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# **An Investigation into the Psychological Factors Related to Occupational Overuse Syndrome.**

A thesis presented in partial  
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## ABSTRACT

The present study investigated the psychological factors that relate to Occupational Overuse Syndrome (OOS). The specific focus of this study was the work related behaviours associated with OOS. OOS is a condition in which sufferers experience pain in the neck, shoulders and/or upper limbs, and is often work related. Previous research in this area has found a relationship between OOS symptoms and work related behaviours encompassed by the Type A Behaviour Pattern. The current study was designed to increase knowledge in this area.

A total of 575 respondents completed a questionnaire designed to measure OOS, Type A Behaviour, and Quality of Working Life. Correlations between the main variables of OOS and Type A Behaviours found a consistent relationship between the syndrome variables and the Speed and Impatience behaviour sub scale. Strong intercorrelations were also found within the OOS variables and the Type A variables. One way analysis of variances determined that there were a range of confounds between main and demographic variables. To control for the effects of the confounds multiple regression analysis was used. The percentage of OOS explained by the Type A variables was small but significant.

The implications of the above relationships were discussed. The Speed and Impatience behaviour type can be seen as a positive employee characteristic and therefore should be further investigated in order to control for its maladaptive aspects.

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## CHAPTER ONE

### INTRODUCTION

#### *Occupational Overuse Syndrome*

In the standard medical model, Repetitive Strain Injury (RSI) is described as the condition by which large numbers of people suffer injuries to the neck, shoulders and/or upper limbs. These injuries are caused by certain activities, which are often work related (Bammer & Martin, 1988). In practice the injuries are thought to be caused by a number of factors, but the three main ones are rapid repetitive movements such as those used by keyboard operators, less frequent more forceful movements, and static load (Stone, 1983). The main people involved in formulating the standard medical view are Browne, Nolan, and Faithful, (1984); Ferguson, (1984); Fry, (1985 & 1986); and Stone, (1984).

It should be noted that most supporters of the medical model have replaced the phrase Repetitive Strain Injury with the term Occupational Overuse Syndrome (OOS) to describe the above phenomenon. This is because repetition is not the only factor thought to cause these injuries, and static load can be the most important factor in many cases (Stone, 1983). Further, the standard view emphasises work-related injuries as being the most common (Stone, 1983), but also recognises that injuries can be caused or aggravated by recreational activities (Browne, Nolan & Faithful, 1984; Ferguson, 1984).

Specifically, the physical symptoms of OOS includes pain, tenderness, fatigue, sudden and unexpected loss of grip, loss of strength and stamina, incoordination and loss of agility (Fry, 1986; Fry, 1985; Stone, 1984). Depression is also common. When the individual avoids the pain inducing activity the depression usually deepens before it lifts (Fry, 1985).

Another dimension to the physical nature of OOS is outlined by Ferguson (1984) who states that the problems often shift in nature from one part of the body to another. This occurs when the affected workers try to compensate for the pain, or as the nature of the work changes. He also maintains that problems in diagnosis occur because repetitive tasks often have more than one component requiring the action of several muscle groups, so that two or more structures may be overloaded, which results in the pain experienced being broadened over a wider area (Ferguson, 1984).

The major weakness with the standard medical explanations of OOS lies in their inability to answer the following question : given similar working conditions, why do some individuals develop OOS while others do not? (Mullaly & Grigg, 1988). The answer to this fundamental question may be provided by exploring the psychological factors related to OOS.

### *Psychological Aspects of OOS*

Research suggests that there is a relationship between psychological factors and OOS. For example, Bammer and Martin (1988); Browne (1985); and Fry (1986) have found that people who have developed OOS are generally highly motivated and have strong work ethics. Wigley (1990) states that perfectionist, competitive types of work related behaviours are the factors that produce individual susceptibility to OOS. OOS sufferers are not lazy, but their relaxation time is too brief. They are also highly conscientious, and often "supernormal performers" (Wigley, 1991, p.g.3). OOS sufferers also tend to delay reporting for a variety of reasons, including fear of retaliatory action by supervisors; or through ignorance of symptoms, economic problems, the attitudes of supervisors and language barriers (Browne et al, 1984), and because of fear of dismissal (Wigley, 1991). Browne (1985) and Wigley (1991) suggest that OOS sufferers are often their own worst enemy as they tend to deny the existence of OOS symptoms and work on regardless, in the hope that the problem will disappear. Further, Wigley (1991) states that they are distressed in their inability to work, so they return to the work setting

prematurely. This often results in a recurrence of the symptoms.

It has also been suggested that social pressure is causing a reduction in the reporting of OOS symptoms (Faithful, Job, Brecht, & Fleming, 1988). Faithful et al. (1988) reported that their patients wanted to avoid being labelled as having OOS as they feared being judged as lazy or as having a psychological disorder. Further, Faithful et al. (1988) state that psychological interventions should not be avoided because of the above stigma as they are achieving 'good results' in this area. One such psychological intervention that Faithful et al. (1988) use are pain-management techniques.

The Task Force Report (1985) has associated OOS with the social context of work (e.g., supervisor's style and power relations), attitudes to the job, and stress responses to work. Similar findings are documented in the research literature. Smith, Cohen, & Stammerjohn, (1981) found that visual, musculoskeletal, and emotional health problems in clerical visual display terminal operators were related to high levels of self-reported stress from workload, work pace, lack of control over job activities, boredom, and concerns about career.

There is also a considerable amount of evidence in the literature that suggests OOS is also associated with aspects of the broader, psychosocial environment in which the work takes place. According to the National Occupational Health and Safety Commission (NOHSC) psychosocial factors include :

"the lack of autonomy at work, increased work pressure, difficulties with interpersonal relations at work, depression, as well as complaints about the physical work environment and pain and stiffness at work" (National Occupational Health and Safety Commission, 1986, p.g. 5).

The factor of increased work pressure is strongly supported by Wigley (1990) who states that people who seem to have coped for years may develop severe symptoms following

a sudden increase in workload. Psychosocial factors described by other studies include low peer cohesion, a frequent need to push oneself, and boredom. These studies suggest that these factors increase muscle tension and therefore the likelihood of an OOS related injury (Meyer, 1987; Ryan, Hage, & Bampton, 1987). Also, researchers have found that support from fellow workers and bosses is relevant to understanding why some individuals and not others suffer from OOS (Ryan & Bampton, 1988).

Conceptually Spillane and Deves (1988) conclude that

"it is more productive to view OOS as encompassing several quite different behavioural patterns founded on the experience (intrapersonal) and communication (interpersonal) of pain in an occupational setting. For example, it can be argued that occupational pain (frequently attributed to biochemical inefficiencies) is an inexorable human condition, but the observed differences in reporting pain are contingent upon the influence of psychosocial factors"(p.g. 26).

The implication of these findings is that OOS cannot be understood exclusively as a medical condition that is caused by bio-mechanical factors. As such, Wigley (1990) believes that a measurement needs to be developed to help identify individuals that have the work related behaviours that may increase individual susceptibility to OOS.

The Diagnostic and Statistical Manual of Mental Disorders (DSM III) records a classification of 'Psychological Factors Affecting Physical Condition' (formerly called psychosomatic disorder) in which psychological factors contribute to the initiation or intensification of a physical condition for which the pathophysiological process is known. It is necessary to note here that according to Hadler (1984) a causal link between patterns of usage and tissue disorders has not been established. Listed under this classification along with such well accepted disorders as migraine headache, angina pectoris, rheumatoid arthritis, asthma, and gastric and duodenal ulcers, is sacroiliac pain, a musculoskeletal disorder. Rosenman and Seligman (1989) have claimed that the

skeletalmusculature is a site for psychosomatic disorder. They described the diathesis-stress model in which it is proposed that an individual develops psychosomatic illness when he or she has both physical vulnerability (diathesis) and psychological disturbance (stress).

As musculoskeletal disorders are included in the Psychological Factors Affecting Physical Disorder classification, and the relationship between stress and OOS is supported in the literature (Mullaly & Grigg, 1988), the possibility of OOS as a psychosomatic disorder cannot be discounted. Just as spicy food, alcohol, and aspirin set up physiological conditions conducive to ulcers (Rosenham & Seligman, 1989), ergonomic factors may set up the conditions for musculoskeletal fatigue and pain (Mullaly & Grigg, 1988). Melzack and Dennis ,(1978), see OOS related pain as a

"complex perceptual and affective experience, determined by the unique past history of the individual, by the meaning of the stimulus to him (sic), by his (sic) 'state of mind' at the moment, as well as by the sensory nerve patterns evoked by physical stimulation" , (p.2).

In other words, OOS related pain can be considered to be a result of the combination of three factors, the individual's physiological condition, the physical work environment, for example, the ergonomics of the work station, and the psychological predisposition of the individual, for example, their reaction to stress. The amount each factor contributes will vary in each case.

Hopkins (1990) discusses occupational stress in some detail in order to explain how its origins are related to psychological predisposition. According to Cox (1987), occupational stress is located in the interaction between the individual and their environment and stems from a discrepancy between job demands and the individual's ability to cope with them. Thus, he writes "the absolute level of demand is ... not the most important factor in determining the experience of stress at work"(p.6). This position is explained further in the following passage, "Stress is not a dimension of the physical or psychosocial environment. It cannot be defined simply in terms of workload

or the occurrence of events determined by consensus to be stressful"(p.6). In other words OOS cannot be simply explained in terms of work environment as individual susceptibility to OOS is also a function of psychological make-up.

The implications for preventative strategies are also important. To ignore the psychosocial factors by adopting "preventative strategies based solely on the bio-mechanical approach and in particular the disease model" (National Occupational Health and Safety Commission, 1985, p.g.42) exposes work reformers to the limitations of these models. The danger for organisations that follow only the bio-mechanical approach is spending large sums of money on work stations and equipment only to find that the problem remains.

An example of this can be documented by the initial response of the Australian Public Service to OOS, who assumed that physical factors were solely responsible. The result was the widespread introduction of ergonomically designed furniture, copy holders, improved keyboards and so on. While OOS rates fell by 25% from March 1986 following these changes (Ellis, 1988) they were not the overall answer to the OOS problem. This finding is understandable considering Hadler's (1984) theory that a causal link between patterns of usage and soft tissue disorders labelled as OOS has not been established (as mentioned earlier).

Hopkins (1990) conducted a study to determine why there was a variability in the reporting of OOS in the Australian Public Service. An explanation by Lucire (1988), argued that OOS is not an injury at all, but a form of epidemic hysteria, in which psychological conflict is subconsciously 'converted' into pain symptoms.

Lucire (1988) believes that the particular location of the reported pain is determined by the social circumstances, or, essentially by what is the 'fashionable' area at the time. Thus, a workplace where some cases of OOS have already been reported is likely to experience many new cases. These cases are triggered by earlier reports. Lucire (1988) believes this explains why there is a concentration of reports in particular areas. Lucire (1988) also believes that treatment for this condition is undermined by well meaning

lawyers, union officials, and medical practitioners who "reinforce in the patient the belief that they have been injured and discourage exploration of self and motivation to overcome disability" (p.g. 150). The hysterical conversion thesis has since been effectively discredited in critiques by Wigley (1990); Russell (1988); and Mullaly and Grigg (1988). Wigley (1991, note 1) states "this (OOS) is not a psychological disease, neurosis or hysteria, but an overextension of the whole system"(p.g.1). In other words, OOS is not just a physical problem, nor is its cause solely psychological. OOS occurs when both mind and body interact together under the appropriate environmental stimulus.

### *Typical OOS Sufferer's Profile*

The following is a 'picture' of the typical OOS sufferer provided by the Occupational Safety and Health (OSH) unit of the New Zealand Department of Labour, which uses psychological behavioural patterns to explain individual susceptibility.

"The typical patient arrives on time, dresses well and delivers a concise history. If not interrupted by someone who has already made up his (sic) mind, initial aggression melts. Pain may precede reporting of symptoms by weeks or years. Exacerbation follows a heavier workload, overtime or the arrival of a dominating supervisor or the introduction of production bonuses. Being competitive by nature she (sic) responds with increased effort, missing tea breaks and missing lunch by the keyboard. She (sic) is usually one of the fastest in the group. Additional domestic work may contribute : moving house, knitting or playing a musical instrument enthusiastically. Contrary to many reports in the literature, there was, in almost all cases, a strong desire to return to work. Most accepted that they were competitive perfectionists or worriers. They were high achievers, but poor relaxers" (p.g. 16, 1992).

The OSH describes these individuals as being valuable employees. Further, it can be seen from the OSH profile, that OOS sufferers exhibit work behaviour's that are

encompassed by a psychological measurement known as the Type A Behaviour Pattern. Therefore, the possibility that this measurement may be a useful tool in exploring the psychological basis of OOS cannot be discounted. To this end, chapter two of the current thesis describes the Type A Behaviour Pattern in more detail.

## CHAPTER TWO

### THE TYPE A BEHAVIOUR PATTERN

The Type A behaviour pattern (or TABP) has its foundations in Friedman and Rosenmans's (1974) behavioural observations of their cardiac patients in the 1950s. As the traditional risk factors for heart disease (e.g. hypertension and smoking) were only able to predict half of the new cases, they turned their attention to the observation of the group of behaviours that was named the Type A behaviour pattern.

The Type A behaviour pattern is a collection of behaviours and emotional expressions that is predictive of coronary heart disease (CHD) (Cooper, Detre, & Weiss, 1981; Dembroski, Weiss, Shields, Janes, & Feinleib, 1978; and Haynes, & Matthews, 1988). The incidence of heart disease varies across cultures, across time periods (being mostly confined to the 20th century), and among subgroups of individuals within a given population (Friedman, Hall, & Harris, 1985). Type A behaviour as a risk factor in heart disease has been firmly established (Matthews, 1982). She defines a risk factor as being a set of attributes exhibited by persons who are likely to be diagnosed later with specific illness. (Matthews, 1982). Friedman et al. (1985) reason that because high risk people and cultures share certain psychological attributes, the stronger statement can be made that Type A behaviour plays a causal role in the development of CHD. Most Type A people however, do not develop heart disease, and the nature of any causal link is not clear.

Friedman and Rosenman (1974) defined the Type A behaviour pattern as:

"an action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or other persons" (p.g. 67).

The overt manifestations of this struggle include explosive, accelerated speech; a

heightened pace of living; impatience with slowness; concentrating on more than one activity at a time; self-preoccupation; dissatisfaction with life; valuation of the worthiness of ones activities in terms of numbers; a tendency to challenge and compete with others even in non-competitive situations; and a free-floating hostility (Matthews, 1982). Type A individuals tend to be guarded, alert, and intense, with rapid and jerky body movements, and have tense face and body muscles (Powell, 1987).

In specific terms, Type A behaviour is characterised by the combination of extremes of aggressiveness, highly competitive achievement striving (Matthews, 1982), a sense of time urgency, and excessive hostility in response to frustration (Chusmir & Hood, 1986). Other behaviours characteristic of Type A include a desire to be helpful and to control (Glass, 1977), restlessness, hyper-alertness, and aggressiveness (Zyzanski & Jenkins, 1970). In contrast, Type B behaviour is the opposite action-emotion tendencies.

Further, Chusmir and Hood's (1986) study found that Type A persons were characterised by high levels of power, achievement, and job commitment; they expressed low degrees of job satisfaction and tended to be younger and occupied high ranking positions in profit making organisations.

Powell (1987) states that as there is a current divergence in the usage of Type A related terms, such as Type A Behaviour, Type A Behaviour Pattern, and Type A Personality. Thus a conceptual confusion exists as to what Type A actually is. The most favoured Type A conceptualization is based on the assumption of the person-situation interaction, where individuals exhibit Type A behaviours in the presence of appropriate environmental events. In other words, Friedman and Rosenmans (1974) description is of lasting trait-like characteristics within a person, which interact with specific environmental events which produce the characteristic pattern of behaviour.

According to Matthews (1983) the Type A pattern should not be considered as a behaviour trait. It is instead a set of overt behaviours that are elicited from susceptible individuals by an appropriately challenging environment. The Type A pattern is thought to be a continuum of behaviours ranging from extreme Type A to extreme non-Type A

(Type B) (Matthews, 1982).

### *Psychological Foundations of Type A*

Little is known about the psychological foundations of Type A individuals. Research suggests that the basic motivational factors are lasting hostile attitudes. Williams, Barefoot, and Shekelle, (1985) found Type A individuals to be "more suspicious about the motives of other people "(p.g. 180) as well as being more cynical. Friedman and Ulmer (1984) found Type A individuals to have lasting low-esteem and insecurity (Friedman & Ulmer, 1984). Some studies have suggested that Type A is independent of neurotic anxiety, (Caffrey, 1968), state or trait anxiety, depression, and symptom distress (Chesney, Black, Chadwick, & Rosenman, 1981), while other studies have reported a connection with neuroticism and psychiatric morbidity (Bass, 1984), emotional lability, and instability (Irvine, Lyle, & Allon, 1982), concerns about aging and daily stress (Haynes, Feinleib, Levine, Scotch, & Kannel, 1978), and extraversion (Lovallo, & Pishkin, 1980).

### *Alternative Views to Type A behaviour.*

Snow (1977) states that although commonly recognised, the Type A behaviour pattern is ambiguously defined and diversely assessed. He gives the example that a tense, driven, business executive who struggles for long hours at his desk, tapping his fingers and pencil, gulping down his lunch, and talking rapidly into two telephones at once while grimacing hostilely at his dallying assistant would almost certainly be labelled Type A. As defined by its discoverers, Friedman and Rosenman (1974) the TABP refers broadly to "any person who is aggressively involved in a chronic incessant struggle to achieve more and more in less and less time ... the most significant trait of the Type A man is his habitual sense of time urgency or 'hurry sickness' "(p.g. 67 and 70).

While the above definitions describe the behaviour pattern, explanation is still required on why some Type A individuals develop disorders and others do not. Thus, investigation into the Type A pattern postulates that a major aspect of the behaviour pattern lies in the inappropriate coping skills exhibited by Type A persons (Antonovsky, 1979; Cohen, 1979). For example Cohen (1979) states that

"inadequate coping strategies that prolong stressful encounters ... result in behaviour that is damaging to health" (p.g. 77).

In a series of studies Glass (1977) has proposed that Type A behaviours represent the individual's excessive desire to assert and maintain control over stressful aspects or threats in the environment. They are motivated by the desire for success and are

"achievement orientated people who work at near-maximum capacity relative to Type Bs" (Glass, 1977, p.g. 164).

Although the overworked, over-stressed, business executive was the stereotypical image motivating research on Type A behaviour, it has been shown that many vigorous, hard-working executives have good health. Healthy executives know how to cope with stress. These individuals have what Friedman et al. (1985) call an 'active personality', and fits their conception of the healthy, active, charismatic person, who may be erroneously identified as coronary prone.

Friedman's et al. (1985) study found that hostility and/or repressed hostility associated with poor coping skills is the critical link to the development of heart disease. They theorize that when a hostile interpersonal orientation is coupled with competitive social situations, the resulting condition of continuous angry arousal and tension, increases the likelihood of heart disease. This view is also supported by Antonovsky, (1990); Cohen and Williamson, (1991); Kamarck and Jennings, (1991); and Smith, (1992).

For example, Smith's, (1992) study found that high interpersonal conflict, low social support and coping skills were very important in the development of CHD and other

life-threatening illnesses. Friedman et al's. (1985) findings may in part explain why most Type A men never develop coronary heart disease. It may very well be that many people labelled Type A are actually healthy, expressive, ambitious individuals who are coping well with their lives. General attempts to slow down the pace of life may thus be misguided (Friedman, Harris, & Hall, 1984). It is interesting to note that a similar conclusion was reached by a study of the correlates of Jenkins Activity Survey (JAS) items (Hansson, Hogan, Johnson, & Schroeder, 1983). This study concluded that the JAS measures a diverse mixture of constructive commitment and ambition responses. As such, labelling these responses only as negative may cloud their usefulness, as they may have constructive aspects also.

Booth-Kewley and Friedman (1987) concluded that overall the picture of the coronary prone personality was not that of the workaholic, hurried, impatient individual, which is the image that is most frequently associated with coronary proneness. Instead, the

"true picture seems to be one of a person with one or more negative emotions: perhaps someone who is depressed, aggressively competitive, easily frustrated, anxious, angry, or some combination" (p.g. 358).

In short, a maladaptive personality may actually be the one that is particularly prone to developing coronary heart disease and perhaps other conditions as well (Friedman & Booth-Kewley, 1987). As the dysfunctional aspects of the TABP have been discussed in relation to coronary heart disease, the following chapter will describe how maladaptive features of the TABP are related to symptoms of physical pain and discomfort.

## CHAPTER THREE

### THE RELATIONSHIP BETWEEN THE TYPE A BEHAVIOUR PATTERN AND OCCUPATIONAL OVERUSE SYNDROME

In Ivancevich and Matterson's (1988) study of Type A behaviour and the healthy individual, they state that the traditional Type A pattern may be useful in determining the characteristics that are desirable for individual health at work. Further, Mayers et al. (1984) state that the TABP appears to be associated with experienced strain at work. Research into this area provides us with an understanding of how the TABP may be part of one's occupation. This area is just beginning to be examined. Further, as work plays an important role in an individual's life, it clearly warrants further study.

A study by Nall and Thomas (1986) found, that in comparison to the control subjects, that OOS sufferers were more likely to have high Type A and anxiety scores (cited from Mullaly & Grigg, 1988). Further, high levels of stress have also been linked to sufferers of another widespread musculoskeletal disorder - low back pain (Frymoyer, Pope, Costanza, Rosen, Goggin & Weilder, 1980).

Mullaly and Grigg (1988) state that the major weakness of such studies is that they mostly describe the psychological state after the person has been injured. It is thus not possible to tell whether the individual's psychological make-up was a contributing factor in the experience of pain or vice versa. However, if all workers are fairly equally exposed to stressful conditions, then it seems reasonable to assume that those who develop stress-related illness are more stress-prone than their healthy co-workers. That is, psychological make-up may predispose the person to injury or aggravate an injury, which already exists (Mullaly & Grigg, 1988).

#### *Type A and Physiological Reactivity*

The most consistent relationship between physiological reactivity and the TABP is gained from skin temperature change. Studies of the treatment efficacy of biofeedback

have clearly shown that a low skin temperature is associated with vascular headache (Diamond, Diamond-Flack, & De Veno, 1978), rheumatoid arthritis (Achterberg, McGraw & Lawlis, 1981), and vasoconstrictive syndrome (Taub & Stroebel, 1978), conditions that have been treated with thermal biofeedback. Furthermore, skin conductance is associated with hyperhidrosis (sweating in response to emotional stimuli such as stressful situations)(Fotopoulos & Sunderland, 1978), and blood pressure changes (Pennebaker, Gonder-Fredrick, Stewert, Elfman & Skelton, 1982). Thus it appears that the relationship between the TABP and physiological reactivity should be examined for other psychophysiological disorders besides CHD.

The specific Type A factor that has consistently been related to physiological reactivity, including blood pressure, as well as skin temperature change, is the hostility component. Individuals who have high hostility scores also tend to maintain high physiological states ,i.e. sweating and bodily temperature, even after the stressor stimulus has been removed (Ganster, Schaubroeck, Sime & Mayers, 1991). These results support previous work that has suggested that hostility is the aspect of the TABP that is most important in predicting sympathetic nervous system reactivity (Houston, 1986).

### *Type A behaviour and physical stress/strain*

Dearborn and Hastings (1987) found the differences between Type A and Type B women to be striking. Of the 20 possible correlations between job dissatisfaction and symptoms (physical i.e physical pain, sleep disturbance and colds, and psychological, i.e. nervousness, anger and depression), 18 were found to be significant in the Type As, and only one in the Type Bs. Similarly, of the 20 possible correlations between job stress and physical and psychological symptoms, 12 were significant in the Type As, and only 6 in the Type Bs.

What is unique to the JAS is self-reported time pressure (Matthews, Kranz, Dembroski, & MacDougall, 1982) which is correlated with self-reports of job strain (eg. satisfaction,

irritation, depression, physical symptoms, Mayers, Sime, and Ganster, 1984). Specifically, Mayers et al. (1984) found the JAS sub-scale to be significantly correlated with physical symptomatology at work. The Speed and Impatience (S&I) sub-scale was significantly correlated with irritation and physical symptoms at work but was unrelated to any of the other measurements of strain. The JAS Job Involvement (JI) sub-scale was unrelated to any of the measured strains, except irritation, where a significant negative correlation was obtained. The Hard-Driving and Competitive (HD&C) sub-scale showed the strongest relationships of all the JAS scales. Significant correlations were obtained among HD&C and job satisfaction, depression, and physical symptoms. It should be noted that there is little overlap between the JAS sub-scales and the strains predicted, with the exception of physical symptoms, which are related to three of the JAS scales. Each scale predicts a different set of strain criteria. While Mayers et al (1984) found the above correlations with the JAS scales, they also found the JAS to be unreliable in their sample.

#### *Nature of the Relationship Between Type A Behaviour and Coronary Heart Disease (CHD)*

While the links between Type A behaviour and CHD seem well established (Friedman & Rosenman, 1974; Haynes, Feinleib & Kannel, 1980; Kittel, Kornitzer, de Backer & Dramaix, 1982), the specific nature of their relationship remains unknown. To date two highly compatible hypotheses explaining how Type A behaviour translates into increased CHD risk have been proposed. The first, which has received considerable indirect empirical support, suggests that excessive sympathetic nervous system arousal (Dembroski, MacDougall & Shields, 1977), and, a significantly greater physiological arousal in the autonomic nervous system relative to Type Bs (Dembroski, MacDougall, Shields, Petitto & Lushene, 1978) may be responsible. Because Type A individuals may be prone to such nervous system arousal, which in turn can produce immunosuppression, the TABP may be a general risk factor for physical disorder (Dienstbier, 1989; Goldstein & McDonald, 1986).

The second hypothesis has received relatively less attention. It suggests that Type As fail to perceive physical symptoms and thus chronically over-expose themselves to stressors. Also, Type As may delay in seeking medical care after the onset of physical symptoms of pain. The current study is concerned with the second hypothesis as it seeks to explore further the possibility of links between symptom perception of OOS and Type A behaviour (Hart, 1983).

### *Type A behaviour and the Reporting Pattern of Stress and Strain*

There is a pool of evidence that suggests that the TABP affects the reporting of CHD symptoms and physical stress and strain. The two main areas of research into symptom reporting appear to be at odds with each other. One proposes that Type A individuals suppress reporting, and the other states that they report more symptoms.

### *Suppression of Symptom Reporting - Theory One*

The clinical observations of Greene, Moss, and Goldstein (1974) infer that Type A persons prefer to avoid reporting early heart attack symptoms rather than face the prospects of being a patient and not being able to work. In addition, where reporting occurs, it has been found that Type As tend to under-report the severity of physical symptoms elicited by a stressor (Carver, Coleman & Glass, 1976; Weidner & Matthews, 1978). Although Type A men put a greater effort into doing well on a strenuous physical task, they report less fatigue than Type B men (Carver, Coleman & Glass, 1976). Weidner & Matthews (1978) conducted a similar study to Carver et al. (1976), but used females as subjects, and they were able to replicate these results.

Carver et al. (1976) asked college students, defined as Type A or B by the Jenkins Activity Survey (JAS), to complete a Balke (Balke, Grillo, Konecni & Luft, 1954) treadmill test while rating their fatigue at two-minute intervals, and found that while the

Type As physically exerted themselves more than the Type Bs, their subjective rating of fatigue was significantly lower than those of Type Bs.

Weidner and Matthews (1978) extended the fatigue suppression findings to general physical symptoms like racing heart, shortness of breath, dizziness, etc. In their study, JAS Type A college women attempted to solve arithmetic problems while being exposed to bursts of aversive noise. Results showed that Type As reported significantly less intense symptoms than Type Bs in the middle of the task. However, following task completion, Type As and Bs reported similar levels of symptoms. It was suggested that Type As allocated more attention than Type Bs to the task, and consequently were less able to notice physical symptoms when preoccupied. The authors interpreted their results as lending support to the notion that Type As may demonstrate a low probability of seeking medical care or resting when experiencing early heart disease symptoms.

Another study provides further support to the symptom suppression, Type A relationship. Matthews and Carra (1982) examined reports of menstrual symptoms of college women defined as Type A and B by the JAS. Analysis of the data revealed, as the authors predicted, that the Type A women paid less attention to symptoms, and the associated positive and negative sensations, during menstruation. This resulted in symptoms being under-reported, relative to the intensity of the same symptoms reported on the day after menstruation.

Also consistent with the above symptom suppression findings are the results of an investigation that studied a sample of senior administrators of correctional institutions (Burke & Wier, 1980). In this study, physician examinations found that there was a positive relationship between Type A behaviour and angina pectoris, ulcerative colitis and muscle tension. Type A scores, however, were unrelated to self-reported psychophysiological symptoms. The authors explained these results by simply suggesting that Type As may fail to attend to stress symptoms. Burke and Weir (1980) also state the effects of this failure as

"over time, the gradual wearing down of the individuals resources continues and

eventually culminates in illness ... (which is why) heart attacks in Type As often strikes individuals who perceive themselves as being healthy"(p.g.37).

Hart's (1983) study of male senior civil engineering students during a high - stress period of their year also supports the symptom suppression findings. His subjects were divided into Type As and Bs using the JAS. Hart's (1983) findings support the results of previous research showing that Type As relative to Type Bs under report the frequency of symptom/illness experiences, and Type As report less intense physical symptoms than Type Bs. Hart (1983) argues that since his data were collected just prior to the final exam week, that the extra demands imposed by examinations caused differential suppression of attention to symptoms across As and Bs, and thus differential symptom reporting. This hypothesis is supported by the results of previous research, which suggests that the suppression of attention to symptoms, like other Type A behaviours, may only occur in response to appropriately challenging, stressful, environments (Matthews & Carra, 1982; Somes, Garrity & Marx, 1981).

The results of Hart's (1983) study support the view that Type A individuals perceive themselves as being more healthy than Type B individuals. Further evidence supporting the notion that Type A individuals tend to subjectively appraise their health status in a favourable light, also comes from Hart's (1983) finding that As see themselves as healthier than their peers, whereas Bs rate themselves as being less healthy than their peers. In light of these findings, and of the results found by Carver et al. (1976) that college aged As and Bs do not differ in 'objective' fitness, Hart's (1983) findings suggest that Type As may be unrealistically optimistic in their self-ratings of health status.

### ***Type 'As' Positive Relationship With Symptom Reporting - Theory Two***

Hart (1983) states how his findings are at odds with the findings of several other studies which have found that certain aspects of the Type A pattern are positively associated with physical symptom reporting (Matterson & Ivancevich, 1982; Workman & La Via,

1988). For example, the following researchers have reported a positive relationship between adults assessed as Type A by the JAS and the number of medical and psychological symptoms on the Cornell Medical Index (Carmody, Hollis, Matarazzo, Fay & Connor, 1984). Compared to Type Bs, Type A adults have also been found to report more symptoms of cardiovascular arousal, and elevated levels of diastolic blood pressure (Haynes, Levine, Scotch, Fienleib & Kannnel, 1978). A study by Woods, Morgan, Day, Jefferson, and Harris (1984) found their sample of Type A individuals to have higher vascular, 'migraine' and muscle-contraction 'tension' headaches. Woods and Burns (1984) found their sample of Type A women to demonstrate more gastrointestinal and respiratory symptoms, sleep disorders, and chest pains.

Eagleston, Kirmil-Gray, Thoresen, Wiedenfeld, Bracke, Heft, and Arnow (1986) conducted a study on school aged individuals in order to investigate the physical symptom reporting behaviour of Type As. The physical symptom of stress inventory used in this study was a modification of the Cornell Medical Index. The items scored included gastrointestinal, muscle tension, headache, and sleep disturbance symptoms.

In terms of reporting physical symptoms, Type As reported more than Type Bs. Further, Type A females reported more overall symptoms as well as more peripheral, gastrointestinal, muscle tension, and sleep disturbance symptoms, but they did not have more visits to their doctors than Type A males.

The findings in Eagleston et al's. (1986) study that Type A females reported more physical symptoms than males on every measure of symptom reports comes as no surprise. As Nathanson (1975) notes,

"one of the most consistent observations in health survey research is that women report more symptoms of both physical and mental illness and utilize physician and hospital services for these conditions at higher rates than men"(p.57).

What is different in the Eagleston et al. (1986) study is that females did not miss school more often because of illness, and utilization of health-care services by physicians was

virtually identical for the two groups.

### *Explanation of Symptom Reporting Hypothesis*

It has been suggested that the apparent contradiction in findings of physical symptom reports (sometimes Type As report more, and sometimes fewer symptoms than Type Bs) may be due to the environmental conditions under which symptom reports have been collected. Carmody et al. (1984) conclude that

"in field or naturalistic settings, Type As suppression of physical symptoms has been shown to occur only under conditions of high challenge"(p.56).

Hart (1983) supports this hypothesis as his study found that high environmental challenge was an important factor in explaining the apparent discrepancy in Type A pattern and physical symptom reporting results. Further Weidner and Matthews (1978) suggest that Type As fail to report fatigue because it enables them to continue to work at a high level - acknowledgment of fatigue would interfere with their performance. They state that failure to report symptoms has a similar instrumental value in avoiding failure. As outlined earlier, Eagleston et al's. (1986) study found that High-Type A children consistently reported more physical symptoms than low-Type A children. Their results lend support to the hypothesis that Type As will report more physical symptoms under conditions of low challenge (Carmody et al. 1984).

An extension to the above findings is the suggestion that high-Type A subjects may differ significantly from low-Type A subjects in their physiological hyperactivity threshold (Krantz & Durel, 1983) or may be genetically 'prewired' to overact or overreact to life's daily challenges, thus predisposing them to increased physiological symptoms.

Eagleston et al. (1986) suggest that measurement of symptom reports at different points in time and data from verifiable sources, such as medical records and reports by

observers, is needed. Such information would be helpful in trying to clarify the question of whether Type As report more physical symptoms than Type Bs in the natural setting, or whether they suppress symptoms as they appear to do in the laboratory under challenging conditions. At issue is whether more physical signs and symptoms occur in Type As, whether they report more symptoms, or both (Eagleston et al. 1986).

### *Conclusion of Chapter Three*

Regardless of the reasons, the finding that Type A men and women in high stress conditions fail to report physical symptoms of pain and fatigue is highly significant. This failure to report physical symptoms and fatigue may contribute to the risks associated with Type A as if they ignore the symptoms, they may be less likely to seek medical care or rest when experiencing early heart disease symptoms (Carver et al. 1976). In reference to CHD, the hypothesis is that Type As wait until the symptoms of the disease become incapacitating rather than seeking treatment earlier when alteration of behaviour to less stress inducing forms would be beneficial (Matthews, 1982).

It is important to note that Eagleston et al's. (1986) study also found that high-Type A children reported health habits that put them at potentially greater risk for CHD than low-Type A children, as the high-Type A children indicated that they kept pushing themselves to perform when ill, thus denying the severity or meaning of their symptoms. This finding is significant as, regardless of age, Type A individuals tend to exhibit behaviours that are indicative to CHD risk factors.

It is evident that the nature of the TABP is complex. As such, there is a range of methods that can be employed to measure the TABP. Therefore, it is important to understand the variety of TABP measurements available in order to discern which is the best to use. The following chapter describes the main methods in turn.

## CHAPTER FOUR

### MEASUREMENT OF THE TYPE A BEHAVIOUR PATTERN

#### *Assessment of the Type A Behaviour Pattern*

Friedman and Rosenman (1974) first characterized the TABP by a simple description of overt behaviours. This is in contrast to most research on psychosocial risk factors which is derived from reasoned conceptualisation. It was only through later research that a conceptualisation was made to fit their set of behaviours.

#### *Type A Measurements*

The two main types of Type A measurement are the Structured Interview and the self-report questionnaire. In general, the Structured Interview and the self-report measures of the Type A Behaviour Pattern should not be considered substitutes for each other as they measure different aspects of the behaviour pattern.

**The Structured Interview.** The Structured Interview (SI) was developed by Rosenman and Friedman (1974) for the purpose of determining the behaviour type (A or B) of the 3500 men in the Western Collaborative Group Study (WCGS). The WCGS was a longitudinal research effort designed to better understand cardiovascular disease. The SI serves as the 'gold standard' against which other Type A measures are evaluated.

The SI contains approximately 25 questions in which individuals are asked about their characteristic way of responding to a variety of situations that should elicit impatience, hostility, and competitiveness from Type A individuals (Rosenman, 1978). Type As report that they are more aggressive, angry, achievement-orientated, shrewd, active, quick, dominant, sociable, lacking in self-control, and hard working than Type Bs report being. Although Type As state that they are self-confident they also report symptoms

that are indicative of stress and being dissatisfied with work, life achievements, and marriage (Waldron, 1978). The actual size of the association between Structured Interview Type A and the above measures is not large but it is statistically significant. Thus the Structured Interview Type As report behaviour is consistent with the descriptions of Pattern A.

**The Jenkins Activity Survey.** The self-report method used to measure Type A behaviour in the current thesis is the Jenkins Activity Survey (JAS). The JAS (Jenkins, Zyzabski & Rosenman, 1979) is a 52 item computer or hand scored self-report questionnaire. The JAS was developed in order to duplicate the behavioural classifications made by the SI, and thereby simplify Type A measurement. It produces scores for a general Type A - B scale, and three Type A components, the hard driving and competitive (highly socialized but intense drives); the speed and impatience (speed in eating, conservation, etc., impatience, strong temper); and the job involvement (dedication to occupational activity).

Items for the survey were initially assembled from two main sources. Questions were either chosen from the SI or were developed because they were consistent with Type A conceptual descriptions. These items were then subjected to a series of psychometric analyses spanning ten years, using data from the WCGS. A set of sixty-one items was found to discriminate between SI determined As and Bs using optimal weighting and scaling procedures (Jenkins, Rosenman & Friedman, 1967). Discriminant analysis determined the best subset of these items that discriminated between behaviour types, resulting in a 19-item A-B scale. Then, all sixty-one items were subjected to factor analysis to determine underlying components (Jenkins, Zyzanski & Rosenman, 1971).

The Jenkins Activity Survey scores were normally distributed in the WCGS validation sample. The resulting linear transformation was applied to all scores and was incorporated into the computer program that was developed to score the test so that the mean of the A-B scores is 0.0 with a standard deviation of 10.0. Positive scores

indicate the Pattern A direction; negative scores indicate the Pattern B direction (Jenkins, Zyzanski & Rosenman, 1971).

Of the 52 items in the JAS, 21 items are weighted substantially by the computer scoring system. An inspection of these 21 items shows the following breakdown: 1 item on hostility when younger; 5 items on hard-driving and competitiveness; 8 items on immediate, quick action (e.g., eating quickly, being told that one is too active); 7 items on a pressured style of working (e.g., not taking vacation, taking work seriously, perceiving deadlines at work) (Jenkins, Zyzanski, & Rosenman, 1979).

Validation of the questionnaire measures of TABP has proceeded along two lines. One approach was to demonstrate the criterion related validity of the TABP questionnaire by showing its relationship to the criterion (CHD) predicted by the SI measure of TABP. This method was used to validate the JAS (Jenkins, Rosenman & Zyzanski, 1974), perhaps the best known of the TABP questionnaires. A second method of validation was to show the empirical association between a proposed questionnaire measure of TABP and the SI measure of the construct. This method was also effectively used by Jenkins et al (1974), in developing the construct. Through this second measure one hopes to demonstrate the convergent aspect of the construct validity of a measure by showing that it 'converges' on other methods intended to measure the same thing (Mayes, Sime & Ganster, 1984).

The predictive ability of the JAS was first observed in the WCGS. A sample of 2750 men were given the JAS and followed for four years to determine the occurrence of a CHD event, such as acute myocardial infarction, silent myocardial infarction, or angina (Jenkins, Rosenman & Zyzanski, 1974). Cases has a CHD A-B score of 1.70 while controls had a score of -0.6 ( $p < 0.01$ ). This relationship was not weakened when the total population was stratified by age or by different manifestations of CHD.

The stability of the JAS A-B score over one year was found to be 0.66, and this estimate did not change appreciably when stability over four years was assessed (Jenkins, Zyzanski & Rosenman, 1971).

More recently, Johnston and Shaper (1983) assessed the stability of the JAS A-B score in a sample of male British civil servants over thirty-four weeks and found the correlation to be 0.79.

Repeated factor analysis of the JAS has identified that the scale can be divided into three independent factors or sub-scales, which have been called Hard-driving and competitive, Job Involvement, and Speed and Impatience (Zyzanski & Jenkins, 1970). The following is a summary of the research that has been conducted on each of the factors.

### *JAS Sub-scales*

*JAS Hard-Driving and Competitive scale.* The JAS demonstrates that Type As outperform Type Bs in difficult situations that call for persistence or endurance. Situations are difficult for subjects due to fatigue (Carver, Coleman & Glass, 1976; Weidner & Matthews, 1978), external distractions (Glass, 1977), or continued performance after a brief salient failure (Glass, 1977).

Type As set higher initial goals for their task performance (Snow, 1978). Also, Type As tend to increase their performance level as a result of multiple tasks. They are also able to perform well in a number of tasks at the same time, because they increase their effort as the number of tasks increase. Type Bs performance decreases as the number of tasks increases. Type Bs outperform As on tasks that require slow careful responses (Glass, Snyder & Hollis, 1974), a broad focus of attention (Brunson & Matthews, 1981) or continued performance after prolonged noticeable failure. When the failure is not highly noticeable the reverse occurs, As out perform Bs (Brunson & Matthews, 1981).

*Job Involvement scale.* Snow (1978) found that Type As indicate more interest in performing well relative to others, to their own standards, and to the best possible performance. Type As value productivity, and that the vagueness of their standards is the result of their standards being extraordinarily high (Snow, 1978). Also, Type A undergraduate men and women report that they study and work more hours for paid employment and sleep less than do Type Bs (Hicks, Lingen & Eastman, 1979).

*JAS Speed and Impatience scales.* Matthews (1982) reports that Type As have a superior performance on tasks that require speed and persistence. In order to achieve a series of goals as quickly as possible it is necessary to work rapidly, Type As persist in spite of fatigue or the possibility of failure, and ignore potentially interfering distractions. The poorer performance of As on tasks that require slow work has been interpreted as consistent with the time urgency and impatience of Type A (Matthews, 1982). Also, Type As work more quickly than Type Bs on simple tasks when subjects are not forewarned of a time deadline (Burnham, Pennebaker & Glass, 1975).

What is unique to the JAS is self-reported time pressure (Matthews, Kranz, Dembroski, & MacDougall, 1982). Self-reported time pressure has been significantly correlated with self-reports of job strain. The job strain measures used were job satisfaction, irritation, depression, and physical symptoms (Mayes, Sime & Ganster, 1984).

Hostility, as measured by the speed and impatience scale, has emerged as an important area of investigation in Type A research. Booth-Kewley & Friedman (1987) undertook a meta-analysis of the psychological predictors of heart disease. In their meta-analysis they found that the anger/ hostility/ aggression category of personality variables related reliably to CHD. Of these attributes, hostility seems to have the strongest relation to disease-outcome variables. Booth-Kewley and Friedman (1987) suggest that this area should receive more research attention.

Friedman, Hall, and Harris's (1985) study supports the theory that the critical link to

heart disease involves hostility. They theorise that a hostile interpersonal orientation, together with competitive social situations, provide a situation of continuous angry arousal and tension. This in turn increases the likelihood of heart disease (Friedman, Hall & Harris, 1985).

*Potential mediators of the Type A Behaviour Pattern - Chronic Heart Disease relationship.*

**Sex.** The TABP was developed as a concept which reflected a pattern of behaviour characteristic of white-collar, employed men, the sample of the WAGS study. Powell, (1987) states that it is therefore possible that studies conducted on women or populations which are sex-mixed may fail to find a link between the TABP, as the operationalisation of the TABP may not be relevant to women.

Questionnaire scores for women are lower than those for men (Haynes, Feinleib & Kannel, 1980; MacDougall, Dembroski & Musante, 1979), but differences decrease when female samples are limited to working women (Haynes, Feinleib & Kannel, 1980; Shekelle, Schoenberger & Stamler, 1976). Research supports that JAS scores in women are influenced both by education and employment status. Higher Type A scores in women are associated with greater education and employment, especially professional employment (Davidson, Cooper & Chamberlian, 1980; Lawler, Rixse & Allen, 1983; Morell & Katkin, 1982; Shekelle, Schoenberger & Stamler, 1976; Waldron, 1978).

Further, Baker, Dearborn, Hastings, and Hamberger (1984) found that, in general, women were no less likely to be Type A than men. This was especially so when education, occupation, or socio-economic status (SES) were controlled. In some samples women were significantly more Type A than the male comparison groups. As with men, Type A score was positively correlated with education and occupational status in women.

When questionnaires are used with women who have a comparable work life to white-collar men, they appear to have comparable psychometric properties. This is especially true for women who are young enough to have been influenced by the women's movement (Mullaly & Grigg, 1988).

Mayers, Sime, and Ganster (1984) state that females are still grossly under-represented in Type A behaviour pattern research. Given the growing similarity of males and females in terms of their occupational participation and in terms of their life-style as well, they feel that the necessity of including large female samples in Type A studies is apparent.

In a recent review, Haynes (1984) concluded that the best assessment for the TABP in women has yet to be determined. Both interview and questionnaire methods have limitations. For example, questionnaire items that discriminate SI classifications for women assess impatience and job involvement. This is in contrast to comparable analysis for WCGS men which found the discriminating items to be anger, and competitiveness (Menninger, 1985).

In the TABP - CHD relationship in women it is also important to note that research had shown that this relationship is also mediated by menstruation (Light, 1981; Little & Zahn, 1974). As women's cardiovascular reactivity varies with phases of the menstrual cycle, knowledge of where each women subject is in the cycle is imperative in assessing her TABP (Houston, 1986).

**Age.** To the extent that progressive changes in the TABP occur with age, a cluster of subjects in a study who are at a specific benign age could weaken the Type A-CHD link. In general, changes in the TABP by age can be observed only if the age range sampled is broad enough.

In the Kelly and Houston (1985) sample JAS was observed to decline with age in women. This is in contrast to Baker, Dearborn, Hastings, and Hamberger's, (1984)

findings of the relationship between Type A and age in women. They found a curvilinear relationship between Type A score and age. Very young women and older women were found to be less Type A, while women in the middle age groups (30s and 40s) were more Type A. Further, Shekelle, Schoenberger, and Stamler, (1976); and Mettlin (1976) found an inverse relationship between the TABP and age in their samples for both sexes. The differences in findings here reflect the need to conduct more research on the relationship between the TABP and age.

**Socio-economic Status and Education.** Since all the TABP measures were developed using white-collar populations, their relevance for blue-collar populations needs to be determined.

Research has consistently found positive associations between the JAS, education, and socio-economic status (Byrne, Rosenman, Schiller & Chesney, 1985; Kelly & Houston, 1985).

**Employment Status.** If the TABP is a kind of stress that is a response to work demands, then individuals who are not employed outside the home may not experience Type A behaviour. Inclusion of these people in studies of association would have the effect of weakening the relationship. In a study of Type A in women, the JAS had the greatest agreement with the SI in employed women ( $r=0.42$ ,  $p<0.01$ ), relative to women who are not employed ( $r=0.19$ ) or employed less than 35 hours per week ( $r=0.21$ )(Anderson & Waldron, 1983).

A Positive association between occupational prestige and Type A scores. Jenkins, Zyzanski, and Rosenman, (1979); Mettlin, (1976); and Shekelle et al., (1976) found in their samples that higher occupational levels were associated with higher Type A scores, with managerial, professional and technical staff having higher Type A scores than sales, clerical or labourers.

*Comment : Self-Report Approaches To Type A Assessment*

Self-report measures of the TABP share four limitations. First, their validity as predictors of hard CHD endpoints has not been established for populations outside of the original, white-collar male population on which the concept was developed (Powell, 1987). While studies such as Baker, Dearborn, Hastings, and Hamberger (1984) have demonstrated that women can be classified as being Type A at similar rates to men, more research is needed to make the precise link between Type A and CHD in women.

A second limitation of the Type A questionnaires is the potential bias associated with the reliance of self-reports. Major components of the TABP -impatience and irritability - are socially undesirable characteristics. The appeal of interview measures lies in their unobtrusive approach to assessment. It is difficult to make assessments of these characteristics using self-reports because Type A subjects may not be aware of or may not admit to them. In an investigation of self-descriptions of 378 employed males who were previously classified for behaviour type using the SI, Herman, Blumenthal, Black, and Chesney (1981) found that those classified as Type A tended to describe themselves in socially desirable ways, including such adjectives as assertive, aggressive, outgoing, energetic, and autonomous, but not in less socially desirable ways, such as hostile, driven or egocentric. The reluctance of Type As to admit to, or be aware of, negative traits makes self-assessment of indices of anger and hostility difficult. If the less socially desirable characteristics are to be included in Type A self-report measures, social desirability bias must be taken into consideration.

A third limitation of self-reports concerns the transformation of continuous scales into behaviour categories. The JAS produces categories using a discriminant equation developed on WCGS data. The generaliseability of the JAS discriminant solution is questionable. For example, subjects classified as A2 by the Rosenman SI had an average JAS score in the Type B range (Shekelle, Hulley, Neaton, Billings, Borhani, Gerace, Jacobs, Lasser, Milltemark & Stamler, 1985).

A fourth factor of concern is that in most cases sample reliabilities for questionnaire

measures of the TABP are not reported in most research reports. This is especially noticeable in studies employing the JAS scales where reliabilities, when reported, are usually those obtained in the early validation studies rather than those relevant to the sample under investigation (Mayers, Sime & Ganster, 1984).

### *Divergence in research findings*

The link between TABP and CHD became known in the late 1970s, where most research on the topic produced positive findings. In contrast, from the mid-1980s research produced more negative rather than positive findings. As a result approximately the same number of studies have found a positive relationship between TABP and CHD, than have found no relationship between them (Powell, 1987).

Powell (1987) suggests that in-light of the conflicting findings stated above that instead of dismissing the whole concept of TABP it is more conducive to examine the measurement techniques used in the studies that did not find a relationship between TABP and CHD.

After more than two decades of debate, testing, and attempting to modify the entire TABP there is now a growing acceptance of the position that a major overhaul or change in the TABP is not necessary or even feasible (Ivancevich & Matterson, 1988).

### *New directions in Type A research*

Time urgency is the second major component of the TABP (Anger/hostility are the first) which offers some promise for an additional pathogenic substrate.....Time urgency appears to be comprised of heterogeneous characteristics which have some overlap with anger and hostility. Factor analysis of items measured on global Type A scales revealed clusters of such diverse items as speed of speech and behaviour, impatience, and irritation at waiting (Matthews, Glass, Rosenman & Bortner, 1977).

Although a variety of instruments have been used to measure anger and hostility (Powell, 1987), only a few exist that measure speed and impatience. The most studied measure is the JAS Speed and Impatience scale. It is significantly related to the Rosenman SI ( $r=0.233$ ,  $p<0.001$ ) (Byrne, Rosenman, Schiller & Chesney, 1985), and to the Videotaped SI ( $r=0.31$ ,  $p<0.001$ ) (Powell, Friedman, Thoresen, Gill & Ulmer, 1984). It is highly correlated with self-report measures of global Type A ( $r=0.52-0.60$ ) (Byrne, Rosenman, Schiller et al., 1985; Mayers Sime & Ganster, 1984).

Two major prospective studies have reported that speed and impatience is predictive of hard CHD endpoints. In the Belgian Heart Disease Prevention Project, JAS Speed and Impatience was related to five-year incidence of CHD (DeBacker, Kornitzer, Kittel & Dramaix, 1983). A measure of time anxiety was also a significant discriminator between Dutch CHD cases and healthy controls (Verhazen, Nass, Appels, van Basteler & Winnubst, 1980)

An alternative approach to the refinement of the Type A conceptualization has been to subdivide Type A traits into positive and negative attributes. This approach has been introduced by two different research teams. Friedman, Hall, and Harris (1985) suggest that the JAS Type As can be subdivided into repressed, tense, and illness-prone types, or healthy talkative, in control, and charismatic types. Leak and MaCarthy (1984) separate JAS items into a positive scale called Involvement to describe constrictive ambition, assertiveness, and personal and social adjustment. Their negative scale is called Drivenness, and includes reflecting self-defeating interpersonal behaviour and anxiety.

#### ***Conclusion of Chapter Four***

As detailed in the above chapter, the issues governing the measurement of the TABP are complex. The measurement chosen to determine the TABP's relationship to OOS is the JAS. This is due to the JAS providing a comprehensive cover of the TABP. Specifically, as the JAS is comprised of four sub scales of Type A, Hard-Driving and

Competitive, Job Involvement, and Speed and Impatience it covers the main aspects of the pattern. Further, as discussed in chapter three, research has established a relationship between the Type A Behaviour Pattern and OOS related pain and discomfort (Mattheson & Ivancevich, 1982; Mayers et al. 1984; Nall & Thomas, 1986; Workman & La Via, 1988). Based on the this information, the following chapter describes the research hypothesis of the current report.

## CHAPTER FIVE

### RESEARCH HYPOTHESIS AND METHOD

#### *The Current Research*

The current research was designed to investigate the work related behaviours that are related to OOS. This research was instigated by the management and Occupational Health Nurse of Independent Newspapers Limited (INL), who reported having difficulties with rising incidents of OOS within their keyboard staff. The two main groups who reported OOS problems were reporters and sub-editors.

Due to the consistent time deadline nature of their job, the behaviour patterns of work aggressiveness, a strong sense of time urgency, and competitive achievement striving are the Type A characteristics that will be targeted in the current investigation into the relationship between Type A and the risk factors of Occupational Overuse Syndrome in INL staff.

#### RESEARCH HYPOTHESIS

Research has established a relationship between the Type A Behaviour Pattern and OOS related pain and discomfort (Mattheson & Ivancevich, 1982; Mayers et al. 1984; Nall & Thomas, 1986; Workman and La Via, 1988). This relationship will not be contaminated by results on symptom reporting, as outlined by Carmody et al. (1984); Eagleston et al. (1986); Heart et al. (1983); and Woods et al. (1984). As the questionnaire will be completed in a low challenge environment, Type A individuals should not suppress OOS related symptoms.

In light of these findings it is hypothesised that there will be a significant positive relationship between the Type A Behaviour Pattern and OOS.

## METHOD

### *Subjects*

Questionnaires were sent to 980 employees of Independent Newspapers Limited (INL), in 8 different newspaper locations throughout New Zealand. The target group of subjects from INL were individuals required to use a key board in their work activities.

### *Procedure*

Union Officials, Occupational Health Nurses, and/or District Managers explained to INL keyboard staff the nature of the study. Also, a covering letter from the researchers was included in each questionnaire (see Appendix A). Participation was on a voluntary basis. All relevant staff were asked to take a copy of the questionnaire, and complete it in their own time.

Two follow-up letters were sent to each subject (see Appendix B and C). The letters were designed to remind the subjects about the questionnaire and request that they complete it and hand it in to their Union Official, Occupational Health Nurse, or District Manager. The first letter was sent one week after initial questionnaire distribution. The second follow-up letter was sent a week later.

Completed questionnaires were collected and given to the District managers. Upon collection, questionnaires were then sent to the researchers at Massey University for coding and data analysis.

### *Occupational Overuse Syndrome Questionnaire*

The questionnaire (see Appendix D) consisted of three main sections. The first section was designed to investigate the incidence and related coping strategies of Occupational Overuse Syndrome (OOS). The second section was designed to investigate the work related behaviours related to OOS. To this end the Jenkins Activity Survey (JAS) was adopted. The final section of the questionnaire examined how quality of working life was related to OOS. Only the first two sections of the questionnaire are relevant to the current thesis.

#### *The Questionnaire: Section One*

##### *OOS Measure*

The first section of the questionnaire investigated the physical aspects of OOS. The main areas investigated were demographic variables of the subjects, incidence of OOS, areas of the body and severity of OOS occurrence, and what methods subjects have adopted to alleviate OOS symptoms.

#### *The Questionnaire: Section Two*

The second section of the questionnaire was designed to measure Type A Behaviour in INL staff. The Type A Behaviour measurement used was the Jenkins Activity Survey (JAS) (Jenkins et al., 1979). The JAS is a self-report Type A questionnaire. Chapter two describes the JAS in detail. A computer program was developed to calculate the weighted scores for each sub-scale on the Type A measure. The Statistical Program for the Social Sciences (SPSSPC) was used for all data analysis.

The data analysis proceeded in three distinct sections. The first section considered the

simple correlations within and between OOS and Type A. The second section considered the confounding effects of the demographic variables between the Occupational Overuse Syndrome - Type A effect. The third and final analysis considered the effects of the predictor variables (Type A) on the affected variables (OOS), while controlling for any emerging confounding variables.

## CHAPTER SIX

### RESULTS

The presentation of results is divided into three sections. In the first section simple correlations were run to explore the relationships between the main variables. In the second section one-way analyses of variance (One-way ANOVAs) were run to determine whether the demographic variables had a confounding effect on the main variables. In the final section hierarchical multiple regressions were run to control for the effects of confounding variables.

#### *Data Analysis Procedures*

Before the analysis began, the data were checked to ensure the assumptions of multiple regression were met. The cases to IV ratio was good at approximately 60:1. Examination of the residual scatterplots revealed no unexpected distributions indicating that assumptions of normality, linearity, and homoscedasticity were adequately met.

Of the 980 questionnaires sent out, 575 were completed and returned. This represents a return rate of 58.67%. 61.7% of the sample were female, and 38.3% were male. 4.4% of the sample were under the age of 20, 36.5% were aged between 20 and 30, 26.1% between 31 and 40, and 32.6% were over the age of 41. 11.5% of the sample came from Palmerston North, 10.3% from Hamilton, 4.9% from Timaru, 22.4% from Christchurch, 7.5% from New Plymouth, 11.0% from Invercargill, 6.4% from Auckland, and 26.1% from Wellington.

As can be seen from Table 1 the most consistent significant correlation is between Speed and Impatience and all the OOS variables, apart from severity of pain (SVRT1). There are significant weak relationships between Speed and Impatience and Discomfort Now ( $r=-.074$ ),  $p = .038$ , Speed and Impatience and past pain in the wrists (PRMAP3) ( $r=-.118$ ),  $p = .013$ , between Speed and Impatience and past pain in the lower back

(PRMAP5)( $r=-.123$ ),  $p = .010$ , between Type A and past pain in the forearms (PRMAP4) ( $r=-.101$ ),  $p = .027$ , and between Job Involvement and past pain in the wrists (PRMAP3) ( $r=-.1103$ ),  $p = .019$ .

Small significant correlations can be found between Speed and Impatience and past pain in the neck or shoulder (PRMAP1) ( $r=-.145$ ),  $p = .003$ , between Speed and Impatience and past pain in the fingers (PRMAP2) ( $r=-.162$ ),  $p = .001$ , and between Speed and Impatience and past pain in the forearms (PRMAP4) ( $r=.154$ ),  $p = .002$ .

**Table 1**  
*Correlation Matrix for OOS by Type A variables.*

	TPA (TYPE A)	SI (SPEED AND IMPATIENCE)	Jl (JOB INVOLVEMENT)	HDC (HARD-DRIVING AND COMPETITIVE)
DISNOW (DISCOMFORT NOW)	0.062	0.074*	0.047	-0.018
SVRT1 (SEVERITY OF PAIN)	-0.065	-0.028	0.018	-0.039
PRMAP1 (PAST PAIN IN NECK/SHOULDER)	0.085	0.145**	0.018	-0.006
PRMAP2 (PAST PAIN IN FINGERS)	0.067	0.162**	0.035	0.065
PRMAP3 (PAST PAIN IN WRISTS)	0.075	0.118*	0.110*	0.003
PRMAP4 (PAST PAIN IN FOREARMS)	0.101*	0.154**	0.087	0.024
PRMAP5 (PAST PAIN IN LOWER BACK)	0.065	0.123*	0.011	0.000

\*= $p<0.05$

\*\*= $p<0.01$

**Table 2**  
*Correlation Matrix of OOS Variables.*

	DISNOW	SVRT1	PRMAP1	PRMAP2	PRMAP3	PRMAP4	PRMAP5
DISNOW (DISCOMFORT NOW)	1.000						
SVRT1 (SEVERITY OF PAIN)		1.000					
PRMAP1 (PAST PAIN IN NECK/SHOULDERS)	-.003	.478	1.000				
PRMAP2 (PAST PAIN IN FINGERS)	.077	.485	.235***	1.000			
PRMAP3 (PAST PAIN IN WRISTS)	.085	.488	.250***	.305***	1.000		
PRMAP4 (PAST PAIN IN FOREARMS)	.075	-.239	.213***	.377***	.404***	1.000	
PRMAP5 (PAST PAIN IN LOWER BACK)	.013	.485	.397***	.182***	.258***	.216***	1.000

\*p<0.05      \*\*p<0.01      p<0.001

As can be seen from Table 2 a correlation between Discomfort Now and Severity of Pain was unable to be calculated due to the nature of the questionnaire subjects who responded in one of the categories were not required to respond in the other. Discomfort Now and Severity of Pain were also un-correlated to the past pain (PRMAP1 to PRMAP5) variables. All the past pain (PRMAP1 to PRMAP5) variables were moderately correlated with each other.

As can be seen from Table 3 relationships among the Type A variables are generally moderate. All the Type A variables are significantly correlated with each other, with

the highest correlations being between Type A subscale, and the other subscales of Speed and Impatience, Job Involvement, and Hard Driving and Competitiveness.

This compares favourably to the findings of Jenkins, Zyzanski, and Rosenman (1979), the developers of the JAS, who reported similar intercorrelations between the JAS subscales.

**Table 3**  
*Correlation Matrix of Type A Variables.*

	TPA	SI	JI	HDC
TPA (TYPE A)	1.000			
SI (SPEED AND IMPATIENCE)	.646***	1.000		
JI (JOB INVOLVEMENT)	.407***	.292***	1.000	
HDC (HARD DRIVING AND COMPETITIVE)	.384***	.104**	.074*	1.000

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

One-way analyses of variance were calculated for the occupational overuse syndrome (OOS) variables, the Type A, and demographic variables, in order to investigate the possibility of confounds between the key variables (OOS and Type A), and the main effect demographic variables. The OOS variables were "Do you have any discomfort right now ?" (DISNOW),

severity of pain (SVRT1), and past physical discomforts in areas ranging from the neck and shoulders to the lower back (PRMAP1 to PRMAP5). The Type A variables were Type A (TPA), Speed and Impatience (SI), Job Involvement (JI), and Hard-Driving and Competitive (HDC). The demographic variables were age (AGE), sex (SEX), type of work (TYPWRK), and the city in which the subjects worked (PAPER).

As can be seen from Table 4, a significant mean difference was found between "ever had neck/shoulder pain" (PRMAP1) and SEX with a F Ratio of  $F(1, 365) = 6.265$ . Males reported having less pain in this area in the past.

Significant F Ratio scores were obtained between Speed and Impatience and SEX with  $F(1, 571) = 7.810$  and also between Job Involvement and SEX with a F Ratio of  $F(1,571) = 25.8$ . In both the Speed and Impatience and Job Involvement scales, males reported higher scores than females.

There was a significant difference between "ever had lower back pain" (PRMAP5) and AGE with a  $F(3, 362) = 3.345$ . This suggests that the older the individual gets the less likely they are to report having lower back pain in the past.

There was a significant difference between Hard Driving and Competitive and AGE with a  $F(3, 572) = 4.170$ . The effect was between individuals aged in the 21-30 and 41+ categories. Individuals who are aged 41 and over are more likely to have higher Hard Driving and Competitive scores than individuals aged between 21-30.

There was a significant difference between "ever had wrist pain" (PRMAP3) and AGE with a  $F(3, 362) = 4.02$ . The effect was between individuals aged in the 21-30 and 41+ categories. Individuals aged between 21-30 are more likely to have had past wrist pain than individuals aged 41 and over.

**Table 4**  
*Means and F Ratios between Sex and Age and Main Effect Variables.*

Means	Sex		F	Age			F	
	Male	Female		<20	21-30	31-40		>41
DISNOW (DISCOMFORT NOW)	1.707	1.702	0.015	1.666	1.679	1.686	1.748	0.921
SVRT1 (SEVERITY OF PAIN)	1.790	1.868	0.567	1.778	1.887	1.777	1.826	0.227
PRMAP1 (PAST PAIN IN NECK/SHOULDER)	1.375	1.253	6.265*	1.333	1.272	1.261	1.354	0.997
PRMAP2 (PAST PAIN IN FINGERS)	1.617	1.666	0.928	1.600	1.646	1.630	1.667	0.154
PRMAP3 (PAST PAIN IN WRISTS)	1.539	1.514	0.223	1.467	1.435	1.495	1.643	4.020**
PRMAP4 (PAST PAIN IN FOREARMS)	1.553	1.577	0.191	1.600	1.596	1.506	1.579	0.655
PRMAP5 (PAST PAIN IN LOWER BACK)	1.426	1.409	0.086	1.200	1.362	1.391	1.516	3.345*
TPA (TYPE A)	244.4	213.5	3.350	207.2	214.9	219.0	220.8	0.452
SI (SPEED AND IMPATIENCE)	175.4	160.6	7.810**	154.2	168.9	166.1	165.1	0.461
JI (JOB INVOLVEMENT)	216.5	194.2	25.88***	195.0	205.2	205.5	198.7	0.851
HDC (HARD DRIVING AND COMPETITIVE)	119.8	123.5	2.419	112.7	119.1	121.2	127.3	4.170**

\*p&lt;0.05

\*\*p&lt;0.01

\*\*\*p&lt;0.001

**Table 5**  
*Means and F Ratios between Type of Work and Main Variables.*

Means	TYPE OF WORK							F
	Rep	S-Ed	T-Ad	D-Set	Acc	Other		
DISNOW (DISCOMFORT NOW)	1.677	1.527	1.831	1.789	1.781	1.716	5.616***	
SVRT1 (SEVERITY OF PAIN)	1.707	1.941	1.600	2.000	1.652	2.000	1.770	
PRMAP1 (PAST PAIN IN NECK/SHOULDER)	1.329	1.305	1.250	1.200	1.357	1.288	0.813	
PRMAP2 (PAST PAIN IN FINGERS)	1.633	1.569	1.558	1.650	1.747	1.678	1.403	
PRMAP3 (PAST PAIN IN WRISTS)	1.487	1.448	1.558	1.425	1.607	1.576	1.302	
PRMAP4 (PAST PAIN IN FOREARMS)	1.494	1.431	1.581	1.667	1.714	1.508	3.281**	
PRMAP5 (PAST PAIN IN LOWER BACK)	1.456	1.483	1.348	1.307	1.476	1.322	1.539	
TPA (TYPE A)	240.5	237.2	203.4	188.2	190.1	224.2	12.08***	
SI (SPEED AND IMPATIENCE)	181.1	181.5	153.6	146.9	145.7	175.4	7.876***	
JI (JOB INVOLVEMENT)	241.0	211.1	173.4	167.5	175.2	213.3	41.94***	
HDC (HARD DRIVING AND COMPETITIVE)	199.0	121.1	126.9	115.3	124.6	124.7	1.754	

\*p&lt;0.05

\*\*p&lt;0.01

\*\*\*p&lt;0.001

Rep=Reporter

S-Ed=Sub-editor

T-Ad=Tele-ads

D-Set=Display settings

Acc=Accounts or Clerical

Other=Other

As can be seen from Table 5, significant differences were found between Discomfort Now and Type of Work. Individuals employed in Tele-ads, Display Settings, and Clerical are less likely to report discomfort than Sub-editors.

The OOS variable "ever had forearm pain" (PRMAP4) was significantly related to Type of Work with a F Ratio of  $F(5, 361) = 3.281$ . Accounts or Clerical staff are less likely to have had past pain in the forearm than Sub-editors.

Type A was significantly related to Type of Work with a  $F(5,570) = 12.0$ . Reporters and Sub-editors more likely to be Type A than Display setting and Clerical staff. Other occupational categories are more likely to be low Type A than Accounts or Clerical staff. Also, Reporters are more likely to be Type A than Tele-ads staff.

Speed and Impatience was significantly related to Type of Work with  $F(5, 570) = 7.87$ . Other occupations were more likely to be low in Speed and Impatience than Clerical occupations. Also, Reporters and Sub-editors were more likely to have higher Speed and Impatience scores than Accounts or Clerical and Display setting staff.

Job Involvement was significantly related to Type of Work with a of  $F(5, 570) = 41.9$ . Sub-editors and Others more likely to be low in Job Involvement than Tele-ads, Display settings and Accounts or Clerical staff. Also, Reporters were more likely to have higher Job Involvement scores than all other occupational groups.

As can be seen from Table 6, a there is a significant relationship between Type A and PAPER with  $F(7, 574) = 2.325$ . Timaru reported the highest mean Type A scores, Wellington and Hamilton were marginally Type A, and the remaining papers reported low Type A means. There is also a significant relationship between Speed and Impatience and PAPER with a  $F(7, 574) = 2.440$ . Timaru and Hamilton scored the highest average Speed and Impatience scores, Auckland scored moderate Speed and Impatience scores, and the remaining paper locations on average scored low in Speed and Impatience.

**Table 6***Means and F Ratios between Location of Paper and Main Variables.*

	Location of Paper								F
	Means	(1)Mn	(2)Hm	(3)Tm	(4)Ch	(5)NP	(6)In	(7)Ak	
DISNOW (DISCOMFORT NOW)	1.621	1.827	1.678	1.633	1.883	1.730	1.729	1.682	0.449
SVRT1 (SEVERITY OF PAIN)	1.761	2.000	1.777	1.848	2.200	1.823	1.800	1.800	0.392
PRMAP1 (PAST PAIN IN NECK/SHOULDER)	1.289	1.309	1.235	1.282	1.265	1.400	1.304	1.303	0.363
PRMAP2 (PAST PAIN IN FINGERS)	1.541	1.574	1.563	1.761	1.677	1.700	1.739	1.607	1.396
PRMAP3 (PAST PAIN IN WRISTS)	1.579	1.556	1.500	1.521	1.636	1.600	1.435	1.438	0.949
PRMAP4 (PAST PAIN IN FOREARMS)	1.684	1.482	1.688	1.535	1.617	1.675	1.652	1.489	1.453
PRMAP5 (PAST PAIN IN LOWER BACK)	1.474	1.374	1.563	1.394	1.353	1.500	1.304	1.416	0.751
TPA (TYPE A)	206.8	227.7	245.2	211.7	199.4	207.2	215.9	227.9	2.325*
SI (SPEED AND IMPATIENCE)	156.9	181.3	185.7	155.7	159.4	156.7	178.8	172.9	2.440*
JI (JOB INVOLVEMENT)	202.8	201.7	228.1	197.1	180.7	214.1	196.5	206.2	2.947**
HDC (HARD DRIVING AND COMPETITIVE)	125.3	123.9	125.6	119.8	117.3	125.4	123.9	120.4	0.784

\*p&lt;0.05      \*\*p&lt;0.01      \*\*\*p&lt;0.001

(1) Mn=Manawatu    (2)Hm=Hamilton    (3)Tm=Timaru    (4)Ch=Christchurch  
(5)NP=New Plymouth    (6)In=Invercargill    (7)Ak=Auckland    (8)Wn=Wellington

There is a significant relationship between Job Involvement and PAPER with  $F(7, 574) = 2.94$ . Timaru scored higher in Job Involvement than all the other paper locations.

The Severity of pain (SVRT1) OOS variable was excluded from further analysis as it was not related to any of the demographic or Type A variables, in either of the one-way ANOVA or correlational statistics.

Table 7 was designed to investigate interaction effects between the main and demographic variables. In order to investigate this possibility the potential confounding variables were entered first in the hierarchical regression equation, and the main effect Type A variables in the second step. This had the effect of partialing out the effect the demographic variables may be having on the Type A / Occupational Overuse Syndrome relationship.

As can be seen from Table 7, the demographic variables entered on step 1 significantly account for very small proportions of the OOS variables Discomfort Now, past pain in wrists (PRMAP3), and past pain in lower back (PRMAP5). When the demographic and the Type A variables are entered on step two, their combination accounts for significant small proportions of the past pain in shoulders (PRMAP1), past pain in fingers (PRMAP2), past pain in wrists (PRMAP3), and past pain in the lower back (PRMAP5). As the  $R^2$  change between step one and two are minimal and non-significant for all of the OOS variables, it can be concluded that the demographic variables do not confound with the Type A variables when measuring the proportion explained of the OOS variables.

In summary, simple correlations were run to investigate the main effects within and between the OOS and Type A relationship. One-way ANOVAs were then run between the demographic and the OOS and Type A variables to explore the possibility of confounds between the OOS / Type A relationship. Finally, multiple hierarchical regressions were run to determine the strength and significance of the confounding variables. It was found that the extent Type A is able to explain the variance of OOS is small, and this relationship is not affected by the demographic variables.

**Table 7**  
*Hierarchical Multiple Regression*

Predictors	Dependent Variables											
	DISNOW		PRMAP1		PRMAP2		PRMAP3		PRMAP4		PRMAP5	
	R <sup>2</sup>	F	R <sup>2</sup>	F	R <sup>2</sup>	F	R <sup>2</sup>	F	R <sup>2</sup>	F	R <sup>2</sup>	F
Step 1 (1)	0.017	2.48*	0.183	1.673	0.013	1.153	0.040	3.0**	0.016	1.44	0.029	2.70*
Step 2 (2)	0.020	1.47	0.042	1.98*	0.045	2.12*	0.053	2.5*	0.036	1.66	0.048	2.20*
R <sup>2</sup> & F	0.003	0.473	0.024	2.270	0.033	1.060	0.013	1.292	0.021	1.87	0.019	1.71
Change (3)	N=566		N=364		N=361		N=361		N=361		N=361	

\*p<0.05

\*\*p<0.01

(1) Note : Variables entered on step 1 were Sex, Age, Type of Work and Paper Location.

(2) Note : Variables entered on step 2 were Type A, Speed and Impatience, Job Involvement, and Hard Driving Competitiveness.

(3) Note : These figures represent the R<sup>2</sup> and F change statistics between the variables entered on step 1 and step 2.

## CHAPTER SEVEN

### DISCUSSION

The purpose of the present study was to explore the work behaviours that are related to Occupational Overuse Syndrome (OOS). To explore this relationship the JAS Type A, Speed and Impatience, Job Involvement, and Hard-driving and Competitive scales were used.

The discussion has been divided into four sections. The first section discusses the main research hypothesis, its implications, and the overall strength of the association. The second section describes the demographic effects on the OOS and Type A scales. The third section outlines the significance of the intercorrelations within the OOS and Type A data. The final section discusses the OOS - Type A findings in more general terms, and makes suggestions for further research.

#### *Research Hypothesis*

It was hypothesised that a significant positive relationship would be found between the Type A Behaviour Pattern and OOS.

This hypothesis was partially supported. The JAS Speed and Impatience sub-scale was significantly correlated to six of the seven OOS variables. Further, the JAS Type A and Job Involvement sub-scales were each significantly correlated to one OOS variable.

The correlations between Speed and Impatience (behaviour pattern of time urgency) and OOS variables of Discomfort Now, and all the past pain variables (the neck or shoulder, the fingers, the wrists, the forearms, and the lower back) are all small. This suggests that while the correlations are significant, their relationship is not strong.

Specifically, the relationships are as follows. Firstly, the higher they scored on the

Speed and Impatience sub-scale the greater the likelihood that they currently experienced OOS related discomfort (DISNOW) . Secondly, the higher the score in Speed and Impatience the greater the likelihood that the individual experienced pain in the neck or shoulders, the fingers, the wrists, the forearms, or the lower back, in the past.

Further significant relationships were discovered between Type A and the OOS variable of past pain in the forearm (PRMAP4), and Job Involvement (Degree of dedication to occupational activity) and the OOS variable of past pain in the wrists (PRMAP3). Both of these correlations were small. This indicated firstly that, the higher the Type A scores the greater the likelihood that the individual experienced pain in the forearm in the past. Secondly, the higher the Job Involvement scores the greater the likelihood that the individual experienced pain in the wrists in the past.

The only OOS variable that was not correlated to any of the JAS scales was the severity of pain measure (SVRT1). The reason behind the apparent lack of usefulness of the severity of pain variable cannot be determined without further research into this variable.

It is clear the most useful section of the JAS scale in the current report is the Speed and Impatience sub-scale. The Type A and Job Involvement sub-scales proved to be only marginally beneficial. The positive correlations found with these three subscales are in line with what one might expect in Type A health research. In CHD research, for example, the higher an individual scores on a Type A scale, the greater the likelihood that s/he will develop a CHD related illness (Cooper et al., 1981; Dembroski et al., 1978; Haynes & Matthews, 1988).

Further, these results compare favourably with the findings of research that has been done previously in the Type A-physical pain and discomfort area. For example, research has found significant *positive* correlations between the Type A Behaviour Pattern and physical pain and discomfort (Mayers et al. 1984; Nall & Thomas, 1986, cited from Mullay & Grigg, 1988; Mattheson & Ivancevich, 1982; and Workman & La Via, 1988).

In the Mayers et al. (1984) study positive correlations between the JAS and physical

symptoms were found. The Type A scale had a correlation of .30, the Speed and Impatience had .28, Job Involvement .12, and Hard-driving and Competitive a correlation of .49 with physical symptoms.

While the results of the present study are consistent with previous findings, two main differences in the methodology can be seen. The first main difference was the OOS measurement used in the Nall and Thomas study (1986, cited from Mullan & Grigg, 1988). While the current study employed the use of the JAS and a pilot OOS measurement, the Nall and Thomas study used the Australian National Heart Foundation Type A Personality inventory, and an unknown OOS measurement. The second difference is that previous research (such as that done by Matteson & Ivancevich, 1982; Mayers et al. 1984; and Workman & La Via, 1988) used known Type A measurements, such as the JAS and the SI, but their pain measurements, while encompassing OOS symptomology, were not specifically designed to measure OOS. The Workman and La Via (1988) study, for example, used a pain inventory which measured chronic pain of at least two years in duration, with episodes occurring two or more times a week. This chronic pain included headaches, backaches, and pain in the extremities. While these symptoms are included in OOS symptomology, the chronic pain questionnaire was not specifically designed to measure OOS in VDU operators.

It is possible that the time urgency element of the Type A Behaviour Pattern may be induced by the environment in which the sample of the current study works. The newspaper industry, by its very nature, has its foundations in strict daily deadlines. Thus, the positive relationships found with time urgency in the current study, may be, partially at least, explained by the unique nature of the newspaper industry. It would be interesting to use the Type A and OOS measurements employed in the current report on a VDU sample in which the time urgency element was not an inherent part of their job. This would indicate how strong the influence of the working environment is in eliciting Type A behaviours.

The implications of these findings are that there is not a strong relationship between the JAS as a whole and OOS. If positive correlations obtained from the Speed and

Impatience sub-scale are not an artifact of the time urgency nature of the newspaper industry, then this construct needs to be investigated further. The exact elements of the sub-scale that play the major part in the relationship could then be determined. In this way the Speed and Impatience construct could be extended to encompass further elements that combine to explain the OOS - Type A relationship more fully.

Also, if Speed and Impatience elements of the Type A Behaviour Pattern are playing a significant role in OOS symptomology, either past or present, affected individuals need to be informed of this relationship. Such knowledge would be indispensable if a behaviour modification programme was implemented to reduce the risk of OOS. The idiom of 'prevention is better than cure' is applicable here.

To determine the strength of the JAS in explaining variance in OOS, hierarchical multiple regressions were performed between the OOS and Type A variables (see Table 7). It was found, after the effects of the demographic variables had been partialled out, that the Type A measurement was only able to explain a very small amount of the variance in OOS. All explained variance of OOS by the JAS was under 6%.

The amount that the Type A sub-scales was able to explain of the OOS variables was minimal which indicates that there is much to the OOS variables that is left unexplained by the present study. Further, as the actual strength of ability of work related behaviours to explain the variance in OOS has not been explored by previous research, it cannot be determined whether or not the JAS is a suitable tool in explaining this variance without these comparisons.

### ***Explanation of Analysis of Variance Results***

Detailed analysis of the significant effects between the demographic variables and the OOS and Type A variables were performed by using One-way ANOVA statistics. Each

will be explained in turn.

### *Sex*

There were significant differences between males and females for one OOS, and two Type A variables. Males were more likely to have past pain in the neck or shoulders than females. As only one OOS variable produced a significant effect, and the magnitude of this effect was small, it is questionable whether gender differences had an overall significant effect in the reporting of OOS symptomology in the current report.

Males reported higher average scores than females in the Speed and Impatience and Job Involvement sub-scales. These results find some support in the literature where Haynes et al. (1980); and MacDougall et al. (1979) found that males had higher Type A scores than females. This difference is reduced when the female sample is limited to employed women, as is the case of the current sample (Davidson et al., 1980; Haynes et al., 1980; Lawler et al., 1983; Morell & Katkin, 1982; and Schoenberger et al., 1976).

### *Age*

Significant differences between age and the OOS variables of past pain in the wrist and past pain in the lower back were found. Specifically, individuals aged between 21-30 were more likely to report having past pain in the wrists than individuals older than 41. Also, the older the individual gets the less likely that they reported having past pain in the lower back. The tentative pattern that seems to be emerging within each of the obtained effects is that older individuals tended to report less past pain in the wrists and the shoulders than other age groups. However, the reliability and validity of the OOS section of the questionnaire needs to be determined in order to verify the significance of the observed pattern.

There was a significant difference between age and the JAS sub-scale of Hard Driving and Competitiveness. It was found that individuals who were older than 41 had higher

Hard Driving and Competitive scores than individuals who were aged between 21 and 30. These results do not find support in the literature. This is not surprising, as previous studies which have investigated Type A behaviour and age have not found agreement on the nature of their relationship. For example Kelly and Houston (1985) found that Type A behaviour declines with age in women; Baker et al., (1984) found a curvilinear relationship with younger and older women lower in Type A, and middle aged groups were more Type A; and Shekelle et al., (1976) found an inverse relationship between Type A and age for both sexes. The wide divergence in the findings of the relationship between Type A behaviour and age clearly warrants the need for further study to be done in this area.

### *Type of Work*

There were significant differences between the type of work and the OOS variables of discomfort now and past pain in the forearms. Individuals who are employed in Tele-ads, Display settings, and Clerical are less likely to report having present discomfort than Sub-editors. Also, Accounts or Clerical staff are less likely to have reported having past pain in the forearm than Sub-editors. This is interesting as in both cases Sub-editors are more likely to have OOS symptoms, both in the past and at present. A comparison of the different elements that comprise each job-type at INL would be useful in order to explore the exact nature of this effect. To this end, further investigation into job-type and OOS symptomology also needs to be done to determine the reliability and validity of this effect.

There were significant differences between Type of Work and Type A, Speed and Impatience, and Job Involvement. Type A was significantly related to the Type of Work the INL staff member was involved with. Reporters and Sub-editors were more likely to be Type A than Display setting and Clerical staff, and Reporters are more likely to be Type A than Tele-ads staff. Also, other occupational categories are more likely to be low Type A than Accounts or Clerical staff.

The JAS Speed and Impatience sub-scale was significantly related to Type of Work.

Reporters and Sub-editors were more likely to have higher Speed and Impatience scores than Accounts or Clerical and Display setting staff. Also, other occupations were more likely to be low in Speed and Impatience than Clerical occupations.

The JAS Job Involvement sub-scale was also significantly related to Type of Work. Sub-editors and Others more likely to be low in Job Involvement than Tele-ads, Display settings and Accounts or Clerical staff. Further, Reporters were more likely to have higher Job Involvement scores than all other occupational groups.

These results find support from the literature. Jenkins, Zyzanski, and Rosenman, (1979); Shekelle et al., (1976); and Mettlin, (1976) found in their samples that higher occupational levels were associated with higher Type A scores, with managerial, professional and technical staff having higher Type A scores than sales, clerical or labourers.

In the current sample, Reporters and Sub-editors consistently scored higher Type A, Speed and Impatience, and Job Involvement scores, than the Display Setting, Tele-ads, Accounts or Clerical, and Other occupational categories. The only exception is that Sub-editors were lower in Job Involvement than Tele-ads, Display settings and Accounts or Clerical staff. The trend seems to be that the more managerial, professional or technical the job is, the higher the Type A, Speed and Impatience, or Job Involvement scores were likely to be.

The implications of these findings in the context of the current research is that these occupational groups may need to be targeted for behavioural modification programmes. Such programmes need firstly, to inform target groups of the potential danger that their group membership initials, and secondly, place target groups on, where possible, individualised programmes, that modify the OOS related behaviour patterns.

### *Paper Location*

There were significant effects between paper location and Type A, the Speed and

Impatience, and Job Involvement sub-scales. Timaru reported the highest average Type A scores, Wellington and Hamilton were marginally Type A, and the remaining paper locations were low in Type A.

Timaru and Hamilton scored the highest average Speed and Impatience scores, Auckland scored moderately, and the remaining papers had low Speed and Impatience scores.

Timaru scored significantly higher Job Involvement scores than any of the other paper locations.

The only trend seems to be that Timaru consistently scored higher in Type A, Speed and Impatience, and Job Involvement than any of the other paper locations.

Apart from urban - rural differences, no previous research has been done on the possible relationship between geographical location and the TABP. As such, the results of the current study cannot be compared to previous research. Further analysis of the Timaru sample would be beneficial in order to determine the apparent concentration of Type A individuals in this area.

### *Explanation of Correlational Results*

#### *OOS*

The intercorrelations obtained between the OOS variables are generally moderate in nature. No significant correlations were obtained between the present OOS pain variables of discomfort now and severity of pain, and the past pain variables in the neck or shoulder, the fingers, the wrists, the forearms, or the lower back. The lack of association here is an indication that the different OOS variables measure different unrelated aspects of OOS.

Past OOS pains are not related to present OOS pains, however, reasons behind this lack of association cannot be determined without further research in this area. One possible reason may be traced to the source of the OOS pain. If the origin of the past OOS pain is different to that of present OOS pain then any possible relationship between the two would be weakened, and if the source of the OOS is different, the type of OOS could vary also.

Moderate but significant intercorrelations were found between the past OOS variables. This indicates that these variables are not only related to each other, but that they measure similar constructs. This is encouraging as it demonstrates that the OOS measure has some internal consistency.

Further research needs to be conducted with this questionnaire in order to determine its reliability and applicability to other than INL staff. It is thought by the researcher that since the OOS measure was designed for VDU operators that results will be able to be generalised to other VDU populations, but this presumption can only be determined by further research.

### *Type A*

All the Type A variables were positively intercorrelated with each other. The correlations obtained are generally moderate in nature. The highest correlations are between the JAS Type A variable and the JAS sub-scales of Speed and Impatience, Job Involvement, and Hard-driving and Competitive.

These results are supported by the research literature. Firstly, the reported intercorrelations in Jenkins et al., (1979) study between the Type A scale and the three sub-scales are almost identical to those of the present study. Further, very similar intercorrelations were obtained between the Jenkins et al., JAS sub-scales and those of the current research. Secondly, the reported intercorrelations in the Mayers et al. (1984) study are also strongest between the Type A scale and the sub-scales. The

intercorrelations between the sub-scales tend to be smaller in the Mayers et al. as compared to the present study.

Thus, consistent results have been found between the intercorrelations of the present, past, and the original Jenkins et al., (1979) JAS studies. This is encouraging as it confirms that the JAS results of the current study are akin to the original JAS study.

### *Summary and Conclusions*

The significant increases in the occurrence of OOS (Hopkins, 1990) clearly justified the need to explore the phenomenon in greater detail. An important area of OOS research that has been largely ignored is its psychological basis. Mullay and Grigg (1988) proposed that an examination of the psychological foundations of OOS related behaviours would help in the understanding of this relationship, and answer their question: "given similar working conditions, why do some individuals develop OOS and others do not?". Typically, the small number of research that has been done into the psychological make-up of individuals with OOS (such as Wigley, 1991; Fry, 1986; and Browne, et al, 1984) has found the OOS sufferer to be a highly motivated perfectionist with a strong work ethic. OOS seems to occur under conditions where the individual suffers from increased work pressure, and has the need to frequently push his/herself (NOHSC, 1986). Further, the ACC describe the typical OOS sufferer as displaying competitiveness and time pre-occupation behaviours. These factors combine to provide us with a group of behaviours that was encompassed by the Type A Behaviour Pattern.

Specifically, the TABP consists of hurried behaviour, work aggressiveness, a strong orientation towards work responsibilities and task completion, and intensive competitive behaviour in situations that involve evaluation. With the exception of Frymoyer et al's (1980) findings that Type As are more likely to be OOS sufferers, little research has been done on the nature of a specific relationship between OOS and Type A behaviours.

This study was designed to expand the information base in this area.

While there has been little documented research between Type A Behaviour and OOS, there is a pool of information on Type A and OOS related pain. This research has found a positive relationship between physical pains and discomfort and Type A individuals (Mattheson & Ivancevich, 1982; Mayers et al. 1984; Nall & Thomas, 1986, cited from Mullay & Grigg, 1988; Workman & La Via, 1988). Further, this relationship is characterised by an apparent contradiction in the reporting patterns of pain and discomfort in Type A individuals. Studies by Carver, Coleman, and Grass (1976); Greene, Moss, and Goldstein (1974); Hart (1983); Matthews and Carra (1982); Somes, Garrity, and Marx (1981) and Weider and Matthews (1978) have found that Type A individuals tend to suppress symptoms of pain and discomfort. In contrast, studies by Carmody et al. (1984); Eagleston et al (1986); Matterson and Ivancevich (1982); Woods et al. (1984) and Workman and La Via (1988), found a positive association between Type A Behaviour and symptom reporting. Carmody et al. (1984); Eagleston et al. (1986); and Hart (1983) theorise that the apparent contradiction in Type A symptom reporting can be explained by environmental conditions. Under conditions of high environmental challenge Type A individuals tend to suppress and thus under report pain symptoms, and in conditions of low environmental challenge Type A individuals tend not to suppress symptoms of physical pain and discomfort.

In light of these findings, and as the Type A Jenkins Activity Survey was administered in conditions of low environmental challenge, it was hypothesised that a significant positive relationship would be found between OOS and the Type A Behaviour Pattern. Generally, it was found that individuals who had developed OOS, either in the past or present, were more likely to be classified as having time urgency Type A behaviours. The time urgency behaviour of a typical OOS sufferer can be valued as a desirable characteristic as it promotes elevated rates of employee productivity. These behaviours are worth reinforcing (Ivancevich & Matterson, 1988). Such individuals should not be discarded but rather should be accepted as potentially the most efficient operators. They need to be given practical instructions on how to minimise OOS. For example, the necessity of making frequent breaks a habit (Wigley, 1991, note 2). It is when the

possible adverse consequences of these valuable qualities are not understood and managed that the conditions for musculoskeletal disorders may develop.

Therefore, in order to minimise maladaptive aspects of Type A behaviours in the long term, Chusmir and Hood (1986) suggest that organisations might do well to include the measurement of Type A behaviour to help identify those managers at greatest risk. This information would enable employers to target certain high-risk groups of its work force with appropriate preventative measures.

Alternatively, Wigley (1990), believes that it would be useful to use a pre-selection questionnaire to explore further the relationship between the competitive, perfectionist personality type and OOS susceptibility. The aim of the questionnaire would be to identify those individuals at risk. Wigley (1990), states that the standard psychological questionnaires would be unsatisfactory in this task as they are designed to detect 'subnormal features', were as these people have usually been above normal achievers. Caution is needed when considering the use of a pre-selection questionnaire as there is a danger that the instrument may be used to discriminate against potential OOS sufferers, despite their apparent advantage as workers. A better method would be to administrate such a questionnaire *after* an individual has been employed, and then advise them of their risk.

Thus, qualities that are valued in an employee can also lead to a condition that is detrimental to his/her physical well-being. As indicated by Chusmir and Hood (1986), and Wigley's, (1990) suggestions, this does not have to be a catch 22 situation. Information obtained through well controlled psychological research will enable a fuller understanding of the processes involved, and thus place researchers in the position of being able to manage psychologically related OOS problems. In this way it can be seen as a research challenge, rather than a perplexing dilemma.

### *Suggestions for Future Research*

In future OOS research there is a need for a greater focus into its psychological foundations, due to the paucity of information in this area. One area in the psychological domain of OOS requiring more attention is the work ethic, perfectionist, time urgency elements of work related behaviours.

To determine whether the findings of this report were an artifact of the strict time deadline nature of the newspaper industry, or an actual significant relationship, more research in the time urgency area of work behaviours is needed. Future research in this area would also be instrumental in removing some of the prejudice that has developed towards OOS sufferers by informing both employers and employees of the positive behaviour types that can help lead to the development of OOS.

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APPENDICES

**APPENDIX A : Covering Letter.**

12 May 1992

Dear INL worker,

**THE INL OCCUPATIONAL OVERUSE SYNDROME (OOS) STUDY**

The enclosed questionnaire has been designed to investigate OOS in INL. OOS (also known as Repetitive Strain Injury) is the phenomenon which describes the muscular aches and pains that are associated with keyboard use. Due to the occurrence of OOS in INL staff a research team has been formed with the aim of reducing this problem.

The questionnaire has been developed with the guidance and support of INL unions represented by Corrine Amber and Penny Harding, Jenny Beek (Occupational Health Nurse), Frank Darby (occupational Safety and Health, Department of Health), and five Massey University researchers (Mike Smith, Bert Biggs, Jon Dannatt, Christine Stephens, and Ross Pirie).

The questionnaire has three sections. Section one is a self reporting form for pain and discomfort, section two investigates the relationship between work related behaviours and OOS, and section three investigates the links between the work environment and OOS.

Participation in this study is voluntary, but it will help to discover possible therapies and build a picture which will, we hope, significantly reduce OOS occurring in the workplace. Complete anonymity is assured since no individual form can be identifies and only group data will be reported. Thank you, in anticipation, for your assistance and time.

Yours sincerely,

Mike Smith  
Bert Biggs  
Jon Dannatt  
Ross Pirie  
Christine Stephens  
Frank Darby  
Jenny Beek

**APPENDIX B : Follow Up Letter One**

**Dear INL worker,**

You will recall receiving a questionnaire to complete, in support of the INL Occupational Overuse Syndrome Project. It is essential to the success of the project that as many of the questionnaires as possible are completed and returned.

If you have not yet completed and returned your questionnaire, we would appreciate your doing so as soon as possible.

If you do not wish to complete a questionnaire please return the forms to the designated person in your office.

Your response will remain confidential and untraceable to any individual. Thank you for your help.

Yours faithfully,

Mike Smith  
Jon Dannatt  
Ross Pirie  
Christine Stephens

**APPENDIX C : Follow Up Letter Two.**

Dear INL worker,

To complete the INL Occupational Overuse Syndrome survey, it is important that as many questionnaires as possible are completed and returned. If you have not completed or returned your questionnaire, could you please do so as soon as possible ?

If you have lost your form but are willing to complete the questionnaire, please ask the designated person in your office for another copy.

If you have any problems with procedures for completing the questionnaire, do not hesitate to ask for advice or for another copy if necessary.

If you do not wish to take part in the survey, please return your uncompleted form.

Thank you for your time and trouble. We hope that the results of this project will be of benefit to all VDT workers.

Yours faithfully,

Mike Smith  
Jon Dannatt  
Ross Pirie  
Christine Stephens

**APPENDIX D : The Questionnaire Used in the Present Study.**

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Code Number

## THE INL OOS STUDY

This questionnaire is designed to investigate muscular aches and pains associated with keyboard use. The study is concerned with Occupational Overuse Syndrome (OOS, also commonly known as Repetitive Strain Injury) in keyboard operator staff in Independent Newspapers Limited.

The questionnaire has been divided into three sections:

Section One begins on page 2, and is a self reporting form for pain and discomfort.

Section Two begins on page 11, and has been designed to investigate the relationship between work related behaviours and OOS.

All participants will be given feedback on the results of the project. The questionnaire is confidential and we will not be able to trace individuals. The code number at the top of this page indicates the newspaper/division you work at, and is only there so that the Occupational Safety and Health Service can follow up in case the number of returns is small.

We do not require names, addresses, IRD or payslip numbers to be added to the questionnaire.

The questionnaire consists of a number of questions. Please answer them all as honestly as you can. No one will be able to query your answers.

**Circle the number of the answer that you think is appropriate.**

Thank you for your help.

Mike Smith	(Massey University)
Bert Biggs	(Massey University)
Jon Dannatt	(Massey University)
Ross Pirie	(Massey University)
Christine Stephens	(Massey University)
Frank Darby	(Occupational Safety and Health, Department of Health)
Jenny Beek	(Occupational Health Nurse, INL)

SECTION ONE.

SELF REPORTING FORM FOR PAIN AND DISCOMFORT.

For each question, choose the answer that is true for you, and circle the appropriate number.  
For example, with Q2,

2. What type of work do you do?

If "Reporter" is the appropriate answer, then circle "1".

Mark only one answer for each question.

If you change your mind, erase the old mark completely.

For example for Q5, if you are left handed, circle the 1.

GENERAL INFORMATION

For Office  
Use Only

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1. My identification number is

2. What type of work do you do?

- 1. Reporter
- 2. Sub-editor
- 3. Tele-ads
- 4. Display settings
- 5. Accounts or Clerical
- 6. Other (Please specify) ..... [ ]

3. Sex.

- 1. Male
- 2. Female [ ]

4. Age in years.

- 1. 20 or younger
- 2. 21 to 30
- 3. 31 to 40
- 4. 41 and over [ ]

5. Are you left or right handed?

- 1. Left
- 2. Right [ ]

6. Estimate your Visual Display Terminal use each day.
1. Less than 2 hours
  2. 2-4 hours
  3. 4-6 hours
  4. 6-8 hours
  5. More than 8 hours
- [ ]

7. How long have you been using a Visual Display Terminal?
1. Less than 1 year
  2. 1 - 2 years
  3. 2 - 5 years
  4. More than 5 years
- [ ]

8. A normal pattern is 8 am to 6 pm, Monday to Friday.  
Do you work a different pattern to this?
1. Yes
  2. No
- [ ]

#### QUESTIONS ABOUT MUSCULAR ACHES AND PAIN

Circle the number of the answer that you think is appropriate. For example, with Q9,

9. Do you have any discomfort right now?

If "Yes" is the appropriate answers, then circle "1".

9. Do you have any discomfort right now?
1. Yes
  2. No
- [ ]

---

If you answered "No" to Q9, go to Q25 on page 8.

If you answered "Yes" to Q9, carry on with Q10 to Q26 on page 9, then carry on with the questionnaire from SECTION TWO onwards.

---

10. Have you reported this discomfort to your manager or supervisor?
1. Yes
  2. No
- [ ]

11. Have you mentioned this discomfort to your work colleagues?
1. Yes
  2. No
- [ ]

12. Do you wake with discomfort?

1. Yes
2. No

15[ ]

If you answered "Yes" to Q12

(a) Do you normally wake with this discomfort after working days?

1. Yes
2. No

[ ]

(b) Do you normally wake with this discomfort after your rostered days off?

1. Yes
2. No

[ ]

13. Is this discomfort continuous throughout the day?

1. Yes
2. No

[ ]

If you answered "Yes" to Q13

(a) Is this discomfort continuous throughout only days that you work?

1. Yes
2. No

[ ]

If you answered "No" to Q13

(a) How many hours during your working day, do you normally feel this discomfort?

1. Less than 2 hours
2. 2-4 hours
3. 4-6 hours
4. 6-8 hours
5. More than 8 hours

[ ]

(b) How many hours during your rostered days free, do you normally feel this discomfort?

1. Less than 2 hours
2. 2-4 hours
3. 4-6 hours
4. 6-8 hours
5. More than 8 hours

[ ]

14. Are you free from this discomfort during your rostered days off?
1. Yes  
2. No [ ]
15. Has this discomfort forced you to take time off work?
1. Yes  
2. No 25[ ]
16. If you answered "Yes" to Q15, how many days in the last year? [ ]
17. Has this discomfort moved from one area of your body, to another area of your body?
1. Yes  
2. No [ ]
18. Has this discomfort spread to other areas of your body?
1. Yes  
2. No [ ]
19. My muscle aches and pains have generally,
1. become more severe  
2. stayed the same  
3. become less severe [ ]

20. Please state the severity of the aches and pains for each part of the body you find discomfort in. Use the six point scale given below.

For example, if you have only slight pain in the shoulders place a 1 in the box provided beside shoulders. (Use whole numbers only please.)

1                      2                      3                      4                      5                      6

---

Slight aches  
and pains

Mild aches  
and pain

Severe aches  
and pain

- Neck ..... [ ][ ]
- Shoulders ..... [ ][ ]
- Right arm ..... [ ][ ]
- Left arm ..... [ ][ ]

- Right wrist ..... [ ][ ]
- Left wrist ..... [ ][ ]
- Right hand ..... [ ][ ]
- Left hand ..... [ ][ ]
- Middle back ..... [ ][ ]
- Lower back ..... [ ][ ]
- Buttocks ..... [ ][ ]
- Thighs ..... [ ][ ]

21. Because of your muscle aches and pains, have you difficulty in sleeping?

- 1. Not at all
- 2. Sometimes [ ]
- 3. Constantly

22. Have you undertaken new activities or strategies to reduce discomfort?

- 1. Yes
- 2. No [ ]

**If you answered "Yes" to Q22**

(a) What are these new activities? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 [ ]

23. Have you reduced, or given up some daily routines or activities, because of your discomfort?

- 1. Yes
- 2. No [ ]

**If you answered "Yes" to Q23**

(a) What are these activities? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

[ ]

24. I have visited a health professional

- 1. Yes
- 2. No

[ ]

If you answered "Yes" to Q24

(a) what treatment or therapy did you receive ? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

<sup>49-50</sup>[ ]

(b) have you tried any other types of treatment or therapy, if so what ? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

[ ]

(c) what treatment or therapy best helped you relieve your feelings of muscle aches and pains?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

[ ]

(d) did any treatments make your aches and pains worse?

\_\_\_\_\_

[ ]

**QUESTIONS ABOUT YOUR WORKSTATION (ERGONOMICS)**

Circle the number of the answer that you think is appropriate. For example, with Q25,

25. For your seating

(a) is the seat adjustable for height?

If "Yes" is the appropriate answer, then circle "1".

25. For your seating

(a) is the seat adjustable for height?

1. Yes

2. No

<sup>59</sup>[ ]

(b) does the seat provide comfortable back support?

1. Yes

2. No

[ ]

(c) is the seat otherwise comfortable?

1. Yes

2. No

[ ]

(d) do you have a footrest?

1. Yes

2. No

[ ]

**For your screen and table**

(e) is the keyboard separately movable from the screen?

1. Yes

2. No

[ ]

(f) is your table adjustable for height?

1. Yes

2. No

[ ]

(g) do you have a wrist-rest?

1. Yes

2. No

[ ]

(h) do you use a 'mouse'?

1. Yes

2. No [ ]

(i) is there room for all your work on the surface available?

1. Yes

2. No [ ]

(j) are you able to get comfortable (posture) at your workstation?

1. Yes

2. No <sup>68</sup>[ ]

26. I believe the design of my workstation (ergonomics) is good

1. Yes

2. No [ ]

If you answered "No" to Q25

(a) please state briefly its problems \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[ ]

---

**If you answered "Yes" to Q9, please carry on with the questionnaire from SECTION TWO onwards. If you answered "No" to Q9, please carry on with the questionnaire from Q27 onwards.**

---

27. Have you ever had neck or shoulder pain?

1. Yes

2. No [ ]

28. Have you ever had pain in your fingers?

1. Yes

2. No [ ]

29. Have you ever had pain in your wrists?

1. Yes

2. No [ ]

30. Have you ever had pain in your forearms?

1. Yes

2. No [ ]

31. Have you ever had pain in your lower back?

1. Yes

2. No [ ]

If you answered "Yes" to any of the previous questions.

(a) to what activities do you attribute any of these complaints \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

<sup>76-78</sup>[ ]

(b) please state what treatment or therapy you took to relieve your feelings of muscle aches and pains \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[ ]

(c) what treatment or therapy best worked for you \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[ ]

## SECTION TWO

### JENKINS ACTIVITY SURVEY

The Jenkins activity scale asks questions about aspects of behaviour that have been found helpful in medical diagnosis. Each person is different, so there are no "right" or "wrong" answers.

For each question, choose the answer that is true for you, and circle the appropriate number. For examples with Q1,

1. Do you ever have trouble finding time to get you hair cut or styled?

If "Never" is the appropriate answer, then circle "1".

Mark only one answer for each question. If you change your mind, erase the old mark completely. Please answer every question.

1. Do you ever have trouble finding time to get your hair cut or styled?
  1. Never.
  2. Occasionally.
  3. Almost always.
2. How often does your job "stir you into action"?
  1. Less than most people's jobs.
  2. About average.
  3. More than most people's jobs.
3. Is your everyday life filled mostly by
  1. problems needing a solution?
  2. challenges needing to be met?
  3. a rather predictable routine of events?
  4. not enough things to keep me interested or busy?
4. Some people live in a calm predictable life. Others often find themselves facing unexpected changes, frequent interruptions, inconveniences, or "things going wrong". How often are you faced with these minor (or major) annoyances or frustrations?
  1. Several times a day.
  2. About once a day.
  3. A few times a week.
  4. Once a week.
  5. Once a month or less.

5. When you are under pressure or stress, what do you usually do?
1. Do something about it immediately.
  2. Plan carefully before taking any action. 5[ ]
6. Ordinarily, how rapidly do you eat?
1. I'm usually the first one finished.
  2. I eat a little faster than average.
  3. I eat at about the same speed as most people.
  4. I eat more slowly than most people. [ ]
7. Has your spouse or friend ever told you that you eat too fast?
1. Yes, often.
  2. Yes, once or twice.
  3. No, never. [ ]
8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, or figuring out problems while driving?
1. I do two things at once whenever practical.
  2. I do this only when I'm short of time.
  3. I rarely or never do more than one thing at a time. [ ]
9. When you listen to someone talking, and this person takes too long to come to the point, how often do you feel like hurrying the person along ?
1. Frequently.
  2. Occasionally.
  3. Almost never. [ ]
10. How often do you actually "put the words in the person's mouth" in order to speed things up?
1. Frequently.
  2. Occasionally.
  3. Almost never. [ ]
11. If you tell your spouse or a friend that you will meet somewhere at a definite time, how often do you arrive late ?
1. Once in a while.
  2. Rarely.
  3. I am never late. [ ]

12. How often do you find yourself hurrying to get places even when there is plenty of time?
1. Frequently.
  2. Occasionally.
  3. Almost never. [    ]
13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. What will you do ?
1. Sit and wait.
  2. Walk about while waiting.
  3. Usually carry some reading matter or writing paper so I can get something done while waiting. <sup>13</sup>[    ]
14. When you have to "wait in line" at a restaurant, a store, or the post office, what do you do?
1. Accept it calmly.
  2. Feel impatient but not show it.
  3. Feel so impatient that someone watching can tell that I am restless.
  4. Refuse to wait in line, and find ways to avoid such delays. [    ]
15. When you play games with young children about ten years old (or when you did so in past years), how often did you purposely let them win ?
1. Most of the time.
  2. Half of the time.
  3. Only occasionally.
  4. Never. [    ]
16. When you were you were younger, did most people consider you to be
1. definitely hard-driving and competitive?
  2. probably hard-driving and competitive?
  3. probably relaxed and easygoing?
  4. definitely relaxed and easygoing? [    ]
17. Nowadays, do you consider yourself to be
1. definitely hard-driving and competitive?
  2. probably hard-driving and competitive?
  3. probably relaxed and easygoing?
  4. definitely relaxed and easygoing? [    ]
18. Would your spouse (or closest friend) rate you as
1. definitely hard-driving and competitive?
  2. probably hard-driving and competitive?
  3. probably relaxed and easygoing?

4. definitely relaxed and easygoing? [ ]
19. Would your spouse (or closest friend) rate your general level of activity as
1. Too slow - should be more active?
  2. About average - busy much of the time?
  3. Too active - should slow down? [ ]
20. Would people you know well agree that you take your work too seriously?
1. Definitely yes.
  2. Probably yes.
  3. Probably no.
  4. Definitely no. <sup>20</sup>[ ]
21. Would people you know well agree that you have less energy than most people ?
1. Definitely yes.
  2. Probably yes.
  3. Probably no.
  4. Definitely no. [ ]
22. Would people that you know well agree that you tend to get irritated easily ?
1. Definitely yes.
  2. Probably yes.
  3. Probably no.
  4. Definitely no. [ ]
23. Would people that you know well agree that you tend to do most things in a hurry?
1. Definitely yes.
  2. Probably yes.
  3. Probably no.
  4. Definitely no. [ ]
24. Will people who know you well agree that you enjoy a "contest" (competition) and try hard to win?
1. Definitely yes.
  2. Probably yes.
  3. Probably no.
  4. Definitely no. [ ]
25. How was your temper when you were younger?
1. Fiery and hard to control.
  2. Strong but controllable.
  3. No problem.
  4. I almost never got angry. [ ]

26. How is your temper nowadays?
1. Fiery and hard to control.
  2. Strong but controllable.
  3. No problem.
  4. I almost never got angry. [ ]
27. When you are in the midst of doing a job and someone (not your boss) interrupts you, how do you usually feel inside?
1. I feel O.K. because I work better after an occasional break.
  2. I feel only mildly annoyed.
  3. I really feel irritated because most such interruptions are unnecessary. <sup>27</sup>[ ]
28. How often are their deadlines on your job?
1. Daily or more often.
  2. Weekly.
  3. Monthly or less often.
  4. Never. [ ]
29. These deadlines usually carry
1. Minor pressure because of their routine nature.
  2. Considerable pressure, since delay would upset my entire work group.
  3. Deadlines never occur on my job. [ ]
30. Do you ever set deadlines or quotas for yourself at work or at home?
1. No.
  2. Yes, but only occasionally.
  3. Yes, once a week or more. [ ]
31. When you have to work against a deadline, what is the quality of your work?
1. Better.
  2. Worse.
  3. The same (pressure makes no difference). [ ]
32. At work, do you ever keep two jobs moving forward at the same time by shifting work back and forth rapidly from one to the other?
1. No, never.
  2. Yes, but only in emergencies.
  3. Yes, regularly. [ ]
33. Are you content to remain at your present job level for the next five years?
1. Yes.
  2. No, I want to advance.

3. Definitely no; I strive to advance and would be dissatisfied if not promoted in that length of time. [ ]
34. If you had your choice, which would you rather get?
1. A small increase in pay without a promotion to a higher level job.
  2. A promotion to a higher level job without an increase in pay. [ ]
35. In the last three years, have you ever taken less than your allotted number of vacation days?
1. Yes.
  2. No.
  3. My type of job does not provide regular vacations.
36. In the last three years, how has your personal yearly income changed?
1. It has remained the same or gone down.
  2. It has gone up slightly (as the result of cost-of-living increases or automatic raises based on years of service).
  3. It has gone up considerably.
37. How often do you bring your work home with you at night, or study materials related to your job?
1. Rarely or never.
  2. Once a week or less.
  3. More than once a week. []
38. How often do you go to your place of work when you are not expected to be there (such as nights or weekends)?
1. It is not possible on my job.
  2. Rarely or never.
  3. Occasionally (less than once a week).
  4. Once a week or more. []
39. When you find yourself getting tired on the job, what do you usually do?
1. Slow down for a while until my strength comes back.
  2. Keep pushing myself at the same pace in spite of the tiredness. []
40. When you are in a group, how often do the other people look to you for leadership?
1. Rarely.
  2. About as often as they look to others.
  3. More often than they look to others. []

41. How often do you make yourself written lists to help you remember what needs to be done?
1. Never.
  2. Occasionally.
  3. Frequently.
- []

For questions 42-46 compare yourself to the average worker in your present occupation, and mark the most accurate description.

42. In amount of effort put forth, I give
1. Much more effort.
  2. A little more effort.
  3. A little less effort.
  4. Much less effort.
- []

43. In sense of responsibility, I am
1. Much more responsible.
  2. A little more responsible.
  3. A little less responsible.
  4. Much less responsible.
- []

44. I find it necessary to hurry
1. Much more of the time.
  2. A little more of the time.
  3. A little less of the time.
  4. Much less of the time.
- []

45. In being precise (careful about detail), I am
1. Much more precise.
  2. A little more precise.
  3. A little less precise.
  4. Much less precise.
- []

46. I approach life in general
1. Much more seriously.
  2. A little more seriously.
  3. A little less seriously.
  4. Much less seriously.
- []

For questions 47-49, compare your present work with your work setting five years ago. If you have not been working for five years, compare your present job with your first job.

47. I worked more hours per week
1. At my present job.
  2. Five years ago.
  3. Cannot decide.
48. I carried more responsibility
1. At my present job.
  2. Five years ago.
  3. Cannot decide.
49. I was considered to be at a higher level (in prestige or social position)
1. At my present job.
  2. Five years ago.
  3. Cannot decide.
50. How many different job titles have you held in the last ten years? (Be sure to count shifts in kinds of work, shifts to new employers, and shifts up and down within a firm.)
1. 0-1.
  2. 2.
  3. 3.
  4. 4.
  5. 5 or more.
51. How much schooling did you receive?
1. 0-4 years.
  2. 5-8 years.
  3. Some high school.
  4. Six Form Certificate.
  5. Polytechnic.
  6. Some university.
  7. Degree from university.
  8. Post-graduate degree from university.
52. When you were in school, were you a leader of any group, such as a student council, a club or the captain of a sports team?
1. No.
  2. Yes, I held one such position.
  3. Yes, I held two or more such positions.

**THANK YOU FOR YOUR TIME.**