self-Efficacy Effects in University Faculty

Institutional Variables on Self-Efficacy in Faculty

Teaching self-efficacy is set of expectations of how teaching effects student performance regardless of environmental factors and intellectual ability (Cook, 1998). Another definition by Ashton & Webb (1986) describes it as personal beliefs about one's capabilities to help students learn. Teaching is a strong source of intrinsic satisfaction for many university faculty members

and is tied to professional commitment, in terms of activities, efforts, and persistence (Ashton & Webb; Clark, 1987).

Institutional reward structures commonly dictate how faculty members perceive their time should be spent. Those faculty who possess teaching self-efficacy and general teaching self-efficacy are the most committed to teaching. Yet, those who possess research and publication skills get the promotions and higher salaries (Coladarci, 1992).

Gender differences in self-efficacy. Although gender differences in self-efficacy have not been well documented, some studies have noted such differences. Vianen and Keizer (1996) found women more frequently report lower levels of self-efficacy than their male counterparts. It is suggested women have lower general efficacy (Dann, 1995). Landino and Owen (1988) examined gender differences in self-efficacy of the main tasks performed by university faculty. The authors developed a brief survey instrument called the Measures of Self-Efficacy in Academic Tasks (MSEAT), which is being utilized in this proposed study. *Research self-efficacy* was lower in female faculty and subsequently research production is lower and their stress from research was higher. Researchers found the greater the percentage of women in the department, the lower the research self-efficacy. Females who were younger and those with higher degrees had greater research self-efficacy. This was significantly influenced by number of articles, university responsiveness, and mentoring. Being male increased service self-efficacy and no variable influenced teaching self-efficacy. It was hypothesized that females are more stressed and have lower self-efficacy due to fewer female models, a hesitancy of males to become mentors, and lower perceived responsiveness of the university (Landino & Owen, 1988).

In summary, self-efficacy seems to be related to burnout. When someone feels self-efficacious there is reduced burnout. However, when someone is unable to gain self-efficacy but

expects it, then frustration sets in and burnout follows. Therefore, the desire to gain self-efficacy and actually obtaining it are both essential components in the onset of burnout. Social support also plays a pivotal role in strain and the burnout state.

Social Support

The creators of the *Demand-Control model* found that integrating social support into the previously established model significantly increased the prediction of strain and subsequently added it to the model (Karasek & Theorell, 1990). Evidence shows that social support provides both a main effect and a buffering effect on job strain (Astrand, Hanson, & Issacson, 1989; Johnson & Hall, 1988). Cohen (1988) found social support was inversely related to physical diseases and developed psychosocial models to explain this relationship.

House (1981) defined social support as- a relationship with one or more other persons that are characterized by relatively frequent interactions, strong and positive feelings, and a perceived ability and willingness to lend emotional and/or instrumental assistance in times of need. According to this definition, social support must include other people and it must enhance one's mood or offer assistance in some manner. Social interactions do not have just a one-way influence. A negative or unhealthy social relationship may actually enhance the ability of a given stressor to cause strain (J.D. Quick, Nelson, Matuszek, Whittington, & Quick, 1996).

Components, Type, And Source Of Social Support

Social support refers to helpful social interaction from superiors or co-workers at the workplace or with family and friends outside the workplace. It is believed that social support has five possible elements: a) emotional support, b) encouragement, c) advice, d) companionship, and e) tangible aid (Hirsh, 1980). Four main types of (social) support have been characterized: emotional, evaluative, instrumental, and informative (House, 1981). The sources are either

within the workplace (coworkers or supervisors) or outside the workplace (friends and family). Because individuals use the mind and body for work and play, support or stress in the workplace is commonly brought into the family or social setting just as family problems can express themselves in the workplace.

Physiological Effects Of Social Support

Several studies have demonstrated a difference in physical health with the presence or absence of social support (Pines, 1983; Johnson, 1985; Cohen,1988). A recent study found loneliness, defined as an absence of social support, negatively affected health. Results showed that lonely people had higher total peripheral resistance (blood pressure), weaker cardiac outputs, and worse sleep quality (Cacioppo et.al., 2002). Bruhn (1996) found a lack of social support in stressful situations could lead to diseases and even death. Heart disease patients who were socially isolated, and had a high life stress, had 4 times the risk of heart disease compared to their peers without stress and no isolation (Ruberman, 1984).

Social Support as a Strain Modifier

When an individual feels supported the incidence of strain decreases and job satisfaction increases (Cohen & Willis, 1985). In other words, when faced with a stressor, the individual realizes he or she has a "safety net" in the form of support from coworkers or supervisors. Therefore, if someone has high demands (stressors) and low control on the job, but a high level of support from peers and organization, the person will not express as much strain or is "buffered" from it. Social support has been shown to contribute to long-term health and the acquisition of new knowledge in all higher-level animals including humans.

Social support may exert its buffering effect directly and indirectly. A direct effect would be noticed if the social support lowered the perceived number or intensity of the stressors.

An indirect effect is seen when social support buffers against adverse health symptoms and burnout (House & Wells, 1978; Karasek, Gardell & Lindell, 1987). Direct effects were seen in those who had lower social integration, had a higher risk of mortality, and those who were socially integrated had longer life spans and positive health outcomes (Quick, Nelson, Matuszek, Whittington & Quick, 1996). A recent study on higher education nursing faculty found those who participated in an informal lunchtime support group had greater personal and professional rewards and were more likely not to leave academia. The group functioned in a mentoring fashion and as a stress reducing mechanism (Lewallen, Crane, Letvak, Jones, & Hu, 2003).

A 'buffering effect' to the typical demand-control relationship is noticed in studies in which workers with positive social support did not display adverse health effects with excessive psychological demands (Johnson, Hall, & Theorell, 1989; Revicki & May, 1985). There is a strong link between social relations and decisional latitude or perceived control of workers. It has been proposed that enhanced productivity and satisfaction will cause the development of *active* behavior patterns and a positive sense of identity, which are socially beneficial (Karasek & Theorell, 1990). Other authors (Ganster, Mayes, & Fusilier, 1986; Leiter, 1991) found a negative correlation between social support and types of job strains including job dissatisfaction, somatic complaints, depression and burnout. After Johnson and Hall (1988) found social support to have a significant role in predicting strain symptoms, it was added as a third dimension to form the current DCS model (Karasek & Theorell, 1990).

Social Support, Race, and Gender Influences on Faculty Strain. Race and university status have an impact on how particular types of work support influence job satisfaction in women, according to a study by Talbert-Hersi (1995). The study investigated how three scales of work support - structural, emotional, and informational- affected White and Black women

faculty. Results showed that structural work support buffered against the affect of chronic job stress on job satisfaction for all groups except Black academic women. Informational support buffered against how chronic job stress affected job satisfaction in Black women.

Section 5: Interrelationships between the Variables

This section will cover the various interrelationships of the independent and dependent variables. The discussion will begin with issues that pertain to self-efficacy. The specificity of self-efficacy to teaching and exercise will be discussed. Burnout is also focused toward faculty, in particular, and how the independent variables ameliorate it. Understanding the variable interdependence is the primary focus of this section.

Self-Efficacy Affects on the Other Variables

Several theories have emerged which relate personal competence with adjustment and adaptation. The self-efficacy theory (SET) is one such theory that has generated more research and in clinical, social, and personality psychology in the past 15 years than any other (Maddux, 1995). Determining why a person is able to initiate and persist at a given behavior is often a difficult thing. It has been shown that those with self-efficacy for a certain behavior will tend to: a) initiate the behavior, 2) put more effort into the behavior, and 3) persist at the behavior, more than someone who has low self-efficacy. Given the difficulty of initiating and maintaining an exercise program, self-efficacy plays a strong role in those who do participate (Cline, 1985; McAuley & Jacobson, 1991).

Self-Efficacy On Exercise and Strain

As previously discussed, self-efficacy seems to have an inhibitory effect on stress and positive effect on exercise participation. Results from a study by Cline (1985) demonstrated increases in self-efficacy were strongly correlated to success as measured by a self-report and a

treadmill test. McAuley and Jacobson (1991) confirmed this result, finding adult females with higher global self-efficacy values tended to be exercisers.

Considerable evidence has linked exercise self-efficacy expectation with exercise intention and performance in people of various ages and levels of health. When looking at this relationship, one should discern the level of participation, if the individual is initiating or maintaining an exercise regime, and individual characteristics. Studies indicate that the age, sex, and socioeconomic and functional status, as well as previous education, and exercise experiences all have variable effects on the exercise and self-efficacy relationship (Clark, 1996; Conn, 1998; DuCharme & Brawley, 1995; Sallis, Hovell, & Hofstetter, 1992,). In addition, cognitive features such as affect, behavioral intention, perceived barriers to performance, and self-perception or body image all have impacts on self-efficacy and exercise adherence depending on the particular context.

It has been shown that daily stress itself may inhibit self-efficacy about exercise, and magnify perceived obstacles to exercise participation (Delongis, Coyne, Dakof, Folkman, & Lazarus, 1982). It was found that in weeks with a high frequency of stressful events, people exercised less time, and had less self-efficacy about meeting their exercise goals. When high perceived stress was reported, participants exercised significantly fewer days, omitted more planned exercise sessions, were less satisfied, and had less self-efficacy about meeting their exercise goals. The results suggest perceptions of stressful events and cognitive reactions toward missed exercise mediate subsequent exercise behavior (Stetson, Rahn, Dubbert, Wilner, & Mercury, 1997).

A large study on smokers found exercise served as a cognitive-behavioral mediator and played a significant role to change behavior. Self-efficacy, decisional balance, and motivational

mechanisms were found to be related. The negative emotions associated with a given behavior are labeled as "costs," and positive emotions about a given behavior are referred to as "benefits." Subjects who valued the benefits of smoking also rated the costs of exercise to be high and those who realized the negative aspects of smoking also realized the benefits of physical activity. Smokers who regularly exercised reported significantly more confidence than non-regular exercisers in their ability to stop smoking. Finally, those who had already started to refrain from smoking had significantly more confidence in their ability to exercise, than those contemplating to refrain from smoking. Self-efficacy may carry over into many aspects of one's life including smoking cessation, stress management, and exercise adherence. Thus, self-efficacy may not only contribute to the reduction of strain in one's vocation but also can initiate health-promoting behaviors and reduce harmful behaviors and an absence of self-efficacy may prevent the initiation of health behaviors (King, Marcus, Pinto, Emmons, & Abrams, 1996).

Interactions of Stressor Intensity with Supervisor Support. Work stress was previously characterized in terms of the intensity and frequency of stressors. Schrimer (2000) found the intensity of the stressor had much more impact on job satisfaction than the frequency. Likewise, the interaction of supervisor support on job satisfaction was significant for stressor intensity, not frequency. Workers who perceived stressors as more intense reported less job satisfaction when supervisor support was low. However, workers who reported stressors as more intense actually had more job satisfaction than workers who reported the stressors as less intense when both had high supervisor support condition.

Social Support and Exercise. The effects of social support on initiating and adhering to exercise programs vary with several intervening variables. Lechner and Devries (1995) performed a study on the determinants of starting an employee fitness program in a model that

included attitude toward fitness, social influence and self-efficacy expectations (ASE). Based on the *Stages of Change model (Transtheorethical Model),* it was found those in precontemplation stage were the least convinced to exercise and had the lowest self-efficacy scores, whereas the those in the action stage had the most social support to participate in the fitness program.

Another study of the role of social support in physical activity promotion found women had increased self-efficacy for making time and resisting relapse, social support from friends, and using behavioral and experiential processes of change. Men had improvements in behavioral processes and increased the perceived barriers to activity. Results showed different mediators played differing roles depending on the intensity level of exercise and the gender of the individual (Sallis, et al, 1999).

Interrelationships of Teacher's Health and Strain. Several studies have examined how stress or strain might cause a decrease in health and how health conditions or behaviors relate to strain. Blix, Cruise, Mitchell, and Blix (1994) looked at the person-environment fit model of occupational stress in California State University teachers. They measured burnout with the MBI, stress-related health problems, perceived work stress, productivity, job satisfaction, and even consideration for job change. In contrast to Seiler and Pearson (1985), they found significant relationships for a lack of fitness and stress in female, but not male, professors. Faculty experiencing higher levels of work stress were more likely to report burnout, acknowledge health problems and job dissatisfaction, and were less able to cope with the stress.

Blackburn, Horowitz, Edington, and Klos (1986) studied the negative health effects from stress in a sample of University of Michigan faculty in comparison to high-level administrators at the institution using a Quality of Life (QOL) measure (consisting of health, job satisfaction, and life satisfaction) to gain a more holistic perspective. Strain was measured as the result of

stressors that are not coped with. They found faculty had more stress-related health problems than administrators despite similar stress levels. Fitness measures did not mitigate the job-strain and QOL relationship. Faculty members with higher self-esteem were more capable of reducing strains than their colleagues with lower self-esteem. Faculty having greater tolerances to overload had less dissatisfaction, and those with a strong social support system and who practiced healthier living habits had fewer sick days. Data indicate faculty are stressed and it is often related to self-efficacy or self-esteem, burnout or poor physical and mental health, as well as job dissatisfaction. Thus, alleviating the perceptions of stressors and enhancing self-efficacy may not only improve the health of faculty, but it may improve their morale and job satisfaction (Dua, 1994).

Summary Of The Literature

In summary, the literature review demonstrated that university faculty have many common stressors. When these stressors are not appropriately coped with, they can become significant factors in producing strain, which may manifest as decreased physical health, mental well-being, and overall quality of life, as well as increased illness, withdrawal, depression, and anxiety. Although the nature of the stress and level of job dissatisfaction have positively shifted in the late 1990's, overall personal stress and strain in faculty has not decreased. Exercise seems to suppress the negative psychological impacts of stress and reduce the incidences of chronic diseases associated with strain in the general population. Thus, strain seems not only to cause or be caused by detrimental physiological processes to one's health, but it may increase negative psychological impacts, which in turn, lower one's drive to improve the conditions of one's life, and burnout. In addition, strain often alters one's perception of their ability to perform coping

mechanisms and inability to perform one's job adequately or at least up to personally-established standards, which further exacerbates the negative health condition.

Self-efficacy is strongly related to lower stress and ill-health incidence, decreased reactivity to stressful events, and a stronger drive or capacity to tolerate a stressful condition. Studies have shown the incorporation of self-efficacy in the job-training program enhances the acquisition of interpersonal skills and idea generation in managers. Also of significance, exercise seems to augment self-efficacy and likewise, self-efficacy is a significant predictor of exercise adherence. Social support enhances vocational self-efficacy, exercise participation, and reduces strain and burnout. Finally, stressful events seem to reduce one's exercise adherence and self-efficacy about making changes to improve health and one's desire to learn new coping mechanisms.

Using this information on the interrelationships between the variables, and establishing these relationships in university faculty in particular can help guide the development of effective stress management techniques or policies. University faculty have particular environmental, interpersonal, and personal variables which induce stress. While there are some good models to predict strain, no current model consistently predicts strain or burnout, nor does any model approach strain holistically with the physical, mental and socio-emotional components combined. This study investigated the association of exercise and leisure activities, vocational self-efficacy, and social support with the incidence of strain and burnout in this particular population and the relationship of socio-demographic variables to these parameters. It was believed various demographic factors as well as exercise or leisure-related patterns may further define any significant relationships found.

CHAPTER 3: METHODOLOGY

This chapter describes: the research design and operational definitions of the variables; research hypotheses; research procedures; the sample; instrumentation used; and methods for data analysis.

Research Design

This study used a survey method in a correlational design to investigate the relationships between the dependent variables and independent variables. The primary purpose of this study was to use the independent variables of self-efficacy for academic tasks, exercise and leisure behaviors, and social support (supervisor and coworker) and relate them to occupational strain and burnout. In addition, demographic variables were used to determine if any differences in strain were due to vocational and personal factors and some additional activity and exercise factors were collected to further discriminate any significant findings.

The *correlational design* is frequently used for descriptive research concerned with determining the extent of relationships existing between variables. Its principal advantage is that it permits one to analyze the relationships among a large number of variables in a single study. Its disadvantage is the lack of causal inference that can be made. This weakness is further complicated or weakened by the survey design and a voluntary response may further bias the results. Thus, any relationship found in this study needs to considered with these limitations.

Using a multivariate regression equation allows the trends or regression slopes of one variable to be examined against the regression slopes of another. In addition, certain variables may be isolated or controlled, thus their relative or proportional influence on each other may be

accurately assessed. Multiple regressions determine whether variables are related and the degree to which they are related (Stevens, 1996).

The *survey method* was chosen for this study to determine whether strain or burnout in urban university faculty is associated with one or all of the independent variables. The survey design is the preferred method for this study because: information is collected rapidly, many variables maybe identified within the same individual, and anonymity is maintained. In addition, in order to make valid inferences, the number of participants in the sample should be higher and the survey method allows for a large number of subjects to respond in a short period and with minimal logistics.

This survey was cross-sectional and information was only collected once. Faculty participants had about 7 weeks to respond. The survey was conducted via campus-wide email; the participating faculty were asked to visit a website link associated with www.surveymonkey.com. The participants were directly led or "linked" to the test and given a password in the email in order to access the survey. Once they accessed the survey, respondents could chose to complete the entire test or come back to the test because the website associates answers with their email addresses.

The use of the surveymonkey.com web site serves several advantages:

1) The survey is easily and rapidly distributed.
2) The survey is not easily lost by faculty in a paper pile or shuffle.
3) The survey is rapidly completed and no return mailing is necessary..
4) The survey is totally anonymous.
5) The results were rapidly and easily entered into a database spreadsheet and subsequently processed more quickly.

The purpose of the survey was to answer the following six research questions in the specified population. The survey was a combination of three well-accepted and validated instruments along with a novel test and certain key demographic questions. The results of the surveys were arranged in a database spreadsheet in order to perform statistical analyses to answer the research questions.

Research Questions

1) Are self-efficacy, exercise behaviors, and social support interrelated in this population?
2) Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty strain?
3) Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty burnout?
4) Do different demographic and academic sub-groups vary in faculty strain or burnout?
5) Will self-efficacy, exercise, and social support predict burnout using faculty strain as an intervening variable?
6) Will the combination of occupational self-efficacy, exercise behaviors, and social support predict faculty strain better than job psychological demands, job control, and social support (DCS)?

Research Hypotheses

It is hypothesized that: a) self-efficacy, exercise behaviors, or social support are not significantly interrelated.

b) a combination of occupational self-efficacy, exercise behaviors, and social support can predict the presence of faculty strain.

c) a combination of occupational self-efficacy, exercise behaviors, and social support can predict the presence of faculty burnout.

d) being female, being non-white, having two or more children at home, being a new or young faculty member, being untenured, and being in a research science department will all be associated with greater strain when compared to a similar participants without one or more of those characteristics.

e) self-efficacy, exercise, and social support will predict burnout using faculty strain as an intervening variable.

f) a combination of self-efficacy, exercise behaviors, and social support will predict faculty strain better than a combination of job psychological demands, job control, and social support.

Research Procedures

Sample

The sample consisted of approximately 1000 faculty entirely of faculty from the University of California, Irvine, who had email addresses listed with the university. The sample pool included all full-time (non-adjunct) faculty at the same institution and no individual meeting this criteria was excluded. Administration and staff were not included. Demographic and occupational data were collected anonymously to classify and distinguish trends in the results. No stratification was used in sampling. Participation was anonymous, voluntary and had no consequences on job status.

Instrumentation

The research questions were focused on answering the following question: Do faculty who possess exercise or leisure activity behaviors, self-efficacy about the different aspects of job performance and occupational tasks, and a supportive supervisor and colleagues have less strain than those faculty who do not? Four different survey instruments were combined into one survey to analyze the experimental components.

Table 1- Survey Description: Relationship of Experimental Variable to instrument used to measure it and the portion of the survey that instrument is found.

Variable Name	*Measurement Instrument*	*Section of Survey*
Demographics/Academic	Standard questions from literature on factors associated with strain in university faculty	Questions 1-14
Exercise Behaviors	Exercise and Leisure Activity Survey- self created (2003-pilot tested). Questions used to determine activity levels and leisure activities	Questions 15-22
Demands-Control-Support combination (on JCQ)	Combined scores on selected sections of Job Content Questionnaire	Questions 23-24
Social Support (on JCQ)	Social Support sub-section of the Job Content Questionnaire	Questions 25-26
Psychological Strain (on JCQ)	Physical Symptoms (Strain) sub-section of Job Content Questionnaire	Questions 27-36
Self-Efficacy for Academic Tasks	Measures of Self-Efficacy in Academic Tasks- Landino and Owen (1988)	Questions 37-44
Burnout	Maslach Burnout Inventory- Educators Survey version	Questions 45-46

One of the surveys used with permission in this study, the Job Content Questionnaire (JCQ) by Karasek (1997), is composed of several components. Each component may be utilized independently without harming the validity or reliability of that test. Physical symptoms and social support, were used to measure strain and social support and job demands, and perceived control were used in comparison to the three independent variables in predicting strain.

The *Maslach Burnout Inventory- Educators Survey* (MBI-ES) by Maslach and Jackson (1983) was used to measure burnout in faculty. The MBI-ES is composed of three components; Depersonalization, Emotional Exhaustion, and Personal Accomplishment, which will all be measured. The *Measures Of Self-Efficacy In Academic Tasks* (MSEAT) by Landino and Owen (1988) was used to determine occupational self-efficacy, and the researcher-developed *Exercise and Leisure Activity Survey* (ELAS) was used to measure exercise and leisure behaviors.

Demand Control Supports Model. One of the purposes of this study was to compare the demands-control-supports theory on strain development to the three variables of this study- self-efficacy, exercise behaviors, and social support in predicting strain and burnout. The DCS model will be measured by the Job Content Questionnaire v 1.7. (Karasek, 1997). This 41-item (recommended version) instrument assesses job demands, job control (a combination of job decision authority, job decision latitude, and skill utilization) and social support (coworker and supervisor support). The *health and well-being outcome test* was used to measure job strain, which has 13 questions. The response options are on a 4-point scale from "strongly disagree" to "strongly agree."

Thus, specific sub-sets based on occupation can be compared to national averages in that sub-set. The results are directly indicative of factors reported to affect worker productivity (motivation and job satisfaction) and worker health or absenteeism and labor turnover (Pieper & Schwartz, 1997). Finally, www.workhealth.org/strain has been established for researchers across the world to exchange data and ideas.

The Psychological *Work Demands* is a weighted sum of five items (excessive work, conflicting demands, insufficient time to do work, work fast, and work hard). The job decision latitude scale consists of two sub-scales- *Skill Discretion* and *Decision Authority*. *Skill*

Discretion is composed of six items (keep learning new things, can develop skills, job requires skill, task variety, repetitiousness, and job creativity required). *Decision Authority* consists of three items- (freedom to make decisions, can choose how to perform work, have "say" on the job). The Workplace *Social Support Scale* is the sum of two sub-scales, *Supervisor Support* (5Q) and *Co-worker Support* (6Q), totaling 11 items. Each subscale measures instrumental support and emotional support. Demographic data includes gender, age, race, years of schooling, income from job, marital status and religion.

The JCQ is based on the nationwide U.S. Quality of Employment Surveys (QES) that was delivered in 1969, 1972, and 1977 and developed by the U.S. Department of Labor. It is still currently the largest and most representative database on job characteristics in the United States (Karasek & Theorell, 1990). The Job Content Questionnaire (JCQ) survey can be compared to the results of a national survey that has (United States) national averages for given occupations as labeled by a 3 digit Census Occupation Code.

To measure reliability, the developers of the JCQ amalgamated the three national surveys (1969. 1972, 1977) into one database of 4503 respondents (Karasek & Theorell, 1990). The within survey (internal scale) reliability as measured by Cronbach *alpha* was statistically acceptable for all variables except job insecurity (.403), which is not being used in the current study. Measures for individual scale validity of decision latitude, psychological demands, and social support were all acceptable (decision latitude- .805, skill discretion- .766, decision authority- .724, psychological demands- .614, social support- .831, job insecurity- .403). When the scores were subdivided into occupational categories, the reliabilities improved further (Karasek, Schwartz, & Theorell, 1982).

A later study corrected for the demographic differences such as race, economic class, and gender biases that would have obvious impacts on strain symptoms. Decision Latitude had very high correlations with social support and was negatively correlated with job demands (Schwartz, Pieper, & Karasek, 1988).

Individual scale reliability scores demonstrate decision latitude and its components are highly reproducible when examined across national samples (Karasek & Theorell, 1990). A correlation matrix shows decision latitude is highly correlated with social support and negatively correlated with physical demands. Social support is another variable with high test-retest reliability. Even though the internal reliability is high, the low correlation within occupation raises measurement questions.

Occupational Strain. Strain symptoms are characterized by the presence of physical which decrease one's health (physical) and well-being (mental). The JCQ has an 13 question section called "Health and Well-being Outcomes" that was used. The lower the health status score in this section, the more strain is possessed.

Burnout. The term burnout has been applied to a wide range of symptoms arising from stress in the workplace. The initial description pertained to the exhaustion, depression, and withdrawal associated with those in the human service professions having abundant and intense social interactions (Freudenberger, 1974). Symptoms associated with burnout, which is a form of chronic occupational strain are particularly associated with those in human service vocations. A specific questionnaire known as the *Maslach Burnout Inventory*- Educators Survey (MBI-ES) has been modified for use with higher education faculty. The only modification made for this study was a change from "students" to "students and colleagues." This version was used to measure burnout (Maslach & Jackson, 1986).

The MBI is a 22-item scale, consisting of statements rated on a 0-6-frequency continuum. The statements concern feelings or attitudes about one's work and how often those feelings occur. The MBI was developed from a pool of items from a variety of questionnaires. The preliminary version of the MBI was 47 items, which reflected the intensity and frequency of the feelings and attitudes. Factor analysis was used to reduce the total number of items to 22. The reliability scores ranged from .71 to .90 (N=1,316). Subscale standard error of measurement ranges from 3.16 to 3.80. Reported test-retest reliability coefficients ranged from 0.60 to .82 . The Cronbach *alpha* estimates of the MBI Form ED are consistent with the MBI and ranged from .76 to .90 or .72 to .88 in two different studies using 469 and 462 subjects, respectively.

The Educator's Survey is different from the Human Services Survey (MBI-HSS) or original version, only in the change of the word "recipient" to "student." Thus, the only change in the version of this study is from "recipient" to "students and colleagues." The MBI-ES measures three different components of burnout: Depersonalization, which is the tendency to think of others as things and distance one's self from others; Lack of personal Accomplishment, which describes the perception of the accomplishments, that an individual is making; and Emotional Exhaustion- which indicates exhaustion and is noticed through cynicism and depressive thoughts. Sub-scale scores are developed for each component and will be analyzed for various correlations in this study.

The three-factor structure of the MBI-ES was supported by Iwanicki and Schwab (1981) and Gold (1984). The reliability was also supported in these studies that showed Cronbach *alpha* estimates of .90, .76, and .76 in the Iwanicki and Schwab study, and .88, .74, and .72 in the Gold study, for Emotional Exhaustion, Depersonalization, and Personal Accomplishment, respectively. These were the similar to reliabilities found for the MBI-HSS. The K-12 teachers

reported higher mean scores compared to the overall sample for Emotional Exhaustion (21.25 vs. 20.99) much higher for Depersonalization (11.00 vs 8.73) and lower for Personal Accomplishment (33.54 vs. 34.58). The above differences indicate the cut-off points being different for teachers versus the overall sample for this test.

The MBI is not theory-driven thus it relies heavily on the constructs associated with burnout and the subject's comprehension of those constructs. Some reviewers believe an 8-phase burnout model developed by Golembiewski, Munzeider, and Stevenson (1986), which uses the three dimensions in varying levels, may be more descriptive (Gryskiewicz, & Buttner, 1992). Data shows that burnout is not influenced by social desirability nor does it measure clinical depression. There are several parallels between the structural model and the current study.

1) Work Demands were the source of stress.
2) A lack of resources or coping capacities was included. In this category (box)- control coping, social support, and decisional involvement were present.
3) The product of burnout was diminished accomplishment and efficacy.
4) The cost of diminished accomplishment and efficacy was turnover, absenteeism and physical illness.

The MBI-ES is a valid and reliable tool to measure burnout in faculty. Due to contractual obligations and copyright agreements the MBI-ES cannot be presented in the appendix as a separate entity but the sub-section of the survey is in appendix B.

Demographic and occupational variables. Variables that have significantly influenced stress levels in previous research studies will be included in this study. The demographic and

occupational variables will be used to discover factors that contribute to strain or burnout development. These variables include:

Personal Factors

- Age
- Gender
- Ethnicity
- Marital Status
- Number of Children
- Ages of Children
- Elderly parents living in one's home
- Does spouse work

Occupational Factors

- Faculty Rank
- Years at Institution
- Department/ Discipline taught
- Tenure status
- Percent of Total Time on Research
- Percent of Total Time on Teaching
- Percent of Total Time on Service
- Educational level
- Salary range

(see Appendix B pg, 177 the Faculty Strain Survey)

Occupational Self-efficacy. It is believed that self-efficacy will counter strain caused by one's occupational tasks. Because of the specificity of self-efficacy, this trait was measured specifically for academic tasks in higher education faculty. Self-efficacy for 3 areas of vocational skills will be measured with the *Measures of Self-Efficacy in Academic Tasks (MSEAT)* instrument, previously used by Landino and Owen (1988).

The MSEAT was developed to test academic self-efficacy, university responsiveness, perceived mentoring, and group participation. Questions on the MSEAT measure three sets of academic tasks: research (11 items), service (11items), and teaching (10 items). The MSEAT also measures university responsiveness (7 items). The perceived mentoring and group

participation sub-factors, determined from the responses to a multiple-choice question, will not be included in this study.

Content validity for the MSEAT was established by an independent critical review of judges (faculty and administration). From the original 67 items, 31 were retained as the most important descriptors of the three academic tasks. The internal consistency of the scales this high reliability estimates (Cronbach alpha scores): research = .84, service = .85, teaching = .84, and university responsiveness = .83.

Other aspects of the survey included demographic and vocational variables such as academic rank, gender, age, years of experience in higher education, and highest earned degree which are included in the demographics portion of this study's survey.

Exercise and Leisure Activity Survey (ELAS). An exercise behavior survey was developed for this study to assess the activity and leisure patterns of faculty. The main national governing body for exercise in the United States, the American College of Sports Medicine, defines exercise with four specific criteria: frequency, intensity, duration, and modality. These variables, as well as other activities not commonly classified as exercise that have similar psychological benefits according to Pate et. al. (1995), were assessed in the ELAS instrument. Activities such as yoga, muscle relaxation, and hobbies are these alternative-exercise activities.

The ELAS measures the number of sessions per week and duration per session of four modalities of exercise- aerobic, anaerobic, vigorous sports, and leisure sports. It also measures the intensity, history of regular exercise, light and moderate everyday activities, practices designed to reduce stress, and hobbies. The ELAS index was determined by the exercise volume (frequency* duration) plus the number of different stress reducing activities and number of different hobbies. Demographic data include: gender, age, ethnicity, and faculty rank. The

ELAS survey is eight questions long plus four demographic questions, which have been included in the demographics section of this survey. Two questions have four exhaustive intervals; six of them require a single check mark response and the other four measure continuous level data. The first question "Do you currently perform structured exercise?" is designed to reroute the non-exerciser to a later portion of the survey that applies to the respondent (See Appendix 2).

The exercise instrument was reviewed by a panel of experts in academic and corporate settings for its content. The experts all had advanced degrees related to exercise science and have conducted research or activities of a clinical nature. The instrument was then pilot tested on a small population (n=18) of college faculty for readability and comprehensibility. No problems were found with the interpretation or format of the questions asked in the entire sample used. However, after the results were processed, an error was found in the "re-routing" question, which is explained in the "Missing Data Impacts" section of the discussion.

Data collection

All faculty in a university were sent an email with a link connecting them to a password protected survey that quantifies strain, burnout, psychological job demands, job control, work social support, self-efficacy for occupational skills, and exercise and leisure habits. Along with those constructs, information regarding several demographic and occupational variables was collected to determine potential explanations for any interrelationships and differences. The instruments mentioned were synthesized in to a single survey both to increase return and completion rate and to avoid any redundancy among demographic questions. Prior to dispersal, the study was approved on March 30th, 2006, by a University of New Orleans Institutional Review Board, which examines ethical and humane treatment of participants. The UCI Dean of Research allowed the distribution of the survey to the UCI faculty via the email system.

Data Analysis

The data from the survey were automatically recorded and logged onto an Excel spreadsheet. The spreadsheet was transformed for statistical analysis using the Statistical Package for Social Sciences (SPSS-13).

Statistical Analysis- The following statistical tests were used to answer the corresponding research questions.

1) *Will self-efficacy, exercise behaviors, or social support be interrelated to each other? Will be they related to faculty strain or burnout?* Pearson Product Moment Correlation Matrix for the 3 independent (IV) and 2 dependent variables (DV).

2) *Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty strain?* Multiple Regression Equation in a stepwise model product with IV= self-efficacy, social support, and exercise and DV= faculty strain

3) *Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty burnout?* Multiple Regression Equation in a stepwise model product with IV= self-efficacy, social support, and exercise and DV= burnout

4) *Do different demographic and academic sub-groups vary in their levels of faculty strain or burnout?* Analysis of variance (k-Group MANOVA) or covariance.

5) *Will self-efficacy, exercise behaviors, and social support predict burnout using faculty strain as an intervening variable?* Multiple regression equation with the 3 IV predicting Faculty Strain and faculty strain predicting burnout.

6) *Will a combination of occupational self-efficacy, exercise behaviors, and social support be better correlated to faculty strain than job psychological demands, job control, and*

social support (DCS)? A comparisons test of correlation coefficients for self-efficacy, social support, and exercise vs the DCS using a 95% confidence interval ($\alpha = .05$).

Each of the tests was selected based upon the research hypothesis, type of data retrieved from the survey, and the results would answer a particular portion of the theoretical framework shown in figure 1.

CHAPTER 4: RESULTS

Overview

The following section will be a presentation of the results and findings of the data collected in this study on occupational strain associated with higher education faculty of various rank. The primary purpose of this study was to investigate the relationship of occupational self-efficacy, social support, and exercise behaviors to occupational strain and burnout in urban university faculty. A survey comprised of items extracted from recognized instruments to measure these variables was distributed to university faculty. Within this primary purpose are several sub-purposes that included testing:

1) The degree of interrelationship among self-efficacy, exercise behaviors, and social support.

2) If a combination of self-efficacy, exercise behaviors, and social support can predict faculty strain.

3) If the relationship between the independent variables and faculty strain or burnout is modified by any demographic or vocational variables.

4) If self-efficacy, exercise, and social support predict burnout using faculty strain as an intervening variable.

5) If the model proposed in this study predicts strain in faculty better than the Demand Control Supports model predicts faculty strain.

These sub-purposes were used to organize and present the findings of this study. A description and discussion of the participants will be presented first.

The Participants and Sample Description

The 171 faculty at the University of California at Irvine, California who responded in the survey were notified by a faculty-level, system-wide electronic mailing request. They were requested to participate in this survey as posted on a *Survey Monkey, Inc.* website by using the hot button portal (link) entry in the e-mail sent to them. There were 171 complete surveys that were usable of the 172 recorded attempts. There were 84 male (49.1%) and 86 female (50.3%) respondents with 1 missing data (0.6%). This was a return rate of approximately 17%. A low return rate such as this may have biased the sample toward a particular personality type or strain level. Attempts to increase return rate included: 1) an easy to access and read electronic survey, 2) relatively brief format, 3) it coming from the Dean of Reseach's office, 4) the long period of exposure, 5) an intradepartmental email reminder in the Education department, and 6) a strictly anonymous format and access to the survey designer for any questions or problems.

The mean age of the participants was 45.50 years (SD=10.89 years). The mean age of men was 46.18 years (SD=11.12 years) and for females was 44.85 years (SD=10.69 years). There was no significant difference between the genders (t=.792; p=.429).

The ethnicity of this sample was distributed as .6% African American (n=1), 8.2% Asian (n=14), 84.2% Caucasian (n=144), and 6.4% Hispanic (n=11) individuals. There was one respondent (.6%) who declined to disclose his/her ethnicity. The relationship distribution of the respondents was 119 married/Domestic partnered (69.8%), 30 Single/Never married (17.5%), 15 Divorced (8.8%), and 3 Widowed (1.8%) respondents with 4 missing respondents (2.3%).

Approximately 101 families with children were reported by these respondents and are presented by child age grouping in Table 2. Thirteen children between the ages of 0-years and 2-years were reported; 22 children between the ages of 2-years and 5-years; 30 children between

the ages of 5-years and 12-years with 36 children between the ages of 12-years and 18-years. Only 20 respondents reported having more than 1 child in it.

When both spouses work part or full time, a family often experiences more stressors since both experience occupational and personal life demands and little time to deal with them. Results showed 92 spouses (53.8%) reported as working either part-time (n=18 or 10.5%) or full-time (74 or 43.3%).

Table 2. Number of children in families of the respondents.

Families with children aged 0 to 2-years old	1 child	13 (7.6%)
Families with children aged 2 to 5-years old	1 child	21 (12.3%)
	2 children	1 (.6%)
Families with children aged 5 to 12-years old	1 child	24 (14%)
	2 children	4 (2.3%)
	3 children	2 (1.2%)
Families with children aged 12 to 18-years old	1 child	23 (13.5%)
	2 children	10 (5.8%)
	3 children	1 (.6%)
	4 children	2 (1.2%)

Thirty-two respondents reported no spouse working (16.7%) and 45 of the participants reported no spouse (26.3%). Two faculty did not respond to the question (1.2%). The possibility of having the care of an aging parent in the home could provide even more time and effort

demands on a respondent. Ten respondents (5.8%) reported the need to provide care for an elderly parent in their home, while 91.8% of them did not (n=157). Four participants (2.3%) did not respond to this question.

Job or Employment Demographics

As demonstrated in Chapter 2, the employment characteristics of academic life are a bit specific and shown to affect strain differentially. So participants were asked questions of: a) faculty rank, b) time at current job, c) department/school employed in, d) tenure, e) salary, f) degree, and g) percent of area of effort were asked. Factors pertaining to beliefs, attitudes and characteristics of the job were gathered by the *Job Content Questionnaire* (Karasek, 1985) and the *Measures of Self-Efficacy for Academic Tasks* (Landino & Owen, 1988) for use in later analysis.

All but two of the 171 responded to the item asking their current academic rank. There were 51 Full Professors (29.8%), 27 Associate Professors (15.8%), 48 Assistant Professors (28.1%), and 43 other ranked faculty (25.1%) comprising this sample of respondents as shown in figure 4. When asked about tenure, 41.5% were tenured faculty (n=71) and 58.5% were not tenured (n=100). Of note is that while gender did not interact significantly with tenure (Chi-Squared=1.130, df=1, p=.223), it did with faculty rank. A Cross tabulation of gender with faculty rank did produce a significant result (Chi-Squared=8.816, df=3, p=.034) suggesting a disparity between men and women faculty members. More women than men were ranked as Other (29 versus 14) and Associate (15 versus 12). More men than women were ranked as Assistant (27 versus 21) and Full Professor (31 versus 20). A lower percentage of women were at the top rank of Full Professor (20 of 85) than men (31 of 84). A situation that is still common in academic institutions in the U.S.

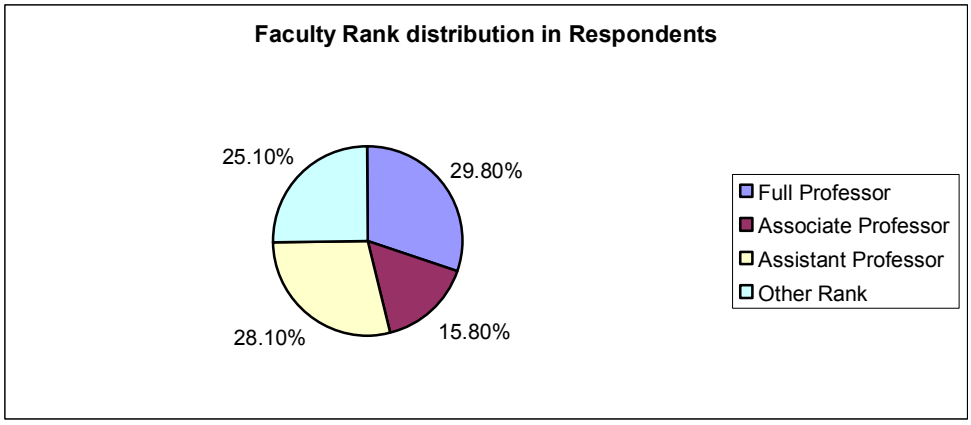


Figure 4: Faculty Ranks distribution in the survey's respondents.

The salary request was broken into a series of categories and suggests that the median salary range for this group is between $70-80,000. In fact, 18.1% reported earning less than $50,000 (n=31) and 30.4% earning more than $90,000 (n=52). Four respondents did not answer this question (2.3%). When asked how long the respondents had been at their current institution, their median category response was "6 up to 10-years" (n-23) and over 16.9% had been there for "over 20-years (n=29). One-quarter of the respondents (n=44) were relatively new employees at a term of "0 up to 3-years." Forty-one respondents had been at their current job for "3 up to 6-years" and 35 had been there for "10 up to 20-years." Over half of the respondents had been employed at their current site for over 6-years suggesting job stability by university standards.

Respondents were asked to break their work time spent down into categories for Teaching, Research, and Service areas. The total had to add to 100 percent (an FTE). The median profile across these three dimensions would suggest that participants of this study spent an average time of 20-30% teaching, 31-50% in research activities, and 11-20% in service

activities. The modal category response suggests that the most frequent reported time distribution across the dimensions was 25% teaching, 60% research, and 15% service.

Degree level is a part of academe in that a terminal degree is the mainstay of our institutions' ability to insure professionalism and adequate faculty preparation, not to mention accreditation. The sample of participants was essentially doctoral prepared with 149 doctoral degrees (87.1%), 11 professional area doctorates (6.4%), and 8 Master level degrees (4.7%). Three participants did not respond to this item (1.8%).

Exercise Dynamics and Activities

About two-thirds (n=107) of the sample participants (62.6%) reported they exercised regularly, 33.9% reported they did not (n=58), and 6 respondents did not answer this question (3.5%). The group reported exercising a mean of 1.54 times per week (SD=1.62) and a range of 0 times to 5 times per week completing aerobic exercises. The median reported category of the estimated minutes per session was "11-20 minutes" with 84.8% of the respondents completing from 10 up to 40-minutes of aerobic activity per session. Anaerobic activities, such as weightlifting, were completed by 35.5% who had a median time per session of 31 to 40 minutes with 81.0% doing between 20 and 60-minutes of anaerobic exercise. The vast majority of respondents (n=158) did not participate in team or individual sport activities (92.4%). Only 13 respondents did with 11 (6.4%) reporting less than weekly sessions (as shown in Figure 5). Two respondents reported once weekly (.6%) and twice weekly (.6%) respectively. For some undetermined reason, six respondents who reported no team sport registered minutes per session. This has made interpreting any utilization of this type of exercise rather limited. Leisure (low-intensity) activities such as walking was used by 41 respondents (24.0%) with the modal

response being once and twice weekly sessions that appear to last a median of 31 to 40-minutes. About 76% of the respondents did not participate regularly in leisure activities (n=130).

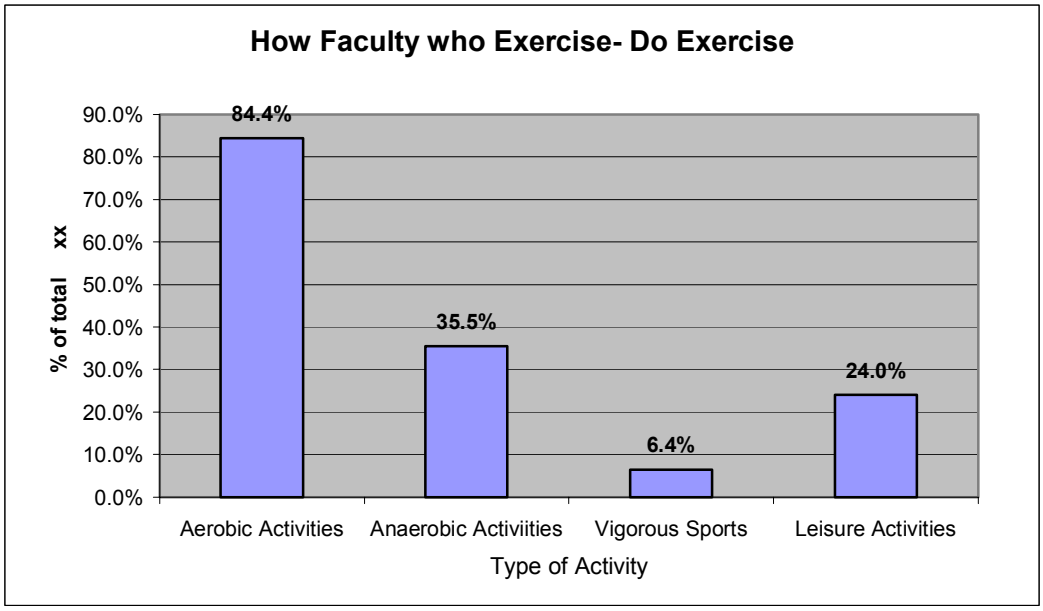


Figure 5: How faculty who Exercise- do Exercise. A representation of how the exercisers reported what they do for exercise. The categories were not exclusive to each other, thus an individual could do all 4.

When asked about how long the respondent had been exercising, those responding (n=111) gave a median response category of "more than 10-years" (50.9%) with only 5.3% reporting less than one year (n=9). Approximately 21.1% had been exercising "between 1 to 4-years" and 20.2% for "between 5 and 10-years." When asked "how hard they exercised" in general, the median response was a "moderate level – breath pretty hard" and the modal category was "breath real hard and sweat" (45%). A vast majority (85.5%) of the respondents who exercised reported a level of intensity that increased respiration rates.

These respondents were asked about their activities of daily living and how many hours each spent on light activities, such as cleaning and cooking as well as moderate level activities, such as yard work. Due to an administrative error addressed in the discussion section, fifty-one

respondents skipped answering this question. Of the 120 respondents reporting total hours spent in light and moderate level activities, more time was spent on domestic chores than performing moderate level activities such as yard work. The mean number of hours spent in light activities was 10.75 hours (SD=7.206 hours) and in moderate activities was 4.62 hours (SD=3.674 hours). This suggests these respondents spend an average of 15.37 hours of light to moderate activity each week.

Stress reducer activities. Two sets of questions were posed to identify the respondent's use of stress reduction activities and hobby activities to reduce stress. The stress reducing activities were consonant with the literature and consisted of a) meditation, b) muscle relaxation strategies, c) tai chi or chi gong, d) positive self-talk, e) prayer, f) counseling or psychotherapy, g) caring for a pet, and h) another technique not listed. Given the qualitative nature of the choices, the number of stress reducing activities was measured. The mean number of activities utilized regularly as stress reducers by the 129 participants who did such was 1.74 activities (SD=.923 activities). The median was one activity. The questions were skipped by 42 respondents (24.6%).

Entertainment and hobbies. The second set of questions consisted of entertainment-oriented activities including: a) movies and plays, b) music and concerts, c) reading and creative writing, d) arts and crafts, e) computer gaming, f) traveling, g) social gatherings, h) shopping, and things otherwise not listed. The mean number of hobby activities participated in was 4.02 activities (SD= 2.03 activities). The median level of activities was 4.00 activities and the modal number of activities was 5.00. Approximately 88.1% of the participants participated in 2 to 8 hobby activities. Eleven participants skipped the questions. The entertainment hobby activities were more likely to be used more commonly than the more directed stress relief activities.

Relationships among the Independent and Dependent Variables

The first research question: Are occupational self-efficacy, exercise behaviors, or social support in university faculty related to each other?

An overview of the means, standard deviations, and number of respondents is presented in Table 3. The sub-scales of the study's main variables are also presented in the table. JCQ Strain subscale score and the MBI scale scores were the two dependent variables in this study; however, the JCQ Demands and Control variables were used in comparison and are therefore included in the table.

A Pearson Product-Moment correlation matrix was prepared using the following as independent and dependent variables, which were then used in the following research questions in this study: a) ELAS- Exercise Index, b) MSEAT Self Efficacy subscale, c) JCQ Social Support, d) JCQ Strain subscale, e)MBI Burnout score, f) MBI Emotional Exhaustion subscale, g) MBI Depersonalization subscale, and h) MBI Personal Accomplishment subscale. Table 4 presents the matrix that was produced.

Table 3. Means and Standard Deviations for Select Variables for Strain Models.

Variable	Mean	SD	N
ELAS Exercise Index	28.24	3 2.83	168
MSEAT Self-Efficacy subscale	3.84	.579	144
JCQ Social Support subscale	27.29	8.07	144
JCQ Strain subscale	22.54	5.28	154
MBI Total Burnout scale score	62.77	16.38	115
MBI Emotional Exhaustion subscale	22.51	11.38	134
MBI Depersonalization subscale	5.82	5.45	146
MBI Personal Accomplishment subscale	33.99	6.10	127
JCQ Decision Latitude subscale	29.20	3.83	157
JCQ Job Demands subscale	36.03	6.73	157

The JCQ Strain score was significantly correlated with the following dependent and independent variables at the .05 level a) JCQ Social Support scale score (r=-.203), b) MBI score (r=.548), c) MBI Emotional Exhaustion (r=.613), d) MBI Depersonalization (r=.409). The MBI score was, of course, correlated significantly at the .05 level with its constituent parts a) Emotional Exhaustion (r=..873), Depersonalization (r=.804), and Personal Accomplishment

n(r=.319). The MBI scales of Emotional Exhaustion and Depersonalization are significantly correlated (r=.602, p<.05). The MBI score is significantly correlated with the JCQ Strain scale (r=-.186, p=.05). The MBI Personal Accomplishment is significantly correlated with the MSEAT Self-Efficacy score (r=.252, p<.05). The JCQ Social Support Scale was significantly inversely correlated with the MBI Emotional Exhaustion (r=-.231, p<.05) and the MBI Depersonalization (r=-.185, p=.05) subscales. Social Support was significantly inversely correlated with Strain subscale score (r=-.203, p<.05).

Table 4. Pearson Product-Moment Correlation Coefficient Matrix for Study Variables.

1. ELAS	1.00									
2. Efficacy	.088	1.00								
3. Social Support	.027	.158	1.00							
4. Strain	-.086	-.134	-.203*	1.00						
5. MBI Total	-.016	.106	-.186	.548*	1.00					
6. MBI EE	-.068	.012	-.231*	.613*	.873*	1.00				
7. MBI DP	-.039	-.038.	-.185*	.409*	.804*	.602*	1.00			
8. MBI PA	.133	.252*	.033	-.060	.319*	-.106	.030	1.00		
9. Job Demands	.002	.228*	-.125	.252*	.538*	.609*	.331*	-.049	1.00	
10. Job Control	.113	.490*	.109	-.074	.202*	.168	.039	.149	.498*	1.00
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

* significant at the alpha = .05 level.

To operationalize Demands, Control, and Support variables in the JCQ, Demand was the JCQ Job Demands, Control was the JCQ Decision Latitude, and Social Support was the JCQ Social Support scales. As seen in Table 4, the correlation between the Decision Latitude and Job Control was direct and significant at the .05 level (r=.498). Social support was primarily independent of the two scales. However, Job Demands was directly and significantly correlated at the .05 level with Strain (r=.252), MBI Burnout (r=.538), Emotional Exhaustion (r=.609), Depersonalization(r=.331), and most notably with Self-Efficacy (r=228). Decision Latitude is composed of the JCQ Decision Authority and JCQ Skill Utilization subscales which very likely accounts for its significant correlation with Self-Efficacy also (r=.490).

Predictors of Faculty Strain and Burnout

The second research question of this study posited: Does a combination of self-efficacy, exercise behaviors, and social support predict faculty strain?

The Regression analysis used to evaluate this relationship produced a significant regression (F= 2.88), and coefficient of determination of .254, but only explained approximately 6.4% of the variability in the Strain response set (R squared= .064). The regression equation to predict Strain was:

-.120 Exercise Index – .216 Social Support – .019 Self-Efficacy

This result supports the hypothesized relationship between faculty strain and the study's three primary independent variables of a) the exercise index developed for this study, b) the JCQ Social Support subscale, and c) the MSEAT Self-Efficacy measure. The relationship between the independent variables and the faculty strain indicator was statistically significant even though it only accounted for 6.4% of variability in that dependent variable. The social support measure

used was the JCQ Social Support subscale and proved to be the significant predictor variable of the set (t = -2.47, p=.015).

Table 5. Regression ANOVA for ELAS, Support, and Efficacy predicting Strain.

	Sum of Squares	df	Mean Square	F	Sig.
Regression	213.438	3	71.146	2.88	5.038
Residual	3106.993	126	24.659		
Total	3320.431	129			

The Durbin-Watson statistic was 1.879 and the residual analysis supported the regression analysis (See Figure 6).

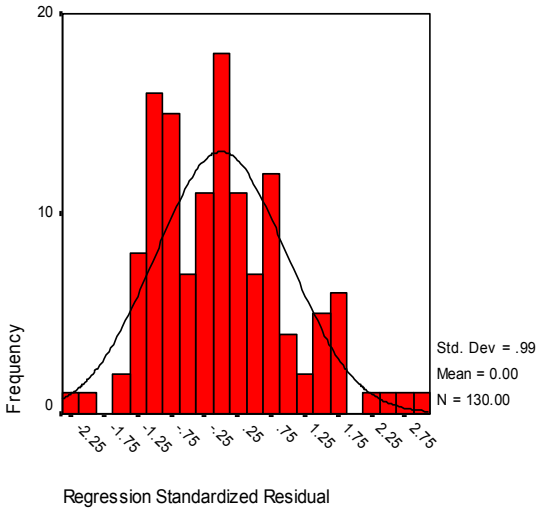


Figure 6. Residual Analysis for Regression using Strain as the DV

The third research question of this study posited: Will self-efficacy, exercise behaviors, and social support predict burn-out?

The regression equation to predict Burnout was:

Burnout= -.232* Social Support + .202* Self-Efficacy + .060* Exercise Index

The regression equation was significant (F= 2.755, p=.05) and yielded an R^2= .076. The model produced a coefficient of determination of .276 but only approximately 8% of the variability in burnout was explained by the independent variables as shown in Table 6 below.

Table 6. Regression ANOVA for ELAS, Social Support, and Efficacy predicting Burnout.

	Sum of Squares	df	Mean Square	F	Sig.
Regression	2055.296	3	685.099	2.755	.046
Residual	25113.619	101	248.65		
Total	27168.914	104			

Impact of Demographic and Occupation Variables on Faculty Strain

The fourth research question of this study posited: Do selected demographic and academic variables modify faculty strain or burnout?

Faculty rank level should be related to two variables as well as the self-efficacy level reported earlier. Those two demographic and occupational variables are the age of the respondents ($F(3, 163) = 57.76$, $p < .001$) and the current salary in their position ($F(3, 162) = 70.60$, $p < .001$). Both were significantly different suggesting strong construct validity in this analysis. The levels of self-efficacy were significantly different for the higher ranked faculty, with higher ranks possessing self-efficacy in their academic tasks ($F(3, 139) = 9.63$, $p< .001$).

This finding was consistent with the finding between tenured and non-tenured faculty as well. The contingency table analysis of the rank by tenure variables (4x2) yielded a Chi-Squared statistic ($df = 3$) of 140.61 ($p < .001$) showing that tenure occurred at higher levels of academic rank with only 6.97% of "non-professor" rank, and 2.08% of Assistant Professors, are tenured

versus 66.67% of Associate, and 90.57% of Full professors being tenured. The breakdown is shown in Table 7.

Table 7. Cross tabulation of Faculty Rank with Tenure Status.

	Tenured?		
Rank	No	Yes	Total
Other	40	3	43
Assistant	47	1	48
Associate	9	18	27
Full	3	48	51
Total	99	70	169

The act of tenure was a significant point in faculty development over the last five decades as universities evolved into the current social-financial realities they face. The impact of tenure was assessed upon reported faculty strain and burnout levels using a t-test. The use of non-equivalence of variances was utilized and there were no differences between those tenured faculty and non-tenured faculty reported levels of faculty strain ($t(152) = 1.39$, $p > .05$) nor reported burnout levels ($t(133) = -.229$, $p > .05$).

The two groups also had no significant differences in their reported exercise index ($t(166) = -.236$, $p = .027$). There were significant differences between non-tenured faculty and tenured faculty on reported levels of social support ($t(142) = -2.24$, $p = .027$) and reported self-efficacy ($t(142) = -6.33$, $p < .001$). Tenured faculty reported significantly higher levels of social support and self-efficacy.

Table 8. ANOVA Results with Rank, Strain, Burnout, and Select Occupational Variables.

Variable	F	df	sig.
Age of Respondent	57.76	(3, 163)	<.001
Burnout Total	.492	(2, 110)	.688
Job Strain	1.17	(3, 149)	.323
Salary Range (current)	70.60	(3, 162)	<.001
Self-Efficacy	9.52	(3, 138)	<.001
Social Support	1.71	(3, 139)	.169
Time on Current Job	48.21	(3, 162)	<.001

While the sample's ethnicity distribution was heavily skewed toward Caucasian (84.2%) and had only a single African American respondent (.6%), thus any interpretation of these results beyond there immediate group is not warranted. The testing of the group means, while limited shows no differences between the ethnic groups on burnout ($F(2,112) = 2.69$, $p = .072$), but did on job strain ($F(3,50) = 3.36$, $p = .02$). Table 9 shows several other comparisons that are of interest, but may not be very reliable due to this sample's ethnicity distribution.

Table 9. ANOVA Results with Ethnicity and Strain, Burnout, and Selected Occupational Variables.

Variable	F	df	sig.
Age of Respondent	1.32	(3, 164)	.268
Burnout Total	2.69	(2, 112)	.072
Job Strain	3.36	(3, 150)	.020
Salary Range (current)	.045	(3, 163)	.987
Social Support	.150	(2, 141)	.853
Time on Current Job	1.06	(3, 166)	.368

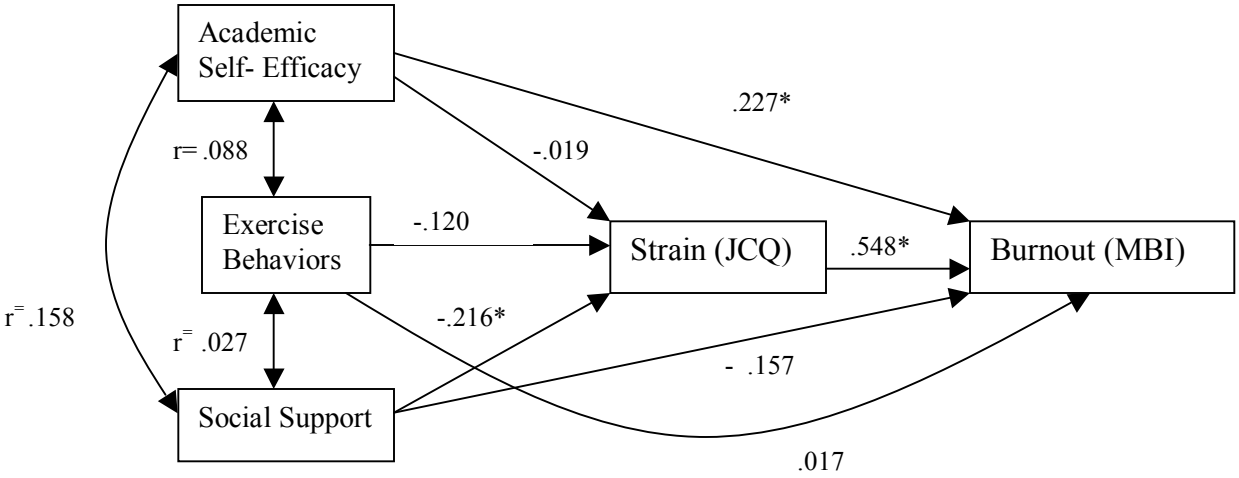
Strain as an Intervening Variable in Predicting Faculty Burnout

The fifth research question of this study posited: Do self-efficacy, exercise, and social support predict burnout using faculty strain as an intervening variable?

This analysis requires using Multiple Correlation and Regression Analysis to achieve the answer, where the independent variables of efficacy, exercise, and social support effects are transmitted through faculty strain to predict the burnout score. The analysis uses part/partial correlation analysis and multiple regression analysis to complete the analysis. The model produces an R-value of .600 yielding about 36% of the MBI burnout variability being accounted for by the four independent variables ($R^2 = .36$).

The Exercise Index did not add to the model's explanatory ability. Self-Efficacy and Social Support were significant predictors of Strain, and Strain is a significant predictor of Burnout as is Self-Efficacy. Social support is negatively correlated with strain, burnout, and

emotional exhaustion. Academic Self-Efficacy is significantly correlated to Burnout when controlling for the other independent variables (r=.227), while social support strongly drops when controlling for the other variables (r=.157). A reasonable rationale might be that perceived strain cuts down acknowledged social support perception and self-efficacy makes it more difficult to ignore strain, thus enhancing its effect.



* Significant at the .05 level,

Figure 7. Regression Model using Strain as an Intervening Variable Predicting Burnout. The boxes to the far left represent independent variables and strain and burnout boxes were dependent variables. The asterisks indicates a significant interrelationship between the variables. Three significant relationships were found.

Table 10. Regression ANOVA results for Model in Question 5 predicting MBI.

	Sum of Squares	df	Mean Square	F	Sig.
Regression	213.438	3	71.146	2.885	.038
Residual	3106.993	126	24.659		
Total	3320.431	129			

The regression was significant (F (3,126) = 2.89, p=.038) (See Table 10). The Durbin-Watson Statistic was 1.879 and the residuals analysis supports the reliability of this regression analysis (See Figure 8).

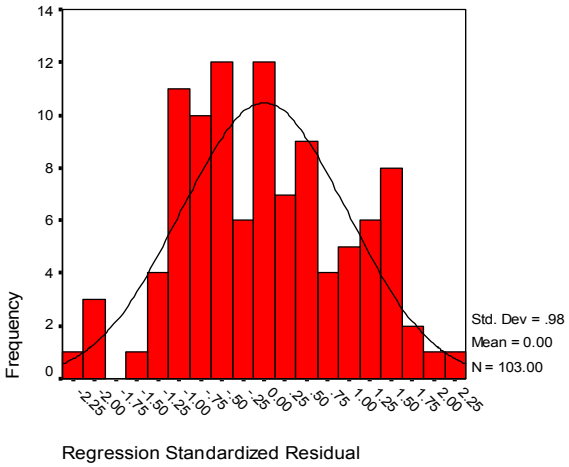


Figure 8. Residual Analysis for the Regression using Burnout as the DV.

DCS Model as a Predictor of Strain and Burnout

The sixth research question of this study posited: Will a combination of occupational self-efficacy, exercise behaviors, and social support be better correlated to faculty strain than job psychological demands, job control, and social support (DCS)?

This research question asks if the three Demand-Support-Control variables (e.g., JCQ Job Demands, JCQ Decision Latitude, and JCQ Social Support scales) predict faculty strain any better than the three independent variables in this study (MSEAT, JCQ Social Support, and the ELAS). To answer this question, two simple linear regression analyses were completed using derived subscales that comprise the independent variables from the JCQ. The dependent variable in both Model I and II was the faculty strain indicator derived from the JCQ. As seen in Table 11, the DCS model variables were a better predictor of the faculty strain score (R = .356) than

were the study's variables (R = .254). Both regressions were significant, but the DCS variables accounted for over twice the variance (R squared = .127) than did the study variables (R squared = .064). The regression equation using the study variables as predictors of faculty strain was:

Strain = - .216* social support + 120 exercise index - .019 self-efficacy.

The second model produced this equation using the DCS variables:

Strain = .358* job demands - .172 decision latitude - .136 social support.

However, only 12.5% of the variability in faculty strain was accounted for at maximum. Model II using the DCS three variables found Job Demands to be the significant predictor of job strain in that predictor set.

A third Model was used to explore the efficacy of the DCS predicting actual reported burnout using the MBI as the dependent variable and the DCS job demands, decision latitude, and social support as the predictor set. The regression analysis was significant (F (3,103) = 16.90). Since it was established that strain was a predictor of burnout, the efficacy of the more powerful model's predictive ability was explored and it accounted for a significant increase in the variance (R squared = .330) from the 12.7% of faculty strain accounted for. The regression equation for this third Model was:

Burnout = .112 social support + .564* Job Demands - .025 decision latitude.

Similar to Model II, job demands was a significant predictor of burnout in this predictor set.

Table 11. Multiple Correlation Coefficient, R^2, and ANOVA Results for the 3 Models.

Model	R	R^2	F	df	sig.
Model I	.254	.064	2.86	(3, 137)	.038
Model II	.356	.127	6.61	(3, 126)	.001
Model III	.574	.330	16.90	(3, 103)	.001

The results of this study yielded some interesting findings; although most of the findings were consistent with the predicted outcomes. While many other statistical tests and comparisons could have been performed, the focus of this section was to answer the research questions. Implications of the findings will follow in the discussion which a sub-section of it also discussing the impact of the missing data on the study.

CHAPTER 5: DISSCUSION OF RESULTS

The discussion of the results will be based around the research questions posed. After a brief overview, findings to each research question in this study will be discussed in terms of past research and expectations or hypothesis made. A sub-section addressing the missing data impacts has also been included. A final summary of the findings and the relevance of them in the emerging fields will conclude this section and the paper.

Project Overview

The purpose of the study was to investigate the relationships between three variables associated with reduced strain- self-efficacy, social support and exercise- with well-known measures of strain and burnout. The theoretical framework of this study is based upon the *demand-control-supports model* (DCS Model) (Karasek & Theorell, 1990), which relates job characteristics to an individual's occupational strain.

Two hypotheses were inherent in this model: a) the *additive hypothesis* where job strain in increased as either high job demands or low job control is increased, and b) the *interaction or buffer hypothesis* which states job control (and/ or social support) moderates the relationship between job demands and job strain. The second hypothesis specifically states that a high strain job (high demand, low control) will cause physical and psychological strain, a decreased capacity to learn, and that high-demand, high-control jobs known as "active jobs", will produce well-being, learning and personal growth. In this model, *job control* is described by the combination of skill discretion and decision authority. This implies a person not only possesses the ability to choose how to perform a job but the authority or control to utilize those abilities.

The current study expanded on the DCS Model by using the additional predictor variables of self-efficacy and exercise. It also looked at burnout as an outcome variable of

psychological strain in university faculty. Although the 1999 Higher Education Research Initiative (HERI) report showed that faculty were more satisfied with many aspects of their careers than they were in previous years, overall stress levels have not decreased. Stress levels may have actually increased in regards to some issues, especially those related to personal health and time pressures (Sanderson, 2000; Sax, Astin, Korn, & Gilmartin, 1999). This increase in occupational stress is also true in the UK with job insecurity, lack of decisional control, work relationships, work-life balance, work overload, and lower salaries than those performing similar jobs and increased accountability all being strong present day stressors (Tytherleigh, Webb, Cooper, & Ricketts, 2005; Houston, Meyer, & Paewai, 2006).

Modifications from the Original Design

Due to the devastation of Hurricane Katrina on the New Orleans area, the dispersal of faculty and staff at the University of New Orleans, along with the subsequent stresses accompanying a major disaster, this study was performed on a faculty sample from a Southern California (Irvine, CA.) university versus one in the South. The population's demographics were shifted to a more affluent, less racially diverse, non-urban setting. While the results of the study may have been altered somewhat, the validity and reliability were not affected in any way. In fact, the university that was utilized had roughly 4 times more faculty (approximately 1400) than the original choice and thus a much larger pool to sample from and potentially a greater number of respondents. The original strategy was to send the survey and then two subsequent reminders before final collection. Due to certain limitations, this could not be performed. This may have affected both the final number of respondents and characteristics of respondent may been have more limited.

The original survey was designed with more opened-ended or continuous, interval scale variables and due to advisement was changed to interval and ordinal scale variables. While this change may have made the survey easier to answer for many respondents, it made the processing of the results more difficult and some statistical tests could not be performed. In addition, misdirection in the survey instructions causing non-exercisers to not answer two questions may have compromised the validity of the results, both on the exercise instrument and interrelationships of exercise to the other variables.

Overview of Findings

In general, this study found the three independent variables could be used to predict faculty strain (Model I). However, only 6.4% of the variance was accounted for by self-efficacy, exercise, and social support. The three factors from the Demand- Control- Supports model (Model II) were a much better predictor and accounted for almost twice (12.5%) the variance compared to the study's variables. A third model, which used job control or decision latitude, job demands, and social support to predict burnout, accounted for 33% of the variance. In both the second and third models, Job Demands was the most significant predictor in the set.

The lack of a strong prediction variable set is not surprising due to exercise behaviors not being related to any other variable. It is believed that either most everyone performs exercise or leisure activities and differences were not realized or the survey did not capture the exercise factor sufficiently. An abundance of research literature has clearly documented the strain reducing effects of exercise as well as reducing burnout. No succinct, well-recognized indexes of exercise and leisure were found, thus the investigator developed a survey for this study known as the Exercise and Leisure Activity Survey. It is not known how well this survey captured or missed activity and leisure as a strain-reducing component; it is also unknown what the exact

impact of the missing data on activities of daily living had on this study and therefore limits the validity of the findings in this area.

The self-efficacy component was measured by a relatively novel survey for academic self-efficacy- called the *Measure of Self Efficacy for Academic Tasks*. Landino and Owen (1988) developed this survey to specifically look at efficacy in the different areas of faculty work, which included research, service, and teaching. Even though this tool has been used with success, it is not believed that faculty at this academically rigorous institution lacked self-efficacy, and thus the variability within the sample was not predictive of strain. The Academic Self-Efficacy component was significantly correlated to job control, job demands, personal accomplishment, and inversely related to depersonalization, and faculty strain.

Surprisingly, the social support component, which was measured by the social support sub-component in the JCS was a strong predictor of not only strain and burnout but the emotional exhaustion and depersonalization components in the MBI as well. Finally, burnout and strain were strongly related and using the MBI Educator's Survey version may be a useful tool to gauge faculty strain. The job demands was the dominant component in predicting burnout. While this finding was not unexpected, the strength of the relationship is a solid foundation for future research.

Discussion of the Sample

Results showed no significant difference between the genders as expected. A nationwide survey of American faculty (Lindholm et al., 2002) showed 38% of the faculty were women in 2001, up from 29% in 1989. Approximately, the same figure (34.8%) was found in the American Faculty Poll (Sanderson, Phua, & Herda, 2000). This sample contained a much higher proportion of women than the previous national standards. The exact breakdown of the UCI

faculty composition was unavailable but the total number is approximately 1000, thus about 17% of the faculty responded. As mentioned this is low for a campus wide survey but good for a national level.

The ethnicity of this sample was distributed as 0.6% African American, 8.2% Asian, 84.2% Caucasian, and 6.4% Hispanic, thus any interpretation of these results beyond there immediate group is not warranted. While this sample may seem heavily skewed, national faculty surveys have shown 86% white, and other minority groups constituting less than 5% of the sample. While the number of Asian faculty in this sample was much higher (8.2% vs. 4.6%) than that found in the American Faculty Poll (Sanderson, 2000), it is not unexpected given the area's and student demographics. The ages of faculty were similar to the American Faculty Poll, where two-thirds were between the ages of 40-59, and this sample had a mean age of 45.50 years (SD=10.89 years). The mean age of men and women were within 1 year of the overall mean and not significantly different.

The testing of the group means, while limited, shows no differences between the ethnic groups on burnout, but did on job strain. Table 5 shows several other comparisons of interest, but these may not be very reliable due to this sample's ethnicity distribution. There were no significant differences between the groups across any of the variables, which suggests either ethnicity had no relationship to the variables tested for or the sampling pool was too small to detect any differences.

The presence of a working spouse in a family is known to place stresses on the couple as both are tied up time-wise in their work life and its demands. There were 92 spouses (53.8% reported as working either part-time (10.5%) or full-time (43.3%). Thirty-two respondents reported no spouse working (16.7%) and 26.3% of the participants reported no spouse. It

appears that 124 respondents had either no spouse or a part- or full-time employed spouse. Sax, Astin, Korn, and Gilmartin (1999) reported that women continue to be more stressed than men, due to extra-vocational matters. A previous version of this study three years earlier showed both vocational and extra-vocational stress was greater in women and has increased more in women since the 1989 study. The 1999 HERI study found women were more likely than men to report stress from managing children and a household (81% to 66%) and spent more than 17 hours per week tending to those duties (31% to 15%). Also, greater stress levels were found in women due to a lack of personal time (88% to 75%) (Sax, Astin, Arredondo, & Korn, 1996). Vasil (1992), Schoen and Wincour (1988), and Landino and Owen (1988) all found females to have lower research self-efficacy than males; however, this study found no differences between genders for self-efficacy, strain or burnout. It is believed that respondents to the survey, regardless of gender, may have had lower strain or burnout, since individuals high in these factors feel time pressured and would not have responded to this voluntary survey. Lease (1999) found faculty who were more strained tended to participate less in many of their duties, especially those involving interactions.

Employment Demographics

The employment characteristics of academic life are a bit specific and have been shown to affect strain differentially. Previous studies on faculty strain found associations in the following areas, which were also included in survey questions: a) faculty rank, b) time at current job, c) department/school employed in, d) tenure, e) salary, f) degree, and g) percent of area of effort were asked. These factors were associated with the *Job Content Questionnaire* (Karasek, 1985) and the *Measures of Self-Efficacy for Academic Tasks* (Landino & Owen, 1988).

There were 51 Full Professors (29.8%), 27 Associate Professors (15.8%), 48 Assistant Professors (28.1%), and 43 other ranked faculty (25.1%) comprising this sample of respondents. The American Faculty Pool (Sanderson, Phua, Herda, 2000) found a higher percentage of higher ranks with 34.9% Full, 26.1% Associate, 22.2% Assistant Professors, and 16.8% other. It is suspected that higher-ranking faculty may have felt less desire or need to fill out this voluntary survey, however this is not known.

Gmelch, Wilke, and Lovrich (1986) found tenure to be related to all dimensions of faculty stress and faculty rank was also related to faculty stress with the higher ranking members having lower stress levels. In this study, 41.5% were tenured faculty (n=71) and 58.5% were not tenured (n=100). A major national survey found 62% of faculty were tenured. Respondents were asked to break down their time spent into categories for Teaching, Research, and Service areas.

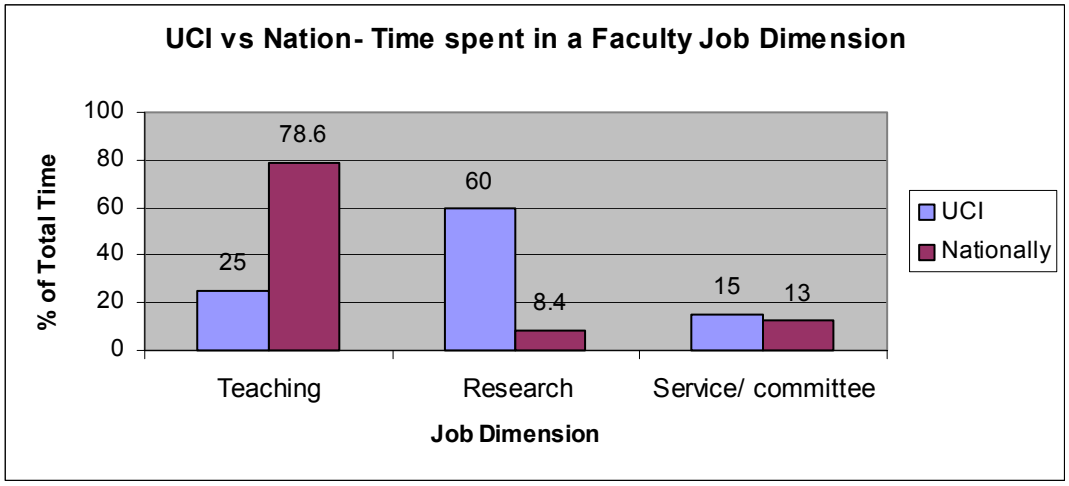


Figure 9- Distribution of total time spent in a job dimension. UCI figures in blue show the shift away from teaching and toward research compared to national standards. Service and committee variable is approximately equal.

The total work time had to add to 100 percent (an FTE). The median profile across these three dimensions would suggest that participants of this study spent an average time of 20-30% teaching, 31-50% in research activities, and 11-20% in service activities. The modal category

response suggests that the most frequent reported time distribution across the dimensions was 25% teaching, 60% research, and 15% service. These three proportions will vary greatly with the type of institution. This institution has been known to be research-oriented, thus the dramatic difference compared to national values of 78.6% teaching, 8.4% research, and 13% administration and other (Sanderson, 2000).

The sample of participants was essentially doctoral-prepared with 149 doctoral degrees (87.1%), 11 professional area doctorates (6.4%), and 8 Master level degrees (4.7%). An increasing national trend of more doctoral degrees was found between 1989 and 2001(Lindholm et al., 2002), going from 61% to 64%. This sample had considerably higher proportion of doctoral degreed (93.5%) respondents, which is expected for a highly competitive research institute such as this; however, this large discrepancy suggests a biasing of the respondents, and many non-doctorates may have not responded to this email survey.

Faculty rank level was related to two variables as well as the self-efficacy level reported earlier. The age of the respondents and the current salary in their position were both significantly different, suggesting strong construct validity in this analysis. Also expected, the levels of self-efficacy in academic tasks were significantly higher for the higher ranked faculty. This was also consistent with the finding between tenured and non-tenured faculty. The contingency table (Table 5) analysis of the rank by tenure showed the fact that tenure occurs at higher levels of rank in academe, with only 6.97% non- professor rank and 2.08% of Assistant Professors are tenured versus 66.67% of Associate and 90.57% of Full professors are tenured. There were significant differences between non-tenured faculty and tenured faculty on reported levels of social support and reported self-efficacy. Tenured faculty had significantly higher levels of perceived social support and self-efficacy. This finding is not surprising. Schonfeld

(2001) found support from non-work sources was directly related to reduced strain symptoms, better self-esteem, and job satisfaction.

The data showed that women were more sensitive to a lack of support in the 1st year. The lack of support was also found in other studies examining stain and burnout in new and junior faculty (Olsen, 1993; Sorcinelli, 1992). A negative spiral may develop with these phenomena. The unsupported faculty feel more stress and often withdrawal from contact, which further augments the lack of social contact and support, which in turn enhances the strain leading to depersonalization and burnout. Verbal persuasion and emotional arousal are critical factors to enhance self-efficacy (Bandura, 1982). Mentorships and careful monitoring of new faculty have been suggestions to counter this negative spiral.

Discussion of Research Question Findings

Discussion of Interelationships of Independent and Dependent Variables

Research Question 1: Will self-efficacy, exercise behaviors, or social support be interrelated to each other? Will be they related to faculty strain or burnout?

A correlation matrix examined interrelationships between: a) ELAS- Exercise Index, b) MSEAT Self Efficacy subscale, c) JCQ Social Support, d) JCQ Strain subscale, e)MBI Burnout score, f) MBI Emotional Exhaustion subscale, g) MBI Depersonalization subscale, and h) MBI Personal Accomplishment subscale. It was of major importance in this study to examine variables related to strain. The JCQ Strain score was significantly correlated with: a) JCQ Social Support scale score, b) MBI overall score, c) MBI Emotional Exhaustion, d) MBI Depersonalization at the .05 level. Thus, both Social Support and all but one Burnout scores were related to the Strain score.

It can be speculated those not receiving appropriate social support on the job begin to feel emotionally exhausted, and depersonalized, which then elicits feelings of strain. A strong relationship has been seen between a lack of social support and these variables in past studies (Olstad, Sexton, & Sogaard, 2001; Searle, Bright, & Bochner, 1999) and it is likely to have been the case here.

Not surprisingly, the MBI score was significantly correlated at the .05 level with its constituent parts a) Emotional Exhaustion (r=..873), Depersonalization (r=.804), and Personal Accomplishment n(r=.319). Also, of no surprise, was MBI scales of Emotional Exhaustion and Depersonalization being significantly correlated (r=.602, $p<.05$).

A powerful finding that has several important implications in this study was the MBI score being significantly correlated with the JCQ Strain scale. While this relationship may seem obvious, some studies have found burnout related to a variety of outcomes (Landsbergis, 1988; Pines, Aronson, & Kafry, 1981). A large number of studies have looked at burnout in teachers and a significant number in post secondary school faculty have also been performed (Guglielmi & Tatrow, 1998; Singh, Mishra, Kim, 1998; Goldenberg & Waddell, 1990; Jancin, 2002). Jancin found that even though personal accomplishment was high for department heads, the depersonalization and especially emotional exhaustion were also high, thus causing burnout. One implication is that burnout, as measured by the MBI, may be utilized as indicator of faculty strain. As mentioned, this study used the Educator's Survey and made a minor adaptation for higher education faculty. It is believed this measure was both valid and yielded some interesting relationships.

Self-Efficacy Interrelationships and Impacts

The MBI *Personal Accomplishment* was significantly correlated with the MSEAT Self-Efficacy score. While this relationship may also seem obvious, one must understand that self-efficacy includes many constructs within it and somebody's feeling about their personal accomplishment, or lack thereof, does not inherently mean they possess or lack self-efficacy. Bandura originally defined perceived self-efficacy "…concerned with judgments of how well one can execute courses of actions required to deal with prospective situations (1982, p.122). However, the connection between these constructs is strong and some theories mention how self-efficacy is a necessary component for burnout to occur, since burnout is often found in human service professions where the individual has strong concern for their personal effectiveness and accomplishments.

In addition, *self-efficacy for academic tasks* was related to both *job demands* and *control*. A large amount of empirical evidence supports self-efficacy beliefs affecting the way one thinks about a given task, how well they motivate themselves, persevere in the face of adversities, and their vulnerability to stress and depression (Bandura, 1997). Self-efficacy is also strongly associated with lower stress or strain in that someone with high self-efficacy for a given task will initiate and persist in behaviors and courses of action to execute a given task and cope with the environmental demands and challenges (Bandura, 1986; Maddux 1995).

Graham and Weiner (1996) stated that self-efficacy was a more consistent predictor of behavioral outcomes than other motivational constructs, especially in the fields of psychology and education. Jex and Gudanowski (1992) found that *collective* rather than *individual* self-efficacy was related to both stressors and strain. Collective efficacy is the belief that a given "unit" or group can be effective at executing a given performance. For example, working long

hours imposed a strain response unless they believed their department was capable of performing. This concept is expressed in the saying, "take one for the team".

Although self-efficacy did not have a direct relationship with strain in this study, it may have served to enhance personal accomplishment and the perception of social support at the workplace. A study by VanYperen (1998) found nurses with low self-efficacy were sensitive to the amount of informational support given to them, and perceived inequitable treatment more readily than high self-efficacy workers. Thus, someone with weak perceived self-efficacy may be unwilling to put out additional effort to enhance personal accomplishment and a sense of personalization, which could lead to their feeling burnt out.

Another study also supported these interrelationships between self-efficacy as a moderator or job strain and burnout in information technology workers (Salanova, Peiro, & Schaufeli, 2002). Researchers used the Job Demand Control Model to characterize strain as high demands and low control perceptions. As expected, they found more specific levels of self-efficacy moderated both the perceived strain and burnout dimensions. This study's finding of self-efficacy being positively related to burnout do suggest other factors such as job demands, control or amount of responsibilities at work or home may be having an effect.

Jimmieson (2000) found the stress-buffering effects of work control was only found in those with high self-efficacy. Evidence suggested self-efficacy moderated effects of work control on job satisfaction and somatic health as well. This specific interaction was also found by Schaubroeck and Merritt (1997). Even though job satisfaction and somatic health questions were contained on the JCQ, they were not isolated measures of these variables. Future studies should incorporate quality of life, and job satisfaction as separate entities to examine self-efficacy and strain interrelationships.

Exercise and Leisure Activities Interrelationships and Impacts

Exercise or physical activity alone, not to mention other leisure time activities, has been associated with significantly reduced strain symptoms and health care cost savings (Pate et al., 1995; Manning & Fuslier, 1999; Petruzzello et al.1991). This concept was operationalized in this current study by use of an experimental survey called the *Exercise and Leisure Activities Survey* or ELAS (Kelly, 2000). The tool yields an ELAS Index- which was calculated by the cumulative total of exercise volume (exercise sessions performed per week * minutes per session) with number of different stress-reducing activites, with the number of different hobbies performed. The American College of Sports Medicine defines activities with four main variables. Three of the variables describe the quantities of the activity- frequency, intensity, and duration and one describes the quality- mode. Questions in this area included- how many minutes per session do you spend exercising, and how many times per week. Those who have been exercising long enough to have it as a habit show lower stress and strain than those just beginning so "How long have you been exercising?" was asked to ascertain this.

The qualitative nature of the stress-reducing activities and hobbies did not permit any multiplicative calculation like exercise volume. It should be noted that the exercise volume was collected for all types of exercise but not the non-exercise activities. The exercise volume concept is used throughout the world in most studies examining leisure-time physical activity surveillance (Caspersen, Merritt, & Stephens, 1994). The goal in many of these studies was too quantify activity and total kilocalories were calculated based on frequency, intensity, duration, and mode. These studies were relating total activity to various chronic diseases and public health.

The goal of this study was to look at exercise, along with stress reducing activities and hobbies, as ways to counter strain. The exercise contribution to the ELAS index is far greater than the contribution of stress reducing and hobbies. Thus, there is a strong bias toward exercisers and this may explain the lack of relationship between this variable and the others. Past research has found support that a properly designed and implemented health and fitness program can improve physical and mental health, provide fiscal benefits from reduced absenteeism, turnover, medical or legal expenses, and promote increased productivity (Horowitz et al., 1985; Kerber, 1994).

The focus of the ELAS was to find out about the exercise and leisure activities of an individual in a very short number of questions. Several of the questions were derived from nationally recognized exercise surveys. The survey was pilot tested on faculty at Nunez Community College for readability, and face and content validity. The survey was easily completed and easy to understand. The ELAS was adapted slightly in the types of hobbies as the research population shifted from New Orleans, Louisiana to (Irvine) Orange County, California.

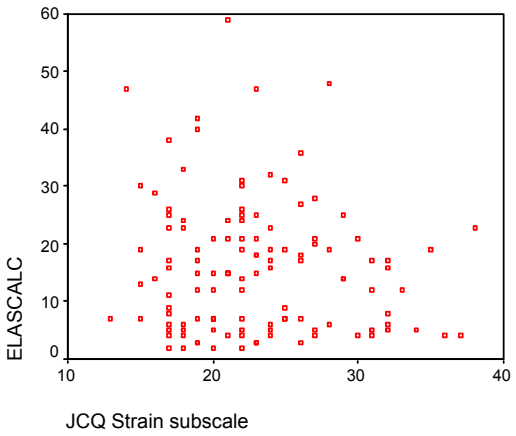


Figure 10- Scatter plot for the ELAS vs. Strain. There was no significant correlation (R= 0.236) as can be seen by the random scatter of points.

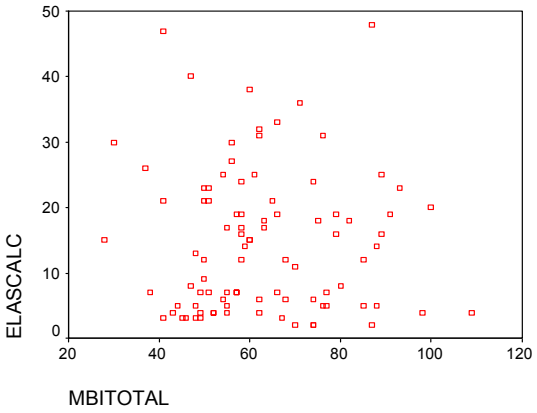


Figure 11- shows the scatter plot for ELAS vs. Burnout. There was no significant correlation (R= -0.061).

About two-thirds (n=107) of the sample participants (62.6%) reported they exercised regularly. This value is very high relative to national values showing about one-third of the population exercises regularly. While this difference is very large it is not unexpected given the socio-economic status, educational level, and geographic location of the sample population. The group exercised a mean of 1.54 times per week and a mean"11-20 minutes" per session. Anaerobic activities, such as weightlifting, were completed by 35.5% for 31 to 40 minutes/session, 81.0% doing anaerobic exercise between 20 and 60-minutes and 24.0% of respondents exercised leisurely once and twice weekly for 31 to 40-minutes. Figure 5 shows this overall breakdown.

Studies have shown that many physical activities outside of structured physical exercise (yoga, tai chi chuan, massage) can have both psychological and physical strain reducing effects, including entertainment and hobbies (Lassater, 2001; Long & Flood, 1993: Roth & Holmes, 1984;Tsai et al., 2003). Martinsen and Stephens (1994) mention that different modalities of exercise seem to promote psychological improvement and improved aerobic fitness was not necessary for enhanced mental state. The authors suggested future research should look at

moderate exercise since it did not show psychological harm and did result in considerable physical health benefits. Therefore questions included, how many hours per week someone spends in a) light, and b) moderate activities. The activities of daily living were asked despite the statement "studies of occupational physical activity are rare". (Martinsen & Stephens, p.57, 1994).

Unfortunately, an error was made in the instruction to respondents, which caused many to skip the questions concerning "activities of daily living" (questions 19 and 20). While these components were not used in the calculation of ELAS, they may have contributed some interesting revelations of overall activity and strain or activity and the other variables. Because of the mistaken instructions no valid interpretation can be made. A thorough discussion of this error follows this section.

When asked about how long the respondent had been exercising, the majority had been engaging a long time "more than 10-years" (50.9%), and exercised at a level of intensity that increased respiration rates. Approximately 20% had been exercising "between 1 to 4-years" and "between 5 and 10-years." Studies have shown stress-buffering effects of exercise increase with higher levels of participation, and participation in recreational activities but not aerobic fitness per se diminishes stress and improves quality of life outcomes (Atlantis, Chow, Kirby, & Fiatarone, 2004).

Stress reducer activities. Two sets of questions were posed to identify the respondent's use of stress reduction activities and hobby activities to reduce stress. The mean number of stress reducing activities utilized regularly by 129 participants who did such was 1.74 activities. The second set of questions consisted of entertainment-oriented activities. A much higher portion of the sample 88.1% participated in hobby activities and much fewer skipped this question. The

entertainment hobby activities were more likely to be used and served as a more common stress relief outlet than did the more directed stress relief activities.

The strain buffering effect of exercise behaviors was not apparent in this study. The studies showing decreases in stress and strain symptoms tend to longitudinal in nature and carefully quantify the physical condition of the subject or their activity level (de Geus & van Doornen, 1993; Martinsen & Stephens, 1994). This study was cross-sectional and grouped all structured exercise with daily living activities. Future studies should measure exercise activity and habits separately from leisure activities. They should also develop a scale, which quantifies the stress or strain reduction factor of a given activity. For example, fishing might be a 3, while yoga is a 6, and vacationing maybe an 8. This may be an invalid standardized scale due to individual differences. An individualized scale similar to the *Borg Perceived Exertion Scale* could be developed where the relative enjoyment or stress relief could be individually quantified and then multiplied by fractions of an hour the individual performed the activity with a maximum of 1 hour or some maximum. Developing such a scale may be difficult but it may help advance theories in stress and strain reduction due to leisure time activities.

Instrument Design Error: Missing Data Impacts

What error occurred?

As mentioned, the Exercise and Leisure Activities Survey (ELAS) respondents were misinformed to skip to question 21 when they should have been instructed to skip to question 19. Thus, two questions (19 and 20), which addressed how much non-structured or daily living activities, were skipped by 31% of the respondents. This may have had a profound effect on the findings, since those who to do not partake in "structured exercise" may, in fact, perform additional "activities of daily living" for strain reduction. Since this was not measured, no

statement about this can be made. Both, the instructional error causing many to miss 18 and 19, as well as the inconsistencies in responses to questions in the ELAS and survey, are cause for concern regarding interpretations that can be made with the ELAS.

How did it occur?

In directing the respondents to bypass certain structured exercise-oriented questions that did not apply to the non-exercisers, the survey designer actually misdirected respondents to question 21 instead. Questions concerning how many hours per week individuals participated in light and moderate activities of daily living (ADL) or non-structured activity were skipped by many of the non-exercisers as a result.

What it means to the results?

Although the particular questions skipped were not in the ELAS calculation and seemingly had no direct bearing on the main research questions, they may have affected the several aspects of the results including strain reduction by physical activity in one's daily life and the psychometric properties of the test were also disturbed. As soon as an individual skips any questions, the respondent is now essentially doing a different test. The order and number of questions on any test can have potential effects on the way a respondent answers those questions (Trochim, 2006).

The potential for this misdirection error may have had profound effects on the exercise factor as well. In the official resource manual for exercise testing and prescription used by a leading exercise and sports medicine group- the American College of Sports Medicine's (ACSM), Fitzgerald and Morrow (2006) stated, "now the impetus is getting individuals to participate in moderate-intensity lifestyle physical activities to improve health. The understanding is that those engaging in the process of physical activity will achieve the product

of physical fitness" (p.136). This error definitely eliminates making any potential relationships of daily living activities with the other variables and may also affect calculations of physical health upon those individuals.

The ELAS index was calculated using a cumulative total of weekly exercise volume-frequency x duration- (question 16), the number different of stress reducing activities (question 21) and hobbies (question 22) the individual participated in. Thus, it was hypothesized the more an individual sought recreation or exercise, whatever form it was in, and the greater variety of "purposeful recreation" they engaged in, the more strain reduction they would receive. While these factors were included because they were known strain reduction factors, it cannot be ruled out that activities of daily living do not affect an individuals strain or burnout levels.

How long the individual has been exercising, activity on the job and activities of daily living were collected for discriminative analysis. In other words, if exercise (ELASCALC) was related to strain or burnout, then other variables may be entered into a regression equation and their relative effect could be measured. The data did not reveal any significant relationships for these additional factors nor did it find the ELAS calculation to be related to other variables. Table 12 shows the number of missing respondents. Because of the anonymity maintained on this survey no inquiries can be done on why or how much someone did not respond.

In question 15, 59 people responded "No" and 8 skipped the question, thus the number of missing in 16-20 should have been about 67 but was 58, 59, or 53, which is 34% and 31%, respectively. Thus, a large portion of the sample pool did not answer and therefore precludes any comparisons for the entire sample. Question 21 may have been misunderstood or misread by many since it had 45 missing respondents. The fact that someone may not do any stress reducing

activity was not asked and this may also be the reason for the lack of any response. It should be noted that two individuals only answered demographic questions and some other portions of the survey. While this number is small it contributes to the error in reporting and overestimates the missing respondents.

Table 12- Missing responses to Faculty Strain survey questions.

Question #	Content area	Missing responses
15	Do you currently perform structured exercise?	8
16	# sessions/wk and minutes/session- for 4 categories	59
17	How hard do you exercise in a majority of workouts?	58
18	How long have you been exercising?	58
19	How many hours/wk spent on light (living) activities?	**53**
20	How many hours/wk spent on moderate (living)activities?	**53**
21	Which stress reducing activities- regularly participate	45
22	What hobbies do you participate in?	13
23	Job Content Questionnaire- job related questions	14
24-34	Various questions- mostly job related	13-19

What impact the missing data had on the study?

The missing data did not impact the calculations involved in the main research questions; however, not including the activity of the missing respondents definitely negates any interpretation of the ADL factors for the whole sample, and by removing a portion of the sample from a portion of the test may ruin the integrity of the entire instrument. Literature searches from major Internet scholarly research databases performed revealed no studies relating "activities of daily living" with "psychological strain" in healthy, non-elderly adults. However, some experts believe that physical activity, in any form, is inversely associated with the risk of premature mortality, and many chronic diseases such as type 2 diabetes, stroke, hypertension, and heart

disease Katzmarzyk, 2006). Since hypertension (question 33), breathing difficulties, and fatigue could be related to ADL, the strain comparison to ADL is directly compromised.

Although most studies looking at emotional distress and exercise therapy have focused on "purposeful activity" or structured exercise, one study did find a dose-response effect of physical activity on depressive and anxiety disorders, but this has not been replicated in clinical trials (Dunn, Trivedi, O'Neal, 2001). Thus, the possibility does exist for simple physical activity to reduce strain symptoms and burnout.

What measures could have prevented the misdirection error?

Survey formats are not the best way to gain reliable and valid information for several reasons. Subject or respondent bias, self-selection of respondent pools, low response rates, incomplete data pools, and misinterpreted or incorrectly written instructions are amongst these reasons (Trochim, 2006). However, survey instruments are a fast, easy, and inexpensive way to get a lot of information from a large pool of individuals who may not be accessible in any other format.

Because surveys are subjective, self-reporting collections of information many precautions must be taken to insure accuracy, reliability and validity. Making sure survey questions are understood in terms of language, and content is of foremost importance. The wording of questions needs to be concerned with assumptions, how personal it is, "leading" phrases, and other biases. Many respondents will refuse to answer when the wording becomes biased, or personal. Insuring the instrument is valid and reliable requires not only great expertise and understanding of a given construct but elaborate statistical tests, large pools of respondents, and repeated sampling in a large variety of situations for appropriate generalizability (Trochim, 2006).

Four experts in the field at the University of New Orleans and one outside expert from an internationally recognized health research institute, first examined the ELAS survey for content validity and those 5 approved of it. The survey was also piloted tested on 14 faculty in a community college. The original survey questions were understandable to the faculty sample and the questions were able to discern not only between exercisers and non-exercisers but the mode, frequency, intensity, and duration of exercise sessions performed. The instrument was also analyzed for language, format, and potential confusing or ambiguous wording by two different faculty dissertation advisors, and a dissertation committee.

The original version did correctly sub-route the respondent to the appropriate question (ADL-oriented). Obviously, the misdirection occurred in the transference of it to the main survey. In the final form, if the respondent was an exerciser, the misdirection error would not have been encountered. To avoid this error, the survey as a whole, in its final form, should have been pilot tested to a faculty panel with varying backgrounds. This may have perhaps exposed the misdirection error and it could have been repaired.

The instrument was derived from the *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription,* recommendations. "Given the health implications of physical activity, it is important to measure the type, frequency, and intensity of physical activities." (Fitzgerald & Morrow, 2006, p.136). Thus, both the structured and non-structured physical activity was asked in accordance with the guidelines for physical activity assessment (Pereira, 1997). However, Tudor-Locke, & Myers (2001) suggest establishing the validity of a physical activity measure is difficult because no gold standard of physical activity currently exists.

Recommendations for physical activity measures to be reliable include testing the reproducibility with test-retest period of 2 to 4 weeks. This period is long enough that the initial

administration does not influence the test and short enough for behaviors not to change. This was not performed in the pilot-study. In addition, it is suggested that the "filter questions" or one's which direct a respondent to another question, should not have more than 3 levels or two jumps in a given question, if two levels then show an arrow and box (which was not possible with www.surveymonkey.com), and if possible have them jump to a new page versus another question (Trochim, 2006).

Question placement is another topic of concern when designing surveys. The problems exist in a respondent either not being appropriately prepared by preceding questions, or being too tired to accurately answer it. Some points to consider include: a) is the answer influenced by prior questions? b) does question placement affect interest? c) does the question get enough attention? (Trochim, 2006). When asking closed-end questions it is recommended to ask it multiple ways and combine the responses. While this was done in the exercise portion it was in other parts of the survey (Trochim, 2006).

Other disadvantages of using surveys to measure physical activity include: inaccurate recall, survey must be age appropriate, limited use in younger populations, and typical overestimations of activity, and inaccurate capture of all types of activity including occupational and lifestyle activity by the respondent. Advantages include the ease and inexpensiveness of administration and economy of questioning, and efficiency for collection (Fitzgerald and Morrow, 2006).

Even large surveys from the U.S. government- CDC *(Behavioral Risk Factor Surveillance System)* will sample exercise with a single question- "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?" Yes, No, Don't know / Not sure, Refused.

The answers dictate either you do or do not exercise. From there several skips are made depending on the form of exercise you do and a coding table is necessary for this survey. This form greatly compromises data needing to quantified or qualified in a simple fashion and would have been inappropriate for this study (Pieria, et al, 1997).

Missing cells or data points of any sort makes data interpretation difficult and invalidates comparisons between groups. Trying to build in fail-safes such as a prompt that occurs on the computer screen when someone has not filled an answer to a given question was provided by www.Surveymonkey.com and occasionally used in this survey.

Besides correctly guided those who did not exercise to question 19, the survey designer should have placed a "must answer" prompt which automatically is represented with an asterisk on the question. On "must answer" questions the faculty member must answer it in order to proceed with the rest of the survey. The exercise survey should have been subdivided into: 1) structured exercise, 2) non-structured exercise or daily living activities, and 3) stress-reducing and hobbies and measured their effects separately. Given the post-hoc situation, claims regarding daily living activities and the influence they have on other variables are being avoided.

Social Support Interrelationships and Impacts

The JCQ Social Support Scale was significantly inversely correlated with the MBI Emotional Exhaustion ($r= -.231$, $p<.05$) and the MBI Depersonalization ($r= -.185$, $p=.05$) subscales, and the Strain subscale score ($r= -.203$, $p<.05$). Social support was primarily independent of the two scales of Job Control but Job Demands was directly and significantly correlated with Strain ($r= .252$), MBI Burnout ($r=.538$), Emotional Exhaustion ($r= .609$), Depersonalization($r=.331$), and most notably with Self-Efficacy ($r= .228$) at the .05 level.

The strong influence of social support with components of burnout and faculty strain was not expected. In some of the literature on Karasek's DCS model, social support does seem to be related to academic self-efficacy. Social support has been found to buffer against occupational stressors psychological strain (Hagihara, Miller, Tarumi, & Nobutomo, 2003). It has been hypothesized that success within academia may require a set of social skills besides the academic ones (Hackett, Betz, & Doty, 1985; Schoen & Winocur, 1988). Betz and Hackett (1981) found differences between male and female in self-efficacy for vocations, where males felt self-efficacy beliefs in traditionally male or female jobs and females only felt it for traditionally female vocations.

Some studies have also shown that social and organizational support moderate the effects of job stress directly (Johnson & Hall, 1988; Landsbergis, Schnall, Deitz, Friedman, & Pickering, 1992). Searle, Bright, and Bochner (1999) examined the role of social support in differing levels of demands and job control. Results showed that high social support reduced stress directly rather than as a buffer to high strain. Even though it did not improve task performance significantly, it did reduce stress and the performance rating from the worker. Similar strain buffering effects from social support were found in other faculty studies as well; data suggests that females may be more sensitive to this support (Beardslee, White, Richter, 1996; Lim, 1997, Schirmer, 2000).

Most previous research on social support and burnout has not looked at university faculty. Van Dick and Wagner (2001) examined German schoolteachers and found global support and self-efficacy moderated or buffered stress reactions caused by work overload and negative social support. This relationship was confirmed when burnout was analyzed as an outcome.

Do the Study's Independent Variables Predict the Dependent Variables

Research Question 2: *Does a combination of self-efficacy, exercise behaviors, and social support predict faculty strain?*

A Regression Analysis was produced a significant regression (See Table 4). The model produced a coefficient of determination of .254 but only explained approximately 6.4% of the variability in Strain response. The regression equation to predict Strain was:

-.120 Exercise Index – .216 Social Support – .019 Self-Efficacy

This result supports the hypothesized relationship between faculty strain and this study's three primary independent variables of: a) the exercise index developed for this study, b) the JCQ Social Support subscale, and c) the MSEAT Self-Efficacy measure. The relationship between the independent variables and the faculty strain indicator was statistically significant even though it only accounted for 6.4% of variability in that dependent variable. The social support measure used was the JCQ Social Support subscale and proved to be the significant predictor variable of the set ($t = -2.47$, $p=.015$).

Previous studies have used combinations of the three variables but not all together. Several factors have been shown to modify the relationship between job control and demands. As mentioned, social support was so powerful that the newer model included it. Several recent reviews have shown support for adding self-efficacy to the JD-C to better predict strain (Jex & Gudanowski, 1992; Jex, Buzzell, Primeau, & Bliese, 2001; Jimmieson, 2000; Schaubroeck, Jones, & Xie, 2001; Schaubroeck & Merritt,1997).

The lack of significance with strain or burnout and self-efficacy for academic tasks is surprising given individual faculty members reporting high self-efficacy also reported high job control and personal accomplishment. It has been shown possessing job control is not always a

beneficial factor to strain moderation. Schaubroeck and Merritt (1997) asserted that the original demand-control model assumed workers had high self-efficacy. For some individuals having control or the ability to make decisions is a burden when to others it may be a blessing. Litt (1988) conveyed that self-efficacy is an important factor in strain prediction because it affects an individual's ability and willingness to utilize decisional control. He stated, "judgments of self-efficacy may be such that having control is not useful or may even have a negative effect. Control may benefit only those who are confident that they can use it, and that it will be effective" (Litt, 1988, p. 253). He believed perceptions of control in a situation and estimates of self-efficacy to use that control to an advantage will interact to determine how a person will appraise the situation and express distress. A possible explanation may be that the MSEATS instrument did not capture the self-efficacy trait or differences in self-efficacy were small in the sample responding and therefore could not predict strain but was strongly associated with job control. The scores in the individual sub-scales were comparable to the national norms as reported in the *Maslach Burnout Inventory Manual* (1996). Demerouti, Bakker, DeJonge, Janssen & Schaufeli (2001) reported that job involvement, and self-efficacy varied with job control but not demands and that personal accomplishment (a subscale of the MBI) was highest for high demands and high control. Personal accomplishment and self-efficacy were also significantly related in this study.

Many of these relationships allude to the "chicken or the egg" scenario. Does someone who needs high control and has high self-efficacy in a given area, go into a particular job that offers this control? Or, does a job, which offers high control, transform the individual into controlling other aspects of their life such as managing their stress with exercise. Although this

was not tested, a longitudinal study examining this sequence of events would be highly revealing and important in understanding carry-over effects.

Research Question 3: Does a combination of occupational self-efficacy, exercise behaviors, and social support predict faculty burnout?

The regression equation to predict Burnout was:

Burnout= -.232* Social Support + .202* Self-Efficacy + .060* Exercise Index

The regression equation was significant (F= 2.755, p=.05) and yielded an R^2= .076. This indicates that only 8% of the variability in burnout was explained by the independent variables. This study's variable set was weak in its ability to explain burnout in faculty and the combination of factors in the DCS model was much stronger as discussed in Model III of question 6.

Individually, all three factors have been associated with reduced burnout. Since, burnout is related to decreased personal accomplishment, depersonalization, and emotional exhaustion it would make sense that social support would have a strong negative association, and the better someone felt about being capable to do their job, the more personal accomplishment they would likely feel. A study by Grossi, et al., 2003) found those who were burned out had more job strain, less social support, and higher anxiety and depression.

Research Question 4: Do selected demographic and academic variables modify faculty strain or burnout?

Overall, there were very few significant findings for demographic factors and those that were found were the very obvious associations. Reasons for this lack of variance between different groups in their strain, burnout is unknown. There were significant differences between non-tenured faculty and tenured faculty on reported levels of social support and reported self-

efficacy. Tenured faculty had significantly higher levels of perceived social support and self-efficacy. Tenured faculty usually have been at a given institution longer, have been in the profession longer, have a higher rank, get paid more, are older, are more competent at their jobs, and enjoy more academic freedom and support than their untenured peers. The finding that tenured faculty had higher social support and self-efficacy was expected. Previous research has found mixed results. Alikah (1992) found tenured faculty were more stressed than non-tenured. Although the difference in faculty stress score was small, it was significant.

Of note is that while gender did not interact significantly with tenure it did with faculty rank. More women than men were ranked as Other (29 versus 14) and Associate (15 versus 12). More men than women were ranked as Assistant (27 versus 21) and Full Professor (31 versus 20). A lower percentage of women were at the top rank of Full Professor (20 of 85) than men (31 of 84). Therefore, a higher percentage of men are tenured and hold a higher faculty rank. Results demonstrated gender with faculty rank did produce a significant interaction, suggesting a disparity between men and women faculty members. Nationally, this gender gap with higher faculty rank has existed for sometime (Finkelstein, 1984; Schoen & Winocour, 1988). Besides the faculty rank, nationally, females are more likely to teach at 2-year institutions and men at four-year institutions (Sanderson, 2000).

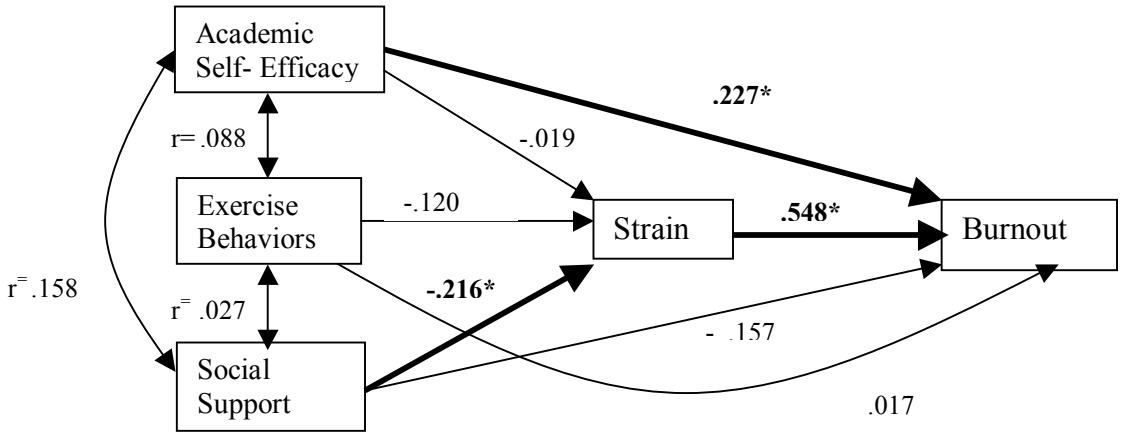
A study by Alikah (1992) did show that being female was associated with greater stress, but did not show faculty rank correlating to stress. Another study found no differences between female vs. male or new vs. veteran faculty (Lease, 1999). In individual performance areas instructors were less stressed with service, and research than all other groups; the assistant professor was more stressed than associate for research and more stressed than all other groups

in teaching. In overall stress, the instructor had less stress than all others and associate or associate were higher than full professors.

Exploring Various Models To Predict Faculty Strain

Research Question 5: Do self-efficacy, exercise behaviors, and social support predict burnout using faculty strain as an intervening variable?

The model (III- discussed on p.114) with four independent variables- job demands, job control, social support, and job strain to predict burnout accounted for about 36% of the MBI burnout variability. The regression model in Figure 7 shows the correlation coefficients between the various factors. The results suggest social support effects are transmitted via perceived faculty strain. In the original model, used in the second research question, social support was a significant predictor of faculty strain. However, in this advanced model of burnout where strain is a significant predictor of burnout, it loses its direct effect. This loss of significance and its correlation with strain suggests that the burnout effect is mediated by strain.



* Significant at the .05 level; also given thicker line

Figure 12. Regression Model with Significant Relationships between Variables. Bold lines denote the three significant relationships found in this study.

Similarly, the partial coefficients suggest that when the effects of each independent variable are controlled for, strain is a significant intervening construct. This model suggests perceived strain cuts down the social support perception and self-efficacy makes it more difficult to ignore strain, thus enhancing its effect. As mentioned, studies by Litt (1988), and Salanova, Peiro, and Schaufeli (2002) show this interactive effect of self-efficacy on strain.

Research Question 6: Will a combination of occupational self-efficacy, exercise behaviors, and social support be better correlated to faculty strain than the JCQ Job Demands, JCQ Decision Latitude, and JCQ Social Support scales combination?

The dependent variables in both Model I and II were weak in predicting faculty strain derived from the JCQ. As seen in Table 9, the DCS model variables were a better predictor of the faculty strain score than were the study's variables. Both regressions were significant, but the DCS variables accounted for almost twice the variance than did the study variables. The regression equation for Model I- using the study variables as predictors of faculty strain was:

Strain = - .216* social support + 120 exercise index - .019 self-efficacy.

The second model produced this equation using the DCS variables:

Strain = .358* job demands - .172 decision latitude - .136 social support.

However, only 12.5% of the variability in faculty strain was accounted for at maximum. Model II using the DCS three variables found Job Demands to be the significant predictor of job strain in that predictor set.

A third model used to explore the efficacy of the DCS job demands, decision latitude, and social support as the predictor set for reported burnout as the dependent variable. The regression analysis was significant. The equation for this model was:

Burnout = .112 social support + .564* Job Demands - .025 decision latitude.

Similar to the Model II, job demands was the significant predictor of burnout. Decision Latitude or Job Control is composed of JCQ Decision Authority and Skill Utilization subscales, which also likely accounts for its significant correlation with Self-Efficacy.

Glass and McKnight (1996) reviewed literature on perceived control, depressive symptomology, and burnout. Their review proposed two models of this very strong link between lack of perceived job control, depression, and burnout and their sequencing. In Model A, "chronic stress, induced by lack of control, is both emotionally draining and promotes negative self-evaluations…and can lead to dramatic changes in affective state even depression." (p.25). In Model B, "exposure to a lack of job control and subsequent helplessness precipitate depressive symptomology…which can in turn, lead to burnout." (p.25). Model A, assumes lack of control induces depression directly, and Model B assumes lack of control leads to burnout through its effects on depression.

This study proposed strain leading to burnout or Model B just described. Glass and McKnight concluded that burnout and depression are not redundant and several factors, including external locus of control and perceived decision-making, have strong associations with burnout and it is likely the strain impacts are mediated through these factors, which mediate burnout. Future studies should include the onset of depression, in with job control, social support, and self-efficacy to determine how these variables may influence or initiate one and another. A longitudinal study by DeLangeff, Taris, Kompier, Houtman and Bongers (2004) look at both forward and reversed causal relationships in work characteristics (demands, control, and support) with mental health. They found both directions had effects but work characteristics on

wellness was causally predominant. There was about a 1-year lag time before DCS conditions and strain onset.

A Final Critique of the Study

The independent variable set originally proposed in this study was based on an abundance of previous research showing each independent variable (self-efficacy, exercise, and social support) to be strongly negatively associated with strain and burnout. The study used these three variables in combination both because no previous study had looked at these three together and because of the holistic aspect of this particular combination. Strain is the product of physical, mental and socio-emotional phenomena.

It was believed that exercise would counter the physically-based stressors as well as promote mental stress relief and a buffering effect to physical symptoms. Previous research has even shown relationships of exercise and leisure activities to social support. The model included self-efficacy both because of its potent effect in countering strain, its strong interrelationships to exercise, social support, burnout, and because it's a mentally or cognitively–based phenomena. Finally, social support was added in last because of the findings in Job Demand Control studies, showing its buffering effect on strain. It was believed this factor would encompass the socio-emotional stressors.

Faculty in higher education are facing stressors on a daily basis and the eventual effects of these uncompensated stressors is strain or burnout. A Glass and McKnight review (1996) had over 50 citations on specific human service professionals and burnout. This interrelationship was responsible for the MBI having specific versions for educators and human service professionals. Even though some stressors in universities are being reduced, others are on the rise and the

overall strain and burnout levels in faculty are still high. Having an understanding of factors negatively associated with strain and burnout and understanding a time sequence or causative relationship of these detrimental and costly phenomena, will greatly relieve pain and suffering from faculty, the financial burden of health care, and other employer related costs.

While longitudinal studies are clearly the way to pursue a sequence of events and causative factors, they are expensive and difficult to conduct. Likewise, while a local sample from a given institution can yield interesting and beneficial findings for the population, national studies are really necessary to generalize the findings to all faculty.

This study used an electronic or internet-based survey. This method of distribution and collection has many advantages including ease of distribution, data collection, ease of completion for faculty, and cost of logistics such as paper and mailings. Even this method must have follow-up and a strong percentage of the total sample as respondents. In addition, while interval-based answers may be easier for faculty to fill out, they limit the statistical processing and comparisons that may be done. Individuals wishing to perform electronic surveys should consult with a statistician or database specialist to aid in survey construction and results coding.

Biasing is great in voluntary surveys. Past research has shown those who feel strained feel like they are in a constant time crunch and attend to only essential items. Likewise, those feeling burned out, possess depersonalization and emotional exhaustion, which would influence them to not get involved or not give truthful answers. Reminders and incentives are critical toward achieving greater returns and a less biased sample. This study was limited it is access to the faculty and could not offer either.

In conclusion, while this study did not find a better conceptual framework to predict faculty strain or burnout with the combination of self-efficacy, exercise and social support, it did

reveal some interesting interrelationships between the variables (academic self-efficacy with burnout, and social support with strain) and confirmed many established relationships (strain and burnout, and burnout components with self-efficacy and social support).

Results suggest faculty with greater self-efficacy in academic tasks may actually become burned-out more than those with less self-efficacy. Thus, faculty with high self-efficacy should be given high levels of challenge or control. Faculty who feel greater social support will express fewer strain symptoms. Thus, a faculty's institution and department should be supportive and encourage mentorships, joint projects, and programs that allow faculty to feel socially supported. Programs should be geared more toward newer and non-tenured faculty and less toward tenured, veteran faculty. Finally, it is important to recognize the strong relationship between strain and burnout. Strain symptoms should be recognized as early stage burnout.

Higher education programs and departments need to recognize that faculty need to be treated as team members and not isolated workers. Psychological job demands are strongly related to overall burnout, strain and the emotional exhaustion component of burnout. Thus, over loading faculty with commitments may serve in the short run to save the institution money, but in the long run may cost the university in absenteeism, poor quality work, and higher turnover or more faculty leaving. Universities also need to be flexible and considerate of their faculty in developing policies to not only enhance a faculty's work, but their health and mental state as well.

Future studies should build on the self-efficacy, exercise, and social support combination with an experimental design, longitudinally based design, and well tested instruments that yield concise and accurate results. These studies should investigate the effectiveness of strain reducing strategies such as social support and recreation programs with a longitudinal before and after

design. In addition, structured exercise and stress-reducing activities should be analyzed separately. A relative perceived relaxation scale may serve to be useful for research trying to quantify the stress or strain-relief a given activity provided to an individual.

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APPENDICES

Appendix A: The Exercise and Leisure Activities Survey- Pilot Test

Gender: Male _____ Female _____

Age: _____

Ethnicity: Amer. Indian___ Asian ____ African American ___ Hispanic ___ Caucasian ___ other _____

Faculty Rank: Full professor ____ Associate Prof. ____ Assistant Prof. ____ Instructor _____

1) Do you currently perform structured exercise? Yes No (If no, proceed to #5)

2) If you exercise, how many times a week and how many minutes do you perform each type of exercise?

Activity Mode	**# sessions/wk**	How long/ session
Aerobic/ cardiovascular *(treadmill, stair machine, bicycle etc.)*		
Anaerobic/ Weight Lifting *(sprinting, jumping, weight lifting)*		
Team/ Individual Sport-vigorous *(football, basketball, soccer, hockey)*		
Team or individual leisure activity (walking, golf, tennis, bowling)		

3) How hard do you exercise in a majority of your workouts?

___Easy- don't breathe hard at all

___Moderate- breathe somewhat hard/ lift about 8-12 repetitions

___Hard- breath real hard and sweat a lot/ lift 6-10 reps, 3 sets

___Highly intense (go to exhaustion every time)/ lift 4-8 reps and 4 or more sets

4) How long have you been exercising regularly?

___Less than a year

___Between 1-4 years

___Between 5-10 years

___More than 10 years

5) How many hours per week do you spend on light activity? Cooking, cleaning, running errands?

_____ hours per week

6) How many hours per week do you spend on activities such as yard work- raking, sweeping, digging; sailing, yoga, dancing, walking? _____ hours per week.

7) Put a check mark by stress reducing activity you regularly practice or participate in

- meditation _____
- muscle relaxation _____
- tai chi, chi gong or other _____
- cognitive (talk yourself through it) ____
- Prayer ____
- Counseling, therapy ____
- Caring for a pet ____
- Other _____ (please name)

8) Put a check mark by any specific hobby (besides leisure sports) such as:

- hunting _____
- f ishing _____
- reading, writing _____
- art or craft- pottery, painting _____
- computer games _____
- traveling _____
- social gatherings_____
- other _____ (please name)

Appendix B: The Faculty Strain Survey

Questions on Dissertation Survey

Subcategorized into the testing instrument

Demographics

1. **Gender?**
2. **Age ?**
3. **What is your current marital status**
4. **How would you describe your race?**
5. **If you have children, how many children do you have living with you and what ages are they (in years)? answer no children once if you don't have children living with you.**
    a. 0-2 yr
    b. 2- up to 5
    c. 5- up to 12
    d. 12- up to 18
6. **Do you have elderly parents living at your home under your care?**
7. **Does your spouse work?**
8. **Does your spouse work?**
9. **How many years have you been at this institution?**
10. **What department are you primarily in? Please name any sub-department title (i.e. Civil Engineering)**
11. **Do you have tenure?**
12. **Please indicate how you divide your total time during an academic year (use 100%= total time)**
    a. Teaching
    b. Research
    c. Service (committees, university business etc)
13. **What is your current 9-month salary range, NOT including additional teaching assignments or work outside your primary institution?**
14. **What is your educational Level?**

ELAS

1. Do you currently perform structured (specific purpose of/for conditioning) exercise? (If no proceed to #21)

2. If you exercise, how many times a week and how many minutes per session- average- do you perform each type of exercise? Enter nothing if you do not perform it often
    i. Aerobic/ Cardiovascular (treadmill, bicycle, stair machine etc.)
    ii. Anaerobic/ Weight lifting (sprinting, jumping, throwing)
    iii. Team or Individual Sport- vigorous (football, basketball, soccer, hockey)
    iv. Team or Individual Sport- leisure (walking, golf, bowling, tennis)
3. (the above categories was questioned for sessions/week and minutes per session

4. How hard do you exercise in a majority of your workouts? Use perceived exertion for weight lifting type exercise.

5. How long have you been exercising?

6. How many hours per week do you spend on light activities? (cooking, cleaning, running errands?)

7. How many hours do you spend on moderate activities such as yard work, building, yoga, dancing, brisk walking?

8. Which stress reducing activities do you regularly practice or participate in? Check all that apply

9. What hobbies do you participate in? Check all that apply

Job Content Questionnaire

Please respond only once to each of the following statements using the four choices.

1. My job requires that I continually learn new things.
2. My job involves a lot of repetitive work.
3. My job requires me to be creative.
4. My job allows me to make a lot of decisions on my own.
5. My job requires a high level of skill.
6. On my job, I have very little freedom to decide how I do my work.
7. I get to do a variety of different things on my job.
8. I have a lot of say about what happens on my job.
9. I have an opportunity to develop my own special abilities.
10. My job requires working very fast.
11. My job requires working very hard.
12. I am not asked to do an excessive amount of work.
13. I have enough time to get the job done.
14. I am free from conflicting demands that others make.
15. My job requires long periods of intense concentration on the task.

16. My work is often interrupted before they can be completed, requiring attention at a later time.
17. My job is very hectic.
18. Waiting on work from other people or departments often slows me down on my job.

Social Support Subsection

Please respond once to the following statements using the five choices. Please note: department head or dean may be substituted for "supervisor". Select "no supervisor" when these may not substitute.

19. My supervisor is concerned about the welfare of those under him or her.
20. My supervisor pays attention to what I am saying.
21. I am exposed to hostility of conflict from my supervisor.
22. My supervisor is helpful in getting the job done.
23. My supervisor is successful in getting people to work together.
24. People I work with are competent in doing their jobs.

Coworker

25. People I work with take a personal interest in me.
26. I am exposed to hostility or conflict from the people I work with.
27. People I work with are friendly.
28. People I work with encourage each other to work together.
29. People I work with are helpful in getting the job done.

30. **How satisfied are you with your job?**
31. Would you advise a friend to take this job?
32. Would you take this job again?
33. How likely is it that you will find a new job in the next year?
34. Is the job like what you wanted when you applied for it?

Strain Symptom Subsection

Please select one of the (4) following choices to the following questions.

35. How often do you become tired in a very short period of time?
36. Do you have trouble with aches in the lower back?
37. Do you have trouble with aches in the neck or upper back?
38. Do you have trouble with breathing?
39. Do you have trouble with pains, jabs, or a feeling of constriction in your chest?
40. Do you have trouble with sweaty hands, which feel damp and clammy?
41. Do you have trouble with feeling nervous, fidgety, or tense?
42. Do you have trouble with poor appetite?
43. Do you have trouble falling asleep?
44. Do you have trouble staying asleep?
45. Do you take tranquilizers or sleeping pills?

46. Do you have high blood pressure?

For the following 8 questions please use a 7-point scale for the two words listed as being the extremes of the scale. Far left is 1 or first word and far right is 7 or the second word or phrase.
For all questions use "Is your life?"

47. Boring-1: Interesting-7

48. Enjoyable-1: Miserable-7
49. Worthwhile-1: Useless-7
50. Friendly-1: Lonely-7
51. Full-1: Empty-7
52. Hopeful-1: Discouraging-7
53. Rewarding-1: Disappointing-7
54. Brings out the best in you-1: Doesn't give you much of a chance-7

55. Do you smoke?
56. If yes, to the above question, how many cigarettes do you smoke per day?

Mean Self Efficacy for Academic Tasks Subsection

How much confidence do you have about performing each research behavior listed below?

1. attending a national professional meeting
2. presenting a paper at a national professional meeting
3. presenting a paper at a regional professional meeting.
4. conducting research in the field or lab
5. reviewing literature for a new research project
6. writing a research grant
7. collaborating with a male colleague on a research project
8. collaborating with a male colleague on a research project
9. using a computer or computer program for analysis of data
10. writing a paper suitable for a national refereed journal
11. advising a colleague about research methodology

Department

12. To what degree does your department encourage you to perform these behaviors?
13. How much does your department reward you (verbal, social, financial) for performing these behaviors?

14. Estimate the number of articles you have published in national refereed journals:

How much confidence do you have about performing each service behavior listed below?

15. presenting a seminar or workshop for colleagues
16. chairing a department curriculum committee
17. attending meetings of your school
18. consulting with a large state business organization
19. evaluating a colleague for tenure or promotion
20. chairing a promotion or tenure committee
21. mediating a dispute between two colleagues
22. negotiating an exception to the rule with a dean
23. recruiting students for your program
24. chairing an ad hoc committee for the university president/ chancellor

Department

25. To what degree does your department encourage you to perform these behaviors?
26. How much does your department reward you (verbal, social, financial) for performing these behaviors?

How much confidence do you have about performing each teaching behavior listed below?

27. Leading a student discussion seminar
28. Lecturing in a small class
29. Preparing a new course in your field
30. Evaluating students' written work
31. Writing recommendations for students
32. Choosing texts for your courses
33. Preparing a new lecture
34. Advising students about academic issues
35. Advising students about career issues

Department

36. To what degree does your department encourage you to perform these behaviors?
37. How much does your department reward you (verbal, social, financial) for performing these behaviors?

Maslach Burnout Inventory (Educators Survey) Subsection

The following choices (0-6) ranging from never to everyday represents frequencies of occurence for the statements or feelings below. Please select the one choice which best describes your feeling.

1. I feel emotionally drained from my work.
2. I feel used up at the end of the day.
3. I feel fatigued when I get up in the morning and have to face another day on the job.
4. I can easily understand how my students and colleagues feel about things.
5. I feel I treat some students or colleagues as if they were impersonal objects.
6. Working with people all day is really a strain for me.
7. I deal effectively with the problems of my students.
8. I feel burned out from my work.
9. I feel I'm positively influencing other people's lives through my work.
10. I've become more callous toward people since taking this job.
11. I worry this job is hardening me emotionally.
12. I feel very energetic.
13. I feel frustrated by my job.
14. I feel I'm working too hard on my job.
15. I don't really care what happens to some students
16. Working with people directly puts too much stress on me.
17. I can easily create a relaxed atmosphere with my students.
18. I feel exhilarated after working closely with my students.
19. I have accomplished many worthwhile things in this job.
20. I feel like I'm at the end of my rope.
21. In my work, I deal with emotional problems very calmly.
22. I feel students or colleagues blame me for some of their problems.

Appendix C: Human Subjects Research Approval Form

University Committee for the Protection of Human Subjects in Research
University of New Orleans

Campus Correspondence

Zarus Watson, PI
Mark Kelly
ED 348

3/30/2006

RE: the effects of self-efficacy, social support, and exercise behaviors on strain and burnout measures in urban university faculty

IRB#: 10apr06

The IRB has deemed that the research and procedures are compliant with the University of New Orleans and federal guidelines.

Please remember that approval is only valid for one year from the approval date. Any changes to the procedures or protocols must be reviewed and approved by the IRB prior to implementation.

If an adverse, unforeseen event occurs (e.g., physical, social, or emotional harm), you are required to inform the IRB as soon as possible after the event.

Best of luck with your project!
Sincerely,

Laura Scaramella, Ph.D.
Chair, University Committee for the Protection of Human Subjects in Research

University Committee for the Protection of Human Subjects in Research
University of New Orleans

Form Number: 10apr06

(please refer to this number in all future correspondence concerning this protocol)

Principal Investigator: Zarus Watson Title: Associate Professor

Department: Educational Leadership and counseling foundations College: Education

Project Title: The effects of self-efficacy, social support, and exercise behaviors on strain and burnout measures in urban university faculty

Dates of Proposed Project Period From April 1, 2006 to March 31, 2007

Approval Status:

☐ Full Board Review ☒ Approved Date: 3/30/06

☒ Expedite ☐ Deferred Date:

☐ Exempt ☐ Disapproved Date:

☐ Project requires review more than annually. Review every _____ months.

**approval is for 1 year from approval date only and may be renewed yearly.*

1st continuation Signature of IRB Chair Date:

2nd continuation Signature of IRB Chair Date:

3rd continuation Signature of IRB Chair Date:

4th continuation Signature of IRB Chair Date:

Committee Signatures:

Laura Scaramella, Ph.D. (Chair)

Pamela Jenkins, Ph.D.

Anthony Kontos, Ph.D. (Associate chair)

Richard B. Speaker, Ph.D.

Gary Talarchek, Ph.D.

Kari Walsh

Kathleen Whalen, LCSW

L. Allen Witt, Ph.D.

Appendix D: Copyright Permission- MBI

Mark P. Kelly, M.S.
5923 Catina Street
New Orleans, LA 70124

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Agreement Issued: **October 16, 2003**
Customer Number:
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CPP, Inc.	I AGREE TO THE ABOVE CONDITIONS,
By Elisa M Lee	By Mark P Kelly
Authorized Representative	**Mark P. Kelly, M.S.**
Date 10/17/03	Date 10/28/03

Appendix E: Copyright Permission- JCQ

Version 1.7 - 2/97 - w/o usage costs

Simplified Form A- Supersedes Sect. IV of Job Content questionnaire User's Guide v 1.1 1985
Sign this form and return it immediately to the JCQ Center -

Contract for Use of the Job Content Questionnaire for Research Use

The JCQ instrument, now translated into more than ten languages, is one of the most frequently used instruments in the world for psycho-social job analysis. Return of a copy of the JCQ data is required of medium and larger sized projects (over 100 subjects [see note below*]). This insures for the JCQ instrument adequate treatment of scale validation issues and attention to scale strengths and weaknesses: specifically: (a) consistency of JCQ scale use; (b) revalidation of the questionnaire scales - including revalidation for important sub-populations; (c) performance of inter-group comparisons between non-representative sub-population; (d) facilitation of understanding of sources of scale covariance variance from demographics, industry, occupational, organizational and community factors; and (e) development of new JCQ scales. Your cooperation can help insure that the JCQ instrument has a long-term future.

User/Study Director: Mark P. Kelly
Study Name: Dissertation on self-efficacy, exercise behaviors, & social support on strain & burnout in urban university faculty
Research Institution: ? University of New Orleans
Address: 5923 Catina Street
New Orleans, LA 7012-1903

Permission for use of the Job Content Questionnaire is granted to the Study Director for the above study with the following requirements relating to providing a copy of the data, and payment (for large projects only, as noted).

Section A. Data File- A copy of the JCQ job data and selected ancillary data (not all data) is to be provided to the JCQ Center (see address below) after the data has been collected, cleaned, and used for your preliminary analyses. The file should include the following variable scores:

a. Subject ID (and location ID if relevant)
b. All JCQ job content question scores (raw data)
c. Demographic question scores:
   Age; Sex; Education; Marital Status; Occupation-usual occupation (the JCQ User's Guide occupation lists [3 digit] give examples of the detailed occupation coding that should be followed): Industry,
   If collected, the additional information should be included;
      Children (#at home/ ages); Hours of work per week; Income; Race; Previous occupation.
d. JCQ psychological strain scales, if used (and not the dependent variable of the study)

1. Data File Labels:
The data file should have the variables labeled with JCQ Questions numbers for the raw data (ex. q23), and scale labels in Section III of the JCQ Users Guide for demographic variables and any scales constructed.

2. Data Format:
The data should be written on standard 3 1/2" floppy disks under IBM MS-DOS/Windows (state software

version), on IBM tape (state machine and operating system version), or Apple Macintosh OS (state operating system, application program name, file type, and version number).

3. Codebook:

A codebook giving appropriate variable label information and information on each variable (including missing value codes) is to be provided to the JCQ Center with the data file. Enclose a printout of the first three subject records.

4. Translations:

Translations of the JCQ questions into the languages of the site countries, and back translation of the questions into English (approved by R. Karasek) are to be provided to the JCQ Center. These may be distributed by the JCQ Center in the future to other users under the same conditions as the English version.

* Study sizes with data copy requirements:

1. U.S. Canada: 100 subjects or over.
2. Europe, Asia, Other Countries: 250 subjects or over; or studies of single occupations of over 100 subjects.
3. Commercial use, health service (other service use): Contact JCQ Center.

Agreement for JCQ, by Robert Karasek Robert Karasek (by) Date 4/9/02

Agreement by Study Director Mark P Kelly JR Date 3-4-02

(print) Mark P. Kelly Title Study Director / Doctoral Student

Appendix F: Copyright Permission for the MSEAT

Mark Kelly

From: Owen, Steven V. [svowen@utmb.edu]
Sent: Friday, March 08, 2002 12:07 PM
To: 'Mark P Kelly'
Subject: RE: Need the MSEAT for my study

Yes, looks good, Mark! You're right about the count. In my hurry to get the thing out to you, I'd just assumed there were 10 items per scale, instead of counting on my fingers!

Unless Rita L. has used, or given others permission to use the scale(s), I'm not aware of any other validity or reliability data. This was the centerpiece of her dissertation, so, if you're inclined, Dissertation Abstracts International should have a copy with more extensive detail.

Scoring each subscale involves taking the mean across the various items. We prefer calculating the mean to the sum for two reasons:
1. it puts the summary score in the same metric as the original items, so you have an easy 5-point frame of reference.
2. the sum is incorrect whenever you have missing data. If a person omits an item or two, the sum automatically decreases, so that it looks like the respondent has less self-efficacy, when it is simply an artifact of missing data.

I don't recall whether we tallied together (with the mean) all of the encouragement and reward items, or created little two-item subscales for each of the three areas.

One of the challenges of studying self-efficacy is that it focuses on particular tasks. So whenever you consider a new behavior, you are back to instrument development. Over the years, we've build S/E measures in academic self-efficacy (3rd grade through college level), study skills self-efficacy (college level), breast self-exam self-efficacy, golf putting self-efficacy, physical and emotional health self-efficacy (high school), social skills self-efficacy (4th-8th grade), cardiac diet and exercise self-efficacy (adults following a cardiac event), nursing clinical skills self-efficacy (presented a paper on this on in Chicago a few days ago) blah, blah.

Please keep in touch; I'm eager to hear how your research turns out!

Note, also, that I don't use a title.

Best regards,
Steve

-----Original Message-----
From: Mark P Kelly [mailto:jockdoc@bigfoot.com]
Sent: Friday, March 08, 2002 12:38 PM
To: Owen, Steven V.
Subject: RE: Need the MSEAT for my study

<< File: MSEAT.DOC >> I can't thank you enough Dr. Owen. I thought the

1

instrument was so good
that "dust" would hardly be on it. I counted 11 questions for research and service, 10 for teaching and 9 for institutional issues. If it is different than that please let me know. I did clean it up some and added a word or two to update it (no content changes however). See attachment. I now just need how to score it and if you have any statistics on its validity and reliability other than in your article I would appreciate it. What other areas have you done self-efficacy analysis in? Other occupations? I will let you know my results in a couple of months when it comes in. Thank you again.

Mark P. Kelly, M.S., CSCS

"The battles that count aren't the ones for gold medals.
The struggles within yourself are where it's at."

Jesse Owens

-----Original Message-----
From: Owen, Steven V. [mailto:svowen@utmb.edu]
Sent: Thursday, March 07, 2002 4:12 PM
To: 'Mark P Kelly'
Subject: RE: Need the MSEAT for my study

Dear Mark,

Sorry to be vague about this, but we've developed many S/E measures, and I need to know exactly which one you're referring to. I'm guessing that it is the faculty S/E measure that actually has three subscales (research, teaching, and service). Let me know.

In any case, there won't be a charge for using the instrument.

Best,
Steve O.

==========
Steven V. Owen, Professor
Senior Biostatistician
School of Nursing and
Department of Preventive Medicine and Community Health University of Texas Medical Branch 301 University Blvd. Galveston, TX 77555-1029

Ph. 409-772-8312
Fax. 409-747-1554

-----Original Message-----
From: Mark P Kelly [mailto:jockdoc@bigfoot.com]
Sent:Wednesday, March 06, 2002 8:12 PM
To:steven.owen@UConn.edu
Subject:Need the MSEAT for my study

Hello Dr.Owen: I am doctoral student who is doing a study on the effects of self-efficacy, health behaviors, and social support on strain and burnout in urban University faculty. I have looked over several instruments including those by Schoen and Wincour but find your instrument (Landino and Owen, 1988) to the best and most concise for my purposes. I would like to use the instrument and have the scoring instructions or service provided. I will gladly offer any and all information I collect. I believe my work can help extend some of your theories as well. Please let me know if this can be provided to me. If there must be a charge for it please let me know what that will be. I will be using the Job Content Questionnaire and MBI - Educators Survey in my study as well. Thank you for your time.

Mark P. Kelly, M.S., CSCS

"The battles that count aren't the ones for gold medals.
The struggles within yourself are where it's at."

Jesse Owens

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Monday, April 02, 2007

Results Summary

Show All Pages and Questions

Export... View Detail >>

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To analyze a subset of your data, you can create one or more filters.

Add Filter... **Total:** 174 **Visible:** 174

Share Results
Your results can be shared with others, without giving access to your account.

Configure... **Status:** Enabled **Reports:** Summary and Detail

1. Faculty Strain- UNO

1. Gender?

	Response Percent	Response Total
Male	49.4%	85
Female	50.6%	87
Total Respondents		172
(skipped this question)		3

2. Age ?

View	Total Respondents	169
	(skipped this question)	5

3. What is your current marital status

	Response Percent	Response Total
Married/Domestic partner	70.8%	121
Single, never married	18.7%	32
Divorced	8.8%	15
Widowed	1.8%	3
Total Respondents		171
(skipped this question)		4

4. How would you describe your race?

	Response Percent	Response Total
Caucasian or White	84.9%	146
African American or Black	0.6%	1
Asian	8.1%	14

Hispanic or Latino	6.4%	11
Other	0%	0
	Total Respondents	**172**
	(skipped this question)	3

5. If you have children, how many children do you have living with you and what ages are they (in years)? answer no children once if you don't have children living with you.

	no children	1	2	3	4 and up	Response Total
0-2 yr	**93% (162)**	7% (13)	0% (0)	0% (0)	0% (0)	**175**
2- up to 5	**87% (153)**	12% (21)	1% (1)	0% (0)	0% (0)	**175**
5- up to 12	**83% (145)**	14% (24)	2% (4)	1% (2)	0% (0)	**175**
12- up to 18	**79% (139)**	13% (23)	6% (10)	1% (1)	1% (2)	**175**
					Total Respondents	**174**
					(skipped this question)	0

6. Do you have elderly parents living at your home under your care?

	Response Percent	Response Total
yes	6.5%	11
no	**93.5%**	**158**
	Total Respondents	**169**
	(skipped this question)	6

7. Does your spouse work?

	Response Percent	Response Total
no spouse	26.3%	45
yes- full time	**44.4%**	**76**
yes- part time	10.5%	18
no	18.7%	32
	Total Respondents	**171**
	(skipped this question)	4

8. What is your current faculty position?

	Response Percent	Response Total
Assistant Professor	28.1%	48
Associate Professor	16.4%	28
Full Professor	**29.8%**	**51**
other	25.7%	44
	Total Respondents	**171**
	(skipped this question)	4

9. How many years have you been at this institution?

	Response Percent	Response Total
0- up to 3	**25.6%**	**44**
3- up to 6	23.8%	41
6- up to 10	13.4%	23
10- up to 20	20.3%	35
over 20	16.9%	29
	Total Respondents	**172**
	(skipped this question)	3

10. What department are you primarily in? Please name any sub-department title (i.e. Civil Engineering)

View	**Total Respondents**	**159**
	(skipped this question)	15

11. Do you have tenure?

	Response Percent	Response Total
yes	42.3%	74
no	**57.7%**	**101**
	Total Respondents	**175**
	(skipped this question)	0

12. Please inicated how you divide your total time during an academic year (use 100%= total time)

	0-10%	11- 20%	21-30%	31-50%	51-70%	>70%	N/A	Response Average
Teaching	9% (15)	20% (33)	**30% (49)**	17% (28)	12% (20)	7% (12)	2% (4)	**3.26**
Research	9% (14)	9% (14)	15% (23)	24% (37)	**27% (42)**	12% (18)	5% (7)	**3.90**
Service (committees, university business etc)	25% (42)	**36% (60)**	15% (25)	9% (15)	6% (10)	5% (8)	4% (7)	**2.47**
						Total Respondents		**169**
						(skipped this question)		5

13. What is your current 9 month salary range, NOT including additional teaching assignments or work outside your primary institution?

	Response Percent	Response Total
below $50,000	18.3%	31
50-60,000	11.8%	20
60-70,000	10.1%	17
70-80,000	14.8%	25
80-90,000	14.2%	24
above $90,000	**30.8%**	**52**

Total Respondents	**169**
(skipped this question)	6

14. What is your educational Level?

		Response Percent	Response Total
	Masters Degree	4.7%	8
	Doctoral Degree	**88.8%**	**151**
View	Other (please specify)	6.5%	11
	Total Respondents		**170**
	(skipped this question)		5

2. ELAS test

15. Do you currently perform structured (specific purpose of/for conditioning) exercise? (If no proceed to #21)

	Response Percent	Response Total
Yes	**65.1%**	**108**
No	35.5%	59
Total Respondents		**166**
(skipped this question)		8

16. If you exercise, how many times a week and how many minutes per session-average- do you perform each type of exercise? Enter nothing if you do not perform it often

 # sessions/wk

	none	less than weekly	1	2	3	4	5 or more	Response Total
Aerobic/ Cardiovascular (treadmill, bicycle, stair machine etc.)	4% (4)	2% (2)	8% (8)	25% (25)	**30% (30)**	15% (15)	15% (15)	**99**
Anaerobic/ Weight lifting (sprinting, jumping, throwing)	14% (10)	10% (7)	7% (5)	20% (14)	**36% (25)**	9% (6)	4% (3)	**70**
Team or Individual Sport- vigorous (football, basketball, soccer, hockey)	**74% (37)**	4% (2)	18% (9)	0% (0)	2% (1)	2% (1)	0% (0)	**50**
Team or Individual Sport- leisure (walking, golf, bowling, tennis)	**40% (27)**	6% (4)	10% (7)	16% (11)	7% (5)	7% (5)	13% (9)	**68**

minutes/ session

	0-10	11-20	21-30	31-40	41-60	more than 60	Response Total
Aerobic/ Cardiovascular (treadmill, bicycle, stair machine etc.)	3% (3)	13% (12)	**23% (22)**	20% (19)	22% (21)	19% (18)	**95**
Anaerobic/ Weight lifting (sprinting, jumping, throwing)	7% (4)	**29% (17)**	17% (10)	16% (9)	19% (11)	12% (7)	**58**
Team or Individual Sport- vigorous (football, basketball, soccer, hockey)	**37% (7)**	5% (1)	0% (0)	11% (2)	11% (2)	**37% (7)**	**19**
Team or Individual Sport- leisure (walking, golf, bowling, tennis)	10% (4)	15% (6)	18% (7)	10% (4)	**25% (10)**	22% (9)	**40**
						Total Respondents	**115**
						(skipped this question)	59

17. How hard do you exercise in a majority of your workouts? Use perceived exertion for weight lifting type

exercise.

	Response Percent	Response Total
Easy- don't breath hard	10.3%	12
Moderate- breath pretty hard	38.8%	45
Hard- breath real hard, sweat	**44.8%**	**52**
Highly Intense- go to exhaustion	3.4%	4
View Other (please specify)	2.6%	3
Total Respondents		**116**
(skipped this question)		58

18. How long have you been exercising?

	Response Percent	Response Total
less than a year	7.8%	9
between 1-4 years	21.6%	25
between 5-10 years	20.7%	24
more than 10 years	**50%**	**58**
Total Respondents		**116**
(skipped this question)		58

19. How many hours per week do you spend on light activities? (cooking, cleaning, running errands?)

View **Total Respondents**	**121**
(skipped this question)	53

20. How many hours do you spend on moderate activities such as yard work, building, yoga, dancing, brisk walking?

View **Total Respondents**	**121**
(skipped this question)	53

21. Which stress reducing activities do you regularly practice or participate in? Check all that apply

	Response Percent	Response Total
meditation	10.1%	13
muscle relaxation	12.4%	16
tai chi, chi gong etc.	5.4%	7
cognitive (self talk)	21.7%	28
prayer	22.5%	29
counseling, therapy	10.9%	14
caring for a pet	**44.2%**	**57**
View **other (please specify)**	**44.2%**	**57**
Total Respondents		**129**
(skipped this question)		45

22. What hobbies do you participate in? Check all that apply

	Response Percent	Response Total
movies or plays	67.7%	109
music concerts or general music listening	54%	87
reading, writing	**75.8%**	**122**
art or craft- wood working, pottery, painting, sewing, knitting etc.	16.1%	26
computer games or chat rooms	20.5%	33
traveling and site seeing	49.7%	80
social gatherings, entertaining	54.7%	88
shopping	29.2%	47
View Other (please specify)	22.4%	36
	Total Respondents	**161**
	(skipped this question)	13

3. Job Content Questionnaire

23. Please respond only once to each of the following statements using the four choices.

	strongly disagree	disagree	agree	strongly agree	Response Average
My job requires that I continually learn new things.	1% (1)	2% (3)	21% (34)	**76% (122)**	**3.73**
My job involves a lot of repetitive work.	9% (15)	**49% (78)**	33% (53)	9% (14)	**2.41**
My job requires me to be creative.	1% (2)	2% (4)	34% (54)	**62% (100)**	**3.58**
My job allows me to make a lot of decisions on my own.	1% (1)	4% (6)	22% (35)	**74% (118)**	**3.69**
My job requires a high level of skill.	1% (1)	0% (0)	22% (35)	**78% (124)**	**3.76**
On my job, I have very little freedom to decide how I do my work.	**48% (77)**	44% (71)	3% (5)	4% (7)	**1.64**
I get to do a variety of different things on my job.	2% (3)	4% (6)	42% (68)	**52% (83)**	**3.44**
I have a lot of say about what happens on my job.	1% (1)	11% (17)	**46% (74)**	42% (68)	**3.31**
I have an opportunity to develop my own special abilities.	1% (2)	6% (9)	39% (62)	**54% (87)**	**3.46**
				Total Respondents	**160**
				(skipped this question)	14

24. Please respond only once to each of the following statements using the four choices.

	strongly disagree	disagree	agree	strongly agree	Response Average
My job requires working very fast.	2% (4)	26% (42)	**44% (71)**	27% (43)	**2.96**
My job requires working very hard.	1% (2)	6% (10)	**47% (75)**	46% (73)	**3.37**
I am not asked to do an excessive amount of work.	20% (32)	**37% (59)**	35% (56)	8% (13)	**2.31**
I have enough time to get the job done.	21% (34)	**39% (62)**	34% (54)	6% (10)	**2.25**

I am free from conflicting demands that others make.	26% (42)	**51% (81)**	21% (33)	2% (4)	**1.99**
My job requires long periods of intense concentration on the task.	1% (1)	8% (12)	42% (68)	**49% (79)**	**3.41**
My work is often interrupted before they can be completed, requiring attention at a later time.	2% (4)	13% (21)	**52% (83)**	32% (52)	**3.14**
My job is very hectic.	6% (10)	29% (47)	**42% (68)**	22% (35)	**2.80**
Waiting on work from other people or departments often slows me down on my job.	13% (21)	**51% (81)**	30% (48)	6% (10)	**2.29**
				Total Respondents	**160**
				(skipped this question)	14

25. Please respond once to the following statements using the five choices. Please note: department head or dean may be substituted for "supervisor". Select "no supervisor" when these may not substitute.

	strongly disagree	disagree	agree	strongly agree	I have no supervisor	Response Average
My supervisor is concerned about the welfare of those under him or her.	3% (5)	11% (17)	**43% (67)**	38% (60)	5% (8)	**3.31**
My supervisor pays attention to what I am saying.	3% (5)	11% (17)	**43% (67)**	38% (60)	5% (8)	**3.31**
I am exposed to hostility of conflict from my supervisor.	**53% (83)**	35% (55)	4% (7)	2% (3)	5% (8)	**1.71**
My supervisor is helpful in getting the job done.	6% (9)	15% (24)	**49% (77)**	23% (36)	7% (11)	**3.10**
My supervisor is successful in getting people to work together.	6% (10)	18% (29)	**47% (74)**	23% (36)	5% (8)	**3.02**
People I work with are competent in doing their jobs.	1% (1)	8% (12)	**55% (87)**	32% (50)	4% (7)	**3.32**
					Total Respondents	**157**
					(skipped this question)	17

26. Please respond once to the following statements using the five choices. Please note: department head or dean may be substituted for "supervisor". Select "no supervisor" when these may not substitute.

	strongly disagree	disagree	agree	strongly agree	I have no supervisor	Response Total
People I work with take a personal interest in me.	4% (6)	20% (31)	**47% (74)**	26% (40)	3% (5)	**156**
I am exposed to hostility or conflict from the people I work with.	32% (51)	**43% (68)**	20% (31)	2% (3)	3% (4)	**157**
People I work with are friendly.	0% (0)	6% (10)	**57% (89)**	35% (55)	2% (3)	**157**
People I work with encourage each other to work together.	4% (6)	25% (39)	**48% (75)**	20% (31)	3% (4)	**155**
People I work with are helpful in getting the job done.	3% (4)	15% (23)	**57% (88)**	24% (37)	2% (3)	**155**
					Total Respondents	**157**
					(skipped this question)	17

27. How satisfied are you with your job?

	Response Percent	Response Total
Not at all	1.9%	3
Not too satisfied	7.6%	12
Somewhat	35.7%	56

Very	**54.8%**	**86**
Total Respondents		**157**
(skipped this question)		17

28. Would you advise a friend to take this job?

	Response Percent	Response Total
Advise Against	9%	14
Have doubts about it	37.4%	58
Strongly recommended	**53.5%**	**83**
Total Respondents		**155**
(skipped this question)		19

29. Would you take this job again?

	Response Percent	Response Total
Take without hesitation	**63.5%**	**99**
Have second thoughts	33.3%	52
Definitely not	3.2%	5
Total Respondents		**156**
(skipped this question)		18

30. How likely is it that you will find a new job in the next year?

	Response Percent	Response Total
Very likely	8.3%	13
Somewhat	26.3%	41
Not at all	**65.4%**	**102**
Total Respondents		**156**
(skipped this question)		18

31. Is the job like what you wanted when you applied for it?

	Response Percent	Response Total
Very much like I wanted	**48.1%**	**75**
Somewhat like I wanted	44.2%	69
Not very much like I wanted	7.7%	12
Total Respondents		**156**
(skipped this question)		18

32. Please select one of the (4) following choices to the following questions.

	often	sometimes	rarely	never	Response Average

How often do you become tired in a very short period of time?	9% (15)	34% (54)	**43% (69)**	14% (22)	**2.61**
Do you have trouble with aches in the lower back?	13% (21)	31% (49)	**34% (54)**	22% (36)	**2.66**
Do you have trouble with aches in the neck or upper back?	25% (40)	**31% (50)**	26% (41)	18% (29)	**2.37**
Do you have trouble with breathing?	2% (4)	8% (12)	22% (35)	**68% (109)**	**3.56**
Do you have trouble with pains, jabs, or a feeling of constriction in your chest?	3% (5)	8% (13)	19% (31)	**69% (111)**	**3.55**
Do you have trouble with sweaty hands which feel damp and clammy?	1% (2)	5% (8)	20% (32)	**74% (118)**	**3.66**
Do you have trouble with feeling nervous, fidgety, or tense?	9% (15)	**35% (56)**	30% (48)	26% (41)	**2.72**
Do you have trouble with poor appetite?	1% (2)	4% (6)	31% (50)	**64% (102)**	**3.58**
Do you have trouble falling asleep?	16% (25)	30% (48)	**32% (52)**	22% (35)	**2.61**
Do you have trouble staying asleep?	19% (31)	29% (47)	**30% (48)**	21% (34)	**2.53**
Do you take tranquilizers or sleeping pills?	7% (11)	6% (9)	13% (21)	**74% (119)**	**3.55**
				Total Respondents	**160**
				(skipped this question)	14

33. Do you have high blood pressure?

	Response Percent	Response Total
Yes	7.7%	12
Borderline	8.3%	13
No	**80.8%**	**126**
Don't Know	3.2%	5
Total Respondents		**156**
(skipped this question)		18

34. For the following 8 questions please use a 7-point scale for the two words listed as being the extremes of the scale. Far left is 1 or first word and far right is 7 or the second word or phrase. For all questions use "Is your life?"

							Other (please specify)	Response Average
Boring-1: Interesting-7	1% (1)	3% (4)	3% (4)	5% (8)	13% (21)	29% (45)	**40% (63)**	7% (11)	**5.95**
Enjoyable-1: Miserable-7	22% (34)	**30% (47)**	17% (26)	11% (17)	7% (11)	8% (13)	4% (7)	1% (2)	**2.94**
Worthwhile-1: Useless-7	**37% (58)**	25% (40)	11% (18)	6% (10)	4% (6)	7% (11)	6% (10)	3% (4)	**2.60**
Friendly-1: Lonely-7	18% (28)	**25% (40)**	20% (31)	11% (17)	9% (14)	11% (17)	4% (7)	2% (3)	**3.18**
Full-1: Empty-7	**33% (52)**	25% (39)	18% (28)	5% (8)	5% (8)	4% (7)	7% (11)	2% (3)	**2.65**
Hopeful-1: Discouraging-7	28% (44)	**30% (47)**	17% (26)	7% (11)	4% (7)	8% (13)	3% (5)	2% (3)	**2.67**
Rewarding-1: Disappointing-7	**33% (52)**	29% (46)	12% (19)	8% (13)	6% (9)	6% (9)	4% (6)	1% (2)	**2.56**
Brings out the best in you-1: Doesn't give you much of a chance-7	17% (27)	**41% (63)**	16% (25)	12% (18)	5% (8)	4% (6)	3% (4)	3% (4)	**2.68**

Total Respondents	**157**
(skipped this question)	17

35. Do you smoke?

	Response Percent	Response Total
Yes	8.9%	14
No	**91.1%**	**143**
Total Respondents		**157**
(skipped this question)		17

36. If yes, to the above question, how many cigarettes do you smoke per day?

	Response Percent	Response Total
Less than 10	**41.7%**	**5**
between 10-20	**41.7%**	**5**
more than 20	16.7%	2
Total Respondents		**12**
(skipped this question)		162

4. Academic Tasks Questionnaire

37. How much confidence do you have about performing each research behavior listed below?

	very little	not much	some	a significant amount	quite a lot	Response Average
attending a national professional meeting	1% (2)	1% (2)	10% (15)	26% (40)	**61% (94)**	**4.45**
presenting a paper at a national professional meeting.	3% (5)	3% (4)	17% (26)	27% (41)	**50% (77)**	**4.18**
presenting a paper at a regional professional meeting.	4% (6)	3% (4)	10% (16)	29% (45)	**54% (82)**	**4.26**
conducting research in the field or lab	6% (9)	4% (6)	11% (17)	29% (45)	**50% (76)**	**4.13**
reviewing literature for a new research project	2% (3)	1% (1)	11% (17)	30% (46)	**56% (86)**	**4.38**
writing a research grant	5% (7)	11% (17)	26% (40)	25% (39)	**33% (50)**	**3.71**
					Total Respondents	**153**
					(skipped this question)	21

38. How much confidence do you have about performing each research behavior listed below?

	very little	not much	some	a significant amount	quite a lot	N/A	Response Average
collaborating with a male colleague on a research project	2% (3)	5% (7)	10% (15)	25% (39)	**54% (82)**	5% (7)	**4.30**
collaborating with a female colleague on a research project	2% (3)	3% (5)	11% (17)	23% (35)	**56% (86)**	5% (7)	**4.34**
using a computer or computer program for analysis of data	4% (6)	9% (14)	19% (29)	20% (31)	**42% (64)**	6% (9)	**3.92**
writing a paper suitable for a national refereed journal	3% (4)	3% (5)	12% (19)	29% (45)	**51% (78)**	1% (2)	**4.25**

advising a colleague about research methodology	3% (4)	7% (11)	20% (30)	27% (41)	**42% (65)**	1% (2)	**4.01**
						Total Respondents	**153**
						(skipped this question)	21

39. Consider all the research behaviors above as a group to answer these questions:

	very little	not much	some	a significant amount	quite a lot	N/A	Response Average
To what degree does your department encourage you to perform these behaviors?	9% (14)	7% (11)	23% (34)	19% (29)	**37% (55)**	4% (6)	**3.70**
How much does your department reward you (verbal, social, financial) for performing these behaviors?	14% (21)	13% (20)	**30% (46)**	23% (34)	17% (26)	3% (4)	**3.16**
						Total Respondents	**151**
						(skipped this question)	23

40. Estimate the number of articles you have published in national refereed journals:

	Response Percent	Response Total
0	7.3%	11
1-5	**20.5%**	**31**
6-10	15.2%	23
11-15	9.3%	14
16-20	4.6%	7
21-30	10.6%	16
31-50	9.9%	15
51-70	5.3%	8
over 70	17.2%	26
	Total Respondents	**151**
	(skipped this question)	23

41. How much confidence do you have about performing each service behavior listed below?

	very little	not much	some	a significant amount	quite a lot	Response Average
presenting a seminar or workshop for colleagues	1% (2)	3% (5)	15% (23)	34% (51)	**46% (70)**	**4.21**
chairing a department curriculum committee	6% (9)	15% (22)	23% (34)	28% (42)	**29% (44)**	**3.60**
attending meetings of your school	0% (0)	5% (7)	13% (20)	34% (52)	**48% (72)**	**4.25**
consulting with a large state business organization	8% (12)	17% (25)	26% (40)	**27% (41)**	22% (33)	**3.38**
evaluating a colleague for tenure or promotion	5% (8)	11% (17)	26% (39)	25% (37)	**33% (50)**	**3.69**
chairing a promotion or tenure committee	11% (17)	25% (37)	19% (28)	20% (30)	**25% (38)**	**3.23**
mediating a dispute between two colleagues	5% (8)	15% (22)	**44% (67)**	21% (31)	15% (23)	**3.26**
negotiating an exception to the rule with a dean	7% (11)	20% (30)	**34% (51)**	23% (35)	15% (23)	**3.19**
recruiting students for your program	2% (3)	5% (7)	26% (40)	31% (47)	**36% (54)**	**3.94**

chairing an ad hoc committee for the university president/ chancellor	14% (21)	20% (30)	**26% (39)**	22% (33)	19% (28)	**3.11**
					Total Respondents	**151**
					(skipped this question)	23

42. Please consider all the service behaviors listed above as a group to answer these questions:

	very little	not much	some	a significant amount	quite a lot	N/A	Response Average
To what degree does your department encourage you to perform these behaviors?	12% (18)	17% (26)	**32% (47)**	23% (35)	12% (18)	3% (5)	**3.06**
How much does your department reward you (verbal, social, financial) for performing these behaviors?	24% (36)	21% (32)	**33% (49)**	13% (19)	4% (6)	5% (8)	**2.49**
						Total Respondents	**150**
						(skipped this question)	24

43. How much confidence do you have about performing each teaching behavior listed below?

	very little	not much	some	a significant amount	quite a lot	Response Average
Leading a student discussion seminar	1% (2)	3% (4)	8% (13)	29% (44)	**59% (90)**	**4.41**
Lecturing in a small class	1% (1)	3% (4)	6% (9)	22% (34)	**69% (105)**	**4.56**
Preparing a new course in your field	1% (1)	3% (5)	11% (17)	34% (52)	**51% (78)**	**4.31**
Evaluating students' written work	1% (2)	2% (3)	9% (14)	26% (40)	**61% (94)**	**4.44**
Supervising students in the field	1% (2)	3% (5)	11% (17)	25% (39)	**59% (90)**	**4.37**
Writing recommendations for students	1% (2)	1% (1)	6% (9)	34% (52)	**58% (89)**	**4.47**
Choosing texts for your courses	3% (4)	1% (2)	16% (24)	27% (42)	**53% (81)**	**4.27**
Preparing a new lecture	1% (2)	1% (2)	8% (13)	31% (47)	**58% (89)**	**4.43**
Advising students about academic issues	1% (2)	3% (4)	14% (21)	30% (46)	**52% (80)**	**4.29**
Advising students about career issues	1% (2)	3% (4)	13% (20)	34% (52)	**49% (75)**	**4.27**
					Total Respondents	**153**
					(skipped this question)	21

44. Please consider all the service behaviors listed above as a group to answer these questions:

	very little	not much	some	a significant amount	quite a lot	Response Average
To what degree does your department encourage you to perform these behaviors?	11% (16)	11% (17)	27% (40)	**31% (46)**	20% (29)	**3.37**
How much does your department reward you (verbal, social, financial) for performing these behaviors?	24% (36)	21% (31)	**31% (45)**	17% (25)	7% (10)	**2.61**
					Total Respondents	**148**
					(skipped this question)	26

45. The following choices (0-6) ranging from never to everyday represents frequencies of occurence for the statements or feelings below. Please select the one choice which best describes your feeling.

	1- a few	2- once a	3- a few	5- a few	6- most

	0- never	times a year	month or less	times a month	4- once a week	times a week	days or every day	Respondent Total
I feel emotionally drained from my work.	7% (11)	**22% (33)**	13% (19)	21% (32)	11% (17)	18% (27)	8% (12)	**151**
I feel used up at the end of the day.	5% (7)	15% (22)	8% (12)	19% (29)	20% (30)	**22% (33)**	13% (19)	**151**
I feel fatigued when I get up in the morning and have to face another day on the job.	19% (28)	**23% (35)**	17% (26)	10% (15)	15% (22)	11% (17)	5% (8)	**151**
I can easily understand how my students and colleagues feel about things.	1% (2)	2% (3)	2% (3)	5% (8)	13% (19)	35% (52)	**41% (60)**	**147**
I feel I treat some students or colleagues as if they were impersonal objects.	**54% (81)**	22% (33)	13% (19)	6% (9)	3% (5)	1% (2)	1% (1)	**149**
Working with people all day is really a strain for me.	**29% (44)**	25% (38)	18% (27)	15% (22)	7% (11)	5% (7)	1% (1)	**150**
I deal effectively with the problems of my students.	2% (3)	2% (3)	7% (10)	13% (20)	16% (24)	**31% (46)**	30% (44)	**149**
I feel burned out from my work.	15% (23)	**32% (47)**	14% (21)	13% (19)	12% (18)	5% (8)	10% (15)	**149**
I feel I'm positively influencing other people's lives through my work.	2% (3)	5% (7)	10% (15)	16% (24)	11% (17)	26% (38)	**31% (46)**	**149**
I've become more callous toward people since taking this job.	**45% (67)**	22% (33)	12% (18)	10% (15)	5% (8)	3% (4)	5% (7)	**150**
I worry this job is hardening me emotionally.	**55% (83)**	17% (26)	12% (18)	2% (3)	7% (11)	3% (4)	4% (6)	**150**
							Total Respondents	**151**
							(skipped this question)	23

46. The following choices (0-6)ranging from never to everyday represents frequencies of occurence for the statements or feelings below. Please select the choice which best describes your feeling.

	0- never	1- a few times a year	2- once a month or less	3- a few times a month	4- once a week	5- a few times a week	6- most days or every day	Response Average
I feel very energetic.	1% (2)	2% (3)	5% (8)	11% (17)	13% (19)	33% (49)	**35% (52)**	**5.69**
I feel frustrated by my job.	3% (5)	21% (32)	15% (23)	**23% (35)**	10% (15)	17% (26)	9% (14)	**4.05**
I feel I'm working too hard on my job.	8% (12)	16% (24)	12% (18)	15% (23)	13% (19)	15% (22)	**21% (31)**	**4.36**
I don't really care what happens to some students.	**47% (70)**	21% (32)	9% (13)	15% (22)	6% (9)	2% (3)	1% (1)	**2.21**
Working with people directly puts too much stress on me.	30% (45)	**35% (52)**	16% (24)	9% (13)	6% (9)	3% (5)	1% (1)	**2.38**
I can easily create a relaxed atmosphere with my students.	0% (0)	5% (7)	2% (3)	7% (10)	14% (21)	31% (45)	**41% (61)**	**5.88**
I feel exhilarated after working closely with my students.	2% (3)	4% (6)	9% (14)	11% (17)	14% (21)	**32% (47)**	27% (40)	**5.35**
I have accomplished many worthwhile things in this job.	0% (0)	3% (4)	11% (16)	14% (20)	17% (25)	24% (35)	**32% (46)**	**5.43**
I feel like I'm at the end of my rope.	**38% (56)**	32% (47)	9% (14)	7% (10)	8% (12)	3% (5)	3% (5)	**2.40**
In my work, I deal with emotional problems very calmly.	0% (0)	7% (10)	9% (13)	17% (25)	13% (19)	27% (40)	**28% (41)**	**5.28**
I feel students or colleagues blame me for some of their problems.	**36% (54)**	**36% (54)**	13% (19)	7% (11)	3% (4)	3% (5)	2% (3)	**2.23**
							Total Respondents	**150**
							(skipped this question)	24

VITA

Mark Kelly was born in Torrance, California and grew up in the Southern Los Angeles area. He then went to El Toro High School in Southern Orange County, CA. and then onto to Univ. of Cal., Los Angeles. At UCLA, he studied his passion of the human body in action in the Kinesiology (exercise physiology) program. He bowled for UCLA and began running marathons competitively. He graduated with a B.S. in Kinesiology and Psychology. He performed some independent research projects in both departments and loved performing research. This passion along with a desire to learn more in physiology and exercise physiology drove him to go to graduate school at the University of New Mexico in Albuquerque. There he studied Exercise Physiology and completed the coursework in the Masters of Science program. He also pursued his personal interest in competitive sports by participating in duathalons, triathlons, and continued marathoning.

He then went to unto Louisiana State University, Medical Center (now Health Science Center) in New Orleans, Louisiana. He spent a total of 17 years of his life in New Orleans. He graduated with an M.S. in Physiology in 1992 and went on to become the Health Promotion Coordinator and Fitness Center Director at LSUMC. During his graduate student career at LSUMC and after, he continued his competitive sports pursuits in duathalons and earned a national ranking of 6^{th} in his age group (20-29) for the 1992 season (awarded by Inside Triathalon 1993) and was named King of Duathlons that year by a popular sportswriter.

Along with working in the fitness field and participating in fitness activities, he became a writer for several monthly newspapers or magazines, including *Inside Triathlon, Health and Home, Northlake News*, the *New Orleans Track Club* newletter- *Footprints*. His writing

continued for the *National Federation of Professional Trainers* where he was asked to become the Research and Development Director. He wrote the training manuals and tests for this organization as well as some certification programs.

Mark has been teaching at various universities and colleges across the last 12 years including LSU-Nursing and Dental Schools, Tulane School of Public Health and Tropical Medicine, Our Lady of Holy Cross, Delgado Community College, and is currently teaching at the University of Phoenix where he has been for the past 6 years
(Louisiana and Southern California/San Diego/ Tuscon, AZ. campuses).

Along with teaching in academic institutions Mark has been testing and instructing individuals in corporate wellness programs. This passion of assessing human performance has blossomed into both a corporate wellness program business as well as performing studies for exercise equipment and programs for infomercials and the fitness industry. Mark has appeared in several nationally televised infomercials as the expert scientific testimonial as well as a fitness model. Mark plans to open up a human performance assessment center that will analyze fitness, nutritional or biochemical state of the body using blood work and cellular analysis, disease risk profiles, and even some psychological and wellness profiles. He hopes to expand both the centers and array of tests as the company develops. Through his fascination with the human body and optimizing its performance through preventative measures, his love of science and analytical techniques, along with his joy of exercise and leisure activities, Mark hopes to both educate and rehabilitate others who wish to enhance their quality of life.