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Relationship between behaviour patterns, coping and sports injuries

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Lakehead University

**THE RELATIONSHIP BETWEEN BEHAVIOUR PATTERNS, COPING AND SPORTS
INJURIES**

by
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Submitted in partial fulfillment of the requirements
for the Master's of Science Degree
in the School of Kinesiology
Lakehead University

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"This is the beginning of a new day. You have been given this day to use as you will. You can waste it or use it for good. What you do today is important because you are exchanging a day of your life for it. When tomorrow comes, this day will be gone forever; in its place is something that you have left behind...let it be something good."
- Unknown

Abstract

The primary purpose of this study was to determine whether a relationship exists between Type A and Type B behaviour patterns and sports injury. A secondary purpose was to investigate the relationship between behaviour patterns and coping styles of injured athletes. Male athletes ($N = 85$) who competed in competitive and recreational soccer leagues completed the Jenkins Activity Survey (JAS) to determine their behaviour pattern type. Those athletes who sustained an injury throughout the season ($n = 17$) completed the Coping with Health and Injury Problems (CHIP) scale to determine their coping strategy. Results showed no significant differences between JAS scale scores of injured and non-injured groups. However, a correlation was found between JAS Hard-driving/Competitive (H/C) sub-scale with Distraction Coping, $r = .579$ ($p = .05$). This finding revealed that individuals with high scores on the JAS H/C sub-scale were more inclined to cope through distraction methods such as concentrating on alternate tasks they wish to accomplish.

Keywords: behaviour patterns, coping strategies, psychology of sports injury

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The Relationship Between Behaviour Patterns, Coping & Sports Injury

Introduction

The risk of injury is inherent in all physical activities. Kraus and Conroy (1984) stated that each year, there are approximately 3 to 5 million injuries that occur in recreational and competitive physical activities, but according to more recent research those numbers have escalated (Ahern & Lohr, 1997; Renstrom, 1991; Williams, Rotella, & Heyman, 1998). Regardless of experience or ability, no athlete is immune to injury (Steadman, 1993). Through the years, there has been technological advances in safety equipment, improvements in coaching styles, more emphasis on mental training techniques, and more importance placed on proper physical conditioning, but athletic injuries have continued to increase in all areas of sports and physical activity (Bergandi, 1985; Crossman, 1997; Cupal, 1998; Gordon, Milios, & Grove, 1991; Hanson, McCullagh, & Tonymon, 1992; Yaffe, 1983).

Research has not identified a complete and specific list of physiological or psychological attributes which distinguish whether an athlete is predisposed to injury (Bergandi, 1985; Bramwell, Musada, Wagner, & Holmes, 1975; Taerk, 1977).

Research has focused on the impact of physical and environmental factors which may cause an individual to become injured. The search for ways of predicting, and possibly preventing athletic injuries has sparked the interest of many researchers. More recent research has examined the role of psychological variables as regulators of injury.

Several early investigations have identified personality traits which are associated with athletic injury (Bramwell et al., 1975; Jackson et al., 1978; McKelvie, Valliant, & Asu, 1985; Valliant, 1980; Valliant, 1981; Yates, Leehey, & Shisslak, 1983;

Young & Cohen, 1981). However, other psychosocial factors such as pain management, social support, and life stress, have received increased attention (Taylor & Taylor, 1998; Udry, Gould, Bridges, & Tuffey, 1997; Williams & Anderson, 1998). Knowing an athlete's personality characteristics could prove to be beneficial, not only in the prevention of injury occurrence, but also for rehabilitation purposes (Diekhoff, 1984; Fields, Delaney, & Hinkle, 1990; Gill, Henderson, & Pargman, 1995).

Personality Versus Behaviour Patterns

There are numerous definitions for personality and each definition is based on the orientation of the theorist (Liebert & Spiegler, 1970). Many personality psychologists have given concise definitions of personality and the following are some examples (as cited by Sanford, 1963):

Allport: Personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment. (p. 494-495)

Eysenck: Personality is the more or less stable and enduring organization of a person's character, temperament, intellect and physique, which determines his unique adjustment to his environment. (p. 496)

Bronfenbrenner: A conception of personality as a system of relatively enduring dispositions to experience, discriminate, or manipulate actual or perceived aspects of the individual's environment (including himself). (p. 497)

Sullivan: ... the relatively enduring pattern of recurrent interpersonal situations which characterize human life. (p. 497)

Cattell: Personality is that which permits a prediction of what a person will do in a given situation. ... Personality ... is concerned with all the behaviour of the individual, both overt and under the skin. (p. 496)

Hilgard: ... the sum total of individual characteristics and ways of behaving which in their organization or patterning describe and individual's unique adjustment to his environment. (p. 497)

Personality is an abstract explanation or hypothesized interpretation originating from behaviour, whereas behaviour is a directly observable characteristic (Mischel, 1968). All that one could ever 'know' about human personality is observed directly from behaviour (Liebert & Spiegler, 1970). Thus some researchers prefer the term behaviour pattern to the term personality as it allows them to describes patterns that are directly observable.

Behaviour patterns are neither considered to be a personality trait or type nor a stress reaction. Rather, they are defined as an observable repeated pattern of behaviour that is stimulated in susceptible individuals when confronted by a challenging situation or environment (Jenkins, Rosenman, & Zyzanski, 1974). The Type A behaviour pattern is one example and will be addressed below.

Many studies have been devoted to the search for personality correlates of Type A behaviour, but so far the findings are controversial. Some researchers have shown that the Type A behaviour pattern is associated with the Eysenck dimensions of personality: extroversion and neuroticism (Bortner, 1969; Lovallo & Pishkin, 1980). Other studies have shown an indirect connection between Type A behaviour pattern and extroversion and neuroticism because of a Type A individual's susceptibility to coronary heart disease and these specific personality dimensions may provoke stenocardia (Eysenck & Fulkner, 1983; Matthews & Krantz, 1976). Still other studies have confirmed a connection between Type A behaviour pattern and such personality features as: aggressiveness, autonomy, dominance, impulsiveness and extroversion (Chesney et al., 1980; Maciejczyk & Terelak, 1986).

Research in the behaviour pattern area first began during the 1950's, when two

cardiologists, Dr. Meyer Friedman and Dr. Ray Rosenman, combined their efforts to develop an operational definition of an apparent behaviour pattern emotional complex that they believed to be prone to coronary heart disease (CHD). For descriptive purposes, this CHD prone behaviour pattern was given the label of Type A, and a non-CHD prone behaviour pattern was given the label of Type B (Friedman & Rosenman, 1959). The results of their first study revealed that men who displayed Behaviour Pattern A regularly, also possessed substantially higher average serum cholesterol levels than men with Behaviour Pattern B (Friedman, Rosenman, & Carroll, 1958). The researchers concluded that an individual's level of serum cholesterol can fluctuate as a function of behavioural variables independent of his/her diet (Friedman & Rosenman, 1959; Rosenman & Friedman, 1961).

In a subsequent study, Rosenman and Friedman (1963) tested other blood lipids (fats) and discovered that men with the Type A behaviour pattern had "significantly higher serum levels of triglycerides, phospholipids, and cholesterol and of serum beta- and other low-density lipoprotein lipids, and significantly lower lipoprotein cholesterol ratios" (Rosenman & Friedman, 1963, p. 938) in comparison to those with the Type B behaviour pattern. Also, these blood lipid differences were not attributed to any variation between diet, weight, or physical activity (Rosenman & Friedman, 1963).

Over time, Friedman and Rosenman combined similar observations of their own patients and the participants from their studies to produce an illustration of the Type A behaviour pattern. It is described as an obvious behavioural syndrome or lifestyle characterized by excessive competitiveness, the need for achievement, aggressiveness, impatience, acceleration of common activities, nervousness,

restlessness, explosiveness of speech, hostility, hyper alertness, and constant feelings of pressure because of time deadlines. The opposite, Type B, is characterized by the relative absence of these designated psychological traits and situational pressures (Bortner & Rosenman, 1967; Friedman & Rosenman, 1959; Jenkins, Rosenman, & Friedman, 1967; Rosenman & Friedman, 1961; Rosenman et al., 1964; Rosenman et al., 1966). It is important to note that not all aspects of this behaviour pattern construct have to be simultaneously present for a person to be classified as being Type A (Jenkins et al., 1974).

Jenkins, Rosenman, and Zyzanski (1974) identified three types of behaviour patterns: Type A, Type B, and Type X. The degree to which individuals possess any of the behaviour patterns is based on a continuum, where the three types intermingle and there is no distinct boundary between each type. The continuum is as follows:

- A-1: Fully developed Type A behaviour pattern
- A-2: Many Type A characteristics present, but no the complete pattern
- X: An even mix of Type A and B characteristics
- B-3: Many Type B characteristics, but with some Type A characteristics
- B-4: Relative absence of Type A characteristics

(Chesney, Eagleson, & Rosenman, 1980)

Differentiating Type As from Type Bs

There are various physical, auditory, and attitudinal characteristics which set Type As apart from Type Bs. While many examples have already been mentioned, a full list and description of typical Type A gestures and characteristics can be found in Appendices A and B.

The structured interview provides a subjective global evaluation that takes into account the comparative presence or absence of certain characteristics (see Appendix

C). Although the obvious terms Type A and Type B are used to describe exhibited behaviour patterns, assessments made with the structured interview can further divide subjects into subgroups defined in a five-point scale (A-1, A-2, X, B-3, and B-4), as mentioned on the previous page.

Individuals in the category A-1 openly display and exhibit those traits of the Type A behaviour pattern in an extreme fashion. If their energy and drive seem less intense, then they are considered an A-2. Conversely, people categorized as B-4 appear to be completely free of all the Type A characteristics. Type X individuals exhibit an even blend of traits from both Type A and Type B behaviour patterns, but at varying depths of each. Finally, people are placed in B-3 when they demonstrate very few Type A attributes. Most of the population is ranked in the intermediate categories from A-2 to B-3 depending on the amount of Type A and Type B qualities that are more evident. As with most ranking-scales, it becomes almost impossible to distinguish an absolute border or cut-off between each subgroup (Friedman & Booth-Kewley, 1987; Jenkins et al., 1967).

Type A Behaviour Pattern and Coronary Heart Disease

Early research showed that Type A behaviour, along with several other factors, was a good predictor of whether or not an individual would exhibit coronary heart disease in the future (Blumenthal et al., 1985; Jenkins et al., 1967; Jenkins et al., 1974; Rosenman et al., 1975; Rosenman et al., 1964). The findings from the early studies could not be replicated in subsequent experiments which brought the increased attention from researchers to the relationship of the Type A behaviour pattern (anger-hostility dimension) and CHD. Recent research has not confirmed this Type A

behaviour and CHD causal relationship, and instead, it appears that only the anger-hostility dimension of Type A behaviour is a contributor to coronary heart disease (Blumenthal, Barefoot, Burg, & Williams Jr., 1987; Dembroski & Costa Jr., 1987; Matthews & Haynes, 1986; Wright, Carbonari, & Voyles, 1992). Why the discrepancies in the research findings? One strong possibility is that Type A predicts CHD in some populations, but not others. The more current studies may have used participants who either were at high risk for developing heart disease or were already coronary prone patients (Matthews, 1988). Another possibility may also be the result of the methods by which Type A is assessed. Different studies often use different measures, which may or may not be measuring the same construct (Sarafino, 1998).

Matthews (1988) has suggested two reasons why some studies did not find the expected association between behaviour patterns and CHD. First, Type A high-risk and CHD participants may have been mis-classified as Type Bs if they were taking certain medications, such as beta-blockers (which dampen sympathetic nervous system transmission), or trying to change their stress-related behaviour. Second, for participants who were coronary prone patients, the main cause of the CHD may have been different for Type A and Type B individuals.

Type A Behaviour Pattern and Cardiac Rehabilitation

Upon the initial discovery of the Type A behaviour pattern's influence on the incidence of CHD, some researchers examined the importance of Type A characteristics on CHD rehabilitation. Oldridge, Wicks, Hanley, Sutton, and Jones (1978) studied 163 men who had myocardial infarctions. The participants were enrolled in a rehabilitation program of physical activity. They discovered that behaviour patterns

have a large effect on adherence to a physical conditioning program for coronary heart disease patients. Those participants who were Type A were considered non-adherers of the program because after one month into the program, 65% of the Type A individuals dropped out. By the 12th month, 71% of the remaining Type A participants had dropped out (Oldridge et al., 1978).

Type A patients in cardiac rehabilitation also appear to have a higher level of perseverance and determination. Rather than giving up or developing effective coping styles for uncontrollable circumstances in their lives, Type As continue to fight, often against overwhelming odds (Rejeski, 1982). It is this constant struggle and excessive need for control over their environment which may trigger chronic physiological illnesses in Type As. Also, other research has demonstrated that Type As have a higher distressful reaction to uncontrollable life events than do Type Bs (Suls, Gastorf, & Witenberg, 1979).

Suppression of Fatigue in Type A Individuals

As the Type A behaviour pattern construct developed, researchers explored other aspects of Type A. Carver, Coleman, and Glass (1976) investigated Type A and Type B college students' personal rating of fatigue level on two-minute intervals while completing the Balke treadmill test. This treadmill test instructed the students to continue on the treadmill for as long as possible with no apparent goal. The results were consistent with the hard driving and competitive characterization of the Type A behaviour pattern, as the Type A participants remained on-task significantly longer than their Type B counterparts. Carver et al. concluded that although Type As physically exerted themselves more than Type Bs (as indicated by oxygen consumption), their

subjective ratings of fatigue were significantly lower than those of Type Bs. Type As are more likely to ignore or be unaware of their internal states and therefore may be at risk for chronic injury because of their delay in seeking treatment for early symptoms. A similar study by De Meerseman (1988) used a cycle ergometer and found the same results as Carver et al. (1976). Again, Type As reported lower fatigue levels and lower perceived exertion than Type Bs, in spite of equivalent cardiovascular and neuroendocrine reactivity. The researcher speculated that studies which use perceived physical exertion as an important indicator could be rendered inaccurate and useless if using participants who are Type A since they chronically underrate their physical exertion (De Meerseman, 1988).

The effects of Type A behaviour and challenging events on intercollegiate football players was investigated by Carver, De Gregario, and Gillis (1981). They found that Type A athletes may be predisposed to injury because of their tendency to suppress or deny subjective states (such as early signs of injury). The Type A's felt that once they admit their feelings of fatigue, the ability for them to achieve their goals is threatened and thus they become even more aggressive in their pursuit of goals related to their achievement (Carver et al., 1981). Franklin (1978) hypothesized that overly competitive individuals (Type A) frequently misjudged their capacities and, as a result, are subject to orthopedic complications and extreme muscle soreness.

It has been proposed that fatigue suppression may be only one example of several physical symptoms that Type As under report (Carver et al., 1976). Hart (1983) continued Carver et al.'s (1976) research and designed a study which examined the Type A's rating of personal physical symptoms other than just fatigue suppression.

Hart's results indicated that Type As under reported the frequency of symptom/illness experiences and admitted to less intense physical symptoms when compared to Type Bs. Hart speculated that Type As may suppress their attention to symptoms only as a response to appropriately challenging (stressful) environments. This study also found that there may be crucial differences between Type As and Type Bs in how they label, or define a body state (Hart, 1983).

Mechanic (1980) has provided a model of illness behaviour that may help explain why Type As perceive themselves as being very healthy. The model implies that individuals who direct their attention externally are not inclined to monitor their bodies, therefore, they perceive themselves as being in better physical health than individuals who direct their attention to inner experiences. Since Type As seek to control their environment, they direct their attention outwards from themselves, and may not be aware of the condition of their own body (Mechanic, 1980).

Prevalence of Behaviour Patterns

Friedman and Rosenman (1974) found that 50% of the general United States of America population is in the Type A category, 40% in the Type B, and 10% are Type X. MacDougall, Dembroski, and Musante (1979) examined college students and found that 53% of the sample was Type A; 38%, Type B; and 9%, Type X. Eby and Van Gyn (1987) compared behaviour pattern distribution among the normal student population with varsity athletes. For the normal student population, their results concur with those of MacDougall et al. with 59%, Type A; 28%, Type B; and 13%, Type X. Conversely, in the varsity athlete population, there was an increase in the observed proportion of Type A behaviour pattern. For the varsity athlete sample, 72% were Type A; 10%, Type B;

and 18%, Type X (Eby & Van Gyn, 1987).

Haynes, Feinleib, and Kannel (1980) also observed behaviour patterns in 79 male students and found that 49.4% of them were Type A. In the same study, 197 male employees of an aerospace industry were examined and 71.4% of them were labeled as Type A. The Western Collaborative Group Study studied 3,500 men from various business organizations and found 52% to be Type A and 48% to be Type B (Rosenman et al., 1975; Rosenman et al., 1964).

Bortner & Rosenman (1967) studied 76 male volunteers who were employed as insurance executives, actuaries and salesmen. The behaviour pattern proportions were as follows: Type A, 48.7%; Type B, 44.7%; and Type X, 6.6%. Boyd (1984) found that firms managed by Type A executives show a higher return on investment and greater five-year growth in sales revenue than firms managed by Type B executives.

Refer to Table 1 for a summary of the prevalence of behaviour patterns investigated by the aforementioned researchers.

Table 1

Prevalence of Behaviour Patterns in Previous Research

| Population | Type A | Type B | Type X | Researchers |
|--|--------|--------|--------|---|
| General U.S. Population | 50% | 40% | 10% | Friedman and Rosenman, 1974 |
| Male College Students | 53% | 38% | 9% | MacDougall et al., 1979 |
| Male College Students | 59% | 28% | 13% | Eby and Van Gyn, 1987 |
| Male Varsity Athletes | 72% | 10% | 18% | Eby and Van Gyn, 1987 |
| Male College Students | 49.4% | N/A | N/A | Haynes et al., 1980 |
| Male Aerospace Industry Employees | 71.4% | N/A | N/A | Haynes et al., 1980 |
| Male Business Employees | 52% | 48% | N/A | Rosenman et al., 1964; Rosenman et al., 1975 |
| Male Insurance Executives, Actuaries, and Salesmen | 48.7% | 44.7% | 6.6% | Bortner and Rosenman, 1967 |

Athletics and Behaviour Patterns

Friedman and Rosenman (1974) hypothesized that there are more athletes who demonstrate Type A behaviour pattern than Type B. This is because some of the characteristics present in the Type A behaviour pattern, such as the competitive and hardworking traits, being achievement oriented, aggressive, and ignoring physical fatigue and injury, are also characteristics that contribute to success in athletics. It is possible that the competitive aspects of sports participation appeals more to the Type A individual. Thus, the competitive and elite levels attract more Type As than Bs. One

study has confirmed that more athletes are Type A than Type B (Eby & Van Gyn, 1987). It is speculated that moderate activity levels have several relaxing aspects and, therefore, draw more Type Bs (Koivula & Hassmen, 1998).

Type A individuals seek out situations where their need for competitiveness and high achievement are fulfilled. They also are more extrinsically motivated. This is in contrast to Type Bs who are more comfortable with themselves, less driven, and more intrinsically motivated (Koivula & Hassmen, 1998). This can be applied to exercise as well. Motivation to participate in exercise for Type A individuals is considered to be extrinsic in nature, where the Type B individual is more motivated by intrinsic factors. Intrinsically motivated individuals participate in sport and physical activity for the joy, pleasure, fun, curiosity, and personal mastery of a skill. Conversely, extrinsic individuals participate in sport and physical activity for reasons such as social approval from peers, material rewards, and an increase in social status (upward social mobility) (Weiss & Chaumeton, 1992).

The possible link between Type A behaviour pattern and running injuries was studied by Fields, Delaney, and Hinkle (1990). Forty participants, all members of a running club, kept daily training logs for the year. This log included information regarding average weekly running mileage, number of injuries, and total number of training days missed because of injury. The results of this study revealed that running injury risk was associated with Type A behaviour. For the Type A participants, 8 of 14 (57%) reported an injury compared to the Type B participants, where 9 of 26 (35%) reported an injury. The researchers also concluded that there are many factors which comprise the Type A behaviour pattern and a specific factor responsible for the injury

cannot be isolated. The researchers recommended that future research should clarify whether behaviour pattern factors lead to running injury (Fields et al., 1990).

Diekhoff (1984) found a significant correlation between the number of reported injuries and the participant's Type A or Type B behaviour pattern. The participants in this study recorded their training variables, such as length of daily run, weekly mileage, and number of races per year. "A significant correlation was found between the number of Reported Injuries and Type A/B scores ($r=-.29$, $n=68$, $p=.01$)." (Diekhoff, 1984, p. 124) Type A individuals were observed as reporting more injuries than Type Bs which is based on training variables. Diekhoff discussed the possibility that injured and non-injured athletes are similar in behaviour pattern types and training variables until injury occurs (Diekhoff, 1984).

Gill, Henderson, and Pargman's (1995) results contradicted those found by Diekhoff (1984). They attempted to determine whether Type A competitive runners were at an increased risk for psychological stress and injury compared with Type B competitive runners. Twenty-four male and 13 female club runners between the ages of 20 and 54 years served as the participants. The runners' training habits were also assessed in terms of average distance run per week, average number of runs per week, average intensity of the run, and number of races run over the past year. Participants self-recorded the intensity of their runs on a 10-point Likert scale. There were two injury variables: the number of running-related injuries experienced over the past year, and the number of training days missed due to running-related injuries over the past year (Gill et al., 1995). Type A runners were no more likely to engage in intense, hard-driving, and competitive training sessions than the Type B runners. As

well there were no differences in either frequency or intensity of daily stressors between the two behaviour patterns. Finally, both groups of runners reported experiencing approximately one injury over the past year and the Type B runners reported missing an average of one week more of training over the past year than the Type A runners. Gill et al. suggest that future research efforts should attempt to determine whether Type A persons tend to perceive athletic situations as stressful, thus increasing their risk of injury. Also, the relationship of behaviour pattern factors and stress perception should be investigated to enhance the ability to predict and prevent the occurrence of athletic injury (Gill et al., 1995).

The contradictory results between Diekhoff (1984) and Gill et al. (1995) could be attributed to two differences. The first discrepancy is in their sample selection process. Gill et al.'s participants were members of a competitive running club in north Florida, while Diekhoff's sample was derived from local running clubs, YMCA running classes, undergraduate students who indicated that they ran or jogged on a regular basis, and patients from local medical practitioners who presented symptoms that were running-related. Thus, Diekhoff's sample lacked homogeneity, contrary to Gill et al.'s. Second, their choice of instruments to measure behaviour patterns differed. Diekhoff used a 12-item, Likert-type measure of Type A/B behaviour developed by Ivancevich and Matteson (1980). This scale was scored such that high scores indicated the presence of Type B behaviour traits. Conversely, Gill et al. administered the Type A Self-Rating Inventory (TASRI, Blumenthal et al., 1985), which is a list of 38 adjectives, 21 of which are characteristic of Type A persons, 7 which are characteristic of Type B persons, and 10 are filler items. Respondents indicate on a scale of 1 (never true) to 7 (always true)

the extent to which each adjective describes him or herself. Diekhoff's instrument is not widely used in the literature, whereas the TASRI has been used on several occasions.

Measuring Behaviour Patterns

People with Type A behaviour tend to exhibit physical characteristics such as facial tension, rapid speech, interruption of others' speech, tongue and teeth clicking, and the audible forced inspiration of air. Therefore, tests based on interviews are superior to those that are more pencil and paper based (Chesney et al., 1980). Since Type A behaviour pattern marks a reaction to a certain situation, the structured interview (SI) is preferred over the others as it evaluates behaviour directly, but is difficult to master and administer properly (Chesney et al., 1980).

Structured Interview

The SI requires intensive interviewer training, in which a margin of error exists due to the interviewer's behaviour while interviewing participants. The SI is time-consuming and expensive to use, and details of the interviewer's and rater's methods can affect the outcome (Chesney et al., 1980). Certain questions in the SI contain words that must be emphasized by the interviewer with a crisp, abrupt, staccato style to specifically target those behaviours of the Type A individual. There is also a deliberate delay or stumbling of words by the interviewer in order to encourage the Type A participant to elicit the behaviour of interruption. Also, the interviewer is trained to interrupt the participant themselves throughout the entire interview. Whether the participant stops and waits for the interviewer to stop talking, or continues to talk over the interviewer, can be considered evidence for his/her behaviour pattern. Finally, a sense of time urgency is created by the interviewer by hurrying the individual using

his/her own verbal cues (Chesney et al., 1980).

The structured interview involves asking individuals a standard set of questions about themselves and not only recording the answer, but also observing their behaviour during the interview: how fast they talk; how much they interrupt; and how they respond to being challenged or provoked. The SI is not an interview where emphasis is placed on obtaining the “correct” answer to the questions, rather it’s purpose is to provide conditions where certain behaviours can be perceived (Chesney et al., 1980).

Inter-rater reliability in classifying individuals ranges from .64 to .84 (Jenkins, Rosenman, & Friedman, 1968). Test-retest stability in the dichotomous Type A/B distinction was found to be .82 (Jenkins et al., 1968). Therefore this test has been proven to be reliable in determining an individual’s specific behaviour pattern type.

Jenkins Activity Survey (JAS)

The Jenkins Activity Survey (JAS) is a 44-item pencil-and-paper, self-report questionnaire, with three standard sub-scales (Type A/Type B, Speed/Impatience, and Hard-Driving/Competitiveness) (see Appendix D). The questions in this survey were based on those used in the structured interview. A high score in the overall Type A sub-scale means that more Type A traits are evident, while a low score is indicative of Type B traits. The Hard-Driving score will give a value for the individual’s drive to achieve. A high score represents the person’s need to strive towards completion of more and more objectives, thus, exhibiting Type A traits. The Speed and Impatience score measures the individual’s sense of time urgency. A high score in this sub-scale will show Type As’ inability to perform tasks at ease and ability to finish their work at a faster rate than others (Friedman & Booth-Kewley, 1987).

The JAS has a test-retest reliability coefficient of 0.74 (Jenkins et al., 1974). Further test-retest reliabilities of the JAS have ranged from .65 to .82, and internal consistency, using a modification of coefficient alpha, is reported in the mid 0.80s. The JAS measures the A/B behaviour pattern along a numerical continuum from -30 to +30, which parallels the alphabetical continuum (see page 3). A participant whose score is positive on this scale is indicative of the Type A behaviour pattern, with A-1 individuals scoring closer to +30 (Boyd, 1984).

For the purposes of this study, the Jenkins Activity Survey which targets the general population was modified to be relevant to athletes.

Other Methods

There are other methods which have been developed to determine an individual's behaviour pattern. Blumenthal et al. (1985) developed the Type A Self-Rating Inventory (TASRI). This measure is a 28-item adjective checklist where individuals rate on a 7-point Likert scale the degree to which they believe that they possess this characteristic. The TASRI is a brief screening alternative to the more lengthy structured interview or JAS, but does not differentiate between A1, A2, X, B3, B4. Usually a score of 120 (or above) on the TASRI distinguishes an individual as Type A.

Another method created by Bortner and Rosenman (1967) is a test battery. This test simulates performance situations which should elicit Type A behaviour. The test battery may give the researcher more precise information of a person's Type A behaviour and is relatively free from problems that are present in self-report methods. However, the test battery requires more skill in administering and scoring. Also, there is

a physical presence of an examiner, which is less useful in studies with a large sample size (Bortner & Rosenman, 1967). Too few studies have been done using these other instruments to pass judgement on them (Booth-Kewley & Friedman, 1987).

Coping Strategies

To athletes, injuries can be seen as stressful events. Folkman and Lazarus (1985) view a stressful encounter as a dynamic process which continually changes. This is also true of injuries. The emotions and states of mind that accompany every stage of a stressful encounter constantly fluctuate (Folkman & Lazarus, 1985). As athletes progress through the stages of an injury, their emotions and states of mind also change (Crossman, Gluck, & Jamieson, 1995; Quackenbush & Crossman, 1994).

Coping is a response mechanism used to reduce the effects of stress (Folkman & Lazarus, 1980). Folkman and Lazarus (1980) defined coping as “the cognitive and behavioural efforts made to master, tolerate, or reduce external and internal demands and conflicts among them.” (p. 223) Coping can be termed as retaining a level of “personal functioning” that is necessary to “face the demands of one’s resources.” (Udry, 1997, p. 74) As the status of the injury changes, so must the athlete’s form of coping.

Functions or Objectives of Coping

There are numerous functions or objectives associated with coping. White (1974) identified three functions of coping: 1) to gather information about the environment, 2) to sustain adequate internal conditions for both action and cognitive assessment, and 3) to obtain the liberty to adapt the use of one solution from a list of many. Pearlin and Aneshensel (1986) described three objectives of coping: 1) to

change the situations that lead to stress, 2) to understand and recognize the value of the situations in order to reduce their effects, and 3) to alleviate and dominate over the symptoms of negative stress. A commonality amongst these sets of objectives is the individual's ability to attain a certain level of internal steadiness and control over the external demands of stressors.

Types of Coping Strategies

Researchers have classified the various ways people cope. The lists are varied in terms of types of coping and the number of strategies. Several researchers have developed instruments to measure coping (Carver, Sheier, & Weintraub 1989; Endler, Parker, & Summerfeldt 1993; Folkman & Lazarus, 1988).

Folkman and Lazarus (1980) state that there are two main types of coping: problem-focused and emotion-focused. Problem-focused coping is directed toward solving a problem or doing something positive to change the effects of the negative stress. This type of coping is used more frequently in controllable situations where the individual believes that a constructive change would make a difference. The emotion-focused coping method regulates the emotional responses that are associated with or elicited by the situation. This type of coping is used more frequently in uncontrollable situations where the individual believes that the stressor is something that must be endured (Folkman & Lazarus, 1980).

Folkman and Lazarus (1988) developed 'The Ways of Coping Questionnaire' to measure the different aspects of problem-focused and emotion-focused coping. The problem-focused subcategories include: confrontive coping (describes aggressive efforts to alter the situation and suggests some degree of hostility and risk-taking);

planful problem-solving (describes intentional problem-focused attempts to alter the situation, coupled with an analytic approach to solving the problem); and social support (describes efforts to seek informational support from knowledgeable persons). The emotion-focused subcategories include: distancing (describes cognitive efforts to detach oneself and to reduce the significance of the situation), self-controlling (describes efforts to regulate one's feelings and actions), accepting responsibility (acknowledges one's own role in the problem with common theme of trying to put things right), escape-avoidance (describes wishful thinking and behavioural efforts to escape or avoid the problem), positive reappraisal (describes efforts to create positive meaning by focusing on personal growth - also has a religious dimension), and seeking social support (describes efforts to seek sympathy and emotional support from someone).

Carver, Scheier, and Weintraub (1989) generated another coping scale (COPE) which conceptualized thirteen subcategories of coping: active coping, planning, suppression of competing activities, restraint coping, seeking of instrumental social support, seeking of emotional support, positive reinterpretation, acceptance, denial, turning to religion, focus on and venting of emotions, behavioural disengagement, and mental disengagement. When this scale was constructed, it was the first of its kind that considered individual differences in the coping process (personality dimensions and specific events). Even though this scale measures several coping responses, it is limited in its use with coping and health problems. "The relevance and significance of the coping activities tapped by specific items may be qualitatively different when medically ill subjects are studied." (Endler et al., 1993, p. 390)

The Coping with Health and Injury Problems (CHIP) scale was developed by

Endler et al. (1993) to assess how people cope with health related issues (see Appendix E). There are four subcategories of coping in this instrument. The first, **Instrumental** coping, is “a task-oriented, problem focused and problem solving approach which includes actively finding out information [about the health problem] and medical advice.” (p.393) Second, **Emotional Preoccupation** coping is “an emotion-oriented and emotion-focused dimension that relates to a preoccupation with the emotional consequences of the health problem.” (p. 393) Third, **Distraction** coping “has common features with avoidance coping, where the individual copes with the health problem by thinking about other experiences, engaging in unrelated activities, or seeking the company of others.” (p. 393) Finally, **Palliative** coping “involves a variety of self-help activities and responses intended to alleviate the unpleasantness of a health problem.” (p. 393)

The above mentioned researchers use many different terms to describe coping strategies or styles resulting in a lack of clarity in the coping literature. Strong conclusions regarding an individual’s way of coping are difficult to establish. However, most recent theorists would agree that coping is a multidimensional concept (Johnston & Carroll, 2000). This refers to coping as being a very large and broad subject area with numerous methods of measurement and application.

One researcher, R.H. Moos (1993), stated that “researchers have used two main conceptual approaches to classify coping responses. One approach emphasizes the orientation or focus of coping (problem- or emotion-focused), whereas the other emphasizes the method of coping (cognitive or behavioural).” (p. 16) Figure 1

illustrates a breakdown of all subcategories by research groups under the headings: Problem-focused and Emotion-focused.

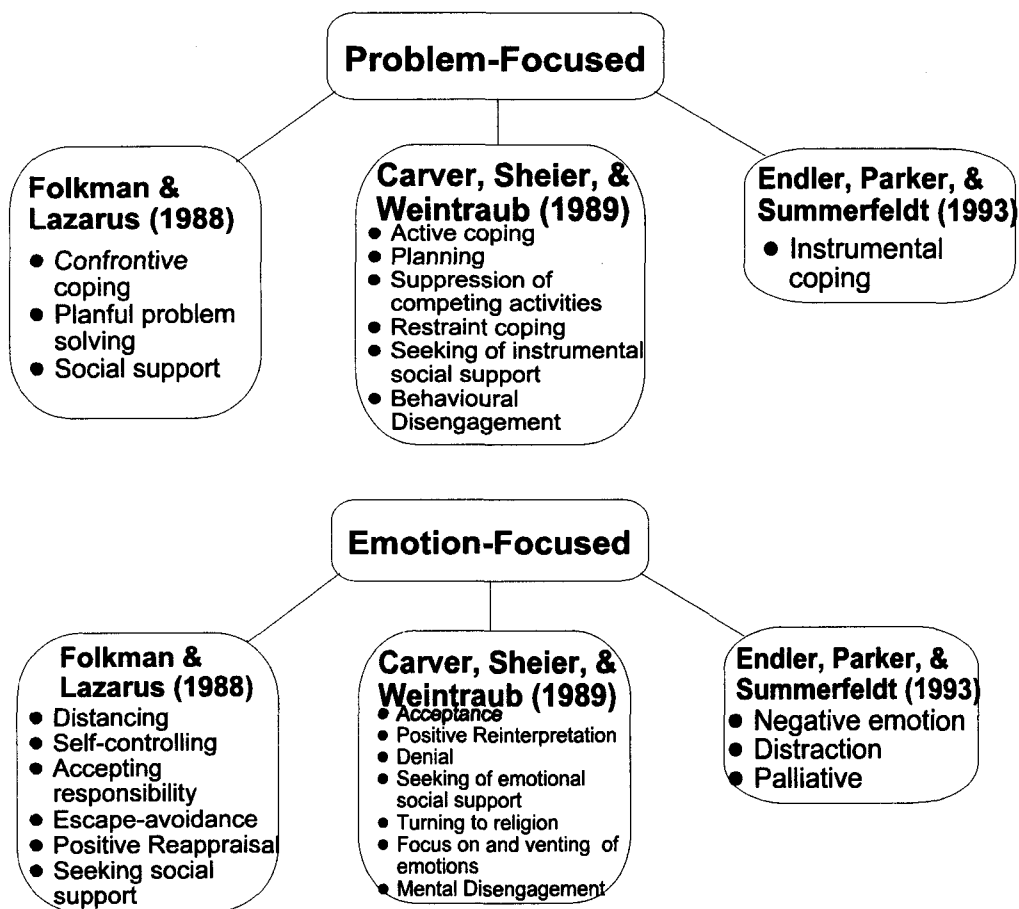


Figure 1. A summary of subcategories of coping by research groups.

Measuring Coping Strategies

Many scales have been developed to assess how people cope with stress including the Ways of Coping Questionnaire (Folkman & Lazarus, 1988) and the Coping with Health and Injury Problems scale (CHIP) (Endler et al., 1993). In fact, researchers interested in the subject area of coping with health problems can choose

from a variety of reliable and valid instruments. Most of these measures are directed towards assessing people's general coping styles and may be inappropriate to use with medical populations (Endler et al., 1993).

When deciding on a coping scale, it is important to determine which approach to coping assessment one is interested in: inter-individual or intra-individual. The inter-individual approach focuses on identifying and comparing basic coping strategies or styles used by the individual across different types of stressful situations. Self-report measures that take this approach ask the individual how they generally react to stressful situations. The intra-individual approach to coping assessment examines how coping behaviours change in response to particular or specific types of situations. Self-report measures that take this approach ask the individual to report how he or she reacted or responded to a specific stressful situation (Endler et al., 1993).

Coping Strategies and Type A Behaviour

There are many individual differences which account for the specific coping methods that people choose. Personality traits may exert a stable influence on the coping efforts that are used when dealing with a specific situation (Carver et al., 1989). One factor Carver et al. (1989) explored was the Type A Behaviour Pattern. They proposed that since Type As seek to control their environment, they will rely on strategies directed toward the management of a problem. Carver et al. (1989) determined that Type A individuals were more likely to plan how they were going to deal with an event, to use strategies that actively confronted the problem in question, and to persist in their coping efforts. Terry's (1994) results supported this finding. She found that participants scoring high on the measure of Type A behaviour favoured the use of

problem-focused coping and these individuals attempted to use coping to seek meaning to the situation.

Fleishman (1984) found that individuals with a tendency to ignore difficulties and avoid thinking about problems (Type A people) will use more avoidance-type strategies. Fleishman examined participants' coping responses to everyday life stressors and also determined that the type and the characteristic of the stressor are the best predictors of an individual's coping response as opposed to his or her personal characteristics, which is contradictory to Carver et al.'s (1989) work. Therefore, these personal characteristics (such as self-esteem and locus of control) will only affect the selection of the coping style through the appraisal of the stressful event, making it an individualistic process. Individuals with internal control beliefs use more problem-focused coping and less emotion-focused coping than persons with external control beliefs. This is attributed to the fact that Individuals who have strong internal control beliefs are more likely to believe that their own efforts will be effective in altering the outcome of a situation (Fleishman, 1984). Individuals with high self-esteem rely more on problem-focused coping than those with low self-esteem, because a high level of self-esteem is likely to predispose a person to feelings of confidence in his or her ability to overcome problems (Fleishman, 1984).

Coping Strategies and Stress in Athletics

Several studies have examined athletes' coping strategies when enduring competitive stress in sport (Gould, Eklund, & Jackson, 1993; Gould, Finch, & Jackson, 1993; Madden, Kirkby, & McDonald, 1989; Madden, Summer, & Brown, 1990). In an exploratory descriptive study, Madden et al. (1989) surveyed 21 middle distance

runners using a coping assessment instrument to determine how they would cope if they experienced a slump in their personal performance. The most common reported forms of coping included seeking social support, increased effort and determination, and problem-focused coping (Madden et al., 1989).

In continuing this research, Madden et al. (1990) evaluated the coping strategies used by competitive basketball players when under stress. The results of this study indicated that athletes reporting low levels of perceived competitive stress also reported less frequent use of coping strategies than athletes reporting high levels of perceived competitive stress. The coping strategies reported by the highly stressed athletes were similar to those found by Madden et al. (1989).

A delimitation, cited in Gould, Eklund, and Jackson (1993), of both of Madden's studies is that the athletes were asked to assess how they would cope in hypothetical situations as opposed to how they coped in a stressful situation they actually experienced. Madden's studies were aimed at developing a testing instrument for the coping strategies used during perceived athletic stress; thus, the researchers were trying to observe reliability and validity for their instrument by using hypothetical situations. Gould, Eklund, and Jackson (1993) attempted to examine coping strategies used by athletes in actual stressful situations. The researchers interviewed 20 Olympic wrestlers and asked how they coped with the stress encountered in the 1988 Olympics in Seoul, South Korea. Four general dimensions of coping strategies emerged: thought control (the athletes imposed order or constraint on their thought processes), task focus (the athletes controlled their thought content by focusing on their present task and concentrating on their goals), emotional control (the athletes controlled their feeling

state and activation level - relaxation, breathing control), and behavioural-based strategies (changing or controlling their environment).

Gould, Finch, and Jackson (1993) furthered this research using figure skaters. Again, the results matched the previous studies, and, in addition, the skaters initiated a wide variety of cognitive and behavioural coping responses, often at the same time. Through the use of multiple coping strategies, the athletes were able to respond to various types of stressful situations.

Coping Strategies and Athletic Injuries

To date, only three quantitative studies have examined the changing pattern of coping strategies in injured athletes (Johnston & Carroll, 2000; Quinn & Fallon, 1999; Udry, 1997). Udry (1997) investigated the coping strategies of 25 athletes (males=15, females=10) who sustained knee surgeries. Participants competed at either the recreational level (N=17), high school level (N=6), or NCAA Division III level (N=2). The participants' coping styles were assessed five times throughout their rehabilitation (pre-surgery, 3, 6, 9, and 12 weeks post-surgery) using the CHIP (Endler et al., 1993). Udry was interested in describing the coping strategies the athletes used, examining whether length of rehabilitation time changed the use of coping, and determining if coping was a significant predictor of rehabilitation adherence. Instrumental coping was found to be the most frequently adopted coping strategy across all assessment periods. This finding corresponds with Endler et al.'s (1993) study, who reported that individuals seeking medical treatment for both acute and chronic medical problems identified instrumental coping as the dominant coping strategy. Through a series of repeated measures analyses, Udry found that time was a significant factor in changing two types

of coping (negative emotion and palliative). It was also determined that all coping styles were more apparent at the beginning of rehabilitation and then decreased from that point onward. Udry speculated that the decline of coping was due to the reduction in the athlete's perceived injury-related stress throughout the course of rehabilitation. Madden et al. (1990) also found that athletes reported less frequent use of coping strategies when their stress levels were low.

The changes in various psychological characteristics and reactions of elite athletes from injury onset until full recovery and the coping skills of these athletes was examined by Quinn and Fallon (1999). Each injury was divided into four different time points. Phase 1 was the first week after the injury occurring, Phase 2 was one-third of the recovery time, Phase 3 was two-thirds of the recovery time, and Phase 4 was the time of full recovery. The total recovery time was estimated by a medical personnel during Phase 1. The researchers surveyed the coping strategies of 136 elite injured athletes at Phase 2 (one-third) and Phase 3 (two-thirds) through rehabilitation using the COPE inventory (Carver et al., 1989). The results showed that athletes used a variety of coping styles throughout their rehabilitation. Even though the athletes consistently employed active coping (cognitively assessing the problem to come up with ways to improve it) more than other strategies, their coping responses remained relatively stable over time. For example, at Phase 2 an athlete may employ active coping, seeking of social support and positive reappraisal. When tested at Phase 3, the assessment instrument reveals the use of identical coping strategies. This example illustrates the same variety of coping styles being used consistently throughout the athlete's rehabilitation.

Neither of the two previously mentioned studies included a non-athletic injured control group. Consequently it is difficult to determine whether the observed coping patterns are only generalized to injured athletes. Johnston and Carroll (2000) realized this discrepancy and took it into consideration when designing their study. The aims of their study were to: compare the coping styles of injured athletes with injured non-athletes; explore, in depth, the relationship between coping and adherence; and investigate the differences in coping style usage between genders. Participants in this study were athletic and non-athletic men and women aged 18-60 years who had severe or acute musculoskeletal injuries. Coping strategies were measured three times over the duration of the rehabilitation (initial physiotherapy appointment, midway point in treatment, and last physiotherapy appointment) by the Coping Response Inventory - Adult Form (Moos, 1993). All coping strategies, except seeking alternative rewards, were found to decrease significantly as rehabilitation progressed. The researchers speculated that since the individual's appraised stress level of the injury decreased throughout rehabilitation, the "participants appeared to do less of everything" in terms of their coping styles (Johnson & Carroll, 2000, p. 299). This finding parallels Udry's (1997) results. The only difference between the athletic and non-athletic groups was that the athletic group was significantly more likely to implement a guidance-seeking and support-seeking coping style. No significant gender differences were found for coping strategies. However, women were significantly more satisfied than men with emotional and practical support at the beginning of rehabilitation and with practical support at the end of rehabilitation. Johnston and Carroll speculate this gender difference is because research has shown that women are more inclined to have

smaller yet more intensive social networks than men. The support that women receive is multi-functional, and they are more likely to accept, develop, maintain and change their social networks than their male counterparts (Shumaker & Hill, 1991).

It is important to remember that results from qualitative studies parallel these quantitative studies, and give further depth and insight into athletes' coping responses to injury. Thus, the type of coping strategy that an injured athlete may employ differs on factors of individuality, nature of injury, self-perception of past coping methods, and self-motivation.

Purpose

At the present time there is a lack of clarity in the research literature about whether Type A pattern increases the risk of injury (Diekhoff, 1984; Fields et al., 1990) or has no effect (Gill et al., 1995). The issue of how Type A or B athletes cope with athletic injuries has not been explored. Therefore, the primary purpose of this study was to determine whether a relationship exists between Type A and Type B behaviour patterns and sports injury. A secondary purpose of this study was to investigate the relationship between behaviour patterns and coping styles of injured athletes.

Methods

Sport Selection

Several factors influenced the researcher's choice of sport for this study. The geographical location for data collection limited the researcher to sports leagues that competed within the city's limits, as inter-regional play was either too great a distance to travel or obsolete. The time of year (summer) was appropriate for data collection in the researcher's thesis process, and thus, enabled those sports that were played in a warm

climate and outdoors to be considered. The chosen sport also needed to have enough participants enrolled in the league that would increase the probability of a significant amount of the athletes to become injured throughout the season. An appropriate age bracket needed to exist in the sport in order for proper assessment of both the behaviour pattern and coping style instruments. Finally, previous studies (Diekhoff, 1984; Fields et al., 1995; Gill et al., 1990) used participants who were individual-sport oriented athletes (runners), therefore the present study aspired to utilize team-sport oriented athletes as the participants. After reviewing the aforementioned factors, soccer remained to be the sport of choice.

Participants

For this study, the participants ($N=85$) were male athletes between the ages of 20 and 44 who competed in local (City of Thunder Bay) summer (from May - September) senior men's competitive and recreational (Division I and II respectively) soccer leagues. Male athletes were chosen due to the availability of numerous participants, unlike its female counterpart. The researcher was unable to combine the genders to make a large sample size because of the previously established conclusion stating that males and females cope differently (Johnston & Carroll, 2000; Shumaker & Hill, 1991).

Instruments

Athlete Demographics Questionnaire. This survey was included to acquire additional information about the participant. It included statements such as the participant's name, age, primary sport, the number of years involved in their primary sport, and whether their primary sport was a team- or individual-oriented activity.

Jenkins Activity Survey. The JAS was originally developed for use with a student population. For the purposes of this study minor adjustments were made to the instrument where the wording of some of the statements which referred to school or studying was changed to reflect the same idea in sports. For example, statement number 2 originally read: Does college “stir you into action”? The choices were: 1) less often than most college students, 2) about average, and 3) more often than most college students. This statement was adapted to read: Does your sport “stir you into action”? The choices are now: 1) less often than most athletes, 2) about average, and 3) more often than most athletes. A total of 14 out of the original 44 items were mildly changed (i.e., one word in the item), not effecting the validity of the instrument.

Coping with Health and Injury Problems Scale. The CHIP is a 32-item self-report measure with four sub-scales (Endler et al., 1993). The participants use a 5-point Likert scale (1=*not at all*, 5=*very much*) to indicate the degree to which they engage in these four coping strategies (Instrumental, Emotional Preoccupation, Distraction, and Palliative). The range of scores for each sub-scale is 8 to 40. CHIP is designed to provide information regarding the use of one or more forms of coping techniques rather than a total measure of coping. The CHIP also contains an Inconsistency Index that measures the overall consistency of the responses for similar items. This Inconsistency Index identifies those individuals who may have misunderstood the instructions, or were responding in a careless or random fashion, so that the researcher can remove those surveys and avoid skewed data. Internal alpha coefficients for the CHIP scale ranges from 0.78 to 0.84 (Endler et al., 1993).

Procedures

Prior to the study, all participants gave their informed consent, (see Appendix F) and completed a short athlete demographics questionnaire (see Appendix G). The athletes were then briefed concerning the importance of not disclosing any information to other participants about the specific procedure or instruments that were used in the study. Confidentiality was guaranteed for all participants, and the results of the study were available to every athlete upon request. Participation in the study was completely voluntary and participants could have withdrawn from the study at any time without repercussions.

The athletes completed the Jenkins Activity Survey (JAS) during their pre-season. This provided the researchers with five groups of participants: those who were Type A-1, A-2, X, B-3, and B-4. If one of the participants became injured, he then completed the second half of the study. For the purposes of this study, the term injury was defined as a musculoskeletal problem that occurred during participation in sport, and as a result, the individual was unable to fully participate in sport for at least one scheduled game. The injured participant was then observed by the researcher with regard to his injury through the duration of their rehabilitation. This was accomplished by having the researcher attend all of the games and through regular communication with the players and coaches of all the teams following every game.

Also upon injury, the participant completed the CHIP scale to determine which coping technique the injured athlete used. The different types of coping strategies (instrumental, emotional preoccupation, distraction, and palliative) were then correlated with behaviour pattern type and the JAS sub-scales (A/B, H/C, and S/I) to determine if a

relationship existed.

Results

A total of 17 participants were injured out of the pool of 85, with all injuries being of low severity (minor ankle sprains, muscle strains, back pain). None of the injured participants were absent for more than one game, therefore they were out of competition for an average of one week. The injury group's mean age was 25.82 (SD = 5.88) years, whereas the non-injured group had a mean age of 26.91 (SD = 5.77) years. The average number of years involved in soccer as their primary sport for the injured group was 17.29 (SD = 5.69), and for the non-injured group it was 19.01 (SD = 4.78). Of the 17 injured participants, 6 of them participated in the recreation league and 11 of them in the competitive league. None of these differences were statistically significant.

To ensure that the sample for this study was a reflection of the population, the sample JAS scores for all three sub-scales were compared to the population norms for the JAS. Table 2 displays the mean scores and standard deviations for the JAS A/B, JAS H/C, AND JAS S/I scales for both the present study and population norms. An independent t-test proved no significant differences between these two groups, thus they can be considered congruent.

Table 2

Present Study JAS Scores versus Population Norms for JAS

| | | JAS A/B | JAS H/C | JAS S/I |
|------------------|-----------|---------|---------|---------|
| Present Study | <u>M</u> | 6.87 | 12.75 | 16.86 |
| | <u>SD</u> | 3.51 | 5.20 | 7.70 |
| Population Norms | <u>M</u> | 7.9 | 10.6 | 16.8 |
| | <u>SD</u> | 3.6 | 5.5 | 6.8 |

Primary Purpose: Type A/B Behaviour Patterns and Sports Injury

A non-parametrical chi-square test was performed between the variables of behaviour pattern (B-4, B-3, X, A-2, and A-1) and injury (yes and no) to determine if there was an association. Four cells (40%) of the chi-square chart contained expected values of less than 5, suggesting that the number of injured participants was inadequate to complete the analysis (Diekhoff, 1992). The observed and expected values from the chi-square chart and calculation are depicted in Table 3. The results indicate no significant association between behaviour pattern type and the presence or absence of injury.

Table 3

Behaviour Pattern Type versus Injury

| Group | <u>n</u> | Behaviour Pattern Type | | | | |
|-------------|----------|------------------------|------|------|------|-----|
| | | A-1 | A-2 | X | B-3 | B-4 |
| Injured | 17 | | | | | |
| observed | | 1 | 4 | 6 | 4 | 2 |
| expected | | 1.4 | 3.0 | 6.2 | 4.6 | 1.8 |
| Non-injured | 68 | | | | | |
| observed | | 6 | 11 | 25 | 19 | 7 |
| expected | | 5.6 | 12.0 | 24.8 | 18.4 | 7.2 |

Note. Pearson χ^2 (4, N = 85) = 0.693, p = 0.952, therefore non-significant at p = .05.

Additional analyses were conducted using independent t-tests with the grouping variable being whether the participant was injured or not, and the testing variables being the three sub-scales from the JAS - Type A/Type B (A/B), Hard-driving/Competitive (H/C), and Speed/Impatience (S/I). The objective of this test was to determine if a specific sub-scale of the JAS could separate those participants who were injured from those who were not. There were no significant differences in the three mean JAS sub-scale scores (A/B, H/C, and S/I) of injured and non-injured individuals ($t = -.476$, $t = -1.4$, and $t = -.681$ respectively).

Secondary Purpose: Type A/B Behaviour Patterns and Coping Styles

Pearson correlation coefficients were calculated to examine the relationship among the JAS sub-scales and CHIP sub-scales, and are shown in Table 4. It can be seen from Table 4 that a correlation was found between JAS H/C Scale with Distraction

Coping, $r = .579$ ($p = .05$). This indicates that individuals who scored high on the JAS H/C scale are more inclined to use distraction coping techniques.

Table 4

Correlations Between JAS and CHIP Sub-scales

| | Distraction Coping | Palliative Coping | Instrumental Coping | Emotional Coping |
|---------------|--------------------|-------------------|---------------------|------------------|
| JAS A/B Scale | .416 | -.177 | -.061 | -.099 |
| JAS H/C Scale | .579* | .092 | .273 | .077 |
| JAS S/I Scale | .286 | .033 | .086 | -.385 |

*. Correlation is significant at the $p = .05$ level (2-tailed).

Emotional Preoccupation was the first choice of coping style and most common among the injured participants with a mean percentile score of 52.82.

Distraction and **Instrumental** coping were chosen as secondary coping strategies with mean percentile scores of 49.24 and 48.65 respectively. Finally, **Palliative** coping was the least prominent coping technique with a mean percentile score of 37.94.

Discussion

The primary focus of this study was to determine whether a relationship exists between Type A and Type B behaviour patterns and sports injury. No significant results were found from the data analysis. The lack of significant differences supports Gill et al. (1995) where Type As were no different in reporting injuries than Type Bs. However, these findings contrast those of Diekhoff (1984). Diekhoff's study had the participants recall their injuries from a longer duration of time (18 months) compared to Gill et al. whose participants only recorded their injuries from the previous 12 months. The findings from this study were also from a short season of only four months.

One advantage of the present study was that it included a control group of uninjured athletes. Previous studies of the same subject nature had samples that only contained athletes who were injured (Diekhoff, 1984; Fields et al., 1995; Gill et al., 1990). Another difference between this study and previous ones is that the participants for the present study played soccer (team-sport oriented athletes). All three relevant previous studies used runners as their participants (individual-sport oriented athletes). There could be a difference in the appearance or prevalence of behaviour patterns in team sports compared to individual sports, where athletes who engage in team sports may present contrasting behaviour pattern characteristics to those athletes in individual sports due to the dissimilar nature of both sport types. For example, the onus of winning in team sports is distributed among all team members, but in individual sports that same responsibility rests solely on the efforts of the individual.

The lack of significant differences between behaviour pattern types and also JAS sub-scale scores for injured and uninjured participants could be attributed to the small injured sample size ($n=17$). A larger injured sample size could be achieved by increasing the sample frame through the inclusion of all teams from both the competitive and recreational leagues. The incidence of injury occurrence could increase with a larger initial number of pooled participants. All teams were not included due to the coach or contact person not responding to numerous inquiries, which was interpreted as lack of interest for participation in the study. A second reason for lack of significant differences between behaviour pattern types and also JAS sub-scale scores for injured and uninjured participants could be attributed to the fact that the entire sample was more reflective of the normal population than an athletic sample. The

mean values for the JAS sub-scales (A/B, H/C, S/I) compare with those of the normal population scores, but are not indicative of athletic samples from previous studies (Eby & Van Gyn, 1987). As previously mentioned, Type A individuals are more prevalent in athletic samples (72%), while Type Bs and Type Xs are of the minority (10% and 18% respectively). Therefore, in studies with athletic samples, it is logical to assume that more Type As sustain an injury because there are more of them.

The lack of Type A behaviour pattern predominance in the athletic sample of the present study could be a result of geographical location. The region in which the data collection occurred, limited the researcher to an isolated population where other metropolitan areas, with larger populations, were not within close proximity to the target city. It is speculated that behaviour pattern prevalence in this specific geographical location may differ from that of an increased urban area (i.e., having multiple large cities situated near each other - a megatropolis) or the general population. Thus, creating an inconsistent population from which to select the sample frame.

The JAS is a self-report instrument and has received much criticism concerning its ability to truly identify behaviour pattern types as compared to the structured interview (SI) (Chesney et al., 1980). Behaviour pattern characteristics are provoked and observed by the interviewer when using the SI, whereas the same characteristics may be underplayed or misrepresented by the individual on self-report measures (JAS). It has been suggested that athletes, because of their high level of motivation, tend to distort questionnaire responses to put themselves in a more positive light, or as they would hope to be (Miller & Edington, 1984).

It is important to note that the chi-square analysis may have significant results

but remains inconclusive due to four of the cells having expected counts of less than five. The chi-square statistic is influenced excessively by small expected frequencies (Diekhoff, 1992). An increase in the number of injured participants would give adequate observed cell values and increase the expected cell count. This, in turn, would provide adequate numbers to complete the chi-square analysis.

The second purpose of this investigation was to examine the relationship between behaviour patterns and coping styles of injured athletes. The outcome of this analysis found a significant correlation ($r = .579$, $p = .05$) between those participants who scored high on the JAS H/C sub-scale and Distraction Coping of the CHIP. As previously discussed, participants with high scores on the JAS H/C sub-scale, strive towards completion of more and more objectives and also have a drive to achieve. These type of individuals were more inclined to cope with their athletic injury by thinking about other experiences, engaging in unrelated activities, or seeking the company of others (Distraction Coping). These particular people would distract themselves from thinking about or concentrating on their injury perhaps by thinking about other important issues or alternate tasks which they wish to accomplish, thus, reinforcing the Hard-driving/Competitive portion of the Type A behaviour pattern construct.

With more attention directed towards a distraction task, less attention is available for the individual to think about pain. Attention is shifted from focusing on the pain, to focusing on the demands of the distraction task, and results in the perception that the injury does not hurt. Therefore, the more effective the distraction task, the more likely it will lower the pain and increase tolerance (McCall & Malott, 1984).

This finding supports Fleishman's (1984) results which found that Type A people,

those individuals with a tendency to ignore difficulties and avoid thinking about problems, use more avoidance-type strategies. However, these results contradict those from Carver et al.'s study (1989) which determined that Type A's are predisposed to employ active coping methods. Carver et al. explained that active coping methods give the individual control over his/her situation and environment, which is one component that governs the Type A person.

In fact, one researcher, Jin Yoo (2001), has assumed that team athletes (those who perform in interpersonal interactions) are more likely to use active coping methods (e.g., problem-focused or emotion-focused). This is attributed to team athletes having more opportunities to rely on the group (or teammates) than individual athletes. There may be more pressure to return to play in a team sport because the athlete refuses to let his/her team down. Individual athletes may then resort to avoidance-type strategies. It should be noted that there are no theoretical and empirical studies which have attempted to clarify this concept, therefore it should be considered an area for future research (Yoo, 2001).

Mechanic (1980) has provided a model of illness behaviour that may help explain why Type As perceive themselves as being very healthy. The model implies that individuals who direct their attention externally (Type As) are not inclined to monitor their bodies, therefore, they perceive themselves as being in better physical health than individuals who direct their attention to inner experiences (Type Bs) (Mechanic, 1980). This may also be true of injuries. Type A people direct their attention outward from themselves and are so preoccupied with gaining control of their environment that they become unaware of the condition of their own body; thus, minor injuries or warning

signs may be disregarded. Mechanic's (1980) model of Type A individuals' externally-directed attention may also provide researchers with another distraction coping technique for athletic injuries.

Distraction coping can also be coupled with the cognitive strategy of pain tolerance termed 'dissociation'. Dissociation involves focusing one's attention away from the pain, and includes distractors that are either internal (e.g., visualizing a pleasant scene, performing mental arithmetic, repeating a selected phrase or word, concentrating on rate of breathing, counting) or external (e.g., concentrating on projected slides, listening to music, watching videos) (Williams & Kinney, 1991). The opposite of dissociation is association, which can involve changing the way the individual appraises their pain (e.g., concentrating on the burning or warming sensations, separating the painful body part from the rest of their body by framing it) (Weinberg, Smith, Jackson, & Gould, 1984). Association strategies allow individuals to constantly monitor their internal states (Spink, 1988), which is uncharacteristic of Type As. The ability to tolerate pain is very dependent on how each individual interprets the pain stimulus, perceives their ability to cope with the pain and the psychological or environmental factors that are present (Anshel, 1990; Dolce, Doleys, Raczynski, Lossie, & Crocker, 1986; Pen & Fisher, 1994).

As an observer of all the soccer games, the researcher found a lack of distinction between the competitive and recreational leagues. The intensity and calibre of play remained equivocal, making the two leagues indistinguishable and could be an important aspect to explain the absence of Type A predominance in the competitive league. Though the review of literature has proposed that competitive and elite levels

of sport attract more Type As than Bs, and moderate activity levels have several relaxing components which draw more Type Bs, the researcher was unable to find no such evidence to support this in the present study (Eby & Van Gyn, 1987; Friedman & Rosenman, 1974; Koivula & Hassmen, 1998).

When performing prospective research in the area of sports injury, one unknown variable from the beginning of the study is the number of individuals who will sustain an injury and hence, become the selected sample. At the commencement of the present study, there was reassurance that soccer was definitely a sport where injury occurred frequently. In this case (during this particular season), few athletes sustained injuries which prevented them from competing, and consequently, the selected sample was very small when compared to the sample frame from which it was derived. Furthermore, a larger sample, including a wider variety of sports, would increase the generalizability of the results to other athletic samples.

After observing all soccer matches, the researcher noticed a trend that may have affected the results. When the game stopped due to a serious injury or collision, the injured athlete would lay immobile on the ground for a few minutes. Teammates and coaches would surround the injured player, asking him questions such as where he was hurt and if he was okay. After several minutes on the ground, the injured player would slowly begin to move the injured part of his body, gradually stand up and walk around for a few seconds, and resume his position on the playing field. One reason for this could be attributed to the fact that the athlete could employ distraction coping techniques through his return to play. If the athlete continues playing, he distracts himself from thinking about the injury, and directs his attention back to the game.

A second reason for the athlete's continual participation in the sport could be an indication of the social interaction or theatrics involved in sport. Theatrics involving 'temporary injures' gain attention from the audience by increasing their awareness of what is occurring on the playing field. Theatrics can also reduce a lead athlete to a minor role after a 'temporary injury' only to score the next goal because he is not seen as a threat. Or, perhaps the 'temporary injury' would influence the referee's next penalty call.

Another reason for the athlete's decision to return to play could be credited to the social support and encouragement he may have received from his teammates. Team sports depend on all members of the team working in synergy to accomplish a common goal (winning the contest). In order to achieve the goal of winning, perhaps the teammates view the 'temporarily injured' athlete's contribution as important; thus they provide social support and encouragement to the athlete showing that he is needed in the game. This type of support from teammates is absent from individual-oriented sports (e.g., running). It is possible that these types of experiences gave the players a sense of performance pain and not injury pain.

Performance pain is pain that is acute, short in duration, produced voluntarily, under the control of the athlete, and capable of being reduced at will (Heil, 1993). The usual response to performance pain is positive emotions, feelings of satisfaction, improved performance, and an enhanced sense of well-being. Therefore, performance pain is viewed as a positive and facilitating aspect of sports participation that reinforces athletes' efforts and inspires them to higher levels of training and competition (Heil, 1993).

Conversely, injury pain is experienced as chronic, long-lasting, uncontrollable, a signal of danger to physical well-being, and motivation for athletes to protect the injured area (Heil, 1993). Athletes' psychological responses to injury pain are a loss of confidence and motivation, increased anxiety and/or depression, and feelings of fear or dread. As a result, injury pain is seen as a negative and discouraging part of rehabilitation that can have debilitating ramifications on recovery and return to sport (Heil, 1993).

The rationale for using only male participants in the present study was because of the large sample frame available with male athletes to achieve the possibility of a significant number of injuries. Any female sports leagues within the city and surrounding regions had an insufficient number of participants to provide significant findings. As previously stated in the review of literature and methods, research has found that males cope differently than females (Johnston & Carroll, 2000; Shumaker & Hill, 1991). Since males' and females' social networks serve alternate purposes, the manner in which males and females interact with their distinct social networks aids in the understanding of their contrasting methods of coping. Women are more inclined to have smaller yet more intensive social networks than men, and the support that women receive is multi-functional. Women are also more likely to accept, develop, maintain, and change their social networks than their male counterparts (Shumaker & Hill, 1991).

Limitations

A major limitation in this study which is a determinant of several other limiting factors lies in the geographical location of the data collection. The region provided population data which was restricted to specific sport (soccer) and gender (male)

selection, thus affecting the generalizability of the results. Coinciding with the sport and gender selection is the length of season. The present study examined a male soccer league with a season of three and a half months. This is a short amount of time in order for athletic injuries to evolve.

Another limitation of the present study is considered in the measurement of the Type A behaviour pattern. Sarafino (1998) states that time- and cost-efficiency are two strengths of Type A self-report measures. However, they have three important weaknesses. First, there is a weak and inconsistent relationship between Type A categorization and health outcomes with many existing self-report instruments. Second, people may under-report characteristics such as hostility and impatience because they are socially undesirable traits. Third, some behaviour pattern classification scales rely very little on and provide poor measures of the anger-hostility dimension of the behaviour pattern. Because of these problems, researchers generally favour the structured interview approach when studying connections between Type A behaviour and illness (Sarafino, 1998).

Recommendations

As mentioned in the limitations, self-report behaviour pattern instruments may provide inconsistency in distinguishing those participants who are Type A from those who are Type B. Therefore, the solution may not lie in using the lengthy and extensive structured interview for behaviour pattern typing, but perhaps in the development of another more current method of measuring and observing Type A and B traits.

Upon furthering research on the behaviour pattern and sports injury relationship, distinct Type A characteristics should be targeted as a possible source for the injury.

Since the anger-hostility dimension has been found to influence the onset of CHD, it is suggested that progressive research measure the level of the anger-hostility dimension in the athlete and correlate this trait with injury frequency and severity. Another attribute which is in need of further investigation is fatigue suppression and its potential link to athletic injuries. Instruments which rate an individual's level of fatigue suppression as well as physiological measure could also be correlated to athletic injuries.

Other future directions that should be considered in psychology of athletic injury research include qualitative studies, the addition of female athletes, and team versus individual sports. Qualitative methods provide researchers with information which may not be evident on self-report surveys, or may be used to further explore or supplement details obtained by self-report measures. New ideas and theories not presented in standard instruments may surface when performing qualitative research. Through the addition of female athletes, results could then be generalized to include those participants. Comparisons of coping styles between male and female behaviour pattern types would be an interesting prospective area to examine. The type of sport an athlete participates in, along with his/her behaviour pattern type, coping style and incidence of athletic injury needs further investigation.

The present study used a dichotomous view of injury (injury - no injury) which has prevented distinctions between the severity of the injury. It is possible that the question is not whether Type As are injured more than Type Bs, but rather which behaviour pattern type is associated with injury severity. Researchers continuing in this area may consider a Likert-scale for injury severity which is determined by a

physiotherapist, or take into account the number of training days or games missed by the athlete due to injury. Perhaps the inclusion of these factors would provide different results.

Since the number of injuries was small and thus problematic for statistical analysis in the present study, it is recommended that future researchers conduct their studies utilizing sports where injury occurrence is more common. Contact sports such as football, rugby and hockey may present more injuries because the sport itself includes an extra component of physical and bodily harm. Ballet is another sport which is well documented in the literature concerning its high frequency of injury (Bachrach, 1987; Bowling, 1989; Ende & Wickstrom, 1982; Hardaker, 1989; Khan et al., 1995; Macchi & Crossman, 1996; Milan, 1994; Miller, 1987; Quirk, 1994; Teitz, 1991). Since this study only involved musculoskeletal injuries of soccer, an interesting direction for future research could concentrate on concussions. Athletes who receive a concussion due to sport may have different coping styles during rehabilitation than athletes who sustain musculoskeletal injuries.

Another determinant of injury incidence that should be taken into account when beginning prospective research on sports injuries is the length of the sport season. In the present study, the season was three and a half months long, but the teams only played on average one game per week. A longer season with more weekly scheduled games increases the number of times the athletes are exposed to injury-provoking situations.

In order to address the issue of the Type A individual's fatigue suppression and lack of physical symptom reporting, future researchers should also consider longitudinal

designs which cover multiple consecutive seasons. For example, follow athletes who play outdoor soccer in the summer and also indoor soccer in the winter. With this type of design, those Type As who delay seeking treatment for early symptoms and ignore their internal body states may be susceptible to more serious chronic injuries. Through the results of a longitudinal design, perhaps Type As could benefit and understand the value in reporting early symptom experiences if they had preconceived knowledge that their suppression of fatigue could have a more chronic impact on their bodies in the future.

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Appendix A

YOU POSSESS THE TYPE A BEHAVIOUR PATTERN:

1. If you have (a) a habit of explosively accentuating various key words in your ordinary speech even when there is no real need for such accentuation, and (b) a tendency to utter the last few words of your sentences far more rapidly than the opening words. The vocal explosiveness betrays the excess aggression or hostility you may be harbouring. The hurrying of the ends of sentences mirrors your underlying impatience with spending even the time required for your own speech.

2. If you *always* move, walk, and eat rapidly.

3. If you feel (particularly if you openly exhibit to others) an impatience with the rate at which most events take place. You are suffering from this sort of impatience if you find it difficult to restrain yourself from hurrying the speech of others and resort to the device of saying very quickly over and over again, "Uh huh, uh huh," or "Yes yes, yes yes," to someone who is talking, unconsciously urging him to "get on with" or hasten his rate of speaking. You are also suffering from impatience if you attempt to finish the sentences of persons speaking to you before they can.

Other signs of this sort of impatience: if you become *unduly* irritated or even enraged when a car ahead of you in your lane runs at a pace you consider too slow; if you find it anguishing to wait in a line or to wait your turn to be seated at a restaurant; if you find it intolerable to watch others perform tasks you know you can do faster; if you become impatient with yourself as you are obliged to perform repetitious duties (making out bank deposits slips, writing checks, washing and cleaning dishes, and so on), which are necessary but take you away from doing things you really have an interest in doing; if you find yourself hurrying your own reading or always attempting to obtain condensations or summaries of truly interesting and worthwhile literature.

4. If you indulge in polyphasic thought or performance, frequently striving to think of or do two or more things simultaneously. For example, if while trying to listen to another person's speech you persist in continuing to think about an irrelevant subject, you are indulging in polyphasic thought. Similarly, if while golfing or fishing you continue to ponder your business or professional problems, or if while using an electric razor you attempt to eat your breakfast or drive your car, or if while driving your car you attempt to dictate letters for your secretary, you are indulging in polyphasic performance. This is one of the commonest traits in the Type A individual. Nor is he/she always satisfied with doing just two things at one time.

5. If you find it *always* difficult to refrain from talking about or bringing the theme of any

conversation around to those subjects which especially interest and intrigue you, and when unable to accomplish this maneuver, you pretend to listen but really remain preoccupied with your own thoughts.

6. If you almost always feel vaguely guilty when you relax and do absolutely nothing for several hours to several days.
7. If you no longer observe the more important or interesting or lovely objects that you encounter in your milieu. For example, if you enter a strange office, store, or home, and after leaving any of these places you cannot recall what was in them, you no longer are observing well - or for that matter enjoying life very much.
8. If you do not have any time to spare to become the things worth *being* because you are so preoccupied with getting the things worth *having*.
9. If you attempt to schedule more and more in less and less time, and in doing so make fewer and fewer allowances for unforeseen contingencies. A concomitant of this is a *chronic sense of time urgency*, one of the core components of Type A Behaviour Pattern.
10. If, on meeting another severely afflicted Type A person, instead of feeling compassion for his/her affliction you find yourself compelled to "challenge" him/her. This is a telltale trait because no one arouses the aggressive and/or hostile feelings of one Type A subject more quickly than another Type A subject.
11. If you resort to certain characteristic gestures or nervous tics. For example, if in conversation you frequently clench your fist, or bang your hand upon a table or pound one fist into the palm of your other hand in order to emphasize a conversational point, you are exhibiting Type A gestures. Similarly, if the corners of your mouth spasmodically, in tic-like fashion, jerk backward slightly exposing your teeth, or if you habitually clench your jaw, or even grind your teeth, you are subject to muscular phenomena suggesting the presence of a continuous *struggle*, which is, of course, the kernel of Type A Behaviour Pattern.
12. If you believe that whatever success you have enjoyed has been due in good part to your ability to get things done faster than your fellow colleagues and if you are afraid to stop doing everything faster and faster.
13. If you find yourself increasingly and ineluctably committed to translating and evaluating not only your own but also the activities of others in terms of "numbers."

YOU POSSESS TYPE B BEHAVIOUR PATTERN:

1. If you are completely free of *all* the habits and exhibit none of the traits previously

listed that harass the severely afflicted Type A person.

2. If you never suffer from a sense of time urgency with its accompanying impatience.
3. If you harbour no free-floating hostility, and you feel no need to display or discuss either your achievements or accomplishments unless such exposure is demanded by the situation.
4. If, when you play, you do so to find fun and relaxation, not to exhibit your superiority at any cost.
5. If you can relax without guilt, just as you can work without agitation.

(Friedman & Rosenman, 1974, pp. 82-86)

Appendix B

IDENTIFYING AND ASSESSING HYPERAGGRESSIVENESS AND FREE-FLOATING HOSTILITY

Psychomotor Signs

- a. Facial hostility which usually reveals itself in the set of the jaw and mouth muscles and the belligerence of the eyes. On occasion, something approaching a chronic sneer is evident.
- b. A *tic-like* grimace in which the corners of the mouth are twitched back, partially exposing the teeth. When this grimace is observed, it *invariably* indicates the presence of severe free-floating hostility.
- c. A hostile, jarring laugh.
- d. Fist-clenching during ordinary conversation.
- e. Unpleasant, frequently irritating, grating speech.
- f. Frequent use of Anglo-Saxon obscenities.
- g. Teeth-grinding.
- h. A *tic-like* tendency to open the eyes widely, exposing the whites around the pupil.

Biographical Manifestations

- i. Eagerness to undertake all activities in a spirit of competition.
- j. Intense compulsion to win at all costs, even when playing in minor contests or with pre-teenage children.
- k. Inclination to dominate in social as well as in business situations.
- l. Easily aroused irritability, particularly in regard to the actions of other persons which do not conform to his/her sense of propriety or correctness.
- m. Fixed and angrily defended opinions on various sociological, economic, and political matters.
- n. Failure to be elated or joyful at the success of others.

DIAGNOSIS AND ASSESSMENT OF A SENSE OF TIME URGENCY

Psychomotor Signs (Voice and Body)

- o. Facial tension and, often, a tense body posture.
- p. Rapid blinking (over 30 times per minute).
- q. Rapid speech, with characteristic elision or telescoping of the terminal words of sentences.
- r. Hurrying or interruption of the speech of others.
- s. Sucking in one's breath during speech while continuing to speak.
- t. Rapid, vigorous finger-tapping or jiggling of knees.
- u. Browning of skin of eyelids and of skin immediately below the eyelids. This tan pigmentation is due to a chronic excess discharge of a pigment-inducing hormone (melanocyte-stimulating hormone, MSH) by the pituitary gland. Unlike the tan coming after exposure to excess sunlight, this type of periorbital pigmentation never seems to disappear. Although it is by no means common to

- all persons exhibiting Type A behaviour, its presence in Caucasians invariably indicates severe Type A behaviour and usually a relatively high level of serum cholesterol.
- v. Lip-clicking while speaking. (If you compress your lips closely, bring the tip of your tongue to the back of your upper incisors and then open your mouth quickly, you will make this sound.)
 - w. Expiratory sighing. This brief sigh or muffled grunt occurs during breathing out. It is usually preceded by a slight lifting of the shoulders.
 - x. Head-nodding while speaking. Normal persons often nod affirmatively while someone is speaking to them, to show their agreement with what is being said. Type A nodding occurs in the speaker while he/she himself/herself is speaking.
 - y. Rapid body movements. The Type A tends to move and act rapidly.
 - z. Excessive perspiration on forehead and upper lip.

Biographical Manifestations

- aa. Self-awareness of impatience.
- bb. Pace of activities so rapid as to attract frequent advice from others to slow down.
- cc. Difficulty in sitting and doing nothing.
- dd. Intense dislike of waiting in line.
- ee. Fast walking, fast eating, and unwillingness to dawdle at table after meals.
- ff. Habitual substitution of numbers for metaphors and nouns, even in casual conversations.
- gg. Polyphasic thought and actions. As already noted, the Type A has a strong tendency to attempt to think or do more than one thing at a time.

(Friedman & Ulmer, 1984, pp. 57-59)

Appendix C

Profiles of the Type A and Type B Behaviour Patterns:

| Characteristic | Type A | Type B |
|--|---|-------------------------------------|
| <u>Speech:</u> | | |
| Rate | Rapid | Slow |
| Word Production | Single-word answers; acceleration at the end of sentences | Measured; frequent pauses or breaks |
| Volume | Loud | Soft |
| Quality | Vigorous; tense; harsh | "Walter Mitty" |
| Intonation/inflection | Abrupt; explosive speech; key word emphasis | Monotone |
| Response Latency | Immediate answers | Pauses before answering |
| Length of responses | Short and to the point | Long, rambling |
| Other | Word clipping; word omission; word repetition | |
| <u>Behaviours:</u> | | |
| Sighing | Frequent | Rare |
| Posture | Tense; on the edge of the chair | Relaxed, comfortable |
| General demeanor | Alert; intense | Calm; quiet attentiveness |
| Facial expression | Tense; hostile; grimace | Relaxed; friendly |
| Smile | Lateral | Broad |
| Laughter | Harsh | Gentle chuckle |
| Fist Clenching | Frequent | Rare |
| <u>Responses to the interview:</u> | | |
| Interrupts interviewer | Often, particularly on question 13 | Rarely, even on question 13 |
| Returns to previous subject when interrupted | Often | Rarely |
| Attempts to finish interviewer's questions | Often | Rarely |
| Uses humour | Rarely | Often |
| Hurries the interviewer ("yes, yes" "m-m", head nodding) | Often | Rarely |

| Characteristic | Type A | Type B |
|--|--|---|
| Competes for control of the interview | Wide variety of techniques - interruptions; verbal duets; extraneous comments, lengthy or evasive answers; questioning or correcting the interviewer | Rarely |
| Hostility | Often demonstrated during the interview through mechanisms such as boredom, condescension, authoritarianism, challenge | None |
| Typical content: | | |
| Satisfied with job | No, wants to move up | Yes |
| Hard-driving, ambitious | Yes, by own and others' judgements | Not particularly |
| Feels a sense of time urgency | Yes | No |
| Impatience | Hates waiting in lines; will not wait at a restaurant; annoyed when caught behind a slow moving vehicle | Takes delays of all kinds in stride and does not become frustrated or annoyed |
| Competition | Enjoys competition on the job; plays all games (even with children) to win | Does not thrive on competition and rarely engages in competitive activities |
| Admits to polyphasic thinking and activities | Often does or thinks two (or more) things at the same time | Does not thrive on competition at once |
| Hostility | In content and stylistics - argumentative responses, excessive qualifications, harsh generalizations, challenges, emotion-laden words, obscenity | Rarely present in any content |

(Chesney, Eagleson & Rosenman, 1980, pp. 260-261)

Appendix D

JENKINS ACTIVITY SURVEY (JAS) - modified

Please answer the questions on the following pages by marking the answers that are true for you. Each person is different, so there are no "right" or "wrong" answers. Of course, all you tell is strictly confidential -- to be seen only by the research team. Do not ask anyone else about how to reply to the items. It is your personal opinion that we want. Your assistance will be greatly appreciated.

For each of the following items, please circle the number of the ONE best answer for you.

1. Do you ever have trouble finding time to get your hair cut or styled?
 1. Never
 2. Occasionally
 3. Almost always
2. Does your sport "stir you into action"?
 1. Less often than most athletes
 2. About Average
 3. More often than most athletes
3. Is your everyday life filled mostly by

| | |
|---------------------------------|--|
| 1. Problems needing solution | 3. A rather predictable routine of events |
| 2. Challenges needing to be met | 4. Not enough things to keep me interested or busy |
4. Some people live a calm, predictable life. Others find themselves often 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 | 3. A few times a week | 5. Once a month or less |
| 2. About once a day | 4. Once a week | |
5. When you are under pressure or stress, do you usually:

| | |
|--------------------------------------|--|
| 1. Do something about it immediately | 2. Plan carefully before taking any action |
|--------------------------------------|--|
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 some friend ever told you that you eat too fast?

| | | |
|--------------|-----------------------|-------------------------------------|
| 1. Yes often | 2. Yes, once or twice | 3. No, no one has ever told me this |
|--------------|-----------------------|-------------------------------------|

8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, 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, do you feel like hurrying him/her along?
1. Frequently
 2. Occasionally
 3. Almost never
10. How often do you actually "put words in his/her mouth" in order to speed things up?
1. Frequently
 2. Occasionally
 3. Almost never
11. If you tell your partner or a friend what you will meet them somewhere at a definite time, how often do you arrive late?
1. Once in a while
 2. Rarely
 3. I am never late
12. Do you find yourself hurrying to get places even when there is plenty of time?
1. Often
 2. Occasionally
 3. Rarely or 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. Will you
1. Sit and wait?
 2. Walk about while waiting?
 3. Usually carry some reading matter or writing paper so you can get something done while waiting?
14. When you have to "wait in line," such as at a restaurant, a store, or the post office, do you
1. Accept it calmly?
 2. Feel impatient but do not show it?
 3. Feel so impatient that someone watching could tell you were restless?
 4. Refuse to wait in line, and find ways to avoid such delays?
15. When you play games with young children about 10 years old, how often do you purposely let them win?
1. Most of the time
 2. Half of the time
 3. Only occasionally
 4. Never
16. Do most people consider you to be
1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably more relaxed and easy going?
 4. Definitely more relaxed and easy going?
17. Nowadays, do you consider yourself to be
1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably more relaxed and easy going?
 4. Definitely more relaxed and easy going?

18. How would your partner (or closest friend) rate you?
1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably more relaxed and easy going?
 4. Definitely more relaxed and easy going?
19. How would your partner (or closest friend) rate your general level of activity?
1. Too slow. Should be more active.
 2. About average. Is busy much of the time.
 3. Too active. Needs to slow down.
20. Would people who know you well agree that you take your sport too seriously?
1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
21. Would people who know you 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 who know you well agree that you tend to get irritated easily?
1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
23. Would people who know you 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. Would 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. Would people who know you well agree that you get a lot of fun out of your life?
1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
26. 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.
27. How is your "temper" nowadays?
1. Fiery and hard to control.
 2. Strong, but controllable.
 3. No problem.
 4. I almost never got angry.
28. When you are in the midst of concentrating (in your sport) and someone interrupts you, how do you usually feel inside?
1. I feel O.K. because I perform better after an occasional break.
 2. I feel only mildly annoyed.
 3. I really feel irritated because most such interruptions are unnecessary.

29. How often are there time constraints in your sport? (If deadlines occur irregularly, please circle the closest answer below.)
1. Daily or more often. 2. Weekly. 3. Monthly 4. Never
30. Do these time constraints usually
1. Carry minor pressure because of their routine nature?
2. Carry considerable pressure, since delay would upset things a great deal?
31. Do you ever set specific game goals for yourself in your sport?
1. No 2. Yes, but only occasionally 3. Yes, once per week or more often
32. When you have to work against a time constraint in your sport, is the quality of your skills
1. Better? 2. Worse? 3. The same? (Pressure makes no difference)
33. In your sport do you ever practice two skills at the same time by shifting back and forth rapidly from one to the other?
1. No, never. 2. Yes, but only when I have to. 3. Yes, regularly.
34. Do you maintain a regular practice schedule during vacations such as Thanksgiving, Christmas, and Easter?
1. Yes 2. No 3. Sometimes
35. How often do you practice your sport outside a dictated practice schedule?
1. Rarely or never 2. Once a week or less often 3. More than once a week
36. How often do you go to the gym or arena when it is officially closed (such as nights or weekends)? If this is not possible, circle 0.
1. Rarely or never 2. Occasionally (less than once a week) 3. Once or more a week
37. When you find yourself getting tired while practicing, do you usually
1. Slow down for a while until your strength comes back.
2. Keep pushing yourself at the same pace in spite of the tiredness.
38. When you are in a team, do the other people tend to look to you to provide leadership?
1. Rarely
2. About as often as they look to others
3. More often than they look to others
39. Do you make yourself written lists of "things to do" to help you remember what needs to be done?
1. Never 2. Occasionally 3. Frequently

IN EACH OF THE FOLLOWING QUESTIONS, PLEASE COMPARE YOURSELF WITH THE AVERAGE ATHLETE IN YOUR CLUB. PLEASE CIRCLE THE MOST ACCURATE DESCRIPTION.

40. 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
41. In sense of responsibility, I am
1. Much more responsible 2. A little more responsible
3. A little less responsible 4. Much less responsible
42. 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
43. In being precise, I am
1. Much more precise 2. A little more precise 3. A little less precise 4. Much less precise
44. I approach life in general
1. Much more seriously 2. A little more seriously
3. A little less seriously 4. Much less seriously

Appendix E

COPING WITH HEALTH AND INJURY PROBLEMS (CHIP)

The following are ways of reacting to HEALTH PROBLEMS such as INJURIES. These are typically difficult, stressful, or upsetting situations. We are interested in your most recent injury. Please circle a number from 1 to 5 for each of the following items. Indicate how much you engaged in these types of activities when you encountered your health problem. Please be sure to respond to each item.

| | Not at All | | Moderately | | Very Much |
|---|------------|---|------------|---|-----------|
| 1. Think about the good times I've had. | 1 | 2 | 3 | 4 | 5 |
| 2. Stay in bed. | 1 | 2 | 3 | 4 | 5 |
| 3. Find out more information about the illness. | 1 | 2 | 3 | 4 | 5 |
| 4. Wonder why it happened to me. | 1 | 2 | 3 | 4 | 5 |
| 5. Be with other people. | 1 | 2 | 3 | 4 | 5 |
| 6. Lie down when I feel tired. | 1 | 2 | 3 | 4 | 5 |
| 7. Seek medical treatment as soon as possible. | 1 | 2 | 3 | 4 | 5 |
| 8. Become angry because it happened to me. | 1 | 2 | 3 | 4 | 5 |
| 9. Daydream about pleasant things. | 1 | 2 | 3 | 4 | 5 |
| 10. Get plenty of sleep. | 1 | 2 | 3 | 4 | 5 |
| 11. Concentrate on the goal of getting better. | 1 | 2 | 3 | 4 | 5 |
| 12. Get frustrated. | 1 | 2 | 3 | 4 | 5 |
| 13. Enjoy the attention of friends and family. | 1 | 2 | 3 | 4 | 5 |
| 14. Try to use as little energy as possible. | 1 | 2 | 3 | 4 | 5 |
| 15. Learn more about how my body works. | 1 | 2 | 3 | 4 | 5 |
| 16. Feel anxious about the things I can't do. | 1 | 2 | 3 | 4 | 5 |
| 17. Make plans for the future. | 1 | 2 | 3 | 4 | 5 |
| 18. Make sure I am warmly dressed or covered. | 1 | 2 | 3 | 4 | 5 |
| 19. Do what my doctor tells me. | 1 | 2 | 3 | 4 | 5 |

| | Not at All | | Moderately | | Very Much |
|---|---------------|----------|------------|----------|----------------------|
| 20. Fantasize about all the things I could do if I was better. | 1 | 2 | 3 | 4 | 5 |
| 21. Listen to music. | 1 | 2 | 3 | 4 | 5 |
| 22. Make my surroundings as quiet as possible. | 1 | 2 | 3 | 4 | 5⁺ |
| 23. Try my best to follow my doctor's advice. | 1 | 2 | 3 | 4 | 5 |
| 24. Wish that the injury had never happened. | 1 | 2 | 3 | 4 | 5 |
| 25. Invite people to visit me. | 1 | 2 | 3 | 4 | 5 |
| 26. Be as quiet and still as I can. | 1 | 2 | 3 | 4 | 5 |
| 27. Be prompt about taking medications. | 1 | 2 | 3 | 4 | 5 |
| 28. Feel anxious about being weak and vulnerable. | 1 | 2 | 3 | 4 | 5 |
| 29. Surround myself with nice things (e.g. flowers). | 1 | 2 | 3 | 4 | 5 |
| 30. Make sure I am comfortable. | 1 | 2 | 3 | 4 | 5 |
| 31. Learn more about the most effective treatments available. | 1 | 2 | 3 | 4 | 5 |
| 32. Worry that my injury might get worse. | 1 | 2 | 3 | 4 | 5 |

Appendix F
 CONSENT FORM

My signature on this sheet indicates I agree to participate in a study by Sarah Gee, concerning Behaviour Patterns and Coping Mechanisms Associated with Sports Injury Amongst Soccer Athletes. It also indicates that I understand the following:

1. I am a volunteer and can withdraw at any time from the study.
2. I am willing to complete a questionnaire concerning my behaviour and reactions in certain situations.
3. Should I get injured, I am willing to complete a second questionnaire concerning my coping strategies.
4. I understand that I can refuse to answer any question(s) if I choose.
5. The data that I provide will be confidential, and any information I divulge will be disguised in any publications which result from this research and my name will never be used in said publication.
6. There is no apparent risk of physical or psychological harm.
7. I will receive a summary of the project, upon request, following the completion of the study.

I have received explanations about the nature of the study, its purpose, and procedures.

Signature of Participant

Date

Signature of Researcher

Date

Appendix G

ATHLETE DEMOGRAPHICS QUESTIONNAIRE

Name: _____

Age: _____

Primary Sport: _____

Number of years played primary sport: _____

Primary Sport Type: individual team