

Occupational Stress Among Canadian University Academic Staff

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Executive Summary

Introduction

Academic staff in post-secondary institutions now appear to suffer from occupational stress. Recent national surveys in the United Kingdom (Tytherleigh, Webb, Cooper & Ricketts, 2005) and Australia (Winefield, Gillespie, Stough, Dua & Hapuararchchi, 2002) have reported a serious and growing problem of academic work stress with several deleterious consequences; including decreased job satisfaction, reduced morale and ill health for academic staff. These issues are aggravated by restructuring, use of short-term contracts, external scrutiny and accountability, and major reductions in funding. These factors have also affected Canadian post-secondary institutions over the last decade. Since different political cultures may modulate generally observed phenomena, it is important to examine the incidence of work stress and its strain related outcomes among Canadian academics.

Study Objectives.

At present, there is no reliable information from Canadian post-secondary institutions with respect to occupational stress. We sought to redress this through a large scale, random sample of Canadian academics. The purpose of our study was to characterise occupational stress by:

- 1 determining stress levels in academic staff
- 2 determining variability in academic stress over academic and demographic variables.
- 3 determining the work related predictors of health outcomes in academic staff
- 4 determining the work related predictors of job satisfaction and other outcome variables in the academic population

Method

We randomly sampled academic staff at 56 universities where the faculty association was a member of CAUT. Requests were sent to 6000 randomly selected academic staff whose names were obtained from the CAUT Bulletin mailing list for August 2005. Because of staff changes, difficulties with spam filters, and other problems, emails were received by only 5445 of those sampled. Email recipients received three reminders to complete the survey.

The email recipients were asked to complete an online survey that consisted of several scales which were known to be reliable and valid and that are typically used to assess stress and stress outcomes. The ten work-related stressors were: Job Control, Skill Use, Work Load, Work Scheduling, Role Conflict, Role Ambiguity, Work-Life Balance, Fairness-Administration, Fairness-Chairperson, and Fairness-Rewards. The seven stress outcome measures were: Job Satisfaction, Affective Commitment, Health & Safety at Work, Positive Well-Being, Physical Health Questionnaire, General Health Questionnaire, and Use of medication.

The number that participated in the survey was 1470, or 27% of those who received our emails, a figure comparable to the Australian (25%) and UK (38%) academic stress studies. Surveys similar to this one generally receive response rates from 27% to 31% (Ibeh, Brock, & Zhou, 2004). This participant rate is lower than we would have desired, but the findings appear to be generalizable to the population of Canadian academics based on demographic comparisons. This can be gauged from the fact that the participant population demographically does not differ significantly from the total pool of Canadian academics in age and rank. There was however a higher female participant rate. The low response rate for our study does mean any results must be interpreted with caution.

All data were analyzed using standard statistical procedures, such as t-tests, MANOVAs and multiple regressions. Within demographic groups, comparisons were all carried out using multivariate procedures to protect the probability of falsely concluding that there were significant differences between groups. We relied on effect sizes to help identify meaningful results since the large sample size has the potential for finding trivial differences to be statistically significant.

Major Findings

1. The overall level of stress in Academic Staff employed in Canadian Universities is very high, consistent with the findings from the UK and Australian academic stress studies. A majority, in most cases a large majority, of respondents reported a high level of agreement with stress indicators on seven of the ten measures we used to assess stress: Work Load (85%), Work Scheduling (73%), Role Conflict (82%), Role Ambiguity (71%), Work-Life Balance (76%), Fairness-Administration (55%), Fairness-Rewards (51%). Job Control (14%), Skill Use (3%), and Fairness-Chairperson (20%) were not sources of stress for the sample respondents, in general.
2. Senior administrative staff are perceived to act unfairly to a much greater degree than unit chairpersons. The difference in perceived fairness of senior administration (37%) compared to unit Chairpersons (77%) parallel those found in Australia where only 19% of respondents agreed that senior administration was trustworthy, while about half (53%) agreed that their Department Head was trustworthy. Academic staff see their immediate supervisor as more supportive and trustworthy than senior administrators. In part this may reflect the fact that at almost every university, chairpersons are members of the same bargaining unit as academic staff and subject to the same requirements. In almost all collective agreements, even where the

chairperson is called a "Head", the chairperson is seen more as a *primus inter pares* rather than as someone who has significantly more authority than other academic staff in the unit.

3. Overall, study participants were satisfied with their jobs (65%) and committed to their institutions emotionally (60%). These results were very similar to those reported in the Australian study of stress in academia for job satisfaction (58%) and commitment (52%).
4. Demographic Factors. Groups of academic staff that are most at risk of stress and strain are women and individuals between the ages of 30 and 59, faculty in tenure-track positions and those whose first language is neither English nor French.
 - a. *Gender*. There were differences between male and female respondents on eight of the ten stressors. On seven of the measures, females reported higher levels on the stressors than males. The strongest effect occurred on the Work-Life Balance measure. Only on the Role Ambiguity measure did males score higher than female respondents. Canadian females had less belief than male academic staff in the fairness of both their Chairperson and senior administrators; however, the opposite effect occurred in Australia where female academic staff had more trust in both levels of administration than did males. Female respondents expressed less job satisfaction and affective commitment than males; this result is the opposite of what was found in the Australian universities. Neither the Australian study nor ours found any differences between males and females on the psychological health questionnaire. Females, however, reported more physical health symptoms and use of stress-related medications.
 - b. *Age*. The youngest and oldest respondents seemed to perceive stressful events more like one another than those between 30 and 59 years of age. They had the lowest levels of workloads and work schedules and the lowest levels of stressors due to role conflict, role ambiguity, and work-life balance. They also had the fewest concerns over the fairness of the rewards they received. The youngest and oldest groups were the most satisfied with their jobs and reported the fewest physical and general health symptoms, although the oldest age category used medication the most frequently.
 - c. *Faculty Rank*. There was an ordered relationship for Faculty across ranks for Job Control and Skill Use in that the lowest scores were reported by the lowest ranks and increasing in order to the Full Professor rank. An ordered relationship also resulted for Role Ambiguity except that the highest scores occurred for Full Professors and decreased with rank. Full professors had the most control over their work and made most use of their skills but also reported the least clarity with respect to their jobs. Associate and Full Professors expressed the least amount of strain in terms of physical and general health symptoms and had the highest levels of job satisfaction. Assistant professors and faculty in tenure track positions were worst off in terms of work-life balance.

- d. *Librarians*. There were differences among the Librarian ranks on only one measure- Work Scheduling. Here, both Librarian III's and Librarian IV's reported more concerns over their work schedules than more junior Librarians. There were no significant effects for the different outcome measures across Librarian groups.
 - e. *Employment Status*. Not surprisingly, tenured academics had more control over their teaching and research than did academics in tenure track positions, who in turn had greater control than did contract academic staff. What was surprising was that contract academic staff expressed less concern about their workloads, and reported less role conflict, role ambiguity and work-life imbalance than either tenure track or tenured academic staff. Tenured academic staff, despite the imbalance between work and family, expressed greater satisfaction with their jobs than did the other types of academic staff. Job Satisfaction increased with job security. Academic staff in tenure track positions reported the most physical and general health symptoms.
 - f. *Language*. The most significant differences among the three language groups were with respect to those respondents whose first language was neither French nor English. This "Other" group perceived lower Job Control and Skill Use than English and French speakers. On the other hand, they had less Role Conflict than the other two linguistic groups. French-speaking respondents had the lowest concern about their workloads but the most negative perceptions of the three groups about the fairness of their chairpersons and the fairness of the rewards in their institution. There were no differences across the three groups for job satisfaction and physical and general health symptoms. French speaking staff expressed fewer concerns about occupational health and safety issues on their campuses.
5. The reported incidence of psychological strain was very high with 13% of respondents exhibiting signs of distress in the number of symptoms reported on the general health questionnaire.
 6. A significant proportion of the Academic Staff in our sample (22%) reported relatively high rates of physical health symptoms that are typically associated with stress.
 7. Predicting Job and Health Outcomes:
 - a. Gender was the most consistent demographic predictor of work and reported health symptoms. It significantly predicted Affective Commitment, psychological strain and use of stress-related medicines. The Australian study found that gender was a significant predictor of job satisfaction but neither affective commitment nor psychological strain.

- b. Language was a significant predictor of the three health measures: physical symptoms, psychological strain and use of stress-related medicine. Both Academic Rank and Employment Status predicted Job Satisfaction; Academic Rank also predicted positive well-being while Employment Status predicted workplace health and safety issues. Age predicted physical health symptoms. In the Australian study a "full-time/part-time" variable, which is similar to Employment Status, predicted job satisfaction but not psychological strain, similar to the results for Employment Status.
- c. Work-life balance was the most consistent stress-related measure predicting low job satisfaction and negative health symptoms. Work-Life Balance significantly predicted six of our seven outcome measures. The only variable it did not predict was Affective Commitment to the academic staff members' institutions.

In summary, this study shows that academic staff working in Canadian universities, like those in Australia and the U.K., are stressed to a high degree. In most cases a large majority, of respondents reported high levels on seven of ten stressors: Work Load, Work Scheduling, Role Conflict, Role Ambiguity, Work-Life Balance, Fairness-Administration, Fairness-Rewards. Job Control, Skill Use, and Fairness-Chairperson were not sources of stress for the sample respondents, in general. Overall study participants were satisfied with their jobs and committed to their institutions emotionally; however, a significant minority of the respondents reported a relatively high occurrences of stress-related physical and psychological health symptoms and the use of stress-related medications over the past twelve month period. These results warrant consideration of contemporary academic work by both academic staff associations and university administrations with respect to the implementation of changes in policies and procedures that might lead to reductions in work-related stress and strain.

Occupational Stress in Canadian Universities: A National Survey

At one time an academic career was seen as a desirable goal. It was work in a clean, safe environment that was free of stress, and was perceived to have a high social standing. Over the past twenty years that perception has changed to the point where stress in academia exceeds that found in the general population. Academic salaries have not kept pace with other professions; an increasing number of positions are untenured or contract status; workloads have increased as the number of academic positions have fallen or stagnated; pressure has increased to obtain external funding; and even primarily undergraduate universities have placed a greater emphasis on publication.

Stress.

Stress may be conceptualized as a complex, multivariate process, resulting from a broad system of variables involving inputs, outputs and the mediating activities of appraisal and coping (Lazarus, 1990; Lazarus, DeLongis, Folkman, and Gruen, 1985). According to Lazarus (1990, p. 4), 'psychological stress, which results from the interplay of system variables and processes, depends on an appraisal by the person that the person-environment relationship at any given moment is one of harm, threat, or challenge'. Stress is subjective in nature as it is based on an individual's interpretation or perception of events. Different individuals may form different interpretations of the same environment and, in turn, react in different ways to the same situation (Beehr, 2000). Stress is an imbalance between the resources and supplies that individuals believe they possess and the perceived threats or demands related to a given situation (Cooper, 2000; Kahn & Byosiere, 1992). The Job Demand-Control model of stress (Karasek, 1979; Karasek & Theorell, 1990) holds that stress is a function of work demands and influence/control at work. Stressful factors include workload, degree of task difficulty, and time pressure. Control relates to an individual's opportunity to exert influence and control over the work situation (Karasek & Theorell, 1990). Stress arises when high demands are combined with low control; a high degree of control can reduce the possible negative consequences of high demands. An understanding of stress requires an understanding of the key environmental and personal antecedents and the longer term consequences of stress for individuals and the workplace (e.g. psychological well-being, health and social functioning). The "Whitehall" studies of civil servants suggest that perceptions of stress and an inability to control individual work-place environments may have deleterious effects on indicators of overall health status, including mortality and rates of ischemic heart disease (Marmot et al., 1991).

Stress and Academia

Academic staff members in post-secondary institutions now appear to suffer from occupational stress. Recent national surveys in the United Kingdom (Tytherleigh, Webb, Cooper & Ricketts, 2005) and Australia (Winefield, Gillespie, Stough, Dua & Hapuararchchi, 2002) have reported on the serious problem of academic work stress with several deleterious consequences including decreased job satisfaction, reduced morale and ill health for academic staff. These issues are aggravated by restructuring, use of short-term contracts, external scrutiny and accountability, and major reductions in funding. These factors have also affected Canadian post-secondary institutions over the last decade. Since

different political cultures may modulate generally observed phenomena it is important to examine the incidence of work stress and its strain related outcomes among Canadian academics.

The Australian study reported in 2002 that academic staff are highly stressed and to a much greater degree than people in the general population. They related the high levels of stress to diminishing resources, increased teaching loads and student/staff ratios, pressure to attract external funds, job insecurity, poor management and a lack of recognition and reward (Winefield et al., 2002). Research has shown that very long working hours, common among academics, are associated with physical ill-health (e.g., Geiger-Brown, Muntaner, Lipscomb, & Trinkoff, 2004; Krantz, Berntsson, & Lundberg, 2005). Other studies in non-academic environments show that job satisfaction and organisational commitment lead to better organisational outcomes, such as profitability and customer satisfaction (e.g., Judge, Thoresen, Bono & Patton, 2001; Riketta, 2002). Within the Australian study, academic staff members were dissatisfied with their jobs in general; and more specifically with university management, hours of work, industrial relations, chance of promotion, and pay. Psychological strain was highest and job satisfaction the lowest among junior academic ranks, working at levels equivalent to assistant and junior associate professors in North America. Among individuals, psychological strain was best predicted by job insecurity and work demands. In contrast, job satisfaction was best predicted by procedural fairness, trust in Heads and senior management and autonomy. Most importantly, the ongoing stress levels were related to changes in the physical health of the respondents with those expressing the highest levels also reporting the occurrence of physical symptoms of health-related problems. If we can generalize from the non-academic studies on job satisfaction, then the low levels of job satisfaction in academia may lead to more negative outcomes for not only the individual but also for universities and their "clients", that is the student population.

The 2005 UK study concluded that, "occupational stress in university staff is widespread and lends further support to the growing evidence that universities no longer provide the low-stress working environments they once did" (Tytherleigh, et al, 2005, p. 54). In particular, they found that academic staff were stressed by co-workers not pulling their weight, lack of control over decisions affecting their jobs, lack of resources, not being informed about job relevant information, work interfering with home and personal life, insufficient time to do their jobs at the quality level the academics felt necessary, and the level of their pay and benefits. Similar to the Australian findings, respondents were concerned with a lack of trust in senior management and their institutions. They also expressed low levels of commitment to their organization, low levels of job satisfaction and high levels of job insecurity.

Both the Australian and UK studies recognized that their results carried major implications for higher educational institutions and the staff who work in them. Both studies made recommendations to higher education authorities, post-secondary institutions and employee unions with respect to implementation of interventions that could lead to reduced stress levels for employees within the higher education sector.

Study Objectives

At present, there is no reliable information from Canadian postsecondary institutions with respect to occupational stress. We sought to redress this through a large scale, random sample of Canadian academics. The purpose of our study was to characterise occupational stress by:

1. determining stress levels in academic staff;
2. determining variability in academic stress over academic and demographic variables;
3. determining the work related predictors of health outcomes in academic staff; and
4. determining the work related predictors of job satisfaction and other outcome variables in the academic population.

METHOD

Participants. We randomly sampled academic staff at 56 universities where the faculty association was a member of CAUT. Requests were sent to 6000 randomly selected academic staff whose names were obtained from the CAUT Bulletin mailing list for August 2005, which constituted a 1:5 ratio of the approximately 30,000 names on the mailing list. The sampling fraction depended on the size of institution. Hence requests to participate were sent to every member at associations with 74 or less members; 75 members were randomly chosen at institutions with 75 - 499 members; 125 randomly sampled from institutions with 500 - 999 members; and 200 at institutions with over 1000 members.

All potential email recipients received a letter from the research team followed by three reminders to complete the survey. In addition, they received a letter from their local faculty association encouraging their participation. A story on the survey and its purpose appeared in the *CAUT Bulletin* a monthly publication that goes to all association members. The on-line survey was available in both English and French between February and April 2006. The French version was a translation of the English survey developed by professional translators and then submitted to a focus group of bilingual leaders of faculty associations. The final French version accommodated suggestions from the focus group and was vetted by a fully bilingual faculty member.

Because of staff changes, difficulties in getting past spam filters, and other problems, emails were received by only 5445 of those who were randomly sampled. The number that participated in the survey was 1470, or 27% of those who received our emails, a figure comparable to the Australian (25%) and UK (38%) academic stress studies. Surveys similar to this one generally receive response rates from 27% to 31% (Ibeh, Brock, & Zhou, 2004). This participant rate is lower than we would have desired, but the findings are likely to be representative of the population of Canadian academics. This can be gauged from the fact that the participant population demographically does not differ significantly from the total pool of Canadian academics in age and rank. There

was however a higher female participant rate. The lower response rate for our study does mean any results must be interpreted with caution.

Ethics. In order to ensure that no violations of privacy occurred, participants could answer the survey anonymously. To further protect privacy, the email addresses of respondents were deleted by the commercial internet provider who hosted the survey before any data were transmitted to, or seen by, the research team. We recognised that this might hamper our ability to boost response rates, since reminders could not be targeted to non-responders, but we considered this preferable to the potential non-response if respondents could be identified. The Research Ethics Boards of the institutions of all the investigators granted approval to the study.

Measures. The email recipients were asked to complete an online survey that consisted of several scales that are typically used to assess stressors and stress outcomes. Our overall approach was to primarily use standard scales that had been either well-validated or used by prior studies. In some unique areas we designed questions on the basis of the research literature. To decrease respondent burden, we reviewed the combined measures to eliminate repetition and overlapping items. All survey items were measured on a seven-point scale unless otherwise noted. The scales, unless otherwise noted, were verbally anchored as follows: 1=Strongly Disagree, 2=Disagree, 3=Moderately Disagree, 4=Neutral or Don't Know, 5=Moderately Agree, 6=Agree, and 7=Strongly Agree. Our study, therefore, included the following, accepted measures that are used to predict the presence of stress and its outcomes.

Stressor Measures.

Job Control is a stressor present when one has a lack of authority to make decisions about one's job. We created three items to assess this variable; e.g., I have the authority to make decisions about content and methods in the courses I teach. Internal consistency for the scale was $\alpha = .64$.

Skill Use is a stressor present when a job does not use the worker's skills and abilities to their fullest potential. We used five items created and validated by Kelloway and Barling (1994) to measure Skill Use; e.g., "I've had to acquire new skills to keep up with my job." Internal consistency for the scale was $\alpha = .83$.

Work Load is a stressor present when one has too much work to do and too little time in which to do it. We used five items created and validated by Kelloway and Barling (1994) to measure Work Load; e.g., "There is never enough time to finish all of my work." Internal consistency for the scale was $\alpha = .94$.

Work Scheduling is a stressor related to work on evenings or weekends, or at irregular times. We used four items created and validated by Kelloway and Barling (1994) to measure Work Scheduling; e.g., "I often have to work extra hours without advance notice." Internal consistency for the scale was $\alpha = .79$.

Role Conflict is a stressor created by conflicting work demands and expectations. We used four items created and validated by Kelloway and Barling (1994) to measure Role Conflict; e.g., "To do my job well I have to do different things for different people at the same time." Internal consistency for the scale was $\alpha = .84$.

Role Ambiguity/Clarity is a stressor created by a lack of clarity in directions, performance standards and expectations at work. We used four items created and validated by Kelloway and Barling (1994) to measure Role Ambiguity/Clarity; e.g., "I usually know what is expected of me at work." Internal consistency for the scale was $\alpha = .87$.

Work-Life Balance is a stressor created by an imbalance between work and family life; we assessed the spillover of work into non-work areas of life with six items developed and validated by Frone and Yardly (1996); e.g., "My work takes up time that I'd like to spend with family/friends." Internal consistency for the scale was $\alpha = .95$.

We also measured perceptions of procedural and distributive justice, variables that were linked to stress in the UK and Australian studies:

Fairness-Administration is a stressor created by senior administration acting in a procedurally unfair manner, such as acting on inaccurate information or not hearing the concerns of all affected by a decision. We adapted seven items from Moorman's (1991) procedural and interactional justice scale to assess this stressor; e.g., "When making decisions, administrators at your university hear the concerns of all those affected by the decision." Internal consistency for the scale was $\alpha = .95$.

Fairness-Chairperson is a stressor created by a Chairperson acting in a procedurally unfair manner such as not considering all viewpoints or dealing with others in a truthful manner. We adapted seven other items from Moorman's (1991) procedural and interactional justice scale to assess this stressor; e.g., "If you approached your chairperson (or the administrator to whom you report) with a concern or request for help, she/he would deal with you in a truthful manner." Internal consistency for the scale was $\alpha = .95$.

Fairness-Rewards is a stressor created by perceptions that the distribution of rewards is unfair, for example, that rewards do not match effort, responsibilities, or experience. We adapted five items from Price and Mueller's (1986) distributive justice scale to assess this stressor; e.g., "In my workplace I am fairly rewarded in view of the amount of experience I have." Internal consistency for the scale was $\alpha = .96$.

Main Outcome Measures.

We asked respondents to tell us about their beliefs with respect to seven psychological and physical health measures that are often influenced by stress. These variables were:

Job Satisfaction is the degree to which the respondents were satisfied with different aspects of their jobs at their institutions. This measure asked seven questions developed for a study of faculty job satisfaction (US Dept. of Education, 1999). It included questions about satisfaction with workload, job security, advancement, and salary and benefits, among others. Participants responded using a five-point scale that ranged from 1= Very Dissatisfied to 5=Very Satisfied. Internal consistency for the scale was $\alpha = .77$.

Affective Commitment is the degree to which the respondents feel emotionally attached to their institutions; e.g. "I would be very happy to spend the rest of my career at this institution." We used eight items developed by Allan and Meyer (1990) to measure affective commitment. Internal consistency for the scale was $\alpha = .81$.

Health and Safety at Work is the degree to which the respondents believed that their health had been affected by the environment in which they work along with the commitment of their institutions to the health and safety of employees. We developed a composite of six items taken from Barling, Loughlin, & Kelloway, (2002) and Mendelsohn, Catano, & Kelloway (2000) to assess this variable; e.g., "The health and safety problems at this institution are serious." Internal consistency for the scale was $\alpha = .84$.

The following three scales were measured with a 7-point scale where 1=Not at All, 2= Rarely, 3=Once in a while, 4=Some of the time, 5=Fairly often, 6=Often, and 7=All of the time. The scale for Medication was also a 7-point scale but ranged from 1=1 time to 7=7 times or more.

Positive Well-Being is the degree to which respondents felt they experienced positive emotional states over the previous twelve-month period; that is the degree to which they were cheerful, enthusiastic, etc. (Hess, Kelloway & Francis, 2005). Internal consistency for this six-item scale was $\alpha = .96$.

Physical Health Questionnaire (PHQ). Stress is often related to physical symptoms of minor illness. This eight-item measure assessed the degree to which respondents experienced minor physical health symptoms; e.g., "During the last 12 months have you gotten a headache when there was a lot of pressure on you to get things done?" (Schat, Kelloway, & Desmarais, 2006). Internal consistency for the scale was $\alpha = .82$.

General Health Questionnaire (GHQ) is a standardized measure of health that is used to assess the degree of psychological strain, that is, the effects of stress on an individual's mental health in occupational settings; e.g., "During the last 12

months have you lost much sleep from worry?" (Banks, Clegg, Jackson, Kemp, Stafford, & Wall, 1980). Internal consistency for this 12-item scale was $\alpha = .89$.

Medication - We asked respondents the degree to which they had taken medication for stress-related illness or had seen a medical practitioner. Internal consistency for this three-item scale was $\alpha = .64$.

Data Analyses.

All data were analyzed using standard statistical procedures. In comparing the overall average score on each stressor or outcome measure, we used a one-sample t-test with the null value set at the neutral point of the stressor or outcome scale. For the set of ten stressors we set the nominal significance level of each at $p = .005$ to ensure an overall significance level of roughly .05. For the set of seven outcome variables we set $p = .007$ to achieve an overall p of roughly .05. We relied on effect sizes to help identify meaningful results since the relatively large sample size in our study has the potential for finding trivial differences to be statistically significant. We used Cohen's d , which is not dependent on sample size, as our effect size measure. Effect sizes of .2 or less are considered small, effect sizes of .5 are considered moderate, and those of .8 or higher are considered large (Cohen, 1977).

Within demographic groups, comparisons were all carried out using multivariate procedures to protect the probability for making errors with respect to any significant differences found through subsequent univariate analyses. In the multivariate analyses, the demographic variables were entered individually as fixed factors and the set of stressors or outcome variables as dependent measures. Wilk's $\lambda < .05$ was the criterion for multivariate significance. We also used $p < .05$ as our criterion of statistical significance but noted where differences were statistically significant at $p < .001$. We used η^2 as our effect size measure and the commonly accepted η^2 -values of .01, .06, and .14 as representing small, moderate, and large effects.

We used hierarchical regressions to identify the significant predictors of our seven outcome variables. For each of our outcome variables we entered the demographic variables of gender, age, academic rank (Faculty and Librarian ranks combined), Language and Employment Status on the first step to control for their relationships with the outcome measures. We next entered the ten stressors on the second step. We report, in all cases, the results from the final regression model but list only the beta weights for the significant predictors; non-significant variables were not dropped from the model. Interpretation of the direction of the beta weight depends on the direction of the scales used to measure the demographic variable or stressor and the direction of the scale used to measure the outcome measure.

RESULTS

Table 1 presents the results for the ten variables assessed as potential stressors in the academic work environment. All ten were measured on a 7-point scale. Table 1 presents the mean score obtained from the participants for each variable along with the percentage of respondents reporting low or high agreement with the statements comprising each scale. Table 1 and other tables indicate whether low or high levels of agreement represent low or high levels of stress. All of the means for the ten variables differ from the neutral point, 4.0, on the each measure. They are significantly different from the neutral point in every case. With the exception of Job Control, Skill Use and perceived fairness of the chairperson, all of the means indicate that the variable is associated with higher stress

Table 1. Results for the Stressors Across the Total Sample						
Variable	Neutral	Total Sample Mean	Effect size, d	% Low	% Neutral	% High
Job Control ^a	4	5.13*	.99	13.7	5.8	80.5
Skill Use ^a	4	6.02*	2.17	3.0	1.0	95.9
Work Load ^b	4	5.59*	1.12	13.5	1.8	84.7
Work Scheduling ^b	4	4.99*	.72	22.2	4.9	72.9
Role Conflict ^b	4	5.27*	.93	14.2	3.7	82.1
Role Ambiguity ^b	4	4.74*	.52	24.1	5.0	70.9
Work-Life Balance ^b	4	5.13*	.72	21.5	2.4	76.1
Fairness-Administration ^a	4	3.57*	-.31	55.0	8.2	36.8
Fairness-Chairperson ^a	4	5.09*	.73	20.5	2.4	77.0
Fairness-Rewards ^a	4	3.87*	-.66	50.7	5.2	44.1
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * p < .005 for comparison with neutral point; family-wise p<.05.						

levels.

All of the effect sizes for the stress variable ranged from moderate to high, except for Fairness-Administration, which was in the small to moderate range.

Differences in Stressors Across Demographic Variables

Table 1 presented a view of stressors in general across our survey respondents. We examined whether there were differences in the stressor levels based on various demographic factors.

Gender.¹

Table 2 shows the distribution of male and female respondents. Our participant sample is skewed compared to the pool they were drawn from in that we had almost an equal proportion of male and female respondents, while the proportion of female academic staff members is 38% (CAUT Almanac, 2007).

<i>Gender</i>	<i>Frequency</i>	<i>Respondents</i>	<i>CAUT Almanac</i>
Male	716	50.2%	62.3%
Female	709	49.8%	37.7%
Total	1425	100%	100%

Table 3 presents comparisons between male and female respondents for all stressors. We present the mean score for each group and the percentage of low, neutral, and high scores for each variable. Independent sample t-tests assessed the significance of the two group means. With the exception of Skill Use and Role Conflict, there were significant differences between male and female respondents on the remaining eight variables. The effect sizes were, on the whole, small. The largest effect, $\eta^2 = .02$, which was still small, occurred for Work-Life Balance where responses from females were higher than from males. Women expressed higher scores on the stressors than men did on Job Control, Work Load, Work Scheduling, Role Ambiguity, Work-Life Balance, Fairness-Administration, Fairness-Chairperson, and Fairness-Rewards. There were no differences on Skill Use and Role Conflict. On the Fairness-Chairperson variable women had higher stressor scores than men but the mean, 4.93, predicts a lack of stress that could be attributed to this stressor.

¹ Gender was coded as follows: 1=Males, 2=Females

Table 3. Comparison of Male and Female Responses on Stress-Related Variables									
Mean Scores and Differences				% Low/ Neutral/ High					
Measure	Means		Effect Size, η^2	Males			Females		
	Males	Females		Low (%)	Neutral (%)	High (%)	Low (%)	Neutral (%)	High (%)
Job Control ^{a*}	5.22	5.05	.01	11.8	5.5	82.7	15.6	5.8	78.7
Skill Use ^a	6.04	6.02	.00	3.1	1.3	95.6	2.7	0.6	96.7
Work Load ^{b**}	5.44	5.72	.01	14.9	2.0	83.1	12.3	1.7	86.0
Work Scheduling ^{b*}	4.92	5.07	.01	24.0	4.8	71.2	20.3	4.7	75.0
Role Conflict ^b	5.22	5.32	.00	14.8	3.3	81.9	13.5	3.9	82.6
Role Ambiguity ^{b*}	4.88	4.62	.01	19.3	5.5	75.3	28.4	4.6	67.0
Work-Life Balance ^{b**}	4.91	5.35	.02	25.1	2.8	72.1	17.9	1.9	80.2
Fairness-Administration ^{a**}	3.71	3.42	.01	51.8	7.2	41.0	57.9	9.4	32.7
Fairness-Chairperson ^{a**}	5.25	4.93	.01	15.5	1.9	82.6	25.3	2.9	71.8
Fairness-Rewards ^{a**}	4.03	3.71	.01	47.0	4.5	48.5	54.2	5.9	40.0

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.
* p < .05; ** p < .001

Age

Table 4 presents the age distribution of our respondents. The distribution shows most respondents between the ages of 40 and 59 and is representative of academic staff based on CAUT Almanac data.

Table 4. Age Distribution of Respondents			
Age Group	Respondent Frequency	Respondent Percentage	CAUT Almanac
20-29	11	0.8%	1.1%
30-39	270	18.9%	20.2%
40-49	466	32.6%	31.8%
50-59	496	34.7%	31.8%
60+	188	13.1%	12.8%
Total	1431	100%	97.7%

We used a multivariate analysis of variance to assess the differences across the Age categories for the 10 stress variables. The multivariate effect was significant. We followed this with univariate analyses for each stressor scale. Table 5 presents the results of these analyses. With the exception of Skill Use and Fairness-Administration, there are significant differences among the age categories; however, all of the effects are small, with the largest, $\eta^2 = .04$, occurring for Work-Life Balance.

Even though the age effect is small, the differences across the age categories are interesting. For example, both the youngest (20-29 yrs) and oldest (60+ yrs) respondents tended to report less stress than those between 30 and 59. The youngest and oldest respondents reported less stress on Work Load, Work Scheduling, Role Conflict, Work-Life Balance, Fairness-Rewards, and Job Control, but higher levels of Role Ambiguity.

Measure	Total Sample Mean	20-29	30-39	40-49	50-59	60+	Effect Size, η^2
Job Control ^{a*}	5.13	5.27	4.91	5.11	5.38	5.37	.01
Skill Use ^a	6.02	6.29	5.99	5.99	6.00	6.20	.01
Work Load ^{b**}	5.59	4.64	5.70	5.78	5.55	5.09	.02
Work Scheduling ^{b*}	4.99	4.12	5.09	5.08	5.00	4.67	.01
Role Conflict ^{b**}	5.27	3.75	5.20	5.41	5.38	4.87	.03
Role Ambiguity ^{b**}	4.74	5.23	4.51	4.65	4.79	5.23	.02
Work-Life Balance ^{b**}	5.13	4.32	5.40	5.30	5.13	4.39	.04
Fairness-Administration ^a	3.57	4.35	3.60	3.51	3.52	3.75	.00
Fairness-Chairperson ^{a*}	5.09	5.43	5.21	5.16	4.90	5.19	.01
Fairness-Rewards ^{a*}	3.87	4.89	3.66	3.83	3.85	4.21	.01

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.
* $p < .05$; ** $p < .001$

Academic Rank

Tables 6a and 6b present the breakdown for academic staff by faculty and librarian status, respectively. The percentage of Faculty respondents across the academic ranks had a very good correspondence to the actual rank distribution of Faculty in Canadian universities. There is a slight over representation of faculty in the Instructor and Lecturer ranks and a slight under representation of faculty in the Full Professor ranks; nonetheless, the distribution appears to be reasonably? representative.

Table 6a. Distribution of Respondents by Faculty Rank			
Rank	Frequencies	Percentages	CAUT Almanac
Instructor	60	4.7%	
Lecturer	45	3.5%	5.8%*
Assistant	371	28.9%	27.7%
Associate	443	34.5%	31.7%
Full Professor	365	28.4%	34.8%
Total	1284	100.0%	100.0%
* CAUT Almanac "Other" category that includes Lecturers and Instructors			

Most Librarian respondents were in either the Librarian I or Librarian III ranks. We have no data that would allow us to assess how representative this distribution is of Librarians in general.

Table 6b. Distribution of Respondents by Librarian Rank		
Rank	Frequencies	Percentages*
Librarian I	21	33.3%
Librarian II	11	17.5%
Librarian III	22	34.9%
Librarian IV	9	14.3%
Total	63	100.0%
* The CAUT Almanac does not provide a breakdown for Librarian ranks.		

Tables 7a and 7b present the mean scores of the faculty and librarian respondents by rank, respectively, for the stressor variables. As can be seen in Table 7a, responses to Job Control, Skill Use, Work Load, Role Conflict, Role Ambiguity, and Work-Life Balance differed across faculty ranks. The effect sizes were small for all the variables except Job

Control, where it was a medium level effect. For Job Control, Associate and Full Professors reported having more control over their work than the junior ranks. These two ranks also made more use of their skills in their workplaces; however, they were less sure of what was expected of them than other ranks by reporting greater levels of Role Ambiguity and Role Conflict. Assistant and Associate ranks expressed the greatest concerns over Work-Life Balance.

Table 7b presents the responses of Librarians on the set of stress variables. Librarians did not differ across the four Librarian ranks in their responses to the stress variables, except for Work Scheduling where there was a large effect, $\eta^2 = .15$. Compared to Faculty, Librarian stress levels on this variable were much lower than those of Faculty ($F_{\text{Faculty}} = 5.05$ vs. $M_{\text{Librarian}} = 3.94$; $t = 6.37$, $df = 1329$, $p < .001$); however, within the Librarian group, Librarian I and Librarian III expressed greater levels of concern over their work schedules than did Librarian II's and IV's. Although the differences across Librarian ranks were not significant for Skill Use, Role Conflict and Role Ambiguity, they represented medium effects. The lack of significance is due to the low number of Librarian respondents in each of the ranks.

Measure	Total Sample Mean	Instructor	Lecturer	Assistant	Associate	Full Professor	Effect Size, η^2
Job Control ^{a**}	5.13	4.48	4.39	4.99	5.26	5.39	.06
Skill Use ^{a*}	6.02	5.91	5.63	5.93	6.04	6.15	.02
Work Load ^{b**}	5.59	4.76	5.13	5.77	5.76	5.48	.04
Work Scheduling ^b	4.99	4.68	4.60	5.16	5.09	5.03	.01
Role Conflict ^{b**}	5.27	4.63	4.57	5.32	5.41	5.30	.03
Role Ambiguity ^{b**}	4.74	4.93	4.54	4.55	4.74	5.05	.02
Work-Life Balance ^{b**}	5.13	4.68	5.04	5.47	5.27	4.89	.03
Fairness-Administration ^a	3.57	3.47	3.73	3.61	3.49	3.68	.00
Fairness-Chairperson ^a	5.09	5.15	5.26	5.20	5.03	5.12	.00
Fairness-Rewards ^a	3.87	3.77	3.37	3.67	3.81	4.18	.01
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * $p < .05$; ** $p < .001$							

Measure	Total Sample Mean	Librarian I	Librarian II	Librarian III	Librarian IV	Effect Size, η^2
Job Control ^a	5.13	5.29	5.06	5.30	4.88	.02
Skill Use ^a	6.02	6.20	6.35	6.20	6.11	.08
Work Load ^b	5.59	5.44	5.25	5.44	5.49	.05
Work Scheduling ^b *	3.94	4.88	3.39	3.51	3.44	.15
Role Conflict ^b	5.27	5.10	5.70	5.10	5.39	.07
Role Ambiguity ^b	4.74	4.33	4.02	4.33	3.72	.06
Work-Life Balance ^b	5.13	3.71	4.47	3.71	4.46	.03
Fairness-Administration ^a	3.57	3.69	3.24	3.69	2.63	.05
Fairness-Chairperson ^a	5.09	4.61	5.25	4.61	4.14	.04
Fairness-Rewards ^a	3.87	4.39	4.16	4.39	3.60	.04

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.
* $p < .05$; ** $p < .001$

Employment Status

Table 8 presents the distribution of our respondents across three types of employment status: Tenured, Tenure Track and Contract Academic Staff. The Tenure Track category also includes respondents who said they were working under renewable contracts without term limits. The Contract Academic Staff category includes those working on term contracts with term limits, where their continuation is dependent on external funding, contracts that were non-renewable, and per course contracts. We present CAUT Almanac data for comparison. As can be seen there are large discrepancies in the percentages for Tenured and Contract Academic Staff. We believe the Almanac data, which is based on data from Statistics Canada may have different inclusion criteria for these two categories. The Tenure Track category, which perhaps has a cleaner definition, is similar to the Almanac data for this category. The Almanac data lists all data on employment status for Quebec schools under "Other". The percentages reported in Table 8 for the Almanac data were computed after removal of the Quebec data.

Employment Status	Frequency	Percentage	CAUT Almanac
Tenured/Appointment without Term	917	67.9%	55.5%
Tenure Track/Renewable without term limits	369	25.7%	24.5%
Contract Academic Staff (Other)	128	8.4%	19.9%
Total	1434	100%	100.0%

Table 9 presents the data with respect to the stress variables for the three categories of employment status. There were significant differences, although small effect sizes, for Job Control, Work Load, Role Conflict, Role Ambiguity, and Work-Life Balance. Contract Academic Staff have the least secure employment status, which might be expected to be associated with increased levels of stress; however, Contract Academic Staff respondents had the lowest levels for Work Load, Role Conflict, and Work-Life Balance. Contract Academic Staff did express the least agreement with the fairness of the reward system; they felt that their compensation was not in keeping with the amount of work they provided to the university. They had about the same level of stress as Tenure Track faculty on Role Ambiguity and the least Job Control among the three groups. Tenure Track faculty had the highest stress levels for Work Load and Work-Life Balance.

Measure	Total Sample Mean	Contract Academic Staff	Tenure Track	Tenured	Effect Size, η^2
Job Control ^a **	5.13	4.45	4.98	5.28	.05
Skill Use ^a	6.02	5.97	5.93	6.06	.00
Work Load ^b **	5.59	5.08	5.70	5.60	.01
Work Scheduling ^b	4.99	4.89	5.14	4.93	.01
Role Conflict ^b **	5.27	4.66	5.25	5.35	.02
Role Ambiguity ^b **	4.74	4.68	4.53	4.86	.01
Work-Life Balance ^b **	5.13	4.98	5.41	5.03	.01
Fairness-Administration ^a	3.57	3.65	3.67	3.52	.00
Fairness-Chairperson ^a	5.09	5.09	5.22	5.04	.00
Fairness-Rewards ^a *	3.87	3.51	3.71	3.97	.01

^a Higher values indicate more positive outcomes.
^b Lower values indicate more positive outcomes.
* p < .05; ** p < .001

Language

Table 10 presents the breakdown of responses according to the respondent's first language. The vast majority of respondents were English-speaking (82.6%), followed by French speakers (8.3%) and "Other" (9.1%). Respondents listed 34 different languages as their first language in the "Other" category. We must note that the French speakers are those working at universities where their faculty association is a member of CAUT. This requirement excluded all of the francophone universities in Quebec. The French speaking respondents work at French, English or bilingual institutions outside Quebec and the three English universities within that province. We do not have any comparative data on

the actual number of Francophones working in these institutions. The CAUT Almanac, based on Statistics Canada data, places the percentage of visible minorities working as academic staff in Canadian universities at 11.1%. Taking into account that the first language of a number of visible minorities may be either English or French and that a number of the "Other" group are not visible minorities, the percentages in these two categories are at least consistent with one another.

The overwhelming majority of English speaking respondents, 96.9%, worked in an English environment with the remaining 3.1% working in French. On the other hand only 74.3% of French speakers worked in a French-language setting with 25.7% working in English universities. 92.9% of the Other group worked in either English or French environments as their second language; the nine respondents who claimed to work in their first language that was neither English nor French listed their language as German, Italian, Spanish or Ukrainian. Presumably this group worked in language departments or schools that were related to their first language; all reported their faculty as being Humanities or a Related Discipline.

Table 10. 1st Language of Respondents				
	1st language		Work in 1st Language	
Language	Frequency	Percentage	Frequency	Percentage
English	1161	82.4%	1126	96.9%
French	121	8.6%	90	74.3%
Other	127	9.0%	9	7.1%
Total	1409	100.0%	1229	87.2%

Table 11 presents the comparison of language groups across the stress variables. English respondents expressed a greater degree of job control than the other language groups, particularly those whose first language was neither English nor French. Both English and French first language speakers expressed a greater degree of Skill Use than Others. Both English speaking and Other respondents had higher means on the Work Load scale than did French speaking respondents. English respondents identified a greater level of Role Conflict than the other two language groups, specifically those whose first language was neither English nor French. English respondents expressed more belief in the fairness of their Chairperson than either of the other two groups. Both the French and Other language speakers felt that the fairness of the rewards they received in comparison to the work they did was more inappropriate than did the English language speakers. All of the effects for Language were very small.

Table 11. Mean Stressor Levels for 1st Language					
	Means				
	Total Sample Mean	English	French	Other	Effect Size, η^2
Job Control ^a *	5.13	5.18	5.06	4.86	.01
Skill Use ^a *	6.02	6.05	6.11	5.75	.01
Work Load ^b *	5.59	5.60	5.33	5.68	.01
Work Scheduling ^b	5.00	5.01	4.91	4.90	.00
Role Conflict ^b *	5.27	5.33	5.12	4.94	.01
Role Ambiguity ^b	4.74	4.75	4.69	4.85	.00
Work-Life Balance ^b	5.13	5.11	5.10	5.35	.00
Fairness-Administration ^a	3.56	3.57	3.47	3.62	.00
Fairness-Chairperson ^a **	5.09	5.17	4.61	4.80	.01
Fairness-Rewards ^a *	3.87	3.92	3.55	3.69	.01
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * p < .05; ** p < .001					

Work and Health-Related Outcomes in Canadian Academic Staff

Table 12 presents a summary of these measures for the respondents as a whole. For all outcome measures, the respondents were either significantly above or below the neutral points on the scales. In general the respondents were satisfied with their job and were committed to their institution; however, a relatively large proportion of respondents were less than satisfied with their job (30.3%) and uncommitted emotionally to their institutions (28.1%). Similarly, a relatively large number of respondents expressed concerns about health and safety issues in their workplaces (36.8%), experienced a substantial number of physical (22.1%) and psychological (23.5%) health symptoms, and used stress-related medication (21.8%) over the past year. A similar percentage, 25.7%, reported that their well-being was not as positive as the immediately preceding year.

Because of its importance as an indicator of psychological strain, or distress, Table 13 presents the percentage of respondents by the mean occurrence of psychological symptoms as assessed by the GHQ experienced over the past year.

Table 12. Work and Health Outcomes						
Variable	Neutral	Total Sample Mean	Effect Size, d	% Low	% Neutral	% High
Job Satisfaction ^a	3	3.37*	.44	30.3	4.6	65.1
Affective Commitment ^a	4	4.17*	.31	28.1	12.1	59.8
Health & Safety at Work ^b	4	3.56*	.45	60.2	3.1	36.8
Positive Well-Being ^a	4	4.63*	.52	25.7	6.9	67.4
PHQ ^b	4	3.18*	.72	74.9	3.0	22.1
GHQ ^b	4	3.30*	.28	73.6	2.9	23.5
Medication ^b	4	2.74*	.70	75.8	2.4	21.8
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * p < .007 for comparison with neutral point; family-wise p<.05.						

Respondents were asked to score each item in the GHQ measure on a seven-point scale where 1= Not at All, 2-Rarely, 3=Once in a While, 4=Some of the Time, 5=Fairly Often, 6=Often, and 7= All of the Time. These response categories were grouped into three based on the possible severity of distress related to the reported occurrence of the GHQ symptoms. Mean scores greater than 4.5 indicate that respondents experienced the symptoms fairly often or greater; 12.9% of our respondents fell into this category.

Table 13. Mean GHQ Scores by Severity of Clinical Concerns Based on Symptoms		
No Concern Mean ≤ 3.5	Some Concern 3.5 < Mean ≤ 4.5	Major Concern Mean > 4.5
62.6%	24.5%	12.9%

Gender

There were significant differences between male and female respondents on five of the seven outcome variables. Males expressed greater job satisfaction and affective commitment than females. In terms of health, males also reported fewer physical health issues and relied less on stress medication than females. Although significant, the effect sizes were small for all of these variables. Table 14 presents the data for these measures by gender.

Table 14. Comparison of Males and Females on Work and Health Outcome Measures

Measure	Means		Effect Size, η^2	Males			Females		
	Males	Females		Low (%)	Neutral (%)	High (%)	Low (%)	Neutral (%)	High (%)
Job Satisfaction ^{a **}	3.43	3.30	.02	28.7	4.8	66.5	32.3	4.3	63.4
Affective Commitment ^{a *}	4.22	4.12	.01	23.2	12.4	64.4	33.1	11.8	55.1
Health & Safety at Work ^b	3.54	3.57	.00	62.0	17.8	20.1	57.8	6.5	35.3
Positive Well-Being ^a	4.63	4.64	.00	26.6	5.7	67.7	24.7	7.8	67.5
PHQ ^{b **}	3.07	3.30	.02	76.9	2.8	20.3	73.0	3.2	23.8
GHQ ^b	3.23	3.36	.00	76.5	2.7	20.8	71.0	2.9	26.1
Medication ^{b **}	2.52	2.96	.03	80.3	1.9	17.6	71.6	2.4	26.0

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.
* p < .05; ** p < .001

Age

Table 15 presents the outcome data according to the different age groups. The youngest and oldest age groups were the most satisfied with their jobs while those between 30 and 59 years were still satisfied but at a lower level than those in the other two age groups. Respondents who were in the 60+ age group expressed the greatest degree of affective commitment to their institution. Respondents in the youngest and oldest age groups also reported the fewest number of physical and general health symptoms compared to those in the 30-59 categories. Use of medication increased with age with those less than 30 years old reporting the least use. Although these differences were significant, the effect sizes were small.

Table 15. Work and Health Outcomes by Age Category

Measure	Total Sample Mean	20-29	30-39	40-49	50-59	60+	Effect Size, η^2
Job Satisfaction ^{a **}	3.37	3.94	3.31	3.24	3.37	3.80	.02
Affective Commitment ^{a *}	4.17	4.06	4.06	4.16	4.13	4.20	.01
Health & Safety at Work ^b	3.56	3.06	3.61	3.52	3.78	3.439	.00
Positive Well-Being ^a	4.46	5.52	4.39	4.53	4.60	4.66	.00
PHQ ^{b **}	3.18	2.63	3.53	3.29	3.28	2.80	.02
GHQ ^{b **}	3.41	2.73	3.57	3.36	3.28	2.85	.04
Medication ^{b **}	2.74	1.40	2.62	2.60	2.98	2.72	.02

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.

* p < .05; ** p < .001

Academic Rank

Table 16 shows that job satisfaction increased significantly with academic rank from a low of 2.75 for Lecturers to a high of 3.66 for Full Professors. Despite their level of job satisfaction, Lecturers expressed the greatest amount of affective commitment to their institutions, followed by Full Professors and then the other ranks. Associate and Full Professors expressed the most concerns about the health and safety of their work environment, while Lecturers and Assistant Professors reported the most physical and psychological health symptoms related to their job. All the significant effects were small except for Job Satisfaction, which had a medium effect size.

Table 16. Comparison of Work and Health Outcomes by Faculty Rank							
Measure	Total Sample Mean	Instructor	Lecturer	Assistant	Associate	Full Professor	Effect Size, η^2
Job Satisfaction ^{a **}	3.37	3.11	2.75	3.24	3.45	3.66	.06
Affective Commitment ^{a *}	4.17	4.11	4.35	4.10	4.10	4.22	.02
Health & Safety at Work ^{b *}	3.56	3.40	3.55	3.49	3.70	3.59	.02
Positive Well-Being ^a	4.63	4.67	4.51	4.48	4.55	4.67	.00
PHQ ^{b *}	3.18	3.32	3.45	3.42	3.26	3.07	.03
GHQ ^{b **}	3.30	3.24	3.42	3.52	3.28	3.08	.02
Medication ^b	2.74	2.45	3.03	2.60	2.91	2.63	.01
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * p < .05; ** p < .001							

Librarians

Table 17 presents the outcome data for Librarians. As can be seen, there were no significant outcome effects for the Librarian groups. The effect sizes, however, were substantial for all the measures except general health symptoms. The lack of significance is likely due to the small number of Librarians in the survey.

Measure	Total Sample Mean	Librarian I	Librarian II	Librarian III	Librarian IV	Effect Size, η^2
Job Satisfaction ^a	3.37	3.43	3.39	3.52	2.55	.30
Affective Commitment ^a	4.17	3.55	4.24	4.35	3.62	.30
Health & Safety at Work ^b	3.56	3.09	4.09	3.82	3.53	.22
Positive Well-Being ^a	4.63	4.67	4.22	4.74	5.03	.20
PHQ ^b	3.18	3.00	3.85	2.96	3.38	.12
GHQ ^b	3.34	3.57	3.45	3.11	3.24	.04
Medication ^b	2.74	2.95	3.67	1.98	2.25	.30

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.
* p < .05; ** p < .001

Employment Status

Table 18 presents the outcome data across the three employment conditions. There is a significant effect across the three categories with Job Satisfaction increasing with job security. Contract Academic Staff were the least satisfied and those with Tenure the most satisfied. Academic Staff in Tenure Track positions reported the most physical health symptoms along with the most general health strain compared to the other two categories. The effect sizes were small for the PHQ and GHQ variables but large for Job Satisfaction.

Measure	Total Sample Mean	Contract Academic Staff	Tenure Track	Tenured	Effect Size, η^2
Job Satisfaction ^{a **}	3.37	2.75	3.26	3.51	.06
Affective Commitment ^a	4.17	4.19	4.09	4.14	.00
Health & Safety at Work ^b	3.56	3.37	3.55	3.66	.01
Positive Well-Being ^a	4.63	4.64	4.51	4.59	.00
PHQ ^{b *}	3.18	3.31	3.46	3.18	.02
GHQ ^{b **}	3.30	3.40	3.50	3.20	.02
Medication ^b	2.74	2.61	2.67	2.80	.00

^a Higher values indicate the positive direction of the scale.
^b Lower values indicate the positive direction of the scale.

* p < .05; ** p<.001

Language

Table 19 presents the breakdown of the outcome variables across the three language groups. The only significant effect was for Health & Safety where English and Other language groups expressed more concerns over the health and safety issues at their institution than did French speaking respondents. The effect, though significant, was small.

Table 19. Comparison of Work and Health Outcomes by Language					
Measure	Total Sample Mean	English	French	Other	Effect Size, η^2
Job Satisfaction ^a	3.37	3.40	3.32	3.24	.00
Affective Commitment ^a	4.17	4.14	4.12	4.05	.01
Health & Safety at Work ^{b *}	3.56	3.61	3.32	3.62	.01
Positive Well-Being ^a	4.63	4.55	4.83	4.58	.01
PHQ ^b	3.18	3.27	3.19	3.24	.01
GHQ ^b	3.30	3.28	3.41	3.32	.00
Medication ^b	2.74	2.78	2.68	2.22	.00
^a Higher values indicate the positive direction of the scale. ^b Lower values indicate the positive direction of the scale. * p < .05; ** p<.001					

Predictors of the Outcome Variables

We report the results for our regression analyses by outcome measure. All beta weights (standardized coefficients) are based on the final regression model after the entry of the demographic variables on Step 1 and the stressors on Step 2 of the regression. The beta weights within a given outcome measure indicates the strength of that variable relative to others as a predictor of the outcome measure. Comparisons of beta weights across outcome variables do not give an indication of their relative value in predicting the different outcome measures. No conclusions can be made from differences in beta weights across the outcome measures. Interpretation of the sign of the beta weight depends on the direction of the scale used to measure the demographic or stressor and the scale used to measure the outcome variable.

Job Satisfaction

The demographic variables accounted for 7.4% of the variance in job satisfaction ($R = .27$, $F(5, 895) = 14.39$, $p < .001$). The addition of the stress-related variables significantly increased the amount of variance accounted for job satisfaction ($R = .78$, $\Delta R^2 = .53$, $F(10, 885) = 117.27$, $p < .001$).

Among the demographic predictors, only Employment Status ($\beta = -.22$, $t = -8.69$, $p < .001$) and Rank (Academic and Librarian Ranks Combined; $\beta = -.06$, $t = -2.55$, $p < .05$) were significant. With regard to the stress variables, Job Control ($\beta = .11$, $t = 4.32$, $p < .001$), Skill Use ($\beta = .11$, $t = 4.25$, $p < .001$), Work-Life Balance ($\beta = -.11$, $t = -3.21$, $p < .001$), Fairness-Administration ($\beta = .13$, $t = 5.12$, $p < .001$), Fairness-Chairperson ($\beta = .14$, $t = 5.24$, $p < .001$) and Fairness-Rewards ($\beta = .39$, $t = 15.12$, $p < .001$) were all significant predictors of job satisfaction.

Affective Commitment

The demographic variables accounted for 1.5% of the variance in affective commitment ($R = .12$, $F(5, 1367) = 4.29$, $p < .001$). The addition of the stressors significantly increased the amount of variance accounted for in affective commitment but only by 3% ($R = .20$, $\Delta R^2 = .03$, $F(10, 1357) = 3.56$, $p < .001$).

Among the demographic predictors, only Gender ($\beta = -.08$, $t = -2.72$, $p < .05$) was significant. With regard to the stressors, Job Control ($\beta = .10$, $t = 3.08$, $p < .01$) and Work Load ($\beta = -.09$, $t = -2.22$, $p < .05$) were significant predictors of Affective Commitment.

Health and Safety at Work

The demographic variables accounted for 0.8% of the variance in Health & Safety at Work ($R = .09$, $F(5, 1382) = 2.30$, $p < .05$). The addition of the stressors significantly increased the amount of variance accounted for in Health & Safety at Work ($R = .23$, $\Delta R^2 = .05$, $F(10, 1372) = 6.73$, $p < .001$).

Among the demographic predictors, only Employment Status ($\beta = -.09$, $t = -2.90$, $p < .01$) was significant. With regard to the stressors, Work Scheduling ($\beta = .08$, $t = 2.18$, $p < .05$), and Work-Life Balance ($\beta = .11$, $t = 2.56$, $p < .01$) were significant predictors of Health and Safety at Work.

Positive Well-Being

The demographic variables accounted for 1.0% of the variance in Positive Well-Being ($R = .10$, $F(5, 1371) = 2.63$, $p < .05$). The addition of the stress-related variables significantly increased the amount of variance accounted for in positive well-being by 29% ($R = .55$, $\Delta R^2 = .29$, $F(10, 1361) = 57.00$, $p < .001$).

Among the demographic predictors, only Gender ($\beta = .09$, $t = -3.68$, $p < .001$) was significant. With regard to the stress-related variables, Skill Use ($\beta = .19$, $t = 7.22$, $p < .001$), Role Ambiguity ($\beta = .17$, $t = 6.04$, $p < .001$), Work-Life Balance ($\beta = -.25$, $t = -6.91$, $p < .001$), Fairness-Administration ($\beta = .06$, $t = 2.05$, $p < .05$), and Fairness-Chairperson ($\beta = .10$, $t = 3.56$, $p < .001$) were all significant predictors of Positive Well-Being.

Physical Health Questionnaire (PHQ)

The demographic variables accounted for 3.3% of the variance in Physical Health symptoms ($R = .18$, $F(5, 1382) = 9.41$, $p < .001$). The addition of the stress-related variables significantly increased the amount of variance accounted for in physical health ($R = .52$, $\Delta R^2 = .24$, $F(10, 1372) = 43.96$, $p < .001$).

Among the demographic predictors, only Age ($\beta = -.09$, $t = -3.45$, $p < .001$) and Language ($\beta = -.06$, $t = -2.29$, $p < .05$) were significant. With regard to the stress-related variables, Skill Use ($\beta = -.08$, $t = -2.79$, $p < .01$), Work Scheduling ($\beta = .09$, $t = -2.73$, $p < .01$), Role Ambiguity ($\beta = -.09$, $t = -3.16$, $p < .01$), Work-Life Balance ($\beta = .25$, $t = 6.78$, $p < .001$), Fairness-Administration ($\beta = -.09$, $t = -3.11$, $p < .01$), and Fairness-Rewards ($\beta = -.08$, $t = -3.04$, $p < .01$) were all significant predictors of Physical Health symptoms.

General Health Questionnaire (GHQ)

The demographic variables accounted for 2.7% of the variance in Psychological Health symptoms ($R = .16$, $F(5, 1232) = 7.57$, $p < .001$). The addition of the stress-related variables significantly increased the amount of variance accounted for in the psychological health symptoms ($R = .63$, $\Delta R^2 = .37$, $F(10, 1232) = 75.90$, $p < .001$).

Among the demographic predictors, Gender ($\beta = -.07$, $t = -2.89$, $p < .05$) and Age ($\beta = -.14$, $t = -4.56$, $p < .001$) were significant. With regard to the stress-related variables, Job Control ($\beta = -.11$, $t = 4.02$, $p < .001$), Skill Use ($\beta = -.13$, $t = 5.03$, $p < .001$), Work Load ($\beta = .08$, $t = 2.34$, $p < .001$), Role Ambiguity ($\beta = -.15$, $t = -5.60$, $p < .001$), Work-Life Balance ($\beta = .26$, $t = 7.29$, $p < .001$), Fairness-Administration ($\beta = -.06$, $t = -2.10$, $p < .05$), Fairness-Chairperson ($\beta = -.13$, $t = -4.76$, $p < .001$) and Fairness-Rewards ($\beta = -.06$, $t = -2.03$, $p < .001$) were significant predictors of psychological symptoms as assessed by the GHQ.

Medication

The demographic variables accounted for 2.9% of the variance in use of stress-related medications ($R = .17$, $F(5, 1032) = 6.22$, $p < .001$). The addition of the stress variable significantly increased the amount of variance accounted for in medication use ($R = .32$, $\Delta R^2 = .07$, $F(10, 1022) = 8.15$, $p < .001$).

Among the demographic predictors, only Gender ($\beta = .09$, $t = 3.02$, $p < .01$), Age ($\beta = .10$, $t = 2.96$, $p < .01$) and Language ($\beta = -.09$, $t = -3.02$, $p < .01$) were significant. With regard to the stress variables, both Work-Life Balance ($\beta = .18$, $t = 3.68$, $p < .001$) and Fairness-Administration ($\beta = -.09$, $t = -2.44$, $p < .05$) were significant predictors of use of stress-related medication.

DISCUSSION

This study examined the occupational stress of a sample of 1470 academic staff from 56 Canadian postsecondary institutions. This report sought to assess the level of stress among academic staff and its impact on physical and psychological health and wellbeing, and on work-related outcomes such as job satisfaction that are commonly associated with stress. Stress and its related outcomes were reviewed over several demographic factors: Gender, age, academic rank (faculty and librarian), employment status, and language. The study first assessed the general level of stress and then examined differences across the different demographic variables. Lastly, we identified those stressors that had an impact on work-related outcomes. We discuss the findings in relation to each of these aims in turn and then compare our results to those from other studies on stress in academia.

The Level of Stress in Canadian Universities.

Based on our data, we can conclude that academic staff working in Canadian universities are stressed to a high degree. A majority, in most cases a large majority, of respondents reported high levels on seven of the ten stressors: Work Load (84.7%), Work Scheduling (72.9%), Role Conflict (82.1%), Role Ambiguity (70.9%), Work-Life Balance (76.1%), Fairness-Administration (55.0%), Fairness-Rewards (50.7%). Job Control (13.7%), Skill Use (3.0%), and Fairness-Chairperson (20.5%) were not sources of stress for the sample respondents, in general.

The lack of stress related to Job Control and Skill Use is not surprising. Academics have a well-entrenched right to freedom in decision-making with respect to their teaching and research. Although small, the 13.7% that reported lack of Job Control is still a significant outcome. Only a tiny proportion of our sample, 3.0%, reported that their jobs were not making use of their skills and abilities to the fullest potential.

The difference in the percentage of respondents who believed in the fairness of senior administration (36.8%) at their institution compared to the fairness of their unit Chairpersons or Heads (77.0%) is very interesting. These results parallel those found in Australia where only 19% of respondents agreed that senior administration was trustworthy, while about half (53%) agreed that their Department Head was trustworthy. Academic staff see their immediate supervisor as more supportive and trustworthy than senior administrators. In part this may reflect the fact that at almost every university, chairpersons are members of the same bargaining unit as academic staff and subject to the same requirements. In almost all collective agreements, even where the chairperson is called a "Head", the chairperson is seen more as a *primus inter pares* rather than as someone who has significantly more authority than other academic staff in the unit.

Job and Health-Related Outcomes

Overall study participants were satisfied with their jobs (65.1%) and committed to their institutions emotionally (59.8%). These results were very similar to those reported in the Australian study of stress in academia for job satisfaction (58%) and commitment (52%).

Of concern is the level of psychological strain reported by study respondents. Table 13 showed that about 13% experience general health symptoms ranging from fairly often to all of the time. This percentage is lower than those reported for academic stress studies in Australia and the UK. In Australia 32.9% of academic staff fell into the highest strain categories that suggested adverse effects of stress on the respondent's health and well-being. In the UK, 31.4% fell into the most severe categories. In part, the difference in rates may be due to the difference in scales used in the studies. Here, we used a 7-point scale while the other two assessed the presence of symptoms on a "Yes-No" basis.

The impact of stress on physical health is well-documented. In the current study, 22% of the respondents reported a relatively high occurrence of physical health symptoms over the past twelve month period; the same percentage of academic staff reported a heavy reliance on stress-related medications. The figure for physical health symptoms is very similar to that reported in Australia, 21.5% for the same set of symptoms. The UK study did not state the percentage of its respondents reporting high levels of physical symptoms.

Stress, Outcomes and Demographic Groups

There were considerable differences among the demographic factors of gender, age, academic rank, employment status, and language with respect to the variables we used to assess stress. Table 20 summarizes the results for the six demographic factors that we used to analyze the data from the survey. An "S", "M", or "L" in the table indicates that there was a significant difference between the groups within the noted demographic factor and that the effect size was Small, Medium or Large, respectively. On the whole,

most of the subgroup differences on the ten measures, while significant, were very small with respect to their effect sizes. When possible, we compare the results of our demographic variables to those reported in Australia. The UK study did not report breakdowns for different categories of respondents except for functional role. Similarly, Table 21 summarizes the results for the outcome and health variables

Gender. There were differences between male and female respondents on eight of the ten stress measures. On seven of the measures, females reported more stress than males. The strongest effect occurred on the Work-Life Balance measure. Most likely this reflects the fact that most women are still the primary care givers for their families and have additional responsibilities in the home; however, in Australia, males reported a greater imbalance than females. In both countries the effect of gender on work-life balance was small. Only on the Role Ambiguity measure did males score higher in stress than female respondents. On the whole these results are not surprising as most female academics are still relatively new to academia, hold lower levels in the academic hierarchy, and are still working to obtain tenure or promotions. The reason why males expressed a greater degree of Role Ambiguity remains to be determined. Canadian females had less belief than male academic staff in the fairness of both their Chairperson and senior administrators; however, the opposite effect occurred in Australia where female academic staff had more trust in both levels of administration than did males. Female respondents expressed less job satisfaction and affective commitment than males; again, the opposite of what was found in the Australian universities. The Australian study did not find any differences between males and females on the GHQ; neither did our study. Females in our study did report more physical health symptoms and use of medication than males.

Table 20. Differences on Stress Measures for Different Demographic Factors^a

	Gender	Age	Faculty Rank	Librarian Rank	Employment Status	Language
Job Control	S	S	M		S-M	S
Skill Use			S			S
Work Load	S	S	S		S	S
Work Scheduling	S	S		L		
Role Conflict		S	S		S	S
Role Ambiguity	S	S	S		S	
Work-Life Balance	S	S	S		S	
Fairness-Administration	S					
Fairness-Chairperson	S	S				S
Fairness-Rewards	S	S			S	S

^a An "S", "M", OR "L" in a cell indicates that there was difference between one or more subgroups on the given demographic factor and that the effect size was either Small, Medium or Large, respectively.

	Gender	Age	Faculty Rank	Librarian Rank	Employment Status	Language
Job Satisfaction	S	S	M		M	
Affective Commitment	S	S	S			
Health & Safety at Work			S			S
Positive Well-Being ^a						
PHQ	S	S	S		S	
GHQ		S	S		S	
Medication	S	S				

^a An "S", "M", OR "L" in a cell indicates that there was difference between one or more subgroups on the given demographic factor and that the effect size was either Small, Medium or Large, respectively.

Age. The youngest and oldest respondents seemed to perceive stressful events more similarly than those between 30 and 59 years of age. They had the least stress from their workloads and work schedules. They had the least amount of stress due to role conflict, role ambiguity, and work-life balance. They also had the fewest concerns over the fairness of the rewards they received. Arguably, those under 30 years old have not been in the system long enough to experience the full impact of the stressors we measured. As well younger faculty are often given reductions in teaching loads to establish their research programs and may have fewer external demands from family. The strongest differences occurred for the Work-Life Balance measure where respondents in the 30 to 49 age group expressed the most distress. Most Academic Staff in this age range have family obligations to partners and children that coupled with workloads produced the imbalance reported here.

Faculty Rank. There was an ordered relationship for Faculty across ranks for Job Control and Skill Use in that the lowest scores were reported by the lowest ranks and increased in order to the Full Professor rank. There was also an ordered relationship for Role Ambiguity except that the highest scores were reported by Full Professors and decreased with rank. Full professors had the most control of their work and made use of their skills to the fullest but also reported the least clarity with respect to their jobs. Similar relationships occurred with respect to Work Load, Role Conflict and Work-Life Balance except that the mean levels of stress for Full Professors on these variables dropped to or below those expressed by Associate Professors. In Australia, the equivalent measures of Work Load and Work-Life Balance increased with increase in rank. With respect to the outcome measures, faculty in the senior ranks expressed more job satisfaction than those in the junior ranks while those in the junior ranks expressed the most affective commitment; in Australia both the lowest and highest ranks reported the greatest amount of job satisfaction and commitment. Australian senior faculty were more likely to believe

in the procedural fairness of administrators than the junior ranks while there was no difference across academic ranks in Canada on this variable. In Australia psychological health symptoms did not differ across academic ranks; in Canada, faculty in junior ranks reported significantly more symptoms. In general, there is a direct correlation between academic rank and age; so, an increase in the occurrence of general and physical health symptoms and the use of medicine is not unexpected. Table 21 shows similar effects for the physical and psychological outcome measures for both Age and Faculty Rank, but with the use of medication related to Age but not Rank.

Librarians. There were differences among the Librarian ranks on only one measure-Work Scheduling. Here, both Librarian III's and Librarian IV's reported more concerns over their work schedules than more junior Librarians. These differences produced a very large effect size. Work scheduling refers to unpredictability in scheduling or having to work evenings and weekends. As Libraries are open throughout the day and on weekends, it appears that the senior librarians have more difficulty working shifts outside a traditional workday schedule. The Australian survey did not report data across different Librarian ranks or levels. Again we must caution about over interpretation of results for the Librarian categories because of the low number of Librarians who participated in the study.

Employment Status. Not surprisingly, tenured academics had more control over their teaching and research than did academics in tenure track positions who in turn had greater control than did contract academic staff. Contract academic staff expressed less concerns about their workloads, and reported less role conflict, role ambiguity and work-life balance than either tenure track or tenured academic staff. In Australia, full-time staff also reported more work-life conflict than did part-time staff. If most individuals holding contract staff positions are engaged primarily to teach, this may explain most of these results. There is no conflict or ambiguity about what they are expected to do. Their reduced scores on Work-Life Balance also may reflect a teaching only emphasis. For most, there is no need to spend evenings or weekends away from family in the laboratory or library to do research, if they are not interested in pursuing a tenure track position or unable to secure such a position. Tenured academic staff, despite the imbalance between work and family, expressed greater satisfaction with their jobs than did the other types of academic staff. In Australia, part-time staff reported slightly more job satisfaction. In Australia there were minimal differences in the health variables across the different types of employment status; in Canada, contract academic staff and those in tenure-track situations reported more physical and psychological health symptoms than tenured academic staff. The relatively small number of contract academic staff that participated in the study means any results from this group must be interpreted with great caution.

Language. The most significant differences among the three language groups were with respect to those respondents whose first language was neither French nor English. This "Other" group perceived lower Job Control and Skill Use than English and French speakers. On the other hand, they had less Role Conflict than the other two linguistic groups. French-speaking respondents had the least concerns about their workloads but

the most negative perceptions of the three groups about the fairness of their chairpersons and the fairness of the rewards in their institution. To a large degree the fairness issues, particularly those related to rewards, may reflect the fact that most respondents whose first language was French work in small, predominantly undergraduate institutions. The Australian survey found that there were no meaningful differences between English speakers and respondents whose first language was not English.

Predictors of Work and Health Outcomes

Table 22 summarizes the results of the hierarchical regression analyses for all academic staff; i.e. faculty and librarians. The significant beta weights are presented in the column for each specified outcome. The results are based on the final entry of all data; as well, the final R^2 is presented at the bottom of the column for each set of predictors. As can be seen in Table 22, the set of significant predictors changes according to the specific outcome measure. There are, however, some commonalities that deserve discussion.

In the case of the demographic predictors, gender is the most consistent variable. "Maleness" significantly predicted Affective Commitment, while "Femaleness" significantly predicted psychological strain and use of stress medicines. Language was a significant predictor of physical symptoms and use of stress medicines. Both Academic Rank and Employment Status predicted Job Satisfaction; Academic Rank also predicted positive well-being while Employment Status predicted workplace health and safety issues. Age predicted physical health symptoms. The Australian study did not use the same set of demographic variables as ours in their regression analyses. They did find that gender was a significant predictor of job satisfaction but of neither affective commitment nor psychological strain. In the Australian study a "full-time/part-time" variable, which is similar to Employment Status, predicted job satisfaction but not psychological strain, similar to the results for Employment Status.

With respect to the stress measures, Work-Life Balance significantly predicted six of the seven outcome measures. The only variable it did not predict was Affective Commitment to the academic staff members' institutions. Work-Life Balance and Role Conflict were the only two stress-related measures that predicted psychological strain. Work-Life Balance and the perceived fairness of the senior administration were the only stress-related measures that predicted usage of stress medications. Skill Use did predict positive well-being and physical health symptoms along with job satisfaction. Work Scheduling predicted perceptions of health and safety issues in the workplace and physical health symptoms. The two procedural justice variables, Fairness-Administration and Fairness-Chairperson, predicted job satisfaction, positive well-being and physical health symptoms. In comparison, the Australian survey found that procedural justice and trust in Heads of Departments and senior administration predicted job satisfaction and organizational commitment while only trust in heads predicted psychological strain.

Somewhat surprisingly other stress-related measures were less strong predictors of workplace and health outcomes. Job control predicted job satisfaction and organizational commitment but none of the health related outcomes. Similarly, Work Load predicted only affective commitment. Our distributive justice measure, Fairness-Rewards, predicted only job satisfaction. In the Australian sample, autonomy, similar to the job control construct, predicted job satisfaction, commitment and psychological strain.

Table 22 also presents a comparison of the amount of variance in the outcome measures that could be attributed to the demographic and stress-related variables. As can be seen, the demographic variables explain only a small amount of variance in each of the outcome measures. After controlling for the demographic variables, the stressors used in this study account for a substantial amount of variance in our health related measures. The stressors accounted for 29% of the variance in psychological health, 29% in positive well-being and 24% in physical health. The extensive nature of the stress-related outcomes argues for both academic staff associations and university administrators to consider the implementation of changes in policies and procedures that might lead to reductions in work-related stress and strain.

Table 22. Significant predictors of Work and Health Outcomes¹							
Predictors	Outcome Variables						
	Job Satisfaction	Affective Commitment	Health& Safety	Well-Being	PHQ	GHQ	Meds
Gender		-.08		.09		-.07	.09
Age					-.09	-.14	.10
Academic Rank	-.06						
Employment Status	-.22		-.09				
Language					-.06		-.09
Job Control	.10	.10				-.11	
Skill Use	.11			.19	-.08	-.13	
Work Load		-.09				.08	
Work Scheduling			.08		.09		
Role Conflict							
Role Ambiguity				.17	-.09	-.15	
Work-Life Balance	-.11		.11	-.25	.25	.26	.18
Fairness-Administration	.13			.06	-.09	-.06	-.09
Fairness-Chairperson	.14			.10		-.13	
Fairness-Rewards	.39				-.09	-.06	
R ² -Variance from Demographics in Final Model	.07	.01	.01	.01	.03	.03	.03
R ² -Variance from Stress-Related Variables in Final Model	.53	.03	.05	.29	.24	.37	.07
R ² -Variance from All Variables in Final Model	.60**	.04**	.06**	.30**	.27**	.40**	.10**

¹Beta weights (standardized coefficients) for significant predictors (p<.05) for the dependent variable listed in the column. Beta weights are from the final regression model.
** p<.0001

CONCLUSIONS

1. The overall level of stress in Academic Staff employed in Canadian Universities is very high.
2. Senior administrative staff are perceived to act unfairly to a much greater degree than unit chairpersons.
3. A majority of Academic Staff was satisfied with their jobs and emotionally committed to their institutions.
4. The reported incidence of psychological strain was very high with 13% of respondents exhibiting signs of distress.
5. A significant proportion of the Academic Staff in our sample (22%) reported relatively high rates of physical health symptoms that are typically associated with stress.
6. Groups of academic staff that are most at risk of stress and strain are women and individuals between the ages of 30 and 59, faculty in tenure-track positions and those whose first language is neither English nor French.
7. Gender was the most consistent demographic predictor of work and health outcomes.
8. Work-life balance was the most consistent stress measure predicting work and health outcomes.
9. There was a direct relationship between both academic rank and employment status and job satisfaction. As both rank and job security increase, so did job satisfaction.

References

- Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, *63*, 1-18.
- Banks, M. J., Clegg, C. W., Jackson, P. R., Kemp, N. J., Stafford, E.M., & Wall, T.D. (1980). The use of the General Health Questionnaire as an indication of mental health in occupational settings. *Journal of Occupational Psychology*, *53*, 187-194.
- Barling, J., Loughlin, C., & Kelloway, E.K. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology*, *87*, 488-496.
- Beehr, T. (2000). An organizational psychology meta-model of occupational stress. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 6-27). Oxford: University Press.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.
- Cooper, C. L. (2000). *Theories of organizational stress*. Oxford: University Press.
- Frone, M.R., & Yardly, J.K. (1996). Workplace family-supportive programs: Predictors of employed parents' importance ratings. *Journal of Occupational and Organizational Psychology*, *69*, 351-367
- Geiger-Brown, J., Muntaner, C., Lipscomb, J., & Trinkoff, A. (2004). Demanding work schedules and mental health in nursing assistants working in nursing homes. *Work & Stress*, *18*, 292-304
- Hess, A., Kelloway, E.K., & Francis, L. (2005, June). *Development of the Positive Affective Well-being Scale*. Paper presented at the meeting of the Canadian Psychological Association, Montreal.
- Ibeh, K., Brock, J. K-U., & Zhou, Y. J. (2004). The drop and collect survey among industrial populations: theory and empirical evidence. *Industrial Market Management*. *33*, 155-165.
- Judge, T.A., Thoreson, C.J., Bono, J.E. & Patton, G.K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, *127*, 376-407.
- Krantz, G., Berntsson, L., & Lundberg, U. (2005). Total workload, work stress and perceived symptoms in Swedish male and female white-collar employees. *European Journal of Public Health*, *15*, 209-14.

- Kahn, R. & Byosiere, P. (Eds.). (1992). *Stress in organizations*. Palo Alto CA: Consulting Psychologist Press.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-308.
- Karasek, R. & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books Inc.
- Kelloway, E.K., & Barling, J. (1994). *Development of the Canadian Forces Occupational Stress Questionnaire*. Working Paper 94-2. Canadian Forces Personnel Applied Research Unit, Willowdale, Ont.
- Lazarus, R. S. (1990). Theory-based stress measurement. *Psychological Inquiry*, 1(1), 3-13.
- Lazarus, R. S., DeLongis, A., Folkman, S., & Gruen, R. (1985). Stress and adaptational outcomes: The problem of confounded measures.
- Marmot MG, Davey Smith G, Stansfeld SA, Patel C, North F, Head J et al. Health inequalities among British Civil Servants: the Whitehall II study. *Lancet* 1991; 337:1387-1393
- Mendelsohn, M., Catano, V.M. & Kelloway, E.K. (2000). Environmental illness, stress and social support: A review and empirical test. *Work & Stress*, 14, 156-170.
- Moorman, R.H. (1991). Relationship between organizational justice and organizational citizenship behavior. Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology*, 76, 845-855.
- Price, J.L., & Mueller, C.W. (1986). *Handbook of organizational measurement*. Marshfield, MA:Pittman
- Riketta, M. (2002). Attitudinal organizational commitment and job performance: A meta-analysis. *Journal of Organizational Behavior*, 23, 257-266.
- Schat, A.; Kelloway, E.K. & Desmarais, S. (in press) The Physical Health Questionnaire (PHQ): Construct Validation of a Self-Report Scale of Somatic Symptoms. *Journal of Occupational health Psychology*.
- Tytherleigh, M.Y., Webb,C., Cooper, C.L. & Ricketts, C. (2005). Occupational stress in UK higher education institutions: A comparative study of all staff categories. *Higher Education Research & Development*, 24, 41-61.
- U.S. Department of Education (1999). National study of post secondary faculty: Faculty Questionnaire. Washington, DC: Author.

Winefield, A.H., Gillespie, N., Stough, C., Dua, J. & Hapuararchchi, J. (2002).
Occupational stress in Australian universities: A national survey 2002. South
Melbourne: National Tertiary Education Union.