

2010

# Does affective commitment decrease the level of stress reported in teachers? A comparison of primary and secondary school teachers

Williams, R.

Williams, R. (2010) 'Does affective commitment decrease the level of stress reported in teachers? A comparison of primary and secondary school teachers', *The Plymouth Student Scientist*, p. 142-163.

<http://hdl.handle.net/10026.1/13916>

---

The Plymouth Student Scientist  
University of Plymouth

---

*All content in PEARL is protected by copyright law. Author manuscripts are made available in accordance with publisher policies. Please cite only the published version using the details provided on the item record or document. In the absence of an open licence (e.g. Creative Commons), permissions for further reuse of content should be sought from the publisher or author.*

# **Does affective commitment decrease the level of stress reported in teachers? A comparison of primary and secondary school teachers**

Rhiannon Williams

*Project Advisor: [Pam Jacobs](#), School of Psychology, University of Plymouth, Drake Circus, Plymouth, PL4 8AA*

## **Abstract**

Occupational stress has been established as a predictor of low physical and psychological well-being. Organisational commitment can act as a buffer to the adverse effects of stress. Two types of commitment (affective and continuance) were studied to determine whether they have the same buffering effect. The ASSET questionnaire was completed by 112 teachers (52 primary, 60 secondary). The two types of commitment differed in their effect on stress, with high affective commitment leading to lower levels of stress and high continuance commitment resulting in higher levels of stress. No difference was found between the reported stress levels of primary and secondary school teachers. Possible explanations for the findings, potential implications and suggestions for future research are discussed.

## **Ethical Statement**

The current study conformed to each clause of the University of Plymouth's Principles for the Research involving Human Participants.

Informed consent was obtained using a brief and those who wished to participate in the study acknowledged their consent by completing and returning a questionnaire, whilst being aware of the voluntary nature of the research. Instructions were outlined with each questionnaire to ensure the participant was sure of what was required. Participants were informed of the confidentiality of their responses and their anonymity throughout the study. Anonymity was obtained using participant numbers to match the questionnaire to the participant. No names were used and there was no way of tracing an individual's responses other than through the participant number.

A brief outlining the general purpose of the study was attached with each questionnaire to achieve openness and honesty throughout the study. The study was questionnaire based and so risk of potential harm was minimal. It was my responsibility to ensure participants would not feel unease at any point during the research and to rectify any situations if unease occurred. Participants had the right to ask questions regarding any aspect of the study, with it being my responsibility to answer them to the best of my knowledge or with advice from the project supervisor. Participants had access to the final report.

The right to withdraw data from the study at any time was explicitly stated in both the brief and debrief. Participants could contact me to withdraw their data, simply by stating their participant number, without having to give a reason for their withdrawal. Withdrawn data would have been destroyed.

Each questionnaire contained a debrief which gave a full outline of the purpose of the study, emphasis on the participants anonymity and confidentiality and a reminder of their right to withdraw. Participants were thanked for their participation and details of contacts were given should the matter of stress become a concern for the participant.

Participating schools and teachers were respected and dealt with in a professional manner, answering any questions they wished to ask. Their participation remained confidential throughout, with no discussions of those who participated with people outside of the research. Head teachers were able to decline participation at any time and were able to request a copy of the final report.

All questionnaires were prepared and data was collected jointly with a second student, Rachel Blatchford. The data was analysed solely by the author, without the assistance of others.

## **Acknowledgements**

I would like to thank my project supervisor, Pam Jacobs, for her help and guidance throughout the project. I would also like to offer my appreciation to all the teachers who participated in the study, as without their help the project would not have been able to be completed. And I would like to thank my parents for their support and proof reading skills.

## **Introduction**

Due to the recent economic crisis, stress in the workplace is inevitable. Worldwide, stress is a well researched topic and although a hard term to define, stress is “any force that puts a psychological or physical function beyond its range of stability, producing a strain within the individual” (Cartwright & Cooper, 1997, p. 5). In particular, occupational stress is stress an individual experiences in the workplace, which there can be numerous stressors, and is an issue of concern in the present day as the consequences can be large for employees and their organisations. As shown in the Labour Force Survey 2008/09, an estimated 415,000 individuals in Britain believed they were experiencing work related stress at a level that was making them ill. In addition, the 2009 Psychosocial Working Conditions (PWC) survey found that around 16.7% of all working individuals thought their job was very or extremely stressful, an increase from the 13.60% reported in 2007 (Health and Safety Executive, 2009a). These statistics show that individuals perceive their jobs to be stressful, which the consequences for the organisation are clear. As discussed by Cranwell-Ward and Abbey (2005), over 1.5 million working days are lost to stress in the United Kingdom, with these absences costing employers £1.24 billion a year. In addition, if an organisation’s employees are under stress, factors such as productivity, job performance and staff retention may also suffer (Ganster & Schaubroeck, 1991) creating problems with staff morale and adding further financial difficulties.

## **Effects of stress**

Ill health created by stress can be experienced by an individual physically, psychologically and/or behaviourally. As stated by the Health and Safety Executive (2009b), an individual suffering from stress can experience emotional and mental symptoms, such as feeling negative and withdrawn or losing their motivation to complete tasks. In addition, changes of behaviour, such as an increase in unhealthy habits, are not uncommon. Physical symptoms experienced by stressed individuals can often be shown through problems such as headaches, nausea or chest pains. Moreover, a cross-sectional study of 1,023 Taiwanese call operators found that the risk of health complaints, such as eye strain and painful throat, is increased in individuals who perceive stress to be higher than those who do not. Difficult customers were the most notable work stressor found in the study, a factor which an organisation can not necessarily control for (Lin, Chen & Lu, 2008). Using self-report data, these findings can be problematic as the answers are subjective and open to the risk of social desirability bias. In addition, cross-cultural differences may affect the results and so a replication using UK workers would be desirable. Jamison, Wallace and Jamison (2004) discussed the fact that modern working conditions are making people more susceptible to chronic diseases and a stress related disorder which has received much attention in recent years is that of cardiovascular disease (CVD). It has long been acknowledged that chronic stress is a risk factor to CVD, as individuals who report higher levels of stress are at greater risk than those who do not. Furthermore, problems with the immune system and hormone levels can arise from stress, which in turn can increase the risk of CVD (Kubzansky & Adler, 2010), showing how health can deteriorate as stress increases.

A much researched psychological symptom of stress is that of burnout, which is a “syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment” in response to the “chronic emotional strain” often associated with people-orientated roles (such as teaching and nursing) (Maslach, 2003, p. 2). Using

180 lawyers as their sample, Tsai, Huang and Chan (2009) found that high occupational stress is associated with high levels of personal and work related burnout. The problems of burnout can further lead to physical disorders such as CVD and research shows that work stressors are more to blame than personality factors (Melamed, Shirom, Toker, Berliner and Shapira (2006). A review from Melamed et al., (2006) explains how a 4.2 year follow up of apparently healthy men showed burnout to be a predictor of myocardial infarction. In addition, an adult's risk of heart attack is tripled with chronic exhaustion, showing the significant consequences workplace stress can have on an employee's physical well-being. These findings show the importance of understanding both the psychological and physical symptoms of workplace stress in order to facilitate overcoming the problem. Furthermore, the symptoms of burnout can lead to the risk of poorer mental health, psychosomatic complaints and work associated withdrawal behaviour and can therefore have a large impact on an employee's personal and professional life (Cubriilo-Turek, 2006). Therefore, it can be seen that high occupational stress can play a significant role in the development of severe ill health.

### **Individual differences**

As discussed, can have a negative impact on an individuals health but in order to understand the reasons why people become stressed, and how to avoid or cope with it, it needs to be established what is initially causing the stress. As defined by Travers and Cooper (1996), a stressor is "something in the environment that acts as a stimulus that can be physical, psychological or behavioural in nature" (p. 13). It is important to understand, however, that individual differences will determine whether someone will in fact become stressed, because people's reactions to stress differ between situations. Showing the importance of individual differences in stress, Cranwell-Ward and Abbey (2005) outlined that personality plays a large role in the production of stress, such as traits of perfectionism and fear of failure. Having these personality characteristics may lead to increased pressure in the working environment and thus create more stress than for an individual who does not show these traits. In support of this, Jepson and Forrest (2006) found that teachers with Type A behaviour reported higher levels of stress than those with Type B behaviour and that being exposed to the same situation, the former would show more physiological and emotional activity. In addition, people with particular traits are better able to cope with stress and therefore suffer fewer of its negative consequences (Edwards, 1988). Therefore, examining individual differences is an important aspect of understanding why two different people may not have the same reactions to the same stressor.

### **Work stressors**

Although individual differences may determine if someone becomes stressed, an understanding of the types of stressors found in the workplace can facilitate an individual in avoiding stress and the risk of ill health. Cartwright and Cooper (1997) have established five workplace stressors that can affect an individual. Primarily, factors intrinsic to the job, such as working conditions, shift work, long hours and work overload can become stressors for an employee. In support of this, Gaither et al. (2008) conducted a mail survey on pharmacists and found that role overload ("the conflict of time and organisational demands concerning the amount of work to be done" p. 232) had a large effect on stress and job satisfaction. In addition, working long hours, such as 55 hours a week, can affect cognitive performance in middle

aged individuals, shown in a longitudinal study by Virtanen et al. (2009). Another stressor which may affect an individual in the workplace is their role in the organisation. If their role becomes ambiguous, or conflicts with other demands, stress is more likely to occur. A study of hotel workers found that female workers are more prone to the detrimental effects of role stress (ambiguity and conflict) on job satisfaction (Kim, Murrmann & Lee, 2009) showing the importance of ensuring that employees are aware of their tasks and that these do not conflict with other roles they may be involved with.

The relationships an individual experiences at work, with people either higher or lower in the organisation, can also affect the risk of becoming stressed. Due to recent changes in the job market, managers may tend to adopt an authoritarian approach within the workplace which can indirectly lead to an employee's increased perception of bullying (Baillien & De Witte, 2009). Bullying in the workplace ultimately puts a strain on interpersonal relationships within the organisation, which in turn can lead to an individual feeling withdrawn and isolated, thus increasing the risk of experiencing the adverse effects of stress.

Career development within an organisation can create stressful circumstances in the workplace, as both the fear of job loss and constant performance evaluations can lead to the development of stress. Finally, the organisational structure and climate of a company is important in understanding the level at which an individual feels a sense of belonging to an organisation. Allowing employees more participation within decision making in the workplace reduces the risk of work related stress, ill health and therefore absenteeism (Margolis, Kroes & Quinn, 1974 as cited in Cartwright & Cooper, 1997).

### **Commitment**

Although it is clear that stressors are found within the workplace, whether the stressors have an effect on ill health or not is dependent on certain moderators, such as commitment (Donald & Siu, 2001). In general, commitment is considered to be "a psychological bond between an employee and his or her organisation" (Schmidt, 2007, p. 26). A three-component model proposed by Allen and Meyer (1990) further outlines the types of commitment seen in the workplace. Affective commitment refers to the level at which an individual *wants* to stay with an organisation as they have an emotional attachment and involvement in the organisation. Conversely, employees who experience continuance commitment continue employment with an organisation because they feel they *have* to, as there is an awareness of the costs associated with leaving the organisation. Finally, normative commitment refers to an individual continuing employment with an organisation because they feel they *ought* to. The former two will be explored for the purpose of this study.

Over recent years, the notion of organisational commitment and its role in moderating the effects of workplace stressors has been divided into two perspectives. From one perspective, being committed may cause an employee to increase their risk of ill health from work stressors. Research from Mathieu and Zajac (1990) supports this notion and found that highly committed employees suffer the adverse effects of stress more so than less committed employees. Schmidt (2007) outlined that this is probably due to the fact that a highly committed employee has high investment and identification with an organisation and thus has an increase in the vulnerability to threat from work stressors. Furthermore, although less committed employees may suffer from stress, the effects are not as adverse, as the individual has a sense of detachment from the organisation and thus does not take on board

any problems too personally (Begley & Czajka, 1993). Therefore, although having highly committed employees may seem advantageous for organisations, research has shown that it is not necessarily beneficial for the employee due to the increased risk of suffering from workplace stress. More recently, Donald and Siu (2001) measured environmental conditions, organisational commitment and health outcomes in blue- and white-collar workers but found organisational commitment to be a poor predictor of physical well-being.

The finding from Donald and Siu (2001) contradicts the second perspective that commitment acts as a buffer to the adverse effects of workplace stress on strain and health outcomes (Schmidt, 2007). This perspective of commitment is a more positive one and derives from the notion that affective commitment involves a psychological bond between an individual and their organisation (Schmidt, 2007). Research in support of this perspective comes from Begley and Czajka (1993) who gathered data from a psychiatric division undergoing numerous organisational changes. The authors were able to conclude that work stress increased job displeasure more in individuals with low commitment than with high commitment. In addition, Glazer and Kruse (2008) have more recently examined commitment in nurses and found that high affective commitment buffers the relationship between job related anxiety and turnover intention. Moreover, although both high affective and continuance commitment increased staff retention, the relationship between job related anxiety and intention to leave for those with high continuance commitment was only slightly positive, which the authors concluded was probably due to the lack of alternatives and perceived high sacrifice. The findings from Glazer and Kruse (2008) add empirical research to support the relationship between initial reaction to stressors (e.g. anxiety) and intention to leave. A third piece of evidence in support of the buffering hypothesis of commitment comes from Schmidt (2007), who studied 506 male and female municipal administrators to determine whether the effects of burnout could be reduced with commitment. As hypothesised, Schmidt (2007) showed that the effects of high stress on two of the burnout dimensions, emotional exhaustion and depersonalisation, were reduced with increasing affective commitment and so these findings enable an understanding of how the risk of burnout can be reduced. This provides valuable information for organisations in decreasing the risk of ill health of their employees but this is perhaps only valuable if an organisation understands how to induce affective commitment.

## **Teachers**

The current research is going to focus on the teaching profession due to its notably stressful nature and requirement of commitment. Over the last two decades, the acknowledgement that teaching is a stressful profession has increased and in 2004 teaching was placed in the top six most stressful jobs (Cranwell-Ward & Abbey, 2005). In addition, 1995 saw 6,075 teachers retire early on health grounds, of which more than 3,000 were overstressed, and the year prior to this saw 76% of teachers taking time off work due to stress-related illness (Cosgrove, 2000). A possible explanation as to why teaching has become a more stressful profession in recent years could be the many changes in teaching, such as the introduction of OFSTED inspections, which adds pressure in an already demanding role (Cosgrove, 2000).

The problem of burnout in teaching has been well documented in recent research, with it being related to teacher retention, turnover and quality in teaching (Jepson & Forrest, 2006). A study of primary school teachers by Kokkinos (2007) established that managing student behaviour and time constraints were

systematically found to be predictors of burnout, thus demonstrating the importance of allowing sufficient time for teachers to complete tasks. In addition, van Dick and Wagner (2001) noted the role of workload in the production of stress reactions, but established the importance of head teacher support in reducing the perception of workload, adding depth to the understanding of the value an organisation has in looking after the well-being of its employees. Kyriacou (2001) explained, however, that feeling overloaded may not always lead to stress, as taking on additional tasks may instead enhance job satisfaction, thus showing the importance of individual differences. Finally, a longitudinal study by Shirom, Oliver and Stein (2009) examined the effect of five work stressors (heterogeneous classes, disciplining children, home-work conflict, physical conditions and extracurricular activities) on somatic complaints. Using a questionnaire based study, teachers were asked to complete the survey at the beginning of the school year and were contacted again approximately seven months later to complete a second questionnaire. A total of 404 questionnaires were analysed and the authors found that all five work stressors predicted the health outcomes at time two of the study. Therefore, it can be noted that there are numerous work stressors found within the teaching profession that can impact on health. Kokkinos (2007), however, acknowledged the important role of personality when establishing whether a teacher will react to a stressful situation or not. The research from Kokkinos (2007) provides a sound understanding to the topic of stress in teaching, however being conducted with only primary teachers prevents a generalisation to secondary school teachers. To account for this, Jepson and Forrest (2006) examined teachers of both school types and found that stress is perceived more so in teachers of primary schools than in secondary schools. Interestingly, Phillips, Sen and McNamee (2007) established that the stressors for primary and secondary school head teachers differ. Primary school head teachers were more stressed about curriculum changes than secondary school head teachers, which the authors concluded was due to the latter having larger management teams and thus are able to delegate tasks to others. Therefore, although research may show that primary school teachers are more stressed, an examination of the particular stressors is required in order to establish what is causing stress in teachers.

### **The current study**

The purpose of the current study is to gain a further understanding of commitment, both affective and continuance, and its relation to occupational stress and work related health. Previous research has shown that the stressful working environment of teaching can lead to physical and psychological ill health (Kokkinos, 2007; Shirom, Oliver & Stein, 2009). Based on these findings, the ASSET questionnaire will be distributed to teachers to measure stress, health and commitment. The questionnaire will include a 13-item scale developed by Meyer and Allen (1997) to establish whether the individual experiences either affective or continuance commitment. The factor of school type has also received research attention (Jepson & Forrest, 2006; Phillips, Sen & McNamee, 2007) and therefore will also be examined in the current study to observe whether differences occur. The review of the existing literature has led to a number of hypotheses being derived regarding work stress, health, commitment and school type.

*Hypothesis 1:* Employees who report high levels of commitment will report lower levels of stress than those who report low levels of commitment.



*Hypothesis 2:* Employees who report higher levels of work stress will report lower levels of physical and psychological health than those who report lower levels of stress.

*Hypothesis 3:* Primary school teachers will report higher levels of stress than secondary school teachers.

## **Method**

### **Participants**

Data was collected from a total of 112 teachers (52 primary and 60 secondary) from a variety of schools in the United Kingdom. The sample consisted of 67% female and 33% male participants, with the majority working on a full time basis (82.1%). Of the sample, 13.4% was aged 25 or under, 27.7% were between the age of 26 and 35, 24.1% were between 36 and 45 years, 21.4% between the years of 46 and 55, and the remaining 13.4% 56 years of age or over. The majority of the teachers (52.7%) had been in the teaching profession for more than six years whilst 42% had received no promotions. Almost all participants were of a White background (96.4%).

### **Materials**

A modified version of The ASSET, an Organisational Stress Screening Tool (Cartwright & Cooper, 2002) was used in the study, with several aspects of the questionnaire not required and one section changed to suit the current study. The questionnaire was comprised of four subsections of questions, which measured different aspects of the study.

#### *1. Perceptions of Your Job*

A 37-item scale measured the participant's feelings toward their current job and was comprised of eight subtopics of work stressors. These were work relationships, aspects of the job (both 8 items each) overload, job security, work-life balance, control, resources and communications (all 4 items each) and pay and benefits (1 item). Participants indicated their response on a 6-point scale ranging from *strongly disagree* to *strongly agree*.

#### *2. Your Health*

This scale contained 19 items which examined how often the symptoms or changes of behaviour stated had occurred over the last three months. The items consisted of physical (e.g. headaches), psychological (e.g. mood swings) and behavioural (e.g. tendency to drink more than usual) symptoms. Participant's rated how frequently the symptoms/changes had occurred on a 4-point scale of, *never*, *rarely*, *sometimes* or *often*.

#### *3. Attitudes towards Your Organisation*

This third section examined commitment and was modified for the current study. The original questions in this section examined commitment simply to and from the organisation. The modified version, however, considered two types of commitment: affective and continuance commitment. A 13-item scale developed by Meyer and Allen (1997) was used establish whether the participant experienced high or low affective or continuance commitment to their organisation. Participants responses were indicated using a 6-point scale ranging from *strongly disagree* to *strongly agree*.

#### 4. Demographics

Participants were requested to indicate their gender, age, nationality, length of time at current institution, years of experience, number of promotions and school type (primary or secondary).

#### Procedure

The study used a between-subjects design and was questionnaire based. Dependent on the hypothesis tested, the dependent variable was occupational stress (measured on eight levels of work stressors), health, (measured on two levels: physical and psychological) or overall stress. The independent variables analysed in the study were level of affective and continuance commitment, level of overall stress (both measured on three levels: low, medium or high) and school type (measured on two levels: primary and secondary).

Correct ethical procedures were followed to ensure the participant's confidentiality, protection from harm and right to withdraw. In addition, the procedure ensured openness and honesty and avoidance of deception throughout the study. A number of primary and secondary schools were contacted via email or telephone to request participation from the head teacher. After permission was gained, questionnaires were distributed to teachers with the notion that participation was voluntary. Each questionnaire contained instructions, including where to return the questionnaire, and a brief, outlining the general purpose of the study, the participant's confidentiality and the right to withdraw. The questionnaire was distributed in an envelope, which was to be used for the participant to return their sealed questionnaire. A debrief, instructed to be read after completion of the questionnaire, was included in a separate envelope and was complete with a participant number matching the participant with the questionnaire. The debrief fully outlined the purpose of the study, thanked the participant for their time and gave contact details for any further questions or withdrawals from the study. Completed questionnaires were collected from the schools and head teachers were instructed they would have access to a copy of the anonymous results after analysis.

Prior to analysis, raw data was scored to create new variables (see Appendix C). The raw stress scores for *Perceptions of Your Job* were transformed into new variables of the eight individual stressors and were also used to create low, medium or high overall stress scores. The raw scores for the affective and continuance commitment items were transformed into new variables of low, medium or high to create the level of commitment experienced. Finally, the health items were divided into two new variables of physical and psychological health. Results were statistically analysed using a Pearson's correlation, a multivariate analysis of variance (MANOVA), a multivariate analysis of covariance (MANCOVA) and a one-way analysis of variance (ANOVA) (all between-subjects). Post-hoc tests were carried out where appropriate. The accepted level of significance for all analyses performed was  $p \leq .05$ .

#### Results

The current study aimed to test the effect of affective and continuance commitment on reported stress levels. It was hypothesised that employees who experience high levels of commitment will report lower levels of work related stress. In addition, it was predicted that higher levels of work stress would negatively impact an employee's physical and psychological health. Finally, a prediction that primary school teachers would report higher levels of stress than secondary school teachers was made.

Table 1 shows the means and standard deviation values for the individual work stressors, affective and continuance commitment and physical and psychological health components. Both the work stressor and the commitment variables were quantified from one (strongly disagree) to six (strongly agree), with a high number relating to either high stress or high commitment. The health variables were quantified from one (never) to four (often) and so a high score relates to an individual suffering from ill-health. It can be seen from the table that *work relationships* causes the least amount of stress, whereas *overload* seems to be the most notable stressor. In terms of commitment, affective commitment is experienced higher than continuance commitment. It is evident that both the physical and psychological health scores are relatively equal.

**Table 1.** Means and standard deviation values for the individual work stressors, type of commitment and health components.

<b>Variable</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Work relationships</b>	2.40	0.85
<b>Aspects of the job</b>	3.10	0.70
<b>Overload</b>	3.26	1.05
<b>Job security</b>	2.77	0.93
<b>Work-life balance</b>	3.10	1.11
<b>Control</b>	2.98	0.99
<b>Resources and communication</b>	2.91	0.89
<b>Pay and benefits</b>	2.84	1.44
<b>Affective commitment</b>	4.09	0.81
<b>Continuance commitment</b>	3.44	1.16
<b>Psychological health</b>	2.19	0.63
<b>Physical health</b>	2.37	0.64

In order to examine the relationships between the variables, a Pearson Correlation was conducted. There was a significant relationship between overall stress and the level of affective commitment,  $r = -.28$ , the level of continuance commitment,  $r = .51$ , physical ill-health,  $r = .52$ , and psychological ill-health,  $r = .56$  (all  $ps < .001$ , one-tailed). In addition, the level of continuance commitment was significantly correlated with school type,  $r = .18$ ,  $p < .05$ , physical ill-health,  $r = .44$ ,  $p < .001$  and psychological ill-health,  $r = .42$ ,  $p < .001$ , all one-tailed.

### Hypothesis 1

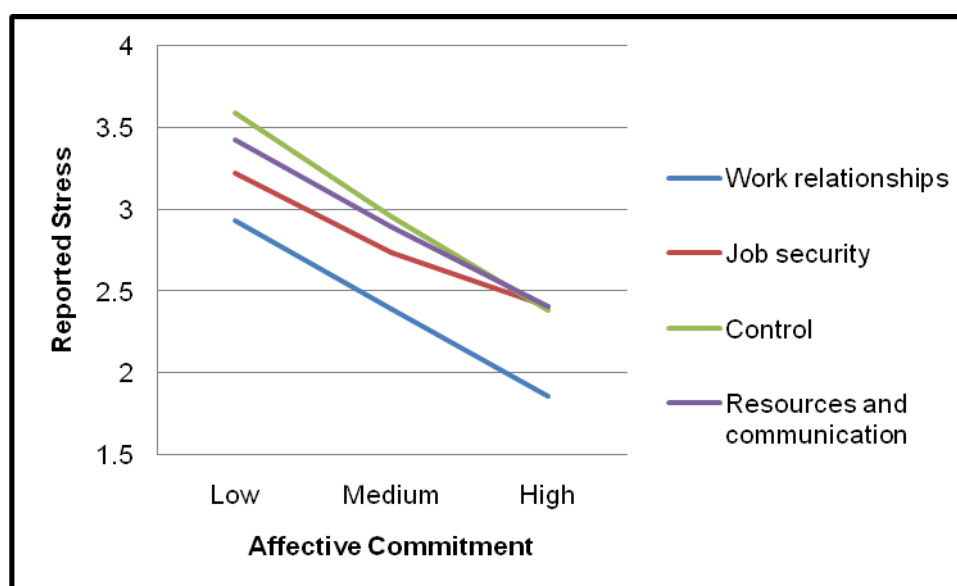
A multivariate analysis of variance (MANOVA) (between subjects) was conducted to test whether stress levels would be different for employees who reported high or low levels of commitment. Levels of affective and continuance commitment were analysed separately to enable comparisons between the two types to be made.

The first MANOVA analysed affective commitment as the independent variable and the individual work stressors as the dependent variables. Using Wilk's

statistic, there was a significant effect of the level of affective commitment on overall stress,  $\Lambda = 0.74$ ,  $F(16, 204) = 2.04$ ,  $p < .05$ . The Levene's Test of Equality of Error Variances was found to be not significant for all the dependent variables,  $p > .05$ , therefore we can assume Homogeneity of Variance and a univariate analysis of variance (ANOVA) can be conducted. Analysis of each individual work stressor showed that there was a significant effect of the level of affective commitment on stress from work relationships,  $F(2, 109) = 6.80$ ,  $p < .01$ , job security,  $F(2, 109) = 2.20$ ,  $p < .05$ , control,  $F(2, 109) = 6.46$ ,  $p < .01$ , and resources and communication,  $F(2, 109) = 5.53$ ,  $p < .01$ .

In order to examine where the significant differences lie, a post hoc analysis using Tukey HSD was conducted. There were significant differences between low and medium levels of affective commitment for work relationships ( $p = .034$ ), control ( $p = .036$ ), and resources and communication ( $p = .05$ ). In addition, there were significant differences between low and high levels of affective commitment for work relationships ( $p = .001$ ), job security ( $p = .041$ ), control ( $p = .002$ ) and resources and communication ( $p = .004$ ).

An examination of the plots ultimately shows that as affective commitment increases, stress experienced from work relationships, job security, control and resources and communication decreases (see Figure 1).



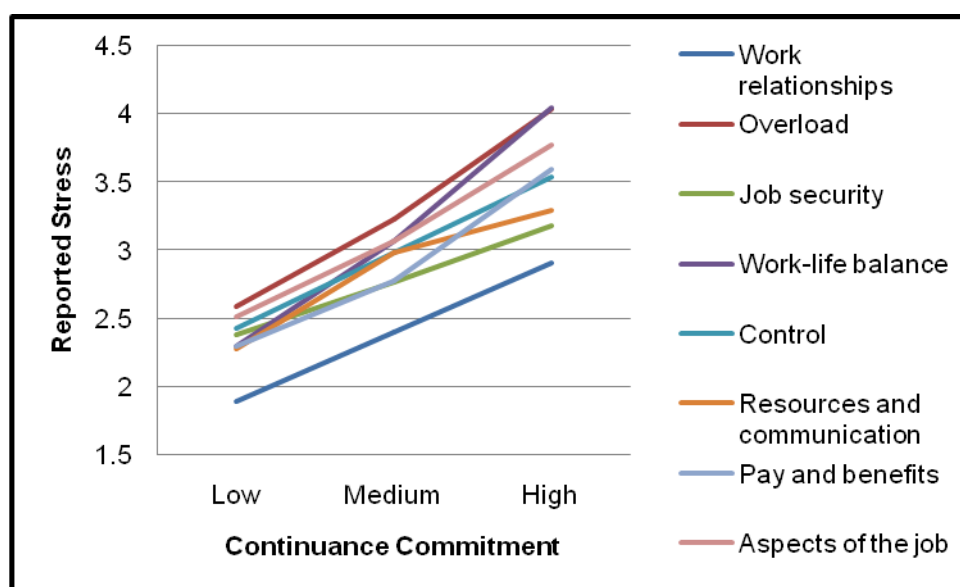
**Figure 1.** The relationship between levels of affective commitment and stress from work relationships, job security, control and resources and communication.

The second MANOVA analysed continuance commitment as the independent variable and the individual work stressors as the dependent variables. Using Wilk's statistic, there was a significant effect of the level of continuance commitment on overall stress,  $\Lambda = 0.64$ ,  $F(16, 204) = 3.14$ ,  $p < .001$ . Analysis of each individual work stressor showed that there was a significant effect of the level of continuance commitment on stress from all eight stressors (work relationships,  $F(2, 109) = 8.01$ ,  $p < .001$ , overload,  $F(2, 109) = 11.53$ ,  $p < .001$ , job security,  $F(2, 109) = 3.88$ ,  $p < .05$ , work-life balance,  $F(2, 109) = 16.03$ ,  $p < .001$ , control,  $F(2, 109) = 7.06$ ,  $p <$

.001, resources and communication,  $F(2, 109) = 8.04, p < .001$ , pay and benefits,  $F(2, 109) = 4.55, p < .05$  and aspects of the job,  $F(2, 109) = 22.84, p < .001$ .

A Tukey HSD post hoc analysis established there were significant differences between low and medium levels of continuance commitment for work relationships ( $p = .037$ ), overload ( $p = .026$ ), work-life balance ( $p = .007$ ), resources and communication ( $p = .003$ ) and aspects of the job ( $p = .001$ ). There were significant differences between low and high levels of continuance commitment and all of the eight stressors ( $p < .05$ ) and there were significant differences between medium and high levels of continuance commitment for work relationships ( $p = .036$ ), overload ( $p = .003$ ), work-life balance ( $p = .001$ ) and aspects of the job ( $p = .001$ ).

Inspection of the plots shows that as continuance commitment increases, stress experienced from the eight individual stressors also increases (see Figure 2).



**Figure 2.** The relationship between levels of continuance commitment and stress from the eight individual work stressors.

The findings from the two MANOVAs give partial support for the first hypothesis which states that high commitment leads to lower levels of stress. This prediction can be supported for affective commitment; however high continuance commitment ultimately leads to high levels of stress and therefore shows a difference between the two types of commitment.

## Hypothesis 2

A multivariate analysis of covariance (MANCOVA) was conducted to test whether high levels of stress leads to negative physical and psychological health outcomes. Physical and psychological health were the dependent variables and level of overall stress was the independent variable, with age added as a covariate. Using Wilk's statistic, age had no significant effect on physical or psychological health,  $p = .411$ . There was, however, a significant effect of the level of overall stress on physical and psychological health,  $\Lambda = 0.77, F(4, 214) = 7.37, p < .001$  when controlling for age.

The means for the adverse health indicators are higher for high overall stress (see Figure 3), showing that as the level of overall stress increases, the level of ill-health also increases thus supporting the second hypothesis.

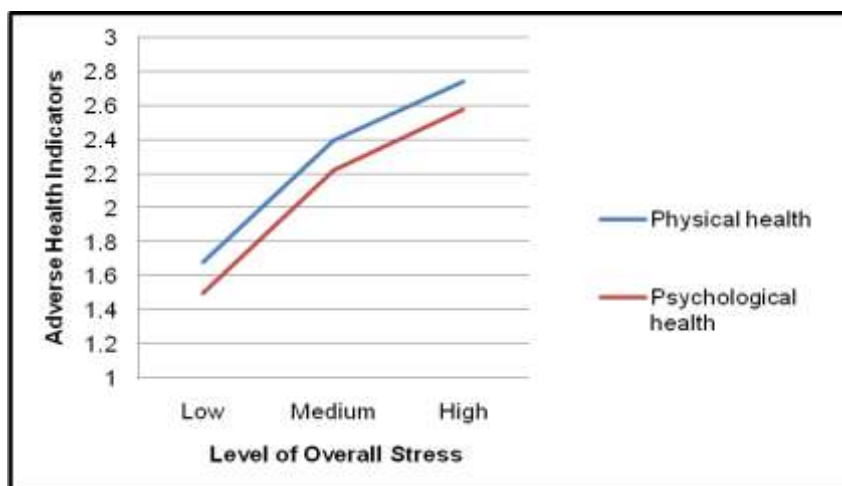


Figure 3. Mean values for the adverse health indicators for employees with low, medium and high overall stress.

### Hypothesis 3

The Pearson Correlation statistic revealed there was no correlation between school type and overall stress,  $p = .065$  and therefore the third hypothesis can not be accepted. Interestingly, when school type was correlated with the individual work stressors, there was a significant relationship between school type and pay and benefits,  $r = .16$ ,  $p < .05$ , one-tailed. To follow up this finding, a one-way ANOVA was conducted however the relationship between school type and pay and benefits failed to reach significance,  $F(1, 110) = 2.83$ ,  $p = .096$ . The means seen in Figure 4 however show secondary school teachers report more stress from pay and benefits than primary school teachers suggesting the stressors found within the two school types may differ.

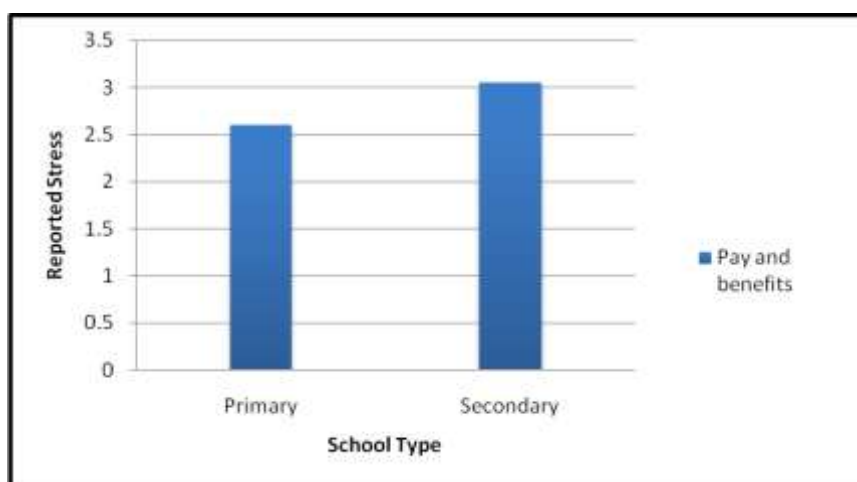


Figure 4. Mean values for stress reported from pay and benefits from primary and secondary school teachers.

Table 2 shows the frequencies for the demographic information obtained from the questionnaires. It is clear to see that teaching is a female dominated role, making up 67% of the sample, and although there appears to be no specific age range related to teaching, the youngest and oldest categories contained the least number of participants. In addition, a large proportion of the sample had worked in the current job and/or institution for six or more years, with 4.5% having received three or more promotions. The sample was relatively equal in terms of school type and the majority were working on a full-time basis.

**Table 2.** *Frequencies and percentages for the demographic information.*

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>		
<i>Male</i>	37	33.0
<i>Female</i>	75	67.0
<b>Age (years)</b>		
<i>Up to 25</i>	15	13.4
<i>26 – 35</i>	31	27.7
<i>36 – 45</i>	27	24.1
<i>46 – 55</i>	24	21.4
<i>56 or more</i>	15	13.4
<b>School type</b>		
<i>Primary</i>	52	46.4
<i>Secondary</i>	60	53.6
<b>Years at institution</b>		
<i>Up to 2</i>	25	22.3
<i>3 – 5</i>	26	23.2
<i>6 or more</i>	61	54.5
<b>Years in current job</b>		
<i>Up to 2</i>	29	25.9
<i>3 – 5</i>	24	21.4
<i>6 or more</i>	59	52.7
<b>No. of promotions</b>		
<i>0</i>	47	42.0
<i>1</i>	38	33.9
<i>2</i>	22	19.6
<i>3 or more</i>	5	4.5
<b>Working hours</b>		
<i>Part-time</i>	20	17.9
<i>Full-time</i>	92	82.1

## **Discussion**

The current study aimed to investigate the moderating effect of organisational commitment on occupational stress within the teaching profession. Two perspectives have been proposed within the literature. On the one hand, commitment has been shown to increase the level of stress experienced (e.g. Mathieu & Zajac, 1990) whereas on the other hand, commitment can act as a buffer to the adverse effects of stress (e.g. Schmidt, 2007). The second perspective was examined, with it hypothesised that employees who experience high organisational commitment would suffer less from the adverse effects of workplace stress than those who have low organisational commitment. Moreover, a comparison was made between employees who have high or low affective or continuance commitment. In addition, research has shown differences between the level of stress reported in primary and secondary school teachers (e.g. Jepson & Forrest, 2006) and so it was predicted that primary school teachers would report higher levels of stress than secondary school teachers.

### **Hypothesis 1**

The first hypothesis was partially supported, as it was shown that employees with high affective commitment experienced lower levels of stress than those with low affective commitment. This supports the research from Glazer and Kruse (2008) who showed that employees with high affective commitment are less likely to leave their organisation, and Schmidt (2007) who found that effects of stress on burnout was reduced with increasing affective commitment. The hypothesis was also refuted, however, as employees with high continuance commitment reported higher levels of stress than those with low levels of continuance commitment. The findings from the current study are of value to the existing literature on commitment and stress because some of the research simply considers commitment to the organisation (e.g. Begley & Czajka, 1993) and states that high commitment leads to lower levels of stress. As shown, it is not merely high commitment that reduces stress, but high affective commitment is required in order to reduce the risk of ill health from workplace stress.

The research from Glazer and Kruse (2008) showed that employees with high continuance commitment were less likely to leave their organisation due to stress than those with low continuance commitment whereas the current study has shown that high continuance commitment increases stress. The difference found here could be due to the differences in the populations studied, with Glazer and Kruse (2008) studying nurses and the current study looking at teachers. It could be considered that although both professions require a great deal of commitment, the stressors experienced in the workplace are different which in turn could have affected the level of stress reported and the intent to leave. In addition, the two studies used different questionnaires to measure the variables and so this variance could have contributed to the differences in the results.

The finding that high affective commitment buffers the effects of workplace stress could be due to the fact that the individual is with the organisation because they want to be (Allen & Meyer, 1990) and is therefore more likely to enjoy their job. Schmidt (2006) has discussed how stress is seen as less threatening in highly committed employees as the commitment gives the individual a sense of security and stability within the organisation. In contrast, employees with high continuance commitment are with their organisation because they feel they have to be due to the awareness of costs associated with leaving (Allen & Meyer, 1990). According to Schmidt (2006), these individuals should also have a sense of security because they



are still committed however because these employees do not have the same sense of attachment to their organisation, they may not necessarily enjoy their job and so this could explain their vulnerability to workplace stressors.

An alternate explanation for the difference in stress reported from employees with affective or continuance commitment could be due to the personality of the individual who develops such commitment. An individual with high affective commitment may also have a high internal locus of control and so because they are with their organisation because they want to be, they feel they have control over their actions. An employee with high continuance commitment, on the other hand, may have a high external locus of control and so feel that being with the organisation is due to factors out of their control, such as the cost of leaving. Research has shown that individuals with a high internal locus of control perceive stress less, and that stress has more negative consequences for those with a high external locus of control (Chen & Silverthorne, 2008). Therefore, it may not in fact be commitment which is moderating the effects of stress, but other personality factors which contribute to the type of commitment that develops. Recent findings from Bowling and Eschleman (2010) add depth to this notion and found that work stressors are more strongly related to counterproductive work behaviours in employees with traits such as low conscientiousness. Therefore, an exploration of the relationship between personality and commitment type would be an interesting topic for further research.

The double dissociation between the type of commitment experienced and the level of stress reported by the employee is valuable for employers as it could encourage them to create an affective level of commitment from their employees. As discussed, employees with high affective commitment are less likely to suffer the effects of burnout (Schmidt, 2007) and are more likely to stay within the organisation (Glazer & Kruse, 2008) and so having employees with this type of commitment is beneficial to both the employee and their organisation. An important antecedent to affective commitment is that of perceived organisational support, which is an "employee's perceptions of the organisations commitment to them" (McFarlane Shore & Wayne, 1993, p. 774) and is determined by how much an employee believes their organisation cares about their well-being and values their contributions. If an employee feels valued by their organisation, they are more likely to repay the organisation in terms of affective commitment which in turn is positively correlated with compliance and altruism within the organisation (McFarlane Shore & Wayne, 1993). This has been shown more recently by Vandenberghe, Bentein and Stinglhamber (2004) who found that not only is organisational support an important antecedent to affective commitment, but a constructive relationship with a superior or a cohesive working group are also important in increasing the level of affective commitment of an employee. Therefore, it is an organisation's responsibility to adequately support their employees in order to gain affective commitment, as this will not only benefit the organisation but also the employee's well-being.

A lack of perceived organisational support may ultimately lead an employee to develop high continuance commitment. If a teacher, for example, does not feel their school provides them with enough support then they may be unwilling to develop a sense of belonging or identification with their organisation. As shown by McFarlane Shore & Wayne (1993) continuance commitment is negatively correlated with compliance and altruism and so not only is high continuance commitment unbeneficial to the employee due to the increased risk of stress, but it also has its disadvantages for the organisation due to the possible lack of effort exerted by the employee within the organisation.

## **Hypothesis 2**

The current study showed that adverse health is an outcome of high overall stress, thus supporting the second hypothesis. This finding supports the extensive existing literature on the effects of stress on both physical (e.g. Lin, Chen & Lu, 2008) and psychological (e.g. Melamed et al., 2006) well-being. If there is a poor match between an employee's task demands and their abilities to complete that task, their risk of stress is increased, which in turn increases their risk of suffering from negative health complaints. Therefore, identifying and eliminating the stressors found within the workplace is likely to reduce the risk of employees suffering from adverse health. Due to the individual differences in response to stress potentially making this a difficult task, facilitating employees in developing affective commitment to the organisation can help to buffer the effects of workplace stress.

It could be argued that the stress itself may not be the cause of adverse health. Other variables may be to blame for the decrease in an individual's well-being and although age was controlled for in the current study, factors such as diet and unhealthy habits were not examined. Although research has shown that stress is a risk factor to health complaints such as coronary heart disease (CHD) (Melamed et al. 2006), it has also been shown that poor diet can contribute twenty percent to the risk of CHD in females (Tran & Barraij, 2009) and that smokers have a 2-4 times increased risk than non-smokers of developing CHD (American Heart Association, 2010). As these factors were not examined in the current study, there is potential that they can affect the health of an individual and that affective commitment cannot buffer for these factors. In addition, the direction of causality is not clear as although it seems that stress increases the risk of poor health, there is also a possibility that poor health may in fact increase the risk of stress. For example, a headache initially caused by something other than stress may in turn become a stressful situation, thus showing how poor health can be a determinant for increased stress. Further research would be able to examine the effect of other factors than stress on negative health complaints.

## **Hypothesis 3**

It was hypothesised that primary school teachers would report higher levels of stress than secondary school teachers, based on the findings from Jepson and Forrest (2006). The current study failed to replicate this finding, with the relationship between overall stress and school type failing to reach significance. The initial explanation for this could be due to the sample size not being large enough to create a significant difference and so a replication of the current study with a larger sample of teachers may produce a different set of results. The research from Jepson and Forrest (2006), however, had fewer participants and so an alternative explanation could be the more recent aspect of the current study. It could be suggested that changes in schools over the recent years has meant changes to the level of stress reported. Therefore, although primary school teachers may have experienced a higher level of stress four years ago, the stress experienced by secondary school teachers may have increased in recent years. A replication of the study would be desirable in order to determine whether primary school teachers do in fact suffer more from stress than secondary school teachers.

An interesting finding was that secondary school teachers may suffer more from stress created by pay and benefits than primary school teachers. Although this finding failed to reach significance in statistical analysis, the means indicated a trend suggesting a topic for further exploration. With more levels of staff in secondary

schools (e.g. teaching assistant, teacher, head of department, deputy head) there is a possibility some individuals may feel they are unfairly paid when compared to their co-workers. In addition, secondary school teachers may feel they carry out more tasks and have more responsibility than primary school teachers and so feel they do more work for the money they are paid. Both of these suggestions could provide explanations for why secondary school teachers may be more stressed about pay and benefits than primary school teachers however due to this being speculation, further exploration of this trend should be examined in order to reach a valid conclusion. As discussed by Phillips, Sen and McNamee (2007), the stressors for primary and secondary school teachers are different and so finding that the work stressor pay and benefits may in fact differ for the two school types adds further depth to this notion.

### **Future research**

An avenue for further research could be determining whether an employee is committed to the organisation or the task they are involved with. All of the research discussed has examined the extent to which an employee is committed to their organisation (Mathieu & Zajac, 1990; Begley & Czajka, 1993; Donald & Siu, 2001; Schmidt, 2007 and Glazer & Kruse, 2008) however there has been no distinction between the organisation as a whole or the task the employee is required to carry out. For example, several of the teachers who participated in the current study expressed their commitment to the children. Therefore, an employee could be very much committed to their role within the organisation (e.g. teaching pupils) but not so much committed to their organisation (e.g. the head teacher). As Allen and Meyer (1990) discussed, although the three independent components of commitment develop independently, they can often be experienced in conjunction with each other. As a result, a teacher may experience affective commitment to their role as a teacher but continuance commitment to their school as an organisation.

A longitudinal replication of the study would be of interest to determine whether teachers are more stressed at certain times of the school year. Research has shown that the highest incidence of stress reported in teachers is at the end of term and at the end of the school year (Hembling & Gilliland, 1981 as cited in Travers & Cooper, 1996). Therefore, a questionnaire could be completed at several times throughout the year, such like the study of Shirom, Oliver and Stein (2009), to determine whether the stress or commitment reported differs, and more so if these findings are different between primary and secondary school teachers. This can provide valuable information for employers to not put too much pressure on their employees during certain stressful time periods.

### **Advantages**

By conducting the research in a real life working environment, the study has high ecological validity. Moreover, no role biases were created as all participants within the study were teachers, allowing a generalisation of the findings to teachers from other organisations. The ASSET questionnaire is a relatively quick and simple tool for measuring stress, health and commitment. The items measured have high reliability giving the tool good internal consistency (Faragher, Cooper & Cartwright, 2004). In addition, substituting the original commitment scale with one developed by Meyer and Allen (1997) allowed a more in-depth examination of the type of commitment an employee experiences.

### **Limitations**

Although no role biases were created, the findings can not be generalised to other occupations, where the personality types and stressors may be different. In addition, there was a bias towards female teachers and the limited sample rate overall could have affected the results meaning the study may not be representative of the population. In addition, the response rate from the teachers was not 100%, suggesting that a certain personality trait may be shown in those who chose to respond. This individual difference in responders and non-responders may have biased the results. Another type of bias which may have affected the results is that of social desirability as participants may have wished to show themselves in a positive light, perhaps by stating they were more committed or less stressed than they really felt. With the ASSET being a self-report method, the problems associated with social desirability are hard to control for. To overcome this, objective measures (such as absenteeism) or reports from employers could be used in conjunction with the ASSET to obtain findings from a different perspective. Finally, situational factors such as parental, marital or social status were not taken into consideration in the current study. These factors may have influenced the results and provided an interesting insight for new research.

### **Implications**

As discussed throughout, the findings from the current study are of value to organisations in understanding the benefits of having employees with high affective commitment. Moreover, it is an organisation's responsibility to reduce the possibility of stress in the workplace in order to reduce the risk of employees suffering from ill-health. Although this can be difficult due to the individual differences in response to stress, coping strategies could be introduced for employees to try when they feel under pressure. In relation to teacher stressors, Travers and Cooper (1996) have outlined several methods organisations can implement such as increasing the level of support teachers are given, introducing stress management workshops or improving the working conditions (such as better staff rooms). In theory these should all lead to an overall better working environment that produces less stress and may in turn increase the level of commitment an employee experiences. Although this may be the case, the recent economic climate has ultimately led to educational budget cuts (Conway, 2009) and so it would need to be determined whether spending money on inducing affective commitment is beneficial in the long term (such as reduced costs associated with absenteeism).

### **Conclusion**

The current study has provided a valuable insight in to the effect of organisational commitment on workplace stress. As shown, a high level of affective commitment can buffer the effects of workplace stress whereas a high level of continuance commitment is likely to increase the level of stress experienced. This difference could be explained by the fact that employees with affective commitment are with the organisation because they want to be whereas employees with continuance commitment are there merely because they have to be. No difference in stress reported by primary and secondary school teachers was found however it is possible that the work stressors experienced in the two school types do in fact differ (e.g. pay and benefits). In sum, different kinds of commitment have different impacts on stress, with one being beneficial and the other detrimental. An understanding of this is

beneficial for organisations and their employees in order to reduce the risk of suffering from workplace stress and its negative health consequences.

## References

- Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organisation. *Journal of Occupational Psychology*, *63*, 1-18.
- American Heart Association. (2010). *Risk factors and coronary heart disease*. Retrieved March 9, 2010 from <http://www.americanheart.org/presenter.jhtml?identifier=4726>
- Baillien, E., & De Witte, H. (2009). Why is organizational change related to workplace bullying? Role conflict and job insecurity as mediators. *Economic and Industrial Democracy*, *30*, 348-371.
- Begley, T. M., & Czajka, J. M. (1993). Panel analysis of moderating effects of commitment on job satisfaction, intent to quit, and health following organisational change. *Journal of Applied Psychology*, *78*, 552-556.
- Bowling, N. A., & Eschleman, K. J. (2010). Employee personality as a moderator of the relationships between work stressors and counterproductive work behaviour. *Journal of Occupational Health Psychology*, *15*, 91-103.
- Cartwright, S., & Cooper, C. L. (1997). *Managing workplace stress*. California: Sage Publications, Inc.
- Cartwright, S., & Cooper, C. L. (2002). *ASSET: An organisational stress screening tool – the management guide*. Manchester: RCL.
- Chen, J.-C., & Silverthorne, C. (2008). The impact of locus of control on job stress, job performance and job satisfaction in Taiwan. *Leadership and Organization Development Journal*, *29*, 572-582.
- Conway, E. (2009, July 22). Education spending to be cut by £100m despite Gordon Brown's pledge. *The Telegraph*. Retrieved March 23, 2010 from <http://www.telegraph.co.uk/education/educationnews/5889812/Education-spending-to-be-cut-by-100m-despite-Gordon-Browns-pledge.html>
- Cosgrove, J. (2000). *Breakdown: The facts about stress in teaching*. London: Routledge Falmer.
- Cranwell-Ward, J., & Abbey, A. (2005). *Organizational stress*. Hampshire, UK: Palgrave Macmillan.
- Cubriilo-Turek, M. (2006). Burnout syndrome – Assessment of a stressful job among intensive care staff. *Collegium Antropologicum*, *30*, 131-135.
- Donald, I., & Siu, O-L. (2001). Moderating the stress impact of environmental conditions: The effect of organisational commitment in Hong Kong and China. *Journal of Environmental Psychology*, *21*, 353-368.
- Edwards, J. R. (1988). The determinants and consequences of coping with stress. In C. L. Cooper & R. Payne (Eds.), *Causes, coping and consequences of stress at work* (pp. 233-263). Chichester: Wiley.
- Faragher, E. B., Cooper, C. L., & Cartwright, S. (2004). A shortened stress evaluation tool. *Stress and Health*, *20*, 189-201.
- Gaither, A. C., Kahaleh, A. A., Doucette, W. R., Mott, D. A., Pederson, C. A., & Schommer, J. C. (2008). A modified model of pharmacists' job stress: The role of organisational, extra-role and individual factors on work-related outcomes. *Research in Social and Administrative Pharmacy*, *4*, 231-243.

- Ganster, D., & Schaubroeck, J. (1991). Work stress and employee health. *Journal of Management*, *17*, 235-271.
- Glazer, S., & Kruse, B. (2008). The role of organisational commitment in occupational stress models. *International Journal of Stress Management*, *15*, 329-344.
- Health and Safety Executive. (2009a). *Stress related and psychological disorders summary*. Retrieved January 6, 2010 from <http://www.hse.gov.uk/statistics/causdis/stress/index.htm>
- Health and Safety Executive. (2009b). *Work related stress: Signs and symptoms*. Retrieved January 6, 2010 from <http://www.hse.gov.uk/stress/furtheradvice/signsandsymptoms.htm#individual>
- Jamison, C. S., Wallace, M., & Jamison, P. L. (2004). Contemporary work characteristics, stress, and ill health. *American Journal of Human Biology*, *16*, 43 – 56.
- Jepson, E., & Forrest, S. (2006). Individual contributory factors in teacher stress: The role of achievement striving and occupational commitment. *British Journal of Educational Psychology*, *76*, 183-197.
- Kim, B. P., Murrmann, S. K., & Lee, G. (2009). Moderating effects of gender and organizational level between role stress and job satisfaction among hotel employees. *International Journal of Hospitality Management*, *28*, 612-619.
- Kokkinos, C. M. (2007). Job stressors, personality and burnout in primary school teachers. *British Journal of Educational Psychology*, *77*, 229-243.
- Kubzansky, L. D., & Adler, G. K. (2010). Aldosterone: A forgotten mediator of the relationship between psychological stress and heart disease. *Neuroscience and Biobehavioral Reviews*, *34*, 80-86.
- Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, *53*, 27-35.
- Lin, Y-H., Chen, C-Y., & Lu, S-Y. (2008). Physical discomfort and psychosocial job stress among male and female operators at telecommunication call centers in Taiwan. *Applied Ergonomics*, *40*, 561–568.
- Maslach, C. (2003). *Burnout. The cost of caring*. Cambridge, MA: ISHK.
- Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, *108*, 171-194.
- McFarlane Shore, L., Wayne, S. J. (1993). Commitment and employee behaviour: Comparison of affective commitment and continuance commitment with perceived organisational support. *Journal of Applied Psychology*, *78*, 774-780.
- Melamed, S., Shirom, A., Toker, S., Berliner, S., & Shapira, I. (2006). Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions. *Psychological Bulletin*, *132*, 327-353.
- Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace. Theory, research and application*. California: Sage Publications, Inc.
- Phillips, S., Sen, D., & McNamee, R. (2007). Prevalence and causes of self-reported work-related stress in head teachers. *Occupational medicine*, *57*, 367-376.
- Schmidt, K-H. (2007). Organisational commitment: A further moderator in the relationship between work stress and strain. *International Journal of Stress Management*, *14*, 26-40.
- Shirom, A., Oliver, A., & Stein, E. (2009). Teachers' stressors and strains: A longitudinal study of their relationships. *International Journal of Stress Management*, *16*, 312-332.

- Tran, N., & Barraij, L. (2009). Contribution of specific dietary factors to CHD in US females. *Public Health Nutrition*, *13*, 154-162.
- Travers, C. J., & Cooper, C. L. (1996). *Teachers under pressure: Stress in the teaching profession*. London: Routledge.
- Tsai, F-J., Huang, W-L., & Chan, C-C. (2009). Occupational stress and burnout of lawyers. *Journal of Occupational Health*, *51*, 443-450.
- Vandenberghe, C., Bentein, K., & Stinglhamber, F. (2004). Affective commitment to the organisation, supervisor, and work group: Antecedents and outcomes. *Journal of Vocational Behavior*, *64*, 47-71.
- van Dick, R., & Wagner, U. (2001). Stress and strain in teaching: A structural equation approach. *British Journal of Educational Psychology*, *71*, 243-259.
- Virtanen, M., Singh-Manoux, A., Ferrie, J. E., Gimeno, D., Marmot, M. G., Elovainio, M., et al. (2009). Long working hours and cognitive function. *American Journal of Epidemiology*, *169*, 596-605.