

# PERFORMANCE APPRAISALS, ATTACHMENT AND PSYCHOPHYSIOLOGY

Geoffrey S. Carter<sup>1</sup>

## ABSTRACT

Attachment theory was found to explain some key aspects of love and work behaviour. Participants supplied urine samples pre and post their annual performance appraisal and allowed the researcher access to appraisal documents and psychological tests. Significant effects were found for gender, success at the performance appraisal, and time. Poor performing men and women experienced significant adrenaline activation during the appraisal. Females experienced significant cortisol activation. Attachment styles of successful men were found to be dismissing, a finding at odds with most management literature. Successful female managers were the only securely attached group, indicating gender styles in management could have neuro-chemical correlates. Issues for supervisors and organisations are also discussed.

## INTRODUCTION

Hazan and Shaver (1987; 1990) conducted the first research on the relationship between love and work, from an attachment perspective. The last line of Hazan and Shaver's (1990) influential research on love and work perhaps best links these theoretical tenets. The authors state that, 'Attachment theory offers a way of explaining why love and work are so closely intertwined' (p. 279). Taking the work on childhood attachment between children and their carers, Hazan and Shaver (1990) have examined adult patterns of interactions with their work based peers, and home based partners. They have then used this characterisation to predict work and love behaviours.

### Attachment style

Feeney, Noller and Hanrahan (1994) formulated the Attachment Style Questionnaire based on four clusters central to adult attachment.

Cluster 1: Secure. The 'confidence in self and others' style is characterized by a secure attachment style in work relationships. It is the only positive attachment style. Typified by notions of positive self-worth and a strong self-image, such individuals are secure in their personal relationships and can trust in others. Models of attachment for such individuals are typified by knowledge of reciprocal trust and care, warm work relationships, being able to depend on others, and comfort with co-workers. About 50% of workers demonstrate this style.

Cluster 2: Fearful or 'discomfort with closeness' begins the three, non-secure attachment styles. Such individuals are typified by feelings of mistrust and being wary or fearful of co-workers. Closeness and intimacy are also problematic for such individuals, who try and avoid settings where they could be hurt. Thus, fearful managers are distant and removed from workplace relationships and avoid everyday banter with co-workers.

Cluster 3: labelled Dismissing, or 'relationships as secondary', presents as the third construct in Feeney et al.'s instrument. Here, individuals place importance on achievement and

---

<sup>1</sup> Dr Geoffrey Carter ([g.carter@mailbox.gu.edu.au](mailto:g.carter@mailbox.gu.edu.au)) is from Department of Management, Griffith University, Australia.

independence as a way of guarding themselves against vulnerability. As well, individuals focus on the concrete and tangible aspects of work. The essence of this style is the dismissing of co-worker relationships in favour of achieving outcomes in terms of career, possessions and objects, and is much less threatening, and more rewarding, for these people than relationships.

Cluster 4 is that of ‘preoccupation with relationships’. Preoccupation with relationships relates to a concern that others will not reciprocate an individual’s work-based friendship. Typified by feelings of low self worth and esteem, these people are fulfilled only when they have someone to care for them at work. Unfortunately, being preoccupied with the relationship means that they continually desire reassurance and support which, in turn, often drives co-workers away. Marked by high levels of need for acceptance and continual confirmation of approval from colleagues, this group is continually seeking self-esteem in the work environment. Such needs result in a quest for approval that often drives others away, creating a need for more approval and more external validation.

The above four clusters can also be seen in Table 1.

**Table 1: Attachment Style and Performance Cluster**

		Attachment Style by Gender by Performance Cross-tabulation					
		Cluster	Gender by Performance				Total
			1	2	3	4	
			Male High	Male, Low	Female, High	Female, Low	
Attachment Style	Dismissing	Count	10	1	3	1	15
	Secure	Count	0	0	13	0	13
	Preoccupied	Count	0	10	0	0	10
	Fearful	Count	0	7	0	3	10
Total		Count	10	18	16	4	48

### Performance issues for managers

Results in this study indicate that women react in a physically different fashion to males. Thus, performance systems that are masculine, i.e. confrontational, numeric, and quantities, may have a significant negative impact on women. Second, performance appraisal systems are not one size fits all: best practice may mean that performance systems need to be more open and flexible (Tattersall & Morgan 1997). In order to account for individual differences,

performance systems may need to be 'looser' and more flexible, with less emphasis on measurement in order to foster creativity and productivity (Scatterfield & Mulenhard 1997).

In this study, female high performers exhibited calm, confident relationships at work, were happy with co-worker evaluations, and perceived as team players. Similar findings by Boswell and Boudreau (2000) tied team behaviour to satisfaction and productivity. Anecdotally, such women were often said to be the 'glue' that held the work groups together: contrast this to the high performing men who were insecure, competitive and results driven. Such men were not team players, yet they were described as giving direction, leaders of the group and operationalised the vision of the firm. So we have leaders and team players, both necessary to the firm's performance, yet males were often seen as being more valuable because of their congruence with the vision of the firm.

### **THE PRESENT STUDY**

In this study, an exploration of attachment theory and performance, as well as neurotransmitter activation, is proposed. It is expected that participants (those doing their annual performance appraisal) will react differentially according to attachment style. For example, secure participants, free from the stress of trying to satisfy unmet attachment needs, may experience lower levels of physical and psychological stress, and perform well in the appraisal. It is also predicted that insecurely attached participants trying to satisfy unmet attachment needs will suffer from elevated psychophysiological stress reactions and poor work performance.

The relationships between stress and psychophysiology have been widely researched. However, the effects of performance appraisals and physical stress appears missing from the literature. The closest situations appear to be examinations (Rauste von Wright, von Wright, & Frankenhaeuser 1981; Vassend, Halvorsen & Norman 1987); mental stress (Fibiger, Singer & Miller 1984); and harassment and competition (Glass et al. 1980). Later researchers (Henry 1993; Henry & Stephens 1979; Herbert, Moore, de la Riva & Watts 1986; Sourkes, 1985) noted two consistent predictors of physical stress—adrenaline and cortisol. These catecholamines are rapidly metabolised, quickly surge through the body, and their outputs found in urine. Simply put, the above research indicates that performance appraisals are stressful and such stress generates two primary catecholamines, adrenaline and cortisol.

Adrenaline is a neurotransmitter produced when the sympathetic-adrenal medullary system is activated (Mason 1968). Activation occurs as part of the flight or fight mechanism. Goodman and Gillman (1975) list the main effects as an increase in blood pressure, constriction of blood vessels in the skin, mucosa and kidneys, and an increase in blood flow to the skeletal muscles. Also reported is an increase in blood sugar and lactic acid. All the above effects are designed to equip the body with immediate power to resist, flee or attack.

Cortisol is a natural steroid necessary so that the body can metabolise protein, fat and carbohydrate. The corticosteroids in general, and cortisol in particular, endow the body with the capacity to resist many types of noxious stimuli and environmental change. Cortisol also has significant effects on the lipid mechanism (cholesterol production) and positive correlations exist between elevated cortisol levels and coronary heart disease (Herd 1983).

The above hormones change the way men and women experience performance appraisals. Men may see appraisals as exciting and thrilling, feelings based on the adrenaline charge arising from the interview. Women meanwhile, see the process as uncomfortable and unpleasant, based on the release of cortisol. Attachment style may then moderate an individual's reaction to stress, that is, secure attachment may ameliorate psychophysical reactions and non-secure styles promote psychophysical reactions. Although the literature is scant, Powers Pietromonaco, Gunlicks and Sayer (2006) found significant relationships between cortisol activation and attachment across the genders. However, this relationship occurred in couples in relationships, not in the workplace. The proposition outlined in this study has not been tested in the literature, and deserves to be expanded upon to support the role of attachment style as a significant variable used to explain human behaviour, and to allow supervisors to understand why staff see appraisals as so unpleasant.

The specific hypotheses are: (a) Securely attached employees will experience higher levels of performance and lower neurotransmitter activation than their non-secure counterparts; and (b) levels of performance will influence neurotransmitter activation. It is also believed gender may play a part in the relationship. Numerous studies of gender differences (Raustevon Wright, von Wright & Frankenhaeuser 1981; Collins & Frankenhaeuser 1978; Frankenhaeuser 1978) show males as being more physiologically responsive than females. The gender hypothesis can be stated as: Males should experience greater increases in neurotransmitter activation than females do. The gender and performance question can be stated as: A significant interaction between gender, performance and neurotransmitter activation should occur; its specific direction remains unclear.

## **METHOD**

### **Participants**

Fifty employees of several large companies operating in Queensland, Australia were asked to participate in the study. Of these, 28 were male and 22 female. Two participants did not wish to be included in the results, hence, the final number is 48. The participants' age ranged from 21-52 years, with a mean age of 35.2 years. Employment locations varied with some working on golf courses, others in building construction, real estate sales, and furniture construction. Almost all were office workers not engaged in manual labour. Participants had an annual average salary of \$ AUD37,456.00.

### **Procedure**

Participants were required to meet with their supervisors and discuss their performance for the previous year. About one hour prior to the meeting the experimenter met with each participant and discussed the experiment, explaining its aims and assuring the participants that any urine samples would only be used to measure the two neurotransmitters. About 5 to 10 minutes prior to the appraisal interview the experimenter returned and asked the subject to supply a urine sample in a sterile container. Participants then proceeded to their yearly performance appraisal interview. At the completion of the interview the experimenter was waiting and requested another urine sample. After the sample was collected and titrated, the participants were asked to complete three psychological questionnaires.

### **Administration of questionnaire measures**

On completion of the annual performance interview, participants were asked to complete Feeney, Noller and Hanrahan's (1994) Attachment Style Questionnaire.

### **Administration of the performance appraisal interview by the participant's work supervisor**

During the one-hour interview both the employee and supervisor jointly discussed and completed a 50-item performance review checklist (available from author) The checklist was the basis of the performance review and was later placed in the employee's personal file. Each party had the opportunity individually to complete the list prior to the interview and the actual meeting was an opportunity to discuss ratings of the employee's performance on each of the five subscales. The interview was essentially a negotiation session where the employee and supervisor could express feelings about employee performance and mutually agree upon some result.

At the completion of the appraisal, staff and supervisor discussed whether a pay rise was to be granted. Such a decision is a key element of the appraisal process. Granting a pay rise was the organisation's way of telling a staff member they were successful. It was widely used as the key indicator of who was a rising star and who was not. It attracted much criticism from those who were unsuccessful and praise from those who succeeded. In essence, it was the only true measure of success for this organisation. Argyris and Schon's (1977) espoused in-use theory of success was the best way to view this dichotomy. 'Management can espouse what they like: it's the money that counts', was the view of many of the staff.

## **RESULTS**

Results presented in this section focus on the effects of gender, performance, and time of measurement on neurotransmitter activation levels. A multivariate analysis of variance (MANOVA) was used to calculate the effects of the independent variables (gender, performance and time) on the dependent variables (rate of neurotransmitter excretion, i.e. adrenaline and cortisol). It is important to note that success is defined as obtaining a pay rise as a result of the performance appraisal and failure (non-success) occurs when the employee does not receive a pay rise. A mixed factorial analysis of variance design was utilised, with two between-group variables, gender and success, and one within-group variable, time. The four independent groups—successful males, unsuccessful males, successful females, and unsuccessful females—had sample sizes of 10, 18, 18, and 4 respectively. As noted in the Method section, measurements were taken (pre and post the performance appraisal) for the two different catecholamines, adrenaline and cortisol. The analysis was, therefore, repeated for each catecholamine.

### **The catecholamine changes**

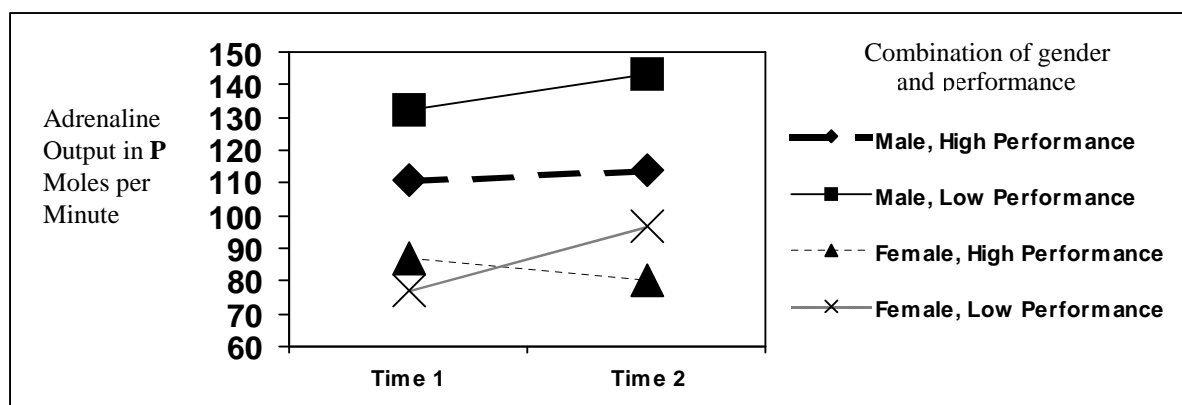
#### *Adrenaline*

The first analysis investigated the difference in adrenaline over time for the four groups, i.e. successful (High performers, gained a pay rise) and unsuccessful (Low performers, did not gain a pay rise) males and females. Table 1 shows means and standard deviations for each group. The results indicate significant main effects for each of the independent variables: gender,  $F(1,46) = 52.25, p < 0.05$ ; success,  $F(1,46) = 6.75, p < 0.05$ ; and time,  $F(1,46) = 55.07, p < 0.05$ . A significant three-way interaction between the variables was also found,  $F(1,46) = 23.86, p < 0.05$ . Table 1 shows the interaction of the means for each group over time.

Planned comparisons were performed to determine whether each group had changed significantly over time. Significant changes were found for unsuccessful (low performing) males,  $F(1,46) = 80.76, p < 0.05$ ; successful (high performing) females,  $F(1,46) = 28.44, p < 0.05$ ; and unsuccessful (low performing) females,  $F(1,46) = 52.07, p < 0.05$ . However, the mean difference for successful (high performing) males was not significant,  $F(1,46) = 3.25, p > 0.05$ .

From Figure 1 it can be seen that unsuccessful males, (i.e. those who did not get a pay rise) experienced the most adrenaline activation. They were the most anxious group pre and post the interview, as well as having the highest levels of adrenaline (both pre and post) of any group. The post interview measure shows that this group also experienced significant levels of adrenaline activation during the interview, indicating that the interview was a stressor. Successful males, however, displayed no significant differences pre and post the interview. Here, the results indicate that they experienced a less stressful reaction than their unsuccessful counterparts.

**Figure 1: Means for the excretion of adrenaline across time and gender**



Female low performers experienced a significant increase in adrenaline during the course of the interview. Here, females experienced about the same percentage increase in adrenaline activation as unsuccessful males, however, they started from a lower level.

The final group is that of high performing females. These females begin the interview feeling anxious and become calmer during the course of the appraisal, indicating that they found the interview less stressful than did any other group. Figure 1 shows high performing females having the lowest level of performance at Time 2.

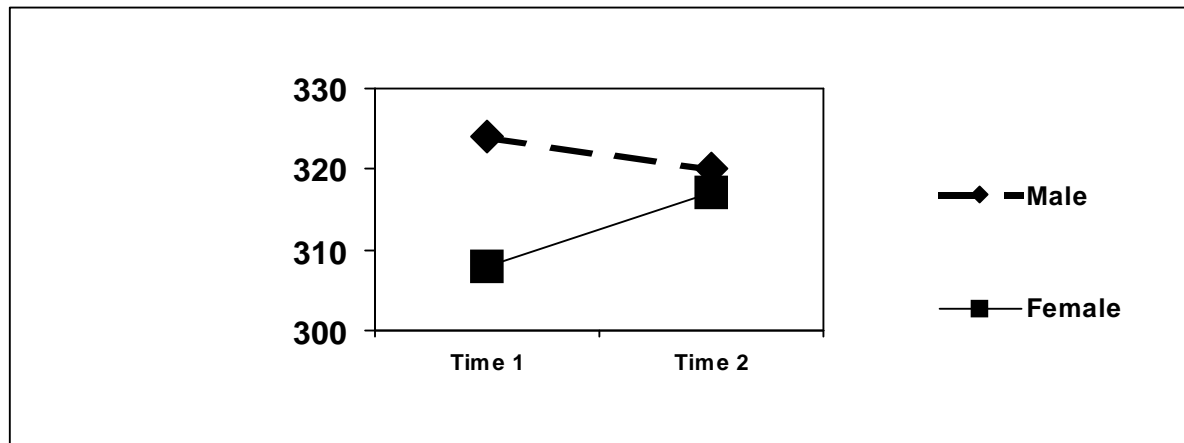
### Cortisol

No significant main effects were found for gender, success or time in this analysis. However, a significant two-way interaction between gender and time was discovered,  $F(1, 46) = 9.09, p < 0.05$ . This two way interaction is displayed in Figure 2.

Planned comparisons were undertaken to determine whether the change in cortisol levels was significant for each gender. For males, the decrease was non-significant,  $F(1,46) = 1.67, n.s.$ ; but for females the increase was significant  $F(1,46) = 5.64, p < 0.05$ . Thus, females experience

significant cortisol activation over the course of the performance appraisal, indicating that they find it a very stressful event.

**Figure 2: Gender differences for cortisol excretion**



#### *Attachment Style Cluster Analysis*

Distinct clusters of individuals were expected in accordance the original developers of the scale, Feeney, Noller and Hanrahan (1994). That is, participants in the secure cluster should show high levels of confidence and low levels of discomfort with closeness, need for approval, and preoccupation with relationships and will not view relationships as secondary. Similarly, the non secure cluster should show average to low levels of confidence, high levels of discomfort with closeness, need for approval, and preoccupation with relationships, and see relationships as being secondary.

To examine these clusters, Ward's method was used utilising the scores on the four attachment scales as the clustering variables. In Table 1, a contingency table linking the attachment style and work performance is presented. From Table 1, it can be seen that male high performers are predominantly dismissing in style and female high performers are mostly secure. Male low performers are generally fearful, as are female low performers.

## **DISCUSSION**

### **Performance review and neurotransmitters**

This study supports the hypotheses developed and is in line with the previous work performed on psychophysiological changes and performance, such as Frankenhaeuser (1978; 1980).

### **Adrenaline**

Increases occurred most dramatically in males who were rated as poor or below average performers within the organisation. Such men experienced greater stress than did high performers. At the completion of the appraisal interview, low performers have a significantly higher concentration of adrenaline in their urine than high performers. Frankenhaeuser et al. (1978), in a study of high and low performing males and females, found that females are less prone than males to respond to challenging situations by increased catecholamine outputs.

One possible explanation for the result is that males generally perceive themselves as breadwinners and are stereotypically expected to always be successful (Willinger 1982; Weise

& Freund 2005). Although there are many other measures of success, job satisfaction, complexity and a myriad of motivating factors, most individuals in this firm saw money as the ultimate accurate predictor of success. When they are not successful, that is, when they are poor performers, and do not receive a pay rise, they tend to feel threatened in terms of social role expectations and perhaps in terms of their psychologies. Such threats are responded to via increases in the 'fight or flight' hormone, adrenaline. Supervisors should note that such men find appraisal physically demanding and unpleasant. Based on these results, supervisors probably need to allow low performers to debrief, express their concerns, and talk in detail about how to improve performance and thus avoid a poor appraisal interview.

Also of interest (in Figure 1) is the equality of adrenaline outputs for high and low performers prior to the interview. Low performers increase adrenaline output post the interview; they also experience the greatest rate of increase. Interestingly, the rate of increase for low performers of both genders is almost identical. Speculation as to the similar levels of stress stemming from poor performance is inescapable. The effect of poor performance excites these differences in both genders. It is important to note, however, that high performing men experience less adrenaline activation than do their low performing counterparts. Such findings have broad support in the literature. Herbert, Moore, de la Riva and Watts (1986) noted similar increases in medical students prior to examinations; Ursin and Murison (1984), in a review of the literature on stress and catecholamine excretion, also report analogous findings.

A different pattern, however, was found for women. Table 1 indicates that while there were no significant differences between high and low performing women prior to the interview, low performers had a higher adrenaline concentration post the interview than did high performers. Such results are akin to the findings for males. It appears that for both genders low performers experience greater stress responses. However, female high performers experience a drop in stress during the course of the interview, indicating that they are perhaps experiencing a positive interaction.

Both men and women experience adrenaline activation as a result of the performance appraisal process. Supervisors need to be aware that physical changes, i.e. heart rate increase, respiration and stomach cramps are a natural outcome of such hormone changes. The explanation for these changes can be found to some degree in changes of psychological state.

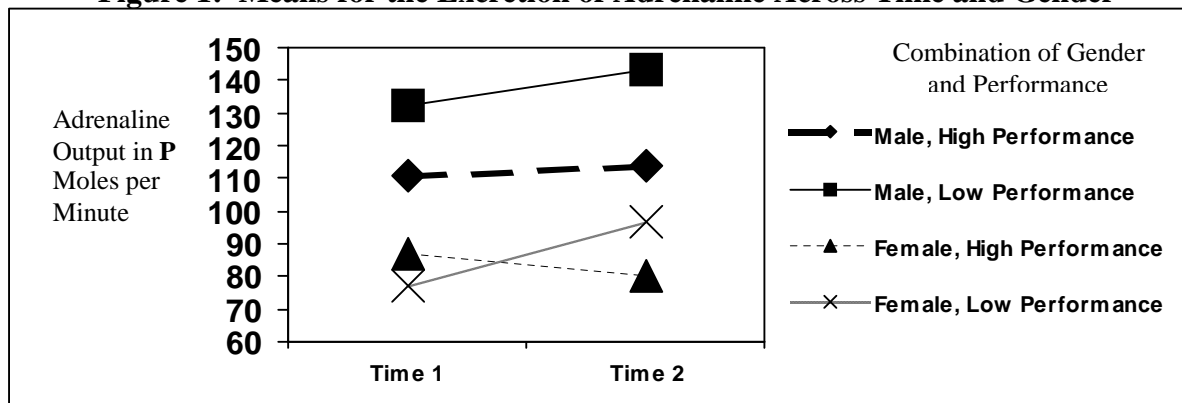
Males found appraisals to be much more physiologically stressful than females. Males seem to be much more reactive to performance measurement and, again, this has its roots in sensitivity to criticism about performance (Ursin, Bade & Levine 1978) and in poor tolerance of stress (Frankenhaeuser 1981). Women, on the other hand, seem to have more tolerance of criticism and may perceive appraisal as a part of the job, rather than a measure of the person. When the findings for performance and trait anxiety are examined this speculation gains credence. The most parsimonious view would be that men see the appraisal as a very deep and personal experience, strongly related to their personal self and personal attributes. Women seem to see appraisal as part of their job, not linked to their personal self.

In all the above, adrenaline is dependent on both gender and performance. Specific differences exist for gender, perhaps caused by the need to achieve, stereotypical behavioural expectations, and rewards or punishments offered during the appraisal.

## Cortisol

Results from this study, Figure 2 indicates that females experience a significant increase in cortisol excretion after the review. Just as adrenaline works to give the body power to resist noxious and potentially dangerous stimuli, the neurotransmitter, cortisol, works to repair the damage done when such agents are perceived to have damaged or traumatised the body in some way. Such increases, as are seen here, have been reported by Lundberg, Hasson and Magnums (1989). Investigations by these researchers examined the convergent validity of the Daily Stress Inventory and 24-hour measures of cortisol. Given that cortisol does increase with stress, it appears from this research that high performing females experience significantly less stress prior to the performance review than do their male counterparts.

**Figure 1: Means for the Excretion of Adrenaline Across Time and Gender**



However, in terms of cortisol excretion, females find the interview much more stressful than do men. Of note in Figure 2 is the level of cortisol output of females at the completion of the review. At this point it is not significantly different from males. Similar results appear in Frankenhaeuser et al. (1978) and Bullinger et al. (1984). Frankenhaeuser et al. noted that the physiological cost involved in coping with situations tends to be lower in females than in males. Such a cost may be comprised of both expectations and the reality of the situation. Here, females did not expect or anticipate increases in anxiety prior to the interview. Males did experience such anticipatory anxiety. During the interview, females received some information that caused significant rises in cortisol. Bassett, Marshall and Spillane (1984) and Odink, Weintjes, Van Deer Beek and Kramer (1987) found that cortisol increased after mental stress, and indeed stated that elevations in cortisol level often reflected distress (Odink et al. 1987).

During this review it is possible that females are experiencing a perceived loss of control. Frankenhaeuser (1979; 1981) reports that cortisol is particularly sensitive to perceptions of loss of control. Unfortunately, she is reporting on a very different subject group and thus some caution is advised. However, Vaernes, Ursin, Darragh and Lambe (1982) report that cortisol is also associated with defensive reactions. Whatever the exact correspondence between cortisol and various psychological measures, it appears that it does operate during times of distress and perhaps defensive situations (Ellersten, Johnsen & Ursin 1978).

## Performance appraisals, men and attachment

It is best to group these variables together to paint a complete picture of the findings. The clusters evolving from the performance review document shown in Table 1 are reasonably

clear. Cluster 1 consists only of males who gained a pay rise. These men were seen to be able to focus on matters pertaining to organisational success. Such high performers were seen as having objectives in line with those of the organisation, and were viewed as being potential high fliers. Supervisors noted the one distinguishing feature was their focus and dedication to the job at hand, as well as their ability to work alone.

When these males are placed in their attachment groups a more detailed picture arises. Such men are surprisingly grouped in the dismissing attachment cluster, a finding at odds with Hazan and Shaver's (1990) report that secure participants reported the highest levels of satisfaction and positive job evaluations. Yet the description of a high performer in the management literature is one of focus (Ivanavitch 1986), dedication to the job regardless of external influences (Schuler, Dowling, Smart & Huber 1992), and a willingness to undertake tasks and be measured upon successful completion of these jobs by a supervisor (Betz, Milkovich & Read 1992). Compared with Feeney, Noller and Hanrahan's (1993) description of the dismissing style, the two are remarkably similar. Feeney et al. (p. 140) state, 'These dismissing individuals emphasised achievement to the exclusion of relationships; they were reasonably confident in themselves, but uncomfortable with being close to others and somewhat concerned with the approval of others'. Clearly, this is a description of a high performer in an organisational setting—yet they are exclusively male?

Males seem to be, in this study, achievement-orientated to the exclusion of other relationships. When the detail of such a style is examined it is clear that dismissing styles, characterised by a score high on 'Relationships as Secondary' where individuals are seen as protecting themselves against hurt and vulnerability by emphasising achievement and independence (Bartholomew, 1990), is an archetypal management success strategy. Perhaps when Hazan and Shaver (1990) collected their data, prior to recessions and high unemployment, the working world was a different place. Then, secure, well adjusted participants (generally females in this study) could be successful—perhaps now only the cunning, closed and perhaps a little paranoid managers are successful.

When the clusters of items relating to successful men are examined, a consistent pattern arises. Men, achievement oriented, dismissing in their relationships and protecting themselves against hurt, clustered around a strong identification with the mission and objectives of the firm. They had a high level of job knowledge, which was demonstrated and imparted to subordinates with an ability to accomplish tasks easily. Again, the tendency to identify with the top of the hierarchy and task accomplishment is the rule in these employees.

Such managers develop employees with similar value sets. Empowering subordinates, giving them more decision-making power and greater freedom in their work, being controlled and monitored by managers is a less important element in the success of these managers. However, subordinates are empowered after they demonstrate goal congruence and loyalty (Boggs, Carr, Fletcher & Clarke 2006). Empowerment is an essential part of these successful managers' skill set, however, subordinates need to demonstrate loyalty and show they are not a threat to the managers' powerbase. Researchers (e.g. Coote & Ackfelt 2004) have linked empowerment to goal congruence in similar settings and it forms an important part of a managerial success strategy. Contrasted with these men are the behaviours of their unsuccessful colleagues.

The unsuccessful men, cluster 2, found with their unsuccessful female counterparts, cluster 4, are also interesting. Here, with one exception, we find no unsuccessful males being secure, 10 are preoccupied and 7 are fearful.

Preoccupied, unsuccessful males are perhaps easier to understand. They worry a lot about their relationships and whether others approve of them, they emphasise the importance of relationships and tend to lack confidence in themselves and others. Fearful low performers are similar—they lack confidence in themselves and others, are worried about relationships, and need the approval of others. Items in their performance appraisals support such a view. Here we find individuals who do not have the skills or understanding of the administration of the firm. Although they are competent, they are also seen as somewhat inept and need some training to reach their potential.

### **Performance appraisals, men, attachment and neurotransmitters**

Successful men, as described above, appear confident in a physiological manner in the experiment. They do not experience much adrenaline activation and it is lower than in their unsuccessful counterparts. Again, this indicates that successful men are more stressed than both groups of women, but less stressed than their unsuccessful brothers. Such a finding is supported by the literature (Bassett Marshall & Spillane 1987; Henry 1993).

Unsuccessful men do, however, experience the most physical excitement pre and post the performance appraisal, their fearful and preoccupied attachment styles perhaps generating anxiety which is turned into adrenaline. Both catecholamines are highest in unsuccessful men. These men, lacking in confidence, uncomfortable about closeness to work colleagues and others, and worried about these relationships, are understandably concerned about their performance appraisals. Here, all such matters are discussed, and they are found wanting. Attachment theory has described in detail the organisational poor performer, and gives insight into why such men are poor performers.

Cortisol is the least distinct result. Henry's (1993) review of the literature noted that cortisol is a reflection of a perception of hopelessness and loss of control. It may be that men, apprehensive about control prior to the interview, somehow feel in control at the end of the process. Unfortunately this is confusing, as a difference between unsuccessful and successful men should have been found. Clearly, larger sample sizes are needed in this research.

### **Performance appraisals, women and attachment**

A completely different picture occurs for women and attachment. Female high performers, cluster 3, are almost all secure ( $n=13$ ), with three dismissing personalities in the high performance column. Such a finding is in line with Hazan and Shaver's (1990) study. When the definition of secure attachment is reviewed we see participants with high self-esteem, confident in their relationships, happy to be close to others, and viewing relationships as important without being obsessed by them. Female high performers seem able to balance the issues of relationships and confidence in them without being dominated by the desire for work success, as their male counterparts are. As Hazan and Shaver (1990) noted, these respondents feel that they are good workers, confident in their co-workers' evaluations of them, and keen to learn on the job. Confidence and security are lacking in the high performing males, yet abundant in their female counterparts.

Low performing women were few in the experiment ( $n=4$ ). They are almost all located in the fearful ( $n=3$ ) and dismissing styles. It is difficult to draw any distinct conclusions from such a small sample size, although the small number of such low performers does indicate that women are seen as being very successful members of the organisation.

### **Performance appraisals, women, attachment and neurotransmitters**

High performing women experienced a significant drop in adrenaline activation over the course of the interview. In this group we see the only participants who did not find the interview a physically exciting experience. Again, this indicates a much calmer, stable view of what will, and does, happen in the review. Such women, with their calm stable view of relationships and themselves, do not anticipate a negative reaction as do their male counterparts. They seem to view the appraisal as job related, rather than a personal review of their performance. Confident that they will get what they deserve in terms of pay they did not suffer excitement in the way that others did.

Contrast this with the unsuccessful females who experience a significant rise in adrenaline activation, with a rise with the same slope as that of their unsuccessful male counterparts. Speculation that these groups are experiencing the same grade of anxiety during the course of the interview is inescapable. Unfortunately, there seems to be no way to test such a hypothesis using the data from this study. Clearly, with such a small sample, the results must be viewed with some caution.

The literature is unclear as to the relationship between cortisol and psychological variables. It does seem that cortisol is linked to control (Henry 1993), in particular a threat to control. It may be that cortisol, elevated by anxiety, does rise for women because of some perceived uncertainty and ambiguity of the situation. Henry's (1993) view of the literature notes that cortisol rises as a result of increasing helplessness and loss of control. Speculation is that as the performance review progresses, there is a growing awareness that some 'unspoken game' is in progress. That is, the issue of a pay rise given, albeit begrudgingly. Such a feeling was anecdotal reported and may be a future research option.

### **CONCLUSIONS, IMPLICATIONS AND LIMITATIONS OF THE STUDY**

Successful women and men were found to have very different attachment styles. Men, with a dismissing style, lacking in confidence and unsure of relationships, saw their organisational success as being tied to identification with the mission and purpose of the firm. Perhaps this strong relationship with the mission of the firm compensated for a lack of 'relationship' with their work colleagues. They were physiologically and psychologically tense and experienced a higher level of adrenaline activation pre and post the performance appraisal than successful women did. Supervisors working with such men reported that they were easy to manage, focused on objectives and had a clear drive to succeed. Also noted was an avoidance of interaction with co-workers and discomfort with sharing jobs or data. Although such autocratic men scored well, they did not manage their teams very successfully; rather, they led from the front with little or no consultation.

Successful women were secure in their work, confident, and viewed relationships with others as important, but not something to be obsessed about. Although there was a relationship between the appraisal and state anxiety, there was not a significant correlation between anxiety and adrenaline activation. Such women were rewarded, but with some interesting

reservations. They did not get the unqualified approbation of the males, essentially because they did not seem willing to make the mission and purpose of the firm the top priority in their lives. It seemed that balance between the job, and perhaps home, was a key factor for these women. Rises in cortisol, and its interesting relationship with loss of control and helplessness, indicates that something aversive went on in successful women's performance appraisals. Successful women also had their weaknesses according to supervisors. They did not take charge often enough, tended to talk and consult too much, and needed to make more tough minded decisions. In many ways it seems that the successful women needed to be more like the men, and the men more like the women.

Unsuccessful men, preoccupied and fearful in their attachment styles, lacking in confidence, uncomfortable with others and worried about these relationships found performance reviews a physically frightening event. With the highest levels of anticipatory anxiety, they were experiencing physical symptoms of sweating and heart palpitations. Again, this was anecdotally confirmed. During the course of the interview their fears were realised and the discussion on their lack of skills, ability and ineptness increased their anxiety.

Unsuccessful women, small in number, paralleled males to a large degree. They experienced the same gradient in adrenaline activation, felt the same embarrassment when their shortcomings were discussed and sensed a loss of control and, perhaps, helplessness.

The above indicate that attachment is a construct which explains a great deal in terms of how people work and are rewarded. When viewed with performance appraisals it does indicate that attachment explains a great deal about behaviour. Supervisors and managers need to keep these physical changes in mind. Often unsuccessful employees will not hear much about their poor performance because the physical changes they are experiencing block out communication during the interview. Supervisors need to keep such facts in mind and perhaps wait a day or so to begin the performance improvement process. Performance appraisals are a real physical trauma to men and women in modern organisations and managers need to consider the physical side of performance appraisals, as well as the organisational requirements.

As with many physiological studies, there is the small sample size to be taken into consideration. Urine assays are expensive and invasive and such issues reduce participation. Finally participants in this study were fairly low in the management level, and this may mean their tasks are routine and unchallenging and although the literature has not explored such a relationship, it may influence attachment style.

## REFERENCES

Arnetz, BB 1985, 'Stress and psoriasis: Psychoendocrine and metabolic reactions in psoriatic patients during standardised stressor exposure', *Psychosomatic Medicine*, 47, 6, 528-538.

Bartholomew, K 1990, 'Avoidance of intimacy: An attachment perspective', *Journal of Social and Personal Relationships*, 7, 147-178.

Bassett, G, Marshall, GM & Spillane, R 1987, 'The physiological measurement of acute stress (public speaking) in bank employees', *International-Journal-of-Psychophysiology*, 5(4): 265-273.

- 
- Boggs, L, Carr, SC, Fletcher, RB & Clarke, DE 2005, 'Pseudoparticipation in Communication Networks: The Social Psychology of Broken Promises', *Journal of Social Psychology*, 145, 5; 62
- Boswell, WR & Boudreau, JW 2000, 'Employee satisfaction with performance appraisal and appraisers', *Human Resource Development Quarterly*, 11 (3); 283-299.
- Brenadin, HJ & Beatty, RW 1984, *Performance Appraisal: Assessing Human Behaviour at Work*, PWS-Kent, California.
- Bretz, RD, Milkovich, GT & Read, W 1992, 'The current state of performance appraisal research and practice', *Journal of Management*, 18, 2, 321-352.
- Bullinger, M, Naber, D, Pickar, D, Cohen, R, Kalin, NH, Pert, A & Bunney, E 1984, 'Endocrine effects of cold pressor test: Relationships to subjective pain appraisal and coping', *Psychiatry Research*, 12, 227-233.
- Coote, L V, Price, E, Ackfeldt, A (2004), 'An investigation into the antecedents of goal congruence in retail-service settings', *The Journal of Services Marketing* 18, 6/7.
- Collins, A & Frankenhaeuser, M 1978, 'Interaction of sex related psychological qualities and psychophysical stress responses', Report from the Department of Psychology, University of Stockholm.
- Collins, A & Frankenhaeuser, M 1978, 'Stress responses in male and female engineering students', *Journal of Human Stress*, 4, 43-48.
- Coopersmith, S 1987, *Self-esteem Inventories*, Consulting Psychologists Press, Palo Alto Calif.
- Ellertsen, B, Johnson, TB & Ursin, H 1978, Relationship between the hormonal responses to activation and coping, Academic Press, New York.
- Feeney, JA 1994, 'Attachment styles communication patterns and satisfaction across the life cycle of marriage', *Personal Relationships*, 1, 333-348.
- Feeney, JA 1996, 'Attachment caregiving and marital satisfaction', *Personal Relationships*, 3, 401-416.
- Feeney, JA 1990, 'The Attachment Perspective on Adult Romantic Relationships', unpublished PhD Dissertation, University of Queensland, Department of Psychology.
- Feeney, JA 1995, 'Adult attachment and emotional control', *Personal Relationships*, 2, 143-159.
- Feeney, JA & Noller, P 1990, 'Attachment style as a predictor of adult romantic relationships', *Journal of Personality and Social Psychology*, 58, 281-291.
-

---

Feeney, JA, Noller, P & Hanrahan, M 1994, 'Assessing Adult Attachment', in MB Sperling & WH Berhman, *Attachment in Adults: Clinical and Developmental Perspectives*, Guilford Press, N.Y.

Feeney, JA, Noller, P & Roberts, N 1998, 'Emotion attachment and satisfaction in close relationships', *Handbook of Communication and Emotion: Research Theory Applications and Contexts*, Academic Press, N.Y.

Fibiger, W & Singer, G 1984, 'Physiological changes during physical and psychological stress', *Australian Journal of Psychology*, 36, 317-326.

Fibiger, W, Singer, G & Miller, AJ 1984, 'Relationships between catecholamines in urine and physical and mental effort', *International Journal of Psychophysiology*, 1, 325-333.

Frankenhaeuser, M 1978, 'Psychoneuroendocrine approaches to the study of emotion as related to stress and coping', *Nebraska-Symposium-on-Motivation*, 26, 123-161.

Frankenhaeuser, M 1981, 'Coping with stress at work', *International Journal of Health Sciences*, 11, 491-510.

Frankenhaeuser, M, Lundberg, U & Forsman, L 1980, 'Dissociation between sympathetic-adrenal and pituitary-adrenal responses to an achievement situation characterized by high controllability: Comparison between type A and type B males and females', *Biological Psychology*, 10, 79-91.

Glass, DC, Krakoff, LR, Contrada, R, Hilton, WF, Kehoe, K, Manucci, EG, Collins, C, Snow, B & Elting, E 1980, 'Effect of Harassment and Competition upon cardiovascular and plasma catecholmine responses in type A and type B individuals', *Psychophysiology*, 17, 453-463.

Goodman, LS & Gilman, A 1975, *The pharmacological basis of therapeutics*, (5th edn), Macmillan Publishing, New York.

Hazan, C & Shaver, P 1987, 'Romantic love conceptualized as an attachment process', *Journal of Personality and Social Psychology*, 52, 511-524.

Hazan, C & Shaver, P 1990, 'Love and Work: An attachment theoretical perspective', *Journal of Personality and Social Psychology*, 59, 270-280.

Hazan, C & Shaver, P 1994, 'Attachment as an organisational framework for research on close relationships', *Psychological Inquiry*, 5, 1-22.

Henry, JP 1990, 'Stress Neuroendocrine Patterns and Emotional Response', in J Noshpitz & D Codd (eds), *Stressors and the Adjustment Disorders*, Wiley, New York.

Henry, JP 1993, 'Biological basis of the stress response', *Integrative Physiological and Behavioural Science Journal*, 27 (1), 66-83.

---

Henry, JP 1993, 'Biological basis of the stress response', *Integrative Physiological and Behavioural Science Journal*, 27 (1), 66-83.

Henry, JP & Stephens, PM 1979, *Stress, Health and the Social Environment*, Springer-Verlag, New York.

Herbert, J, Moore, GF, de la Riva, C & Watts, FN 1986, 'Endocrine responses to examination anxiety', *Biological Psychology*, 22, 215-216.

Herd, JA 1983, 'Psychological basis for behavioral influences in atherosclerosis', in TM Dembroski, TH Schmidt & G Blumchen (eds.), *Biobehavioural bases for coronary heart disease*, Basel:Karger Press.

Ivancevich, JM 1986, *Managing for performance: an introduction to the process of managing*, Plano, Business Publications, Texas.

Lundberg, U, Hasson, T & Magnusson, M 1989, 'Psychological and physiological stress responses during repetitive work at an assembly line', *Work-and-Stress*, 3(2), 143-153.

Mason, JW 1968, 'A review of psychoendocrine research on the pituitary-adrenal cortical system', *Psychosomatic-Medicine*, 30 (5, Pt. 2), 576-607.

Mason, JW 1968, 'A review of psychoendocrine research on the pituitary-adrenal cortical system', *Psychosomatic-Medicine*, 30 (5, Pt. 2), 576-607.

Mason, JW 1968, 'A review of psychoendocrine research on the pituitary-adrenal cortical system', *Psychosomatic-Medicine*, 30 (5, Pt. 2), 576-607.

Moyer, PT, Jaing, NS, Tyce, GM & Sheps, SG 1979, 'HPLC: Detection of Urinary Catecholamines'. *Clinical Chemistry*, 25, 256-263.

Odink, J, Weintjes, CJ, Thissen, JT & Van Der Beek, EJ 1987, 'Type A Behaviour, borderline hyperventilation and psychological, psychosomatic and neuroendocrine responses to mental task load', *Biological Psychology*, 25, 2, 107-118.

Powers, S I, Pietromonaco, P. R, Gunlicks, M, Sayer, A 2006, 'Dating Couples' Attachment Styles and Patterns of Cortisol Reactivity and Recovery in Response to Relationship Conflict', *Journal of Personality and Social Psychology*, 90,4.104-119

Rauste-von Wright, M, Von Wright, J & Frankenhaeuser, M 1981, 'Relationships between sex related psychological characteristics during adolescence and catecholamine excretion during achievement stress', *Psychophysiology*, 18, 362-370.

Scatterfield, AT & Muehlenhard, CL 1997, 'Shaken confidence: The effects of an authority figure's flirtatiousness on women's and men's self-rated creativity', *Psychology of Women Quarterly*, Sept, Vol 21(3), 395-416.

---

Struthers, CW, Weiner, B & Allred, K 1998, 'Effects of causal attributions on personnel decisions: A social motivation perspective', *Basic and Applied Social Psychology*, June, Vol 20(2), 155-166.

Schuler, RS, Dowling, PJ, Smart, JP & Huber, VL 1992, *Human Resource Management in Australia*, Harper Educational, Sydney.

Sources, TL 1985, 'Neurotransmitters and central regulation of adrenal functions', *Biological-Psychiatry*, 20 (2), 182-191.

Sperling, MB, Foelsch, P & Grace, C 1996, 'Measuring adult attachment: Are self-report instruments congruent', *Journal of Personality Assessment*, 67, 1, 37-51.

Spielberger, CD 1983, *Test Anxiety Inventory*, Consulting Psychologists Press, California.

Stein, H, Jacobs, NJ, Ferguson, KS, Allen, JG & Fonagy, P 1998, 'What do adult attachment scales measure?', *Bulletin of the Menniger Clinic*, 62 (1), 62-81.

Tattersall, AJ & Morgan, CA 1997, 'Engineering psychology and cognitive ergonomics', in D Harris (ed), Vol.2, Ashgate Publishing, Burlington, VT, pp. 247-255.

Ursin, H & Murison, RCC 1984, 'Classification and description of stress', in GM Brown (ed.), *Neuroendocrinology and Psychiatric disorder*, Raven Press, New York.

Vaernes, R, Ursin, H, Darragh, A & Lambe, R 1982, 'Endocrine response patterns and psychological correlates', *Journal of Psychosomatic Research*, 26, 2, 123-131.

Vassend, O, Halvorsen, R & Norman, N 1987, 'Hormonal and psychological effects of examination stress', *Scandinavian Journal of Psychology*, 28, 75-82..

Wiese, B S, Freund, A. M. 2005, 'Goal progress makes one happy, or does it? Longitudinal finds from the work domain' *Journal of Occupational and Organizational Psychology*, 78,2, p.287

Willinger, B.A. 1982, 'An analysis of college men's attitudes toward the male role and toward sex-role equality' *Tulane University Monograph*.