

**THE EFFECTS OF GROUP SPORT
ON
TYPE A BEHAVIOUR
IN
PRIMARY SCHOOL CHILDREN**

by

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I dedicate this dissertation to my father

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UNIVERSITY
OF
JOHANNESBURG

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OPSOMMING

Die navorsing van hierdie studie is gedoen teen die agtergrond van Koronêre Hartsiekte as een van die hooforsake van sterftes in Suid-Afrika. 'n Deurtastende literatuurstudie het getoon dat ten spyte van suksesvolle intervensieprogramme wat die tempo van Koronêre Hartsiekte verminder het, dit steeds die belangrikste oorsaak van sterftes is. Dit kan moontlik toegeskryf word aan voorkomingsprogramme wat histories op biologies verwante leefstylfaktore gefokus het en so 'n baie belangrike bykomende risikofaktor vir Koronêre Hartsiekte, naamlik Tipe-A-gedrag, verwaarloos het.

Die doelwit van hierdie verhandeling is om die lewensvatbaarheid van die verandering van Tipe-A-gedrag in kinders deur deelname aan groepsport te bestudeer, aangesien die Tipe-A-gedragspatroon wat reeds in kinderjare teenwoordig is, tot hede nog nie as 'n primêre voorkomende moontlikheid aangespreek is nie. Groepsport is gekies as 'n intervensie omdat dit kinders sal noop om saam te werk, en dit ook sosiaal ondersteunend en suksesvol is in die verbetering van 'n aantal relevante faktore. Sport het ook getoon dat dit 'n toepaslike uitlaatklep is vir aggressiewe impulse wat duidelik deel vorm van Tipe-A-gedrag.

Twintig respondente het aan die intervensieprogram deelgeneem wat oor 'n tydperk van agt weke plaasgevind het. 'n Tweede groep van tien Tipe-A-respondente het as 'n "nie-behandeling"-kontrolegroep gedien. Die intervensie het by 'n laerskool in Johannesburg plaasgevind.

Die resultate van die studie het getoon dat Tipe-A-gedrag nie verminder is deur die deelname aan groepsport nie, behalwe vir die ongeduldigheidskomponent. Aggressiewe potensiaal en angs in die Tipe-A-kind het ook nie verminder nie.

Die gevolgtrekking word gemaak dat die intervensie van groepsport in die vermindering van Tipe-A-gedrag nie suksesvol was nie, en dat toekomstige studies 'n intervensie moet ondersoek wat suksesvol is vir die vermindering van Tipe-A-gedrag in kinders.



ABSTRACT

This research has been undertaken against the background of Coronary Heart Disease (CHD) as being one of the major causes of death in South Africa. An in-depth literature study made it evident that, despite intervention programs that have been successful in reducing the CHD rate, it still remains a number one killer. This could possibly be attributed to CHD prevention programs that historically have focused on biologically related lifestyle factors, and neglected a very important adjuvant risk factor for CHD, namely Type A behaviour.

The aim of this dissertation was to study the viability of changing Type A behaviour in childhood through group sport participation in view of the fact that the Type A behaviour pattern (TABP) already present in childhood, has to date not been addressed as a primary preventative possibility. Group sport was chosen as an intervention by nature of it being co-operative, socially supportive and successful in the improvement of a number of relevant factors. Sport has also been demonstrated to be an appropriate outlet for aggressive impulses apparent in Type A behaviour.

Twenty subjects participated in the intervention program that took place over a period of eight weeks. A second group of ten Type A subjects served as a no-treatment control group. The intervention was carried out at a primary school in Johannesburg.

The results of the study revealed that Type A behaviour (TAB) was not reduced, save for the impatience component, by participation in group sport. Aggressive potential and anxiety in the Type A child, were also not reduced.

It is concluded that the intervention of group sport in the reduction of TAB was not successful, and that future studies should investigate an intervention that is successful for the reduction of the TABP in childhood.

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CHAPTER 1

LITERATURE REVIEW

1.1 INTRODUCTION

Coronary Heart Disease (CHD) has become one of the major causes of death in most affluent, westernised countries. South Africa is no exception, even though as a whole it is considered a developing country (Heart Foundation of South Africa, 1997).

In South Africa, CHD causes twice as many deaths amongst Whites every year as cancer and road accidents combined (Heart Foundation of SA, 1997). In 1988, circulatory problems were the cause of 33 percent of deaths in Indian persons, 32 percent in White persons, 22 percent in Coloured persons and 14% in African persons in South Africa (Webster, 1994). In 1990, heart disease was number 5 on a list of the most important causes of death. By the year 2020, heart disease is predicted to be number 1 on this list (Murray & Lopez, 1996).

In 1979, with the publication of Healthy People 2000 in the United States of America by the public Health Service, health scientists provided an overview of major causes of all premature death and disability, including Heart Disease (Allensworth, 1996). Hereditary causes were responsible for 20 percent, inadequate or inefficient medicine was responsible for 10 percent, and lifestyle factors were responsible for 30 percent of premature illness and death.

The actual cause of CHD, in addition to the genetic factor, is often a lifestyle that includes tobacco usage, physical inactivity and a high fat diet that elevates cholesterol, as well as promoting obesity (Allensworth, 1996). It is possible to modify this lifestyle, as a preventative means for CHD, by not smoking, lowering high blood cholesterol, hypertension and obesity, and increasing physical activity (Taubert et al., 1996).

In addition to genetics and lifestyle factors, a behavioural style known as Type A behaviour is also strongly associated with CHD. According to Scherwitz et al. (1978), this behaviour pattern is made up of certain characteristics that predispose a person to CHD. Type A behaviour is characterised by relatively high ambition, aggressiveness, hostility, competitive drive, and a chronic sense of time urgency (Čatipovic-Veselica et al., 1995).

Substantial epidemiologic evidence implicates the Type A pattern in a) the incidence and prevalence of clinical CHD, b) recurrent myocardial infarction, and c) severity of autopsy and arteriographically documented atherosclerosis. Since these associations between the Type A pattern and CHD have been established independently of the traditional risk factors of elevations in age, serum cholesterol, blood pressure, and cigarette smoking, it is reasonable to assume that the Type A pattern confers risk through non-traditional mechanisms (Dembroski, 1979).

The reduction of Type A behaviour characteristics is known to be linked to a reduction in CHD and reinfarction. The most comprehensive effort at tertiary prevention is the Recurrent Coronary Prevention Project, carried out by Friedman and Colleagues (Friedman et al., 1986). This project tested the hypothesis that interventions designed to

alter Type A behaviours lower the risk of a recurrent event among myocardial infarction patients. Results based on the first three years of the project have shown a significantly lower occurrence rate associated with the intervention, relative to the control group (Matthews & Haynes, 1986).

It would appear from the literature that most of the Type A/CHD interventions were on a tertiary interventive level, although being a lifestyle factor, it appears logical that intervention for Type A behaviour should be used at the secondary or even primary preventative level. This would mean that people who show high indices of the Type A behavioural pattern in the absence of heart disease or its precursors, could be subjected to a Type A reduction intervention. In fact it is possible to assume that it could be implemented at the earliest possible stage in the development of this behavioural constellation.



Type A behaviour has already been identified in childhood (Keltikangas-Jarvingen et al., 1991) and according to Siegel (1984) the accumulation of evidence is striking in showing similarities in self-reports between the behaviours and physiology among young and adult Type As. Because of the known link between cardiac heart disease (CHD) and Type A behaviour pattern (TABP) it is important to prevent the establishment of Type A behaviour in childhood, thereby lowering the risk for the development of CHD in adulthood. Similarly Matthews & Angulo (1980) believe that it is likely that the antecedent of Pattern A behaviour by adults can be traced to childhood experiences. Given the seriousness of the health problem associated with Pattern A behaviour by adults, Matthews and Angulo (1980) hold that it seems worthwhile to explore the origins of Pattern A in childhood.

Although many interventions are possible, it would be important that these interventions being applied in the realm of childhood satisfy the needs and stimulate the co-operation of the child to maximise his effectiveness. A "natural" preventative behaviour in changing or lessening the intensity of TABP would seem to be the approach of choice. One such preventative "natural" intervention is in the arena of sporting activities.

Whereas Type A behaviour is characterised by extreme competitiveness, sport on the other hand combines competition with co-operation as well as social support. It therefore appears possible that participation in group sport will reduce the Type A behavioural constellation.

Weiss and Duncan (1992) find that many developmental psychologists have suggested that friendships and positive peer relations serve as social support mechanisms for children and aid in their psychological growth, emotional adjustments and coping skills with stressful transitions in their lives. Similarly Hawkins and Gruber (1982) point out that the behavioural dynamics involving the interactions of players in sport and their coaches can influence the development of self-esteem. Because of the positive association of sporting behaviour with the Type B behaviour pattern and the incompatibility of the Type A and Type B behavioural constellation, it can be assumed that participation in group activities, such as group sport, could be associated with a decrease in Type A behaviour. However, before such an assumption can be investigated, it would be necessary to investigate the nature of Type A behaviour and its development, as well as the nature of childhood group sporting activities in order to postulate links between them.

1.2 CORONARY HEART DISEASE

CHD is a clinical disorder produced by lesions of the coronary arteries (CHD or atherosclerosis) (Friedman and Rosenman, 1974). Krantz et al. (1988) describe CHD as beginning with the symptomless development and progression of atherosclerosis followed by clinical manifestations such as angina, heart attack and sudden death.

"Although the Clinically Overt Symptoms of sudden death, myocardial infarction, or angina pectoris are extremely rare in children, a cryptic stage of atheromatous vascular disease may well have its origins in childhood." (Lauer et al., 1975, p. 697).

1.2.1 Coronary Artery Disease

The thickening and deterioration of the blood-supply conduits to the heart probably begins during the first few years of one's life. The thickenings arise because the coronary arteries in their incessant twisting, turning and telescoping upon themselves, often receive many tiny wounds and the arteries try to heal or bridge these with newly formed cells. Such collections of new cells probably serve as "patches" and are the arterial thickenings we first observe so early in life. (Friedman & Rosenman, 1974).

Very frequently, there is an accumulation or deposit of cholesterol and fats in and around these overgrown cells. Instead of disappearing, too often this cell overgrowth accumulates an excess amount of fat/cholesterol (Friedman & Rosenman, 1974).

This excess accumulation of fat/cholesterol in turn promotes a further overgrowth of cells. The cell "tumours" continue to expand and encroach increasingly upon the main channel, or lumen of the vessel, through which the vital blood supply for the heart passes

(Friedman & Rosenman, 1974). Such expansion and encroachment may continue throughout childhood and adolescence until at some stage there is no possibility of the disappearance of these grease-laden (that is, food/cholesterol-impregnated), distorted arterial cells (Friedman & Rosenman, 1974).

1.2.2 What is CHD?

Luckily for the majority of persons coronary *artery* disease never becomes coronary *heart* disease. However, in about 3 percent of American adults, after the third decade, CAD is exacerbated to such an extent that the coronary arteries cannot carry enough blood to supply the muscles of the heart with sufficient oxygen and nourishment for them to perform *all* their functions under *all* demands made on them. When coronary artery narrowing has progressed to this point, then coronary *artery* disease may be considered to have evolved into coronary *heart* disease (Rosenman & Friedman, 1974).

1.2.3 Clinical Manifestations of CHD

There are two major manifestations of clinical CHD, namely angina pectoris and myocardial infarction (Glass, 1977).

a) Angina Pectoris

Angina Pectoris is a term which "designates a disorder involving a type of chest pain which arises when the heart muscle experiences anoxia because of an inadequate blood supply occasioned by an occlusion of one or more of the coronary arteries (Glass, 1977). Anginal episodes rarely involve permanent and substantial damage to the heart tissue. By contrast, myocardial infarction signifies necrosis of a portion of the heart muscle because of an interruption of its blood supply (Glass, 1977).

b) Acute Myocardial Infarction

Coronary occlusion, coronary thrombosis and myocardial infarction (MI) are used synonymously. It is the disorder commonly called a heart attack. In many, though not all cases, the infarction is a result of a clot or thrombosis forming in a coronary artery. The thrombosis obstructs the artery, thereby diminishing the blood supply to some portion of the left heart ventricle, which then dies (Glass, 1977).

1.2.4 The Aetiology of CHD

The literature generally indicates that adult cardiovascular diseases have their origin in childhood. The cardiovascular risk factors identified in adults are already present in many young children. Fatty streaks are found in children as young as three (Moller et al., 1994) and occur in a progressively greater proportion of children with increasing age.

Growing evidence suggests high levels of cardiovascular risk prevalence among school-aged children, with estimates as high as 45 percent of children who are at risk (Cowel, Montgomery & Talashek, 1989). The risk factors include smoking, elevated cholesterol and blood pressure, obesity and inactivity.

In recent years "tracking" of the most common CHD risk indicators have been reported. Tracking refers to the consistency of the risk indicators over time. In general, children who are at the high end of the percentile distribution of for example, resting blood pressure, continue to retain their relative position as they grow older (Hofman & Valkenburg, 1979, cited in Kemper, 1986).

Since cardiovascular risk factors emerge in childhood and become substantially solidified by teenage years, these risk factors should be addressed in childhood, with the aim of modifying or preventing them in the early years. Such action could lead to improved heart health in adulthood (Taubert et al., 1996).

These risk factors for CHD that are already present in childhood will be discussed below.

1.2.4.1 Risk Factors

a) Blood pressure

Epidemiologic studies have estimated that elevated blood pressure accelerates atherogenesis and increases the incidence of CHD and cerebrovascular disease. The effect of hypertension is additive and independent of other risk factors and may be considered the single most important cardiovascular risk factor (Hertzel & Berenson, 1987).



Hypertension appears to increase the fibrillation of lipid from the plasma to the intimal layer by virtue of increased arterial pressure. According to Sokolow & McIlroy (1981), this in turn leads to injury of the intimal layer. Susceptibility to injury is increased by shear force, torsion and lateral wall pressure changes as a result of hypertension.

Although high blood pressure is usually identified in adulthood, it can also occur in children (National High Blood Pressure Education Program, 1996). Early detection, evaluation and treatment of hypertension in children will improve long-term health. Weight control is particularly important in the intervention/ treatment of hypertension because studies have shown that high blood pressure is more prevalent in overweight children than in those of normal weight (Lauer et al., 1975; Berenson et al, 1993).

The literature above (Hertzel and Berenson, 1987; Sokolow and McIlroy, 1981) has shown that high blood pressure is an important cardiovascular risk factor, and that this risk factor exists in childhood (National High Blood Pressure Education Program, 1996; Lauer & Shekelle, 1980). The need therefore is obviously to address high blood pressure and the contributing factors, such as obesity in childhood, rather than in adulthood.

The Muscatine, Iowa study (Lauer & Shekelle, 1980) has examined the prevalence of coronary risk factors in over 4000 school children. Of those with body weight in the upper decile, 28.6 percent had systolic arterial pressure levels, and 28.4 percent had diastolic pressure levels more than the 90th percentile (Lauer & Shekelle, 1980).

Court et al. (1974, cited in Lauer & Shekelle, 1980) studied 209 obese children, of which 114 had diastolic pressure equal to or greater than 90 mmHg and systolic pressure 135mmHg or above. Arterial pressure correlated positively with estimates of obesity.

b) Obesity

Every kilogram of extra mass that one carries means an extra kilogram of tiny blood vessels through which one's heart has to pump blood. So even moderate extra mass can mean considerable excess strain for one's heart (Heart Foundation of S.A., 1997). In adults, obesity is associated with an increased prevalence of hyperlipidaemia, hypertension, diabetes and certain types of cancer (Cowell, Montgomery & Talashek, 1992).

The relationship of body fat patterning to CHD as found in adults already begins in childhood (Hertzel & Berenson, 1987). It is estimated that between 6 and 15 million children are obese, based on triceps skinfold measurements. This is an increase of 39 percent (in 12- to 17-year olds) to 54 percent (in 6- to 11- year olds) since the 1960s (Moller et al., 1994). Though not considered an independent cardiovascular risk factor, obesity is associated with other risk factors, including elevation of blood pressure, elevation of total cholesterol level, physical inactivity and low high-density lipoprotein cholesterol, that contribute to cardiovascular risk (Moller et al., 1994). In childhood, obesity is associated with high blood pressure levels, lower levels of high density lipoprotein cholesterol, higher insulin levels, increased heart rate and increased cardiac output (Berenson et al., 1993).

Furthermore, Berenson et al. (1993) maintain that persistent obesity beginning in early life can become a major determinant of other adverse risk factor changes extending into adulthood. The value is apparent, therefore, to prevent obesity from developing in childhood, thereby preventing the risk factors that are associated with CHD from developing. A start to prevention may be to address the issue of physical inactivity associated with obesity, in addition to it being an independent risk factor.

c) Physical inactivity

Physical inactivity is an independent risk factor for cardiovascular disease. The risk factors of high blood pressure, high blood cholesterol, and obesity in particular are associated with decreased physical activity and decreased physical fitness (Blair et al., 1995 cited in Taubert et al., 1996). The proportion of children who are not physically active may be increasing. During the past decade, the percentage of high school

students who participate in vigorous physical activity at least three times per week has declined from 61.7 percent to 36.1 percent (Moller et al., 1994). If individuals who are sedentary can be identified in childhood, it is logical to assume that the incidence of obesity, high blood pressure and elevations in cholesterol may be reduced in childhood.

According to Riopel et al., (1986), exercise habits should lead to the maintenance of a more efficient cardiovascular system and reduce other atherosclerotic risk factors. The authors further reason that if regular exercise is beneficial for adults, and if habits are formed in childhood, then regular physical activity in childhood should be encouraged. The emphasis should begin in schools with programs set by teachers (Taubert et al., 1996).

d) Cholesterol

Certain blood fats (mainly cholesterol) when present at higher than normal levels, signify a substantially increased risk of CHD. Surveys have shown that as many as one-third of White South African adults have high blood fat levels (Heart Foundation of S.A., 1997). Fat intake causes the blood vessels of the digestive tissues to dilate. With the blood flow concentrated in the digestive tract, less blood is available to supply the heart with oxygen (Friedman & Ulmer, 1985).

The National Cholesterol Education Program Expert Panel on Blood Cholesterol levels in children and adolescents noted that an elevated cholesterol level early in life plays a role in the development of adult atherosclerosis, which frequently leads to heart disease. Numerous studies have shown that the atherosclerotic process begins in childhood and is affected by high blood cholesterol levels (Allensworth, 1996).

In the 1950s studies performed on young soldiers killed in Korea showed fatty deposits ("fatty streaks") in their aortas, and that these deposits contained cholesterol (Enos et al., 1955). Subsequent studies have shown similar fatty streaks, believed to be the precursors of the atherosclerotic plaque in even younger children (Holman et al., 1958; Strong et al., 1969; Stary, 1989). Recent data from the Bogalusa Heart Study correlated with the extent of fatty deposits in the aorta and coronary arteries of teenagers accidentally killed (Newman et al., 1991). One of the major components of these deposits is cholesterol. Therefore, strong evidence is shown of the role of fat and cholesterol in the diet of children and the development of atherosclerosis before adulthood. Based upon this and other scientific evidence, elevated blood cholesterol which is considered a risk in adults, was identified as a coronary risk factor in children as well (Taubert et al., 1996). According to Moller et al., (1994), children from countries where there is lower consumption of saturated fat and a lower incidence of CHD have lower levels of blood cholesterol.

As previously discussed, elevated cholesterol levels early in life plays a role in the development of adult atherosclerosis which frequently leads to heart disease. In order to prevent heart disease from occurring in adulthood, it seems prudent to focus attention on the prevention of elevated levels in childhood.

e) Smoking

Each time one inhales cigarette smoke a reaction is set up which causes the arteries to become narrower and the heart to work harder to keep one's blood circulating. Apart

from the risks of cancer, smokers are up to nine times more likely to die from CHD than non-smokers (Heart Foundation of S.A., 1997).

According to Reddy et al., (1986), national smoking rates in South Africa have increased by 3% from 1992 to 1996 and one in nine deaths in the country are related to tobacco use. Primary prevention of smoking is essential, because nicotine is one of the most highly addictive substances available. The onset of tobacco use usually begins during adolescence and is primarily a social behaviour (Taubert et al., 1996).

When considering the above literature, it is evident that tobacco education programs and campaigns warning about the hazards of smoking should be aimed at the child and adolescent segment of the population. This will aid in preventing children and adolescents from starting to smoke and becoming smokers who are up to nine times more likely to die from CHD than non-smokers.

In addition to the above risk factors, specific premorbid behavioural characteristics of persons appear to increase their susceptibility to CHD. Prominent in this category has been Type A coronary-prone behaviour (Rahe et al., 1978).

f) Type A Behaviour

The possibility that individuals with heart disease might share certain behavioural characteristics has been advanced since the end of the nineteenth century (Siegel, 1984). An increasing flow of research from different scientific teams has shown the following: This complex Type A pattern, or traits that form a portion of it, is validly associated with the incidence of CHD, related to the recurrence of myocardial infarction

in persons already having clinical CHD, and correlated with the severity of coronary atherosclerosis as determined angiographically (Jenkins, 1978).

The Type A Behaviour Personality will be defined and discussed in greater detail in the following section.



1.3 THE TYPE A BEHAVIOUR PATTERN

1.3.1 Definition of Type A Behaviour

Early in this century, Osler (1910) described the tendency of patients with angina pectoris to work long hours with greater intensity of purpose and to frequently obtain little pleasure from their labours. Thirty years later Dunbar (1943) observed the rigid strivings of CHD patients.

Arlow (1945) added other characteristics such as "longstanding and unabated tension".

In the late 1950s Friedman & Rosenman (1959) conceptualised much of the above, as well as formulated additional behaviour characteristics of patients with CHD under the rubric "behaviour pattern Type A". (Rahe et al., 1978).

Friedman & Rosenman (1974) hold that Type A behaviour refers to a complex of personality traits including:

"...excessive competitive drive, aggressiveness, impatience, and a harrying sense of time urgency. Individuals displaying this pattern seem to be engaged in a chronic, ceaseless and often fruitless struggle - with themselves, with others, with circumstances, with time, sometimes with life itself. They also frequently exhibit a free-floating but well rationalised form of hostility, and almost always a deep-seated insecurity". (p.28)

They further maintain that "The Type A behaviour pattern is an action-emotion complex, which is exhibited by men and women in the presence of the appropriate environmental event" (Friedman et al., 1974, p. 53). Type A persons appear to be directed toward achieving or doing more and more in less and less time, or toward obtaining the most number of things from the environment in the shortest period of time possible.

In service of such objectives, they often exhibit extremes of competitiveness and aggression, and may be easily annoyed when progress is impeded. They appear extraordinarily alert and exhibit various overt signs of their intense drive, such as tense facial musculature or explosive speech (Matthews & Haynes, 1986). The aggressive component of Type A behaviour has been investigated in the laboratory. In two social psychological studies, Carver and Glass (1978) found that Jenkins Activity Survey defined Type As were willing to deliver more shocks to a confederate following harassment than were Type Bs. A second experiment determined that Type As will express aggression following both frustrated effort and derogation (Diamond, 1982).

Similarly Matthews and Angulo (1980) conducted a laboratory study of male and female children from the second and sixth grades in order to provide evidence that children assessed by Matthews Youth Test for Health behave in a competitive, impatient and aggressive fashion.

The findings of this study demonstrate that Type A children aggressed against a Bobo doll with less experimenter encouragement and exhibited more signs of impatience than did Type B children. (Matthews & Angulo, 1980).

This behaviour pattern is thought to be encouraged by Western society because it appears to offer special rewards and opportunities to those who can think, perform, and even play more rapidly and aggressively than their peers (Matthews & Haynes, 1986). In other words it is a socially acceptable - indeed often praised - form of conflict (Friedman & Rosenman, 1974).

According to Matthews & Haynes (1986), this Type A behaviour is not a set of personality characteristics leading to behaviour and physiologic responses by some invariant processes elicited by any environment. Rather it is seen as the outcome of a set of predispositions interacting with specific types of eliciting situations, including those that are stressful or challenging. This behaviour pattern is a characteristic manner with which some persons habitually respond to their environments (Jenkins et al., 1978).

Friedman & Rosenman (1974) hold that the person with a Type B behaviour pattern is the exact opposite of the Type A subject. Unlike the Type A person, he is rarely harried by desires to obtain a wildly increasing number of things or participate in an endlessly growing series of events in an ever-decreasing amount of time. His intelligence may be as good as, or even better than that of the Type A subject. Similarly, his ambition may be as great or even greater than that of his Type A counterpart. He may also have a considerable amount of "drive", but its character is such that it seems to steady him, give him confidence and security, rather than to goad, irritate and infuriate, as with the Type A man.

Historically, there has been an implicit assumption that Type B referred to healthier personal styles of seeking occupational ambition and a more relaxed lifestyle (Dembroski et al., 1978).

As might be expected, there are degrees in the intensity of this behaviour pattern (Friedman & Rosenman, 1974). No one Type A individual manifests all the characteristics constituting the pattern, and even a Type B individual will show some A-like features. In clinical practice, the designation of a person as Type A or Type B

depends upon a summation of the number of Pattern A characteristics and their intensity (Glass, 1977).

Friedman and Rosenman (1974) believe that in the absence of Type A behaviour pattern, CHD almost never occurs before seventy years of age, regardless of the fatty foods eaten, and cigarettes smoked or the lack of exercise. However, when this behaviour pattern is present, coronary heart disease can easily erupt in one's thirties or forties. "We are convinced that the spread of Type A behaviour explains why death by heart disease, once confined mainly to the elderly, is increasingly common among younger people." (Friedman & Rosenman, 1974, p. 53).

A quandary exists in that for many people the Type A behaviour pattern is construed to do more good than harm. The similarity between the Type A person and the cultural stereotype of the successful person is no coincidence. The Type A behaviour pattern is the embodiment of the industrial achievement ethic because Type A behaviours are reinforced in our society. Some individuals may be unwilling to change these behaviours or may suffer loss of esteem, identity, or occupational success because of behaviour change. In addition, the society itself may be unwilling to support wide-scale behaviour change if such change were to compromise creativity or economic productivity (Siegel, 1984).

1.3.2 Global Type A

At first Type A conceptualisation was perceived as a global concept where several components were grouped into one model. These components were competitiveness,

impatient or hurried behaviour, aggression, hostility and achievement oriented drive (Friedman & Rosenman, 1959).

Several studies are cited below that found global Type A behaviour patterns to be associated with CHD, but not all were successful.

Based on the evidence linking Type A behaviour patterns to CHD, both prospectively in the Western Collaborative Group Study and in angiographic studies, a distinguished panel of scientists met in December of 1978 under the auspices of the National Heart, Lung & Blood Institute. They concluded that the Type A behaviour pattern was a risk factor for CHD "over and above that imposed by age, systolic blood pressure, serum cholesterol and smoking, and appears to be of the same order of magnitude as the relative risk associated with any of these factors" (Siegman & Demboski, 1989). Thus for the first time a psychosocial variable was accepted by the medical community as a risk factor for CHD (Siegman & Demboski, 1989).

The major diagnostic tools of the Type A behaviour pattern are a structured interview developed by Friedman & Rosenman and a self-administered questionnaire called the Jenkins Activity Survey for Health Prediction (JAS) (Siegrist & Halhuber, 1981). The major focus for assessment of the structured interview was on how the interviewee responded to the interview, rather than on what he said. For example, the interviewer adopted a provocative style and deliberately interrupted the interviewee, alternatively speeded up or slowed down the pace of questions and challenged the interviewee's responses.

Behaviour typing was based on the interviewee's response to this provocative interview style as reflected by aggressive speech (e.g. loudness, explosive modulation, interruptions), attitude (hostile, challenging) and facial and postural gestures (signs of alertness, fist clenching). Relying upon the overall clinical impressions, the interviewee was thus classified into either Type A1 (fully developed A), A2 (weak A), X - (neither A nor B), B3 (weak B), B4 (fully developed B). The Jenkins Activity Survey (JAS) items were selected and weighed in terms of how well they could mimic structured interview assessments. Relative to the structure interview the JAS possesses certain advantages in that it is easy and relatively inexpensive to administer and score (Siegel, 1984).

In a study conducted by Williams et al., (1980) a significantly greater proportion of Type A patients, in contrast to non-TypeA/Type B patients, had at least one artery with a clinically significant occlusion of 75 percent or greater.

The Review Panel on Coronary-Prone Behaviour and Coronary Heart Disease (1981) reviewed a great deal of investigations that have been conducted on the association of Type A behaviour and atherosclerosis. In the first of these investigations, Zyzanski et al. (1976) studied 94 men who had been referred by private cardiologists to the Boston University Medical Centre for angiography. The results showed that men with 50 percent or greater occlusion in two or more vessels had significantly high JAS scores on the Type A scale, as well as the three factor scores than those of less disease.

Frank et al. (1978) studied 124 male and 23 female patients referred because of clinical symptoms of CHD. A large proportion of men, 73 percent, were classified as Type A by the structured interview. Multivariate analyses showed that after controlling for

cholesterol, sex, age, smoking, and high blood pressure, Type A behaviour was associated with the number of vessels occluded 50 percent or more.

A series of studies has emanated from the Duke University Medical Centre in Durham, North Carolina. In the first of these studies a sample of 80 male and 62 female patients was administered both the structured interview and JAS. A total coronary index was developed as a measure of atherosclerosis. The results showed that the prevalence of Structured Interview Type A behaviour rose with CHD scores (Blumenthal, et al., 1978).

Williams et al. (1980) studied the association among Type A behaviour and CHD in the same population, combined with additional patients totalling 307 men and 117 women. The results from the Structured Interview reported that significantly more of the Type A group (71 percent) had at least one vessel with 75 percent or more occlusion than the Type B group (56 percent).

However, not all studies have found a positive effect between CHD and Type A behaviour patterns. The analyses of Matthews et al. (1986) show that studies of high-risk persons fail to consistently support the hypothesis that Type A behaviour is a risk factor for recurrent events or for mortality in men at high risk for CHD. In recent years, under the weight of notable failures to replicate the relationship between Type A and CHD, confidence waned in a 20-year stream of largely confirmatory findings that led reviews to the conclusion that Type A pattern was an estimated risk factor for CHD

The decrease of the observed strength of the relationship between Type A behaviour and CHD may be due to more sceptical investigators who are studying the issue, or that more

failures to replicate are now being accepted for publication. The inconsistent effects may also be due to measurement error in the behaviour pattern. According to Thoresen and Powell (1992) research on the Type A behaviour pattern has been plagued by inadequate theory, insensitive assessment and insufficient interventions. Alternatively, it may be that the phenomenon itself is changing.

Futhermore Thoresen & Powell (1992) maintain that Type A is not a homogenous trait-like construct that can readily be assessed on one occasion and proved stable over decades. Viewing Type A as a global syndrome and assessing it as a dichotomy (e.g. A or B) is no longer useful or scientifically valid. Rather, the components of Type A need to be seen as contextually sensitive phenomena elicited by perceived challenges to self-evaluative processes and commonly influenced by emotional memories and biases as well as social and cultural factors (Thoresen & Powell, 1992).

According to Dembroski and Costa (1987) the major task of epidemiological research is to identify the risk factors for CHD, because without these markers, prevention of this chronic and deadly disease is virtually impossible (Dembroski & Costa, 1987). It is therefore necessary to identify the "toxic" components of the Global Type A behaviour pattern, i.e. those components that are responsible for CHD.

1.3.3 Components of Type A

The Jenkins Activity Survey (a test to assess Type A behaviour) was factor-analysed by Pred, Spence and Helmreich (1986). It was found that two dimensions, namely Impatience/Irritability and Achievement Striving reflect global Type A. According to these researchers Impatience/Irritability comprise impatience, time urgency and irritability, whereas Achievement Striving encompasses job dedication, target setting and hard driving behaviour (Helmreich, Spence & Pred, 1988). In addition to Impatience/Irritability and Achievement Striving, Friedman & Rosenman (1974) also include as central components to the Type A behaviour pattern time urgency, excessive competitive overdrive and hostility.

It is evident therefore that five dimensions of Type A behaviour have been indicated, namely achievement striving, impatience, anger, hostility and competitiveness (Rosenman, 1989); each dimension yielding differential relationships with health and work outcomes (Burns & Bluen, 1991).

Siegman and Dembroski (1989) found that the search for the dangerous element within the broad band of Type A characteristics has produced a converging set of findings implicating hostility as the culprit. According to Rosenman and Chesney (1985), Hostility is defined as "a complex set of attitudes that motivate aggressive behaviour" (p.421). These hostile attitudes include animosity, resentment and the major component of chronic anger. Aggression is used to refer to destructive or punitive behaviours directed toward other persons or objects.

Type As are considered more hostile and easily angered than Type Bs. Price (1982) proposed that Type As rely excessively on the approval of others for their sense of self worth, will go to great lengths to avoid social disapproval, and may be especially vulnerable to criticism. She outlined how vulnerability to criticism could become manifested as hostility against another.

Williams et al. (1980) independently measured Type A behaviour and hostility in a group of patients undergoing coronary arteriography. Both Type A behaviour and scores on the Cook and Medley (1954) hostility scale (HO) of the Minnesota Multiphasic Personality Inventory (MMPI) were independently correlated with the degree of coronary occlusion. Patients with low scores were less likely than those with higher scores to have one or more coronary arteries with a 75 percent or greater stenosis. This finding probably represents the strongest direct evidence for the role of hostility in the development of atherosclerosis (Diamond, 1982).

Item analysis of recorded answers given by 186 men to the structured interview in the Western Collaborative Group Study, yielded results showing four of the seven significant items were directly related to anger and that the other three could be motivated by anger. Thus, anger and hostility would seem to be critical components of the Type A behaviour pattern in contributing to the aetiology of CHD (Chesney & Rosenman, 1985).

In the study of Barefoot et al. (1983), hostility scores predicted subsequent mortality from all causes, although there was no evidence of an association between HO scores and the incidence of diseases other than CHD and hypertension. It therefore appears that HO

scores not only contribute to the pathogenesis or progression of cardiovascular disease, but they also may affect one's ability to survive other disorders.

Although the above investigators have found hostility to be the toxic element in the Type A behaviour pattern, not all investigators ascribe the toxicity of the Type A pattern solely to hostility (Maclennan, 1994).

By reconsidering the personality profiles of their patients who had CHD, Friedman and Rosenman (1974) discovered that time urgency and excessive competitive overdrive were components of the behaviour pattern that were invariably evident in patients under sixty-five years of age. These components they found to be "toxic dimensions of TAB that predicted subsequent CHD" (Burns & Bluen, 1991, p. 978).

According to Friedman and Rosenman (1974), overwhelmingly, the most significant trait of the Type A man is his habitual sense of time urgency or "hurry sickness". Of all the Type A elements, competitiveness was found by Lundberg et al. (1989) to yield the strongest association with physiological reactivity, while Spence et al. (1987) found competitiveness to be negatively related to physical health complaints.

The picture of the coronary-prone personality emerging from the review by Booth-Kewley and Friedman (1987), does not however appear to be that of the workaholic, hurried, impatient individual. Rather, the true picture seems to be one of a person with one or more negative emotions: perhaps someone who is depressed, aggressively competitive, easily frustrated, anxious, angry, or some combination of these traits.

1.3.4 Physiological Mechanisms Linking Type A to CHD

A study of sudden death by Friedman et al. (1973) has provided evidence for Type A behaviour as a contributing factor. A few studies of patients who have had coronary arteriography have found Type A behaviour to be correlated with the severity of coronary atherosclerosis (Zyzanski, 1978; Blumenthal et al., 1978; Frank, et al., 1978; Williams, et al., 1978).

The strongest available evidence on the association between Type A behaviour and CHD comes from the Western Collaborative Group Study (WCGS). The results indicate that Type A men, compared to Type B men experienced about twice the incidence of acute clinical events over an 8.5 year follow-up period (Rosenman et al., 1964 cited in Siegrist & Halhuber, 1981). This difference occurred independently of other risk factors, including total serum cholesterol, systolic blood pressure, and daily cigarette smoking. Still other research, using coronary arteriography has documented more severe occlusion of the coronary arteries in Type A compared to Type B patients (Siegrist & Halhuber, 1981).

The Review Panel on Coronary-Prone Behaviour and Coronary Heart Disease (1981) hold that alternative explanatory models could account for the demonstrated association between Type A behaviour and ischemic myocardial disease (myocardial infarction, angina pectoris and sudden cardiac death). According to the Review Panel the first and simplest model assume that Type A behaviour leads to or causes coronary disease, presumably through stress-related automatic neuroendocrine (physiologic) mechanisms. The second model would postulate that both the behaviour pattern (Type A) and the coronary disease are parallel (basically independent) manifestations of a central

aggressive constitutional trait that expresses itself in the psychophysiologic realm as Type A and in the somatic realm as progressive coronary atherosclerosis.

Sieglman and Dembroski (1989) believe that there are three logical ways in which a behaviour pattern might be associated with CHD or sudden cardiac death status:

Firstly, the behaviour pattern might be a marker of some underlying *inborn structural weaknesses* that makes CHD or sudden cardiac death more likely.

The second mechanism, the *hyperresponsivity hypothesis*, refers to the behaviour patterns possible association with exaggerated physiological reactivity to certain situational circumstances, and this reactivity may in turn increase the atherosclerotic process.



The third possibility the *dangerous situations hypothesis*, is that Type As are exposed or expose themselves to inherently more risky circumstances dangerous to cardiovascular health.

1.3.4.1 Structural weakness

The consistent association of a behavioural pattern with a clinical disease entity presents a very difficult "chicken and egg" logic problem of causation. In an attempt to deal with this Sieglman and Dembroski (1989) indicated that amongst all the possible causal links and pathways, an inborn physical weakness or abnormality should be considered first, and could explain both the illness and the behavioural pattern. According to Suls &

Sanders (1989) the Type A behaviour is in itself harmless, and merely serves to indicate the presence of some pre-existing abnormality.

Another theory with regard to structural weakness is that instead of considering the fact that a specific pathogen-pathway is responsible for this disease, it could be that generalised stress would impact on a structural weakness, thereby activating the CHD process. Suls & Sanders (1989) suggest that most studies have found Type As and Bs to differ on physiological parameters only in situations perceived to be stressful by the individual and do not differ in resting periods.

1.3.4.2 Hyperresponsivity

The most popular working hypothesis linking Type A or hostility to heart disease is that the coronary-prone individuals exhibit higher levels of cardiovascular and neuroendocrine arousal that increase the atherosclerotic process and/or the incidence of life-threatening cardiac arrhythmias. In the face of stress, Sympathetic Nervous System (SNS) arousal produces increases in blood pressure that may produce damage to the inner lining of arterial vessels due to turbulence and sheer stress (Ross & Glomset, 1976). In addition, SNS arousal appears to produce alterations in the metabolism of myocardial cells and increases the deposition and incorporation into coronary artery plaques of thromboembolitic components of the blood. There is also evidence that SNS arousal facilitates the necrosis, calcification and rupture of plaques, which in turn could produce thrombosis and myocardial infarction. Furthermore catecholamines can interact with existing atherosclerosis to result in ventricular fibrillation and sudden coronary death.

Studies of physiological reactivity have indicated that Type As are not more responsive than Type Bs in all situations. It would rather seem that Type As are more reactive in situations characterised by difficult tasks, threats to self-esteem and threats to control or negative interpersonal interactions, but are not typically more reactive in situations involving minimal levels of psychological challenge or demand (Siegman & Dembroski 1989).

- ***The Transactional Model***

The *transactional model* contends that Type As show greater reactivity and more overall arousal because not only do they respond more strongly, but they also create more frequent sources of stress for themselves. Type As create such physiologically taxing situations through their actions and thoughts; that is, the Type A pattern may represent an ongoing process of challenge and demand-engendering behaviour, with pathogenic physiological results. (Siegman & Dembroski, 1989).

Once these challenging and demanding environments have been created, such an environment is likely to reinforce and maintain Type A behaviour. As a result, relative to Type Bs, Type As demonstrate increased physiological reactivity in two ways: through more reactivity to challenge or demand, and through contact with the more frequent, severe and enduring stresses they have created. (Siegman & Dembroski, 1989).

1.3.4.3 Dangerous situations explanation

The dangerous situations hypothesis proposes that individuals high in Type A or hostility are at greater risk because they are exposed to inherently more risky circumstances more often than are Type Bs. It is hypothesised that Type A risk is the result of routine

physiological reactivity to abnormally stressful situations, which the individual places him/herself under.

An example of a "dangerous situation" is the tendency to delay seeking medical attention. There is a fairly consistent body of evidence showing that Type As tend to underreport the severity of physical symptoms under conditions of challenge (Carver, Coleman & Glass, 1976; Weidner & Matthews, 1978). In fact Type As and Bs might have the same underlying disease, but Type As fail to take appropriate measures, thus increasing the risk status carried by Type A (Suls & Sanders, 1989).

Suls & Sanders (1989) further suggest that Type As place themselves in another possible dangerous situation in that they tend to be involved more frequently in potentially dangerous eating/drinking situations than Type Bs.

Finally, Type A or hostile persons may place themselves in a "dangerous situation" because they create inadequate social support resources for themselves. Presumably social support buffers the effects of stress, encourages preventative health measures, and so forth and hence serves to protect the individual from illness. In this regard, the common stereotype of Type A individuals suggests that persons would have a difficult time forming or maintaining close bonds with others because of their competitiveness and intensive work schedules (Suls & Sanders, 1989).

1.3.4.4 Blood pressure

Lyness (1993) found that in stressful situations, Type As show greater systolic blood pressure, diastolic blood pressure and heart rate reactivity than Type Bs. Furthermore,

that over the years such cumulative, chronic stress leads to the development of greater incidence of CHD. Keys et al. (1971, cited in Lyness, 1993) reported that the most effective predictors of CHD 23 years later was the diastolic blood pressure increase to a cold pressor test.

The frequent observation that Type As evidence greater blood pressure and heart rate elevations under appropriately challenging experimental conditions has encouraged speculation that the Type A pattern may promote CHD, in part, via recurrent activation of centrally mediated hemodynamic and neuroendocrine responses to stress (Corse et al., 1982).

An investigation was conducted by Corse et al. (1982) with the purpose of examining the physiological responses of Type A and Type B individuals among persons with and without CHD. Results indicated that independent of A/B typology, CHD patients experienced significantly greater Diastolic Blood Pressure (DBP) elevations during the experimental tasks than did non-CHD controls. Type A subjects as determined by the structure interview, exhibited greater task-related increases in Systolic Blood Pressure (SBP) and DBP than did Type Bs. The results of this investigation are consistent with the hypothesis that heightened cardiovascular reactivity under stress may mediate relationships between behaviour factors and CHD.

1.3.4.5 Cholesterol

The results of Friedman and Rosenman's (1974) research led them to conclude that there is no question about the fact that the serum cholesterol level may vary directly with the intensity of the Type A behavioural pattern.

Friedman and Rosenman (1974) followed the serum cholesterol level of a group of accountants from January to June when the April 15 tax deadline approached, and as the sense of true urgency of these accountants rose sharply, so did the level of their serum cholesterol. Conversely in May and early June, when their sense of time urgency almost disappeared, their serum cholesterol fell. According to these researchers, this change in serum cholesterol could only have been due to their emotional stress, as neither their food, smoking, nor exercise habits had changed during the period of their surveillance. Here then was the first completed documented and controlled demonstration that the brain and its functions could alter the blood or serum cholesterol level.

Friedman and Rosenman (1974) also did some epidemiological studies. In one study they had data collected from approximately eighty Type A men and approximately eighty Type B men. The results again showed that the eighty Type A men had a higher serum cholesterol than the eighty Type B men; 28 percent of these seemingly well Type A men (age 35 to 60 years) *already* had coronary heart disease. Indeed they had *seven times* more CHD as the Type B men, but their diets and exercise habits were almost identical.

1.3.4.6 Neurohormonal aspects

- ***Norepinephrine***

Haft (1974) believes that available data support the hypothesis that norepinephrine or its metabolites in both urine and plasma are increased in persons classified as Type A and in ambulatory persons with CHD.

Glass (1977) investigated the hypothesis that Type A persons, when performing a task requiring both competition and harassment, will show heightened levels of norepinephrine. According to Friedman and Rosenman (1974) people who are struggling against time, events and other people were believed to be at greater risk for CHD because of chronic overstimulation of sympathetic nervous system pathways resulting in elevated catecholamines and corticosteroids, increased blood pressure and heart rate, arterial constriction, release of fatty acids and increased platelet aggregation.

1.3.4.7 The autonomic nervous system

- ***Sympathetic/Parasympathetic Division***

Central to the approach of Glass (1977) to Type A is the idea that active efforts by Type A to control their environment are accompanied by sympathetic activation and elevated levels of circulating catecholamines. When efforts at control fail as they inevitably will with an uncontrollable stressor, the theory predicts a shift from sympathetic to parasympathetic dominance. Such abrupt shifts have been implicated in sudden cardiac death (Siegrist & Halhuber, 1981). According to Richter (1957) it is interesting to note that many years prior to the study of Type A behaviour pattern, it had been suggested that rapid shifts between sympathetic and parasympathetic control might play a precipitating role in sudden death.

One can therefore note that there are several possible explanations that address the issue of the connection between the Type A behaviour pattern and heart disease (Webster, 1994). In addition to understanding the link, this information must, and has been used in interventions to prevent CHD from occurring and re-occurring.

1.3.5 Aetiology of the Type A Behaviour Pattern

There are different theories regarding the origin and aetiology of the Type A behaviour pattern. These range from the idea that Type A behaviour pattern is the result of child-rearing practices and the environment in which one is raised, to research by Siegel (1984) which found that Type As responded and behaved physiologically like their counterparts. This will be discussed in more detail below.

According to Glass (1977), the motivation underlying the overt expression of Type A behaviour is a desire for control over the environment. The hurrying, the impatience, the striving and the hostility when blocked can all be viewed as reactions of the Type A person to threats of his or her mastery (Siegel, 1984).

According to Siegel, (1984) self-involvement is another psychological construct which has been hypothesised to play an aetiologic role in the TABP. Type As are more self-involved than Type Bs (Scherwitz et al., 1978). Self-involvement may promote constant comparison between the self and ideal self, thus resulting in certain overt Type A behaviour such as achievement striving or impatience.

According to Keltikangas-Jarvinen et al. (1991), certain pre-adolescent Type A determinants such as hyperactivity, the likelihood to social maladjustment, aggressiveness and low self-esteem may be the predictors of risk Type A behaviour in young adulthood.

Low self-security in pre-adolescence may explain the high competitiveness in young adulthood. Lack of self-esteem is compensated for the need to strive for competence (Keltikangas-Jarvinen et al., 1991).

The results of the study conducted by Keltikangas-Jarvinen et al. (1991) support the hypothesis that Type A behaviour is a coping mechanism: a person tries to cope with stress by increasing his or her level of achievement.

Similarly, Friedman and Rosenman (1974) conjectured that beneath the outward facade of competence and control was a profound inward sense of insecurity and a deeply felt inadequacy. Thus the chronic struggle to achieve served to avoid or reduce negative appraisals by others and of oneself.

There is also converging evidence that parental standards of performance, which are ever-escalating, play a role in the aetiology of Type A behaviour, particularly in the achievement-striving component. High achievement motivation is associated with the following parental behaviour: high expectations and aspirations, frequent approval and disapproval, a competitive and involved attitude, and authoritative discipline techniques. (Dembroski et al., 1978).

A developmental perspective on the origin of Type A behaviour believes that the environment in which the child was raised was distinguished by disapproval or losses of approval. Parental child-rearing practices associated with Type A children should be characterised by frequent use of disapproval and approval contingent upon improving

performance relative to the child's previous performance or the standards of others (Dembroski, 1978).

According to Matthews (1984) child-rearing practices of the parents are likely to play a critical role in the development of Type A behaviour. It has furthermore been found that Type A adults and children respond similarly to modest losses of control.

In an effort to understand the aetiology of the Type A behaviour pattern, Matthews and Siegel (1982, 1983) have proposed that adaptation to ambiguous performance standards might contribute to Type A behaviour pattern in the young. They conducted a study which explicitly tested the role of ambiguous standards in Type A behaviour. The findings of this study suggested that the absence of clear standards led children to compare themselves with extraordinarily high standards, which should promote their striving to achieve higher and higher goals (Siegel, 1984).

According to Keltikangas-Jarvinen et al. (1991) TAB has already been identified in childhood. Siegel (1984) believes that because children and adolescents rarely manifest clinical symptoms of CHD, it has not been considered a practical research strategy to gather CHD end-point data as a means of validating the Type A construct in the young. Efforts have been directed at determining whether young Type As behaved and responded physiologically like their counterparts. Siegel (1984) cited data showing that Type As were more impatient relative to Type Bs when confronted with a frustrating task. They were also more aggressive than Bs during play; scored higher on self-report measures of competition, achievement striving, time urgency and anger, and were more

concerned than Bs with mastery in that they persisted longer at a fatiguing task and responded more vigorously.

When considering the fact that the Type A behavioural pattern could be present from early childhood, the first aetiological consideration would be that it is genetically caused. This would then, as a point of departure, presuppose a high degree of similarity between physiological responsiveness between young and adult Type As. Siegel (1984) mentions three studies which provide evidence for similarities in physiological responsiveness among young and adult Type As. The accumulation of evidence, according to Siegel, is striking in showing similarities in self-reports, overt behaviour, and physiology among young and adult Type As.

Bergman and Magnussen (1986) conducted a longitudinal study of a sample of Swedish males and females. Type A related behaviour at age 13 was related to scores on an abbreviated Type A scale which was administered when the same subjects were 27 years old. Aggression, motor hyperactivity, overambition, and over-achievement measured at age 13 were used as predictors in a multiple regression analysis, with Type A score at age 27 as the dependent variable. It was concluded that Type A-related behaviour could be identified rather early and that it shows an unexpected degree of stability over a period of 14 years.

According to Siegel (1984) it is possible that physiological responsiveness is inherited, which could explain why the Type A person might exhibit greater physiological responsiveness than Type B. The general finding has been that Type As responded more vigorously than Bs to threats of control. In other research laboratories, active

coping or efforts to exert control have been associated with increases in sympathetic activity in both human and animal populations (Obrist, 1981, Weiss et al., 1970).

Matthews et al. (1984) re-analysed the Rosenman study of heritability of Type A behaviour in twins. The structured interview responses were analysed, producing three notable features:

Firstly, there is clear evidence for familial resemblance in the clinical ratings factor. Secondly, the pattern of results for the clinical rating factor is consistent with a genetic explanation. Thirdly, the analyses of specific items on the clinical ratings factor show that individual differences in loudness of speech, competition for control of the interview and potential for hostility may have a heritable component.

These individual differences in clinical ratings may share a common element. All may reflect a general hyperresponsivity to environmental challenge.

Recent evidence also indicates that cardiovascular hyperresponsivity to environmental challenge, which characterises the Type A pattern may have a heritable base (Rose et al., 1982 cited in Matthews et al., 1984).

According to Matthews et al. (1984), should there be a modest heritable base the individual differences in clinical ratings, the above findings, in combination with the cardiovascular hyperresponsivity data, may be best interpreted as indicating that underlying pattern A is a general responsivity that has a heritable base.

A cautionary note seems in order about the possibility of an overlap between hyperactivity and Type A behaviour pattern. The goal of a study conducted by Whalen and Henker (1986) was to examine whether such an overlap exists. The findings of this study showed that hyperactive boys received higher Type A scores than did their comparison peers. Children who scored high on the Impatience-Aggression subscale were perceived by the staff as intense and as having serious problems, by their peers as causing trouble, and by objective observers as showing relatively high rates of noise, verbalisation, and both regular and positive contact, as well as low rates of task attention in the classroom. Even the self-reports yielded a consistent pattern, showing modest relations between Impatience-Aggression and self-ratings of aggression, inattention and hyperactivity. This overlap must be taken into consideration when testing for TAB in childhood.

1.3.6 Conclusion

Cardiovascular diseases are the leading causes of death in South Africa for males and females (Medical Research Council, 1996) and the mortality rate of CHD in South Africa is two-and-a-half times greater than that of the United States (Viljoen, 1991). The need for preventative strategies is therefore obvious.

The actual cause of CHD is often a lifestyle that includes tobacco usage, physical inactivity and a high fat diet that elevates cholesterol, as well as promoting obesity (Allensworth, 1996). Elevated blood pressure is also a risk factor for CHD, as well as a psychosocial risk factor - Type A behaviour.



The cardiovascular risk factors identified in adults are already present in childhood and the importance of reducing these risk factors when they are just emerging and before they become too firmly entrenched, is therefore evident.

Type A behaviour, which has been identified as being an independent risk factor for CHD (Whalen and Henker, 1986) has also been found to have its origins in childhood (Keltikangas-Jarvinen, 1991). It appears that Type A behaviour is a behaviour learnt in childhood, and as with the other risk factors, the aim should be to prevent or modify Type A behaviour when behaviours are more malleable and before habitual patterns become too difficult to change.

The literature reporting on interventions for Type A behaviour in childhood, however, are limited. The literature discussed below has focused on the reduction of traditional risk factors in childhood, as well as studies which have attempted to modify Type A behaviours in adulthood, with the hope that these studies would shed some light on the intervention of this thesis.

1.4 INTERVENTION

Intervention is identified as a "...health promotion aimed at a target audience that alters a pre-existing condition related to that target audience's behaviour. The purpose of the intervention is to create healthful behaviour(s)" (Elder and Hovell, 1993, p.4). To elaborate, health promotion refers to the modification of human behaviour and environmental factors which directly promotes health, prevents illness or protects individuals from harm.

Because there is evidence that risk factors exist in childhood (Francis, 1996) and continue into adulthood, one can logically assume that an intervention that reduces mean levels of risk factors in a majority of children could eventually have an impact on mortality rates and morbidity, provided it is carried out for a longer period of time (Harrel, 1996).

This was the aim of The Child and Adolescent Trial for Cardiovascular Health (CATCH) which is a multi-site study of a school based intervention (Edmunson et al., 1996), and the Cardiovascular Health in Children (CHIC) study, which aimed to test a classroom based intervention to reduce cardiovascular risk factors in elementary school children (Harrel et al., 1996).

These interventions will be discussed in greater detail below, in addition to the Recurrent Coronary Prevention Program (RCPP) and the study by Blumenthal et al. (1980). These two latter interventions aimed at, and were successful in, reducing Type A behaviour that has been identified as an independent risk factor for CHD.

1.4.1 Child and Adolescent Trial for Cardiovascular Health (CATCH)

CATCH is a longitudinal cardiovascular risk factor intervention that was implemented for three years among children of 96 schools, from the beginning of third grade through the fifth grade. The conceptual framework for the CATCH intervention assumes a causal model in which psychosocial risk factors influence behaviour risk factors (dietary, physical activity and smoking) which influence physiological risk factors (blood lipids and blood pressure), which finally determine morbidity (heart attack and stroke). In this model, social risk factors become the most proximal targets for change by the CATCH intervention (Edmunson et. al., 1996).

The combined effects of the classroom curriculum strategies, environmental changes in the school food service and the physical educational program did lead to changes in what children themselves expect to do, their confidence in being able to perform the behaviour and their perceived support for their behaviour to consume lower fat, lower sodium food as well as to engage in additional moderate to vigorous physical activity (Edmunson et. al., 1996).

The researchers conclude therefore that the CATCH Program was effective in changing the psychosocial variables likely to influence a reduction in behaviour for cardiovascular disease. The study is significant in that it demonstrates the viability and effectiveness of a sustained multifaceted intervention in a pre-adolescent population (Edmunson et. al., 1996).

1.4.2 The Cardiovascular Health in Children Study (CHIC)

This study tested an eight-week school-based intervention for third and fourth graders. The classroom-based intervention incorporated health education and regular supervised physical activity; both components were given to all children in the school assigned to the intervention group. When compared with the control group at post-test, children in the intervention group had lower serum cholesterol, decreased body fat, increased aerobic power, greater heart health knowledge, and higher self-reported activity. Blood pressure normally rises as children grow, but the diastolic blood pressure of children in the intervention schools did not rise as much as in children in the control group (Harrell et al., 1996).

The results of these researches suggest that even a modest rise in physical activity can be important in modifying CHD risk factors in children. A classroom-based or public health approach provides the intervention for all children and thus avoids the possibility of "labelling" at risk children as somehow different, while giving all children the potential benefits of the intervention. A public health or population approach also prevents the possibility of misclassification and eliminates additional screening costs (Harrell et al., 1996).

The above interventions have aimed to reduce lifestyle factors that increased chances for CHD. In addition to genetic and lifestyle factors, the behavioural style of Type A is also strongly associated with CHD.

Effective interventions for Type A in adulthood, namely the Recurrent Coronary Prevention Program (RCCP) and the Study of Exercise and Type A, conducted by Blumenthal et al. (1980) have been carried out and will be discussed below.

1.4.3 The Recurrent Coronary Prevention Program (RCCP)

The RCCP tested the hypothesis that interventions designed to alter Type A behaviours, lower the risk of a recurrent event among myocardial infarction patients (Matthews & Haynes, 1986).

Approximately two-thirds of the 1 035 male myocardial infarction study participants were randomly assigned to a behavioural intervention plus cardiology counselling group and the remainder were assigned to the cardiology counselling only group. Results based on the first three years of the project have shown a significantly lower recurrence rate in the intervention group, 7.2 percent, relative to the cardiology counselling only group, 13.2 percent.

Due to the uniqueness and pertinence of Blumenthal et al's study to this study, it will be discussed in more detail than the recurrent coronary prevention program.

1.4.4 Blumenthal et al.'s Study

As discussed above, the use of physical fitness programs as a preventative approach to CHD has received growing attention and several large scale epidemiologic studies have associated habitual physical activity with reduced incidence of CHD (Blumenthal et al., 1980).

The purpose of Blumenthal et al's (1980) study was to determine if a systematic exercise program could be effective in modifying the risk profile of Type A individuals, including the Type A behaviour pattern itself, in a group of adults free of overt Cardiovascular Disease.

Subjects exercised under supervision three times weekly for a total of ten consecutive weeks. Exercise sessions consisted of ten minutes of stretching exercises followed by 30 to 45 minutes of continuous walking or jogging. For the first week almost all subjects were walking only, but by the tenth and final week, over half the subjects were jogging continuously for 30 minutes and approximately 90 percent of the group were doing at least some jogging. Exercise intensity was prescribed to produce elevations of heart rate to 70 to 85 percent of the maximal heart rate achieved on each person's initial treadmill test, and subjects were taught to measure their own heart rate by carotid or radial artery palpitation. Subjects were encouraged to limit their dietary intake of total calories, salt and cholesterol and saturated fat, but no closer regulation of dietary habits was attempted.

While previous reports have documented the utility of physical exercise in reducing blood pressure, blood lipids and resting heart rate (Martin & Calfas, 1989; Francis, 1996; Lakka et al., 1994), the study of Blumenthal et al. (1980) is the first to provide evidence that the Type A behaviour pattern may be modified by participation in a regular exercise program.

To the researcher's knowledge, the results of this study represent the first demonstration of the reduction of risk of cardiovascular disease by the simultaneous reduction of both physical risk factors and a measure of the Type A behaviour pattern. Blumenthal et al.

do emphasise however that "...the reduction in Type A scores does not represent a personality change or a shift from Type A to Type Behaviour. Rather, it represents a reduction in the *magnitude* of the Type A behaviour pattern" (1980, p. 294).

1.4.5 Conclusion

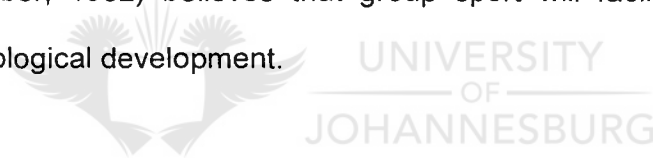
The above interventions have certain pro's and con's which must be taken into consideration when designing an intervention for children demonstrating the Type A behaviour pattern. A longitudinal study, as was used in the RCPP and the CATCH, is time consuming and costly and would not be practical for this study, since the primary school from which the sample was drawn did not continue into high school. This means that upon completion of their primary education, the children would be placed in high schools of their parents' choice, and the group would disperse. A follow-up study would therefore be difficult to conduct.



The CATCH and CHIC studies focused on the reduction of traditional risk factors for CHD, but not on the behavioural risk factor of Type A behaviour. On the other hand, the RCPP focused on the reduction of Type A behaviour, but this was in adulthood and on individuals who had already suffered a myocardial infarction. According to Siegel (1983) children and adolescents rarely manifest symptoms of CHD. For this reason, parents would not be keen to subject their children to a CHD reduction program, where the likelihood of CHD is so far into the future.

It appears more prudent therefore to introduce an intervention in the context of a more naturally occurring behaviour in children such as play or organised play such as sport. According to Morgan & Meier (1988) sport is primarily an extension of play. The study of

Blumenthal et al., (1980) was successful in demonstrating the reduction of Type A behaviour as the result of an exercise intervention. The intervention of Blumenthal et al. could be beneficial for use in the present study, since exercise can be considered a "natural" intervention. However, the target group in Blumenthal et al.'s study was adults, and children would get bored with 30 to 45 minutes of continual walking or jogging. The exercise intervention as used in Blumenthal et al.'s study will therefore be extended to the sporting arena, since according to Edwards (1973) one of the most salient features of sport is that it always involves physical exertion, without which there simply is not sporting activity. In addition to the benefits of exercise, sport comes naturally to children and in the correct environment, it will be fun. According to Rowland (1990) group sport will build character, honesty, selflessness and commitment. Skubic (1954, cited in Hawkins and Gruber, 1982) believes that group sport will facilitate sound emotional growth and psychological development.



The interaction of the group and the benefits of the sporting experience will be discussed below.

1.5 GROUP SPORT

1.5.1 Introduction

The late General Douglas MacArthur said the following of sport:

"It is a vital character builder. It moulds the youth of our country for their roles as custodians of the republic. It teaches them to be strong enough to know they are weak, and brave enough to face themselves when they are afraid. It teaches them to be proud and unbending in honest defeat, but humble and gentle in victory... . It gives them a predominance of courage over timidity, of appetite for adventure over love of ease. Fathers and mothers who would make their sons into men should [do so] in [sports]" (Cited in Edwards, 1973, p.38).

Organised youth sports in the United States actually go back to the early 1900's. The first programs were instituted in public schools when it was recognised that physical activity was an important part of education (Smith, 1989). Today physical activity and sport are basic and universal elements within virtually all cultures, from highly industrialised societies to developing countries (Carron, 1980).

The literature below will demonstrate that, provided sport takes place in an environment which is "positive" for the child, the sporting experience will result in social and emotional development. The child learns through the group how to make friends, how to react to his environment, and how to deal with authority.

The literature will also show how sport facilitates moral growth and pro-social behaviour. Improved self-esteem and the ability to channel aggression in a positive manner are also amongst the benefits of the group sporting experience.

These benefits will be discussed in greater detail below.

1.5.2 The Group in Sport

Carron (1980) views sports from a sociological perspective, and suggests that both generally and in the specific context of sport and physical activity, a considerable proportion of individual behaviour occurs within a group. Therefore, according to Carron, in order to gain an understanding of the antecedents and consequences of behaviour, it is imperative to focus on the group.

The basis for this suggestion is that a fundamental distinguishing characteristic of sport is its organisational structure. The individual athlete practices and competes within the context of a larger social system comprising an organisation, a group or a team. In turn, this social structure has both a direct and indirect influence upon the athlete's behaviour and performance effectiveness. Carron (1980) believes that "groups are essentially microcosms of the larger society" (p193).

The principle properties which serve to define a group and in turn to distinguish it from a crowd of individuals or a random collection of people, include the following: a collective identity, a sense of shared purpose or objectives, structured patterns of interactions, structured modes of communication, personal and/or task interdependence and interpersonal attractions (Carron, 1980).

The variables that exist in group sport such as those mentioned above which characterise a group, in addition to co-operation, the potential for the development of leadership skills, the need of the individual players to have patience and understanding

with others in the team, the possibility of raised confidence as a result of being a team player and the aggressive potential of sport, are all variables which can be manipulated in the context of group sport in order to prevent the development of Type A behaviour.

An example of this is the statement by Friedman & Rosenman (1974) that ambition associated with Type B behaviour is characterised by confidence and satisfaction, whereas the ambition associated with the Type A pattern is dominated by aggression.

This demonstrates how the variables that exist in group sport such as aggression can be manipulated in a positive or negative manner.

It should be the aim of those involved in an intervention to reduce Type A behaviour, to manipulate the above variables in a manner such that Type B characteristics will be fostered.

1.5.3 Definition of Sport

In order to continue with a discussion of group sport and the benefits of group sport for the wellbeing of an individual, it is necessary to define the concept sport.

Edwards (1973) defines sport as

"...involving activities having formally recorded histories and traditions, stressing physical exertion through competition within limits set in explicit and formal rules governing role and position relationships and carried out by actors who represent or who are part of formally organised organisations having the goal of achieving valued tangibles or intangibles through defeating opposing groups" (p. 116).

Edwards claims that sport derives its root meaning from "disport" meaning "to divert oneself". It carried the original, implication of people diverting their attention from the rigors and pressures of daily life by participating in the myth and whimsy of frolic - some physical activity.

Coakley (1994) defines sport as

"...an institutionalised competitive activity that involves vigorous physical exertion or the use of relatively complex physical skills by individuals whose participation is motivated by a combination of the intrinsic satisfaction associated with the activity itself and the external rewards through participation" (p. 382).

Partington et al., (1982) believe that sport today has many facets. Everyone understands the term according to what he or she has experienced in the past or is still experiencing now in connection with sports.

For the purpose of this thesis and based on the above definitions, sport can be regarded as a high level of physical exertion governed by certain rules which underlie any group-related activity performed by people for pure enjoyment and achievement of goals.

As mentioned before, Morgan & Meier (1988) believe that sport is primarily an extension of play and that it rests upon and derives its central value from play. When children are engaged in an activity such as sport that is purely for enjoyment, and when the variables that exist in a group such as co-operation, communication and interpersonal attractions, etc. are at play, then it seems logical to conclude that the Type A behaviour pattern will be more "open" to modification.

Below will follow a discussion of the benefits of sport.

1.5.4 The Benefits of Sport

The benefits of sport range from the areas of psychological, physiological, social and emotional benefits. Participation in group sport especially, teaches the child important developmental skills (Cahill & Pearl, 1993) and promotes psychological development (Seidel et al., 1993).

Although group sport is often associated with aggressive and sensation-seeking behaviour, if channelled in a positive direction, a decrease in aggressive behaviour will become evident. In addition to a decrease in such aggressive behaviour, sport is shown to improve moral reasoning and self-esteem. The discussion below will focus on the important social and emotional skills that sport has the potential to foster, in addition to a decrease in aggressive behaviour and improved moral reasoning and self-esteem.

1.5.4.1 Social and emotional development

According to the Social Learning Theory reported by Fisher (1976), sport is supposed to be a powerful force in today's society. Many human characteristics are supposedly developed by sport participation. It is argued that sport enhances co-operation among individuals, allowing opportunities for the enhancement of leadership qualities and generally improves the human lot.

Smith (1989) suggests that the development of leadership skills, self discipline, respect for authority, competitiveness, co-operation, sportsmanship and self confidence are

maintains that parents should establish the goals or objectives that are appropriate for children's sport such as the positive attributes mentioned above.

Smith (1989) goes on to say that youth sports programs are viewed as microcosms of society in which children can learn to cope with realities they will face in later life. In a developmental model sport is an area for learning, where success is measured in terms of personal growth and development.

Furthermore, Smith holds that youth sports are also an important social activity in which children can make new friends and acquaintances and become part of an ever-expanding social network. According to Weiss and Duncan (1992) many developmental psychologists have suggested that friendships and positive peer relations serve as social support mechanisms for children and aid in their psychological growth, emotional adjustment and coping skills with stressful transitions in their lives.

Morgan and Meier (1988) hold that the emotional development of the adolescent within the group is accomplished simply and energetically. The individual is less hampered by problems of feelings but he learns more quickly what is essential, the mechanisms with which he will henceforth always react to his surroundings. It is perhaps here, Morgan and Meier (1988) believe that the superior educational value of the group can be seen.

Similarly, if participation is evaluated in terms of the developmental tasks faced by children between the ages of 5 and 12, Cahill and Pearl (1993) believe that it is evident that children may benefit from participation by gaining an increased sense of self

mastery, increased abilities to deal with authority and peers, and opportunities to develop friendships crucial to social development.

In addition to the beneficial qualities of sport in regard to character building qualities and the developmental potential that it holds for youth, youth sports have also long been viewed as a cathartic mechanism through which young people might avoid delinquent behaviour (Diamant, 1991).

1.5.4.2 Aggression and Sport

From a physical evolutionary point of view, it has been concluded that aggressiveness, being an inherent instinct, can be kept under control, but can never be completely cured. However, the metaphysical concept of evolution suggests that by human effort, aggressiveness can be channelled to competition - an acquired instinct of lesser destructive mode (Chatterjee, 1992). According to these theorists, competition, through its positive re-direction to an aspiring motive for joy, love and beauty, will act as the implicit force for transforming human vital instinct of survival by fight and divisiveness to self fulfilling joy of co-operation and unity.

This innate aggressive tendency of man is therefore apparent and it is the responsibility of the parent or coach of the child participating in sport to redirect this aggression in a positive direction, to move from "fight" to "joy, co-operation and unity".

What follows are several theories and explanations for the decrease of delinquent/aggressive behaviours through participation in group sport.

The basic tenet of the surplus energy theory is that through participation in sport young people are able to channel their tensions. Without sports, some young people may "blow off" their tensions through such destructive behaviour as vandalism or gang assaults (Diamant, 1991).

Similarly, Vanderzwaag (1972) finds sport to be an excellent medium for youth to "let off steam". Within this context sport is viewed as a safety valve for the release of pent-up emotions. Thus, it is felt that the individual is attracted to sport, be it an unconscious attraction, because sport offers the sort of physical and or emotional release which is satisfying to the individual.

According to Vanderzwaag (1972) the surplus theory has been postulated as the *raison d'être* for sport participation.



According to Rowland (1990) in addition to the Surplus Energy Theory there are some other sound psychosocial constructs, including the following that make tenable a causal relationship between sport participation and decreased delinquent behaviour.

- **Recapitulation Theory**

According to this theory children possess innate, animalistic tendencies toward disruptive behaviour, which are thwarted by play activities. When sport and organised recreational exercise are not available, children may become delinquent and demonstrate other antisocial behaviour. The recapitulation theory was a driving force behind the early creation of urban playground and athletic programs.

- **Personality Theory**

According to this theory, athletic participation promote the development of self-discipline, social adequacy, emotional security and optimism. By promoting these wholesome traits, athletics helps to inhibit antisocial attitude, the growth of self-esteem through sport participation may be particularly important, because delinquency often serves as a response to inadequate self-concept (Rowland, 1990).

- **Stimulus-seeking Behaviour**

According to this concept, delinquency occurs because of a heightened need to increase stimulation. Sport allows individuals to gain their thrills through the excitement of athletic participation rather than antisocial activities (Rowland, 1990).

- **Boredom Theory**

Similar to the previous idea, this theory advocates that delinquency results largely from boredom. In the face of "nothing better to do", antisocial behaviour fills the time void. Sport provides alternative use of spare time (Rowland, 1990).

Segrave's (1983) review of the literature on the relationship between youth sports and delinquency reveals the following: Young athletes tend to engage in less delinquent behaviour than their non-athletic peers; athletes from lower socio-economic families are particularly less likely to engage in delinquent behaviour than their non-athletic peers from similar socio-economic families and young athletes are less involved in more serious offences like vandalism and physical assault than are their non-athletic peers.

These trends show support for the cathartic function of sport in that delinquency and aggression decreases as sport participation increases.

1.5.4.3 Moral reasoning and sport

Several studies have shown that participation in sport leads to improved moral reasoning in children. These studies are discussed below:

The cognitive-developmental perspective has led to direct investigation of the relationship between the development of morality and sports participation. For example, Piaget's stages have been found to be associated with game-related perceptions by children. In the sporting domain for instance, Jantz (1975) found that first and second grade children displayed more mature levels of moral reasoning than did children only a few years older than themselves when asked how they approached the rules of basketball (Diamant, 1991).

Bredemeier & Shields (1986, cited in Diamant, 1991) noted that sport may provide a temporary release from the constant demand to co-ordinate one's own sense of morality with the interests, needs and perceptions of other moral beings. Sports-related morality was termed "bracketed morality". It is bracketed within everyday morality rather than being completely separate from everyday morality. Sports participation is, after all, a part of life.

According to the above authors, sport participation may be positively related to moral growth. Horrocks (1979) in a study of fifth and sixth grade children found a positive correlation between sport involvement and reasoning about a hypothetical sport dilemma.

Bredemeier et al. (1986) found that sport experiences deliberately designed to promote growth in moral reasoning can be efficacious.

Similar results were observed by Romance et al., (1986) in their study. Their results indicate that a specific program designed to promote moral development through physical education can affect levels of moral growth. They exposed the experimental group to special teaching strategies designed to foster moral growth whereas the control group was not. The test scores showed significant differences between the groups in moral reasoning. The tests conducted within the group showed significant pre- to post-test improvement for the experimental group in sport and overall moral reasoning. Concomitant growth did not occur in the control group.

Romance et al. (1986) investigated the relationship of certain pro-social play behaviours of fifth and sixth grades to stages of moral development, youth sport participation, and perception of sportsmanship. Significant relationships were found between pro-social behaviours and moral reasoning.

1.5.4.4 Sport participation and self-esteem/concept

Sport participation and exercise have been shown to be associated with significant improvements and increases in the self-esteem and self-concept scores of children.

Self-concept is defined as the perception of one's self, while self-esteem is the value one places on that self-image (Pettrakis & Bahls, 1991).

In the study of Hatfield et al. (1985) two measures of self-concept were administered to eleven children aged from nine to eleven years, before and after eight weeks of participation in a guided exercise program of precision rope jumping. The results showed a significant rise in global self-concept as measured by the Piers-Harris Scale after the jump-rope regimen.

In a review of physical activity and self-esteem in children, Gruber (1986) found evidence for a positive influence of exercise on self-esteem. He found that children in studies experiencing a physical activity intervention displayed self-esteem scores nearly one-half of the standard deviation higher than the equivalent of children in control groups.

Hawkins and Gruber (1982) investigated the effect of a season on Little League Baseball on the self-esteem of 94 players. At the end of the season they were able to conclude that a season of Little League Baseball enhanced the total self-esteem scores of the players involved.

Hershey (1977, cited in Hawkins & Gruber, 1982) reported that after a season of youth baseball the self-concepts of older boys (11 and 12) in high level competition improved significantly.

The study conducted by Kamal et al. (1995) of 95 male university athletes and ninety male non-athletes found that athletes have higher overall self-esteem in comparison to non-athletes of the same gender.

More recently Hawkins and Gruber (1982) have shown that coaches effectiveness training programs can increase the self-esteem scores of players and Taylor (1983) and Vallerand (1983) have also indicated that positive informational feedback from others is essential for the development and maintenance of self-esteem.

According to Feltz (1986) it is important that parents be sensitive to the impact that sport experiences can have on a child's developing self-concept.

If a child receives attention, approval and loving concern from parents during the sport experiences, sport can help develop a positive self-concept. If, however, a child receives disapproval, rejection, and hostility from parents during the sport experience, sport can contribute to the development of a negative self-concept.

The importance of the coach and the sporting environment is not limited to the child's self-esteem and self-concept but rather it influences the sporting experience as a whole.

1.5.5 The Sports Environment and the Influence of the Coach

Cahill and Pearl (1993), believe the following:

"By itself, participation does not lead to positive or negative developmental outcomes. It is becoming more and more clear that the conditions under which participation occurs set the stage for outcomes. This is why some children seem to grow in positive ways because of their involvement in sport whereas others seem to suffer from retarded social development as a result of their involvement." (p. 80).

Information from peers, parents, and coaches significantly impacts the meaning that children assign to sport participation in general, and individual experiences in particular. Children construct definitions of success and failure primarily through social interactions during and after practices or games. It is in conversations with coaches, parents and peers that a good play or a mistake takes on meaning and is integrated into a child's life (Cahill & Pearl, 1993).

Wankel and Berger (1983) cite the study of Scanlan and Lewthwaite (1986) which found the enjoyment of age-group wrestlers to be positively related to high parental satisfaction with performance, positive adult involvement and interactions, and low frequency of negative maternal interactions.

Chambers (1987), believes that without a coach as a role model and teacher of morals, mature moral reasoning may not be achieved through sport participation. Maslow (1965) noted that the great leader is one who has the right combination of humility and flexibility while at the same time possesses strength of character to stand alone when an important principle is involved. A critical factor with regard to the legitimate use of authority by the coach is scope.

According to Smith (1989) it is not sport itself that automatically determines the worth of the activity for the child in the final analysis, but rather the nature of the experiences within the program.

Provided the sporting experience is a positive one and the environment in which the activity takes place is a warm and encouraging environment, the literature demonstrates

that differences between an athlete and a non-athlete will be evident. The literature also shows differences between an individual and a team athlete, which will be discussed below.

1.5.6 Individual vs. Team Sports

According to the findings of Schurr and Associates (1986, cited in Bird & Cripe, 1986) team sport participants tended to be more dependent and extroverted with accompanying higher anxiety, in comparison with individual sport participants.

Team-oriented athletes had higher degrees of extroversion and were less tough-minded whereas the individually oriented athletes demonstrated lower anxiety.

The study conducted by Kamal (1985) examined the differences in personality of team sport and individual sport athletes. The general personality attributes of athletes may determine why they are drawn toward sports. Vanek (1977, cited in Kamal et al., 1985) identified athletes as independent, self-confident, dominant, egocentric, selfish and of limited insight. They found that athletes in team sports tend to be extroverted and self-confident, while those in individual sports tend to be more inclined to exhibit introvert characteristics, and are stable and confident. Individual athletes are primarily concerned with their own achievement, training for themselves, often alone. Their motivation is dependent on enjoyment of sport, feedback and success.

Higher levels of intrinsic motivation will pre-dominate among individual sport athletes because the nature of their sport attracts athletes who are introverted, confident, less anxious who set goals for themselves to achieve. Conversely, the nature of team sports

pre-supposes that athletes will be less intrinsically motivated because success does not depend upon one individual's performance, but rather from the collective effort of the team.

Simon and Martens (1979, cited in Feltz, 1986) hold that individual sports with a higher evaluation potential than team sports, elicit higher stress responses to competition. From the research conducted they found that individual sport participants demonstrated higher pre-competition state anxiety than team sport participants did.

1.5.7 Athletes vs. non-athletes

Bird & Cripe (1986) show that in comparison to non-athletes both team and individual sport participants tended to be more dependent. In sports that entail direct physical contact, the athletes tended to be both extroverted and more independent than non-athletes. Athletes who took part in parallel sports demonstrated lower anxiety, less independence and less tough-mindedness as compared with non-athletes. According to Diamant (1991), young athletes have a higher self-image and peer status and participate more in school/non-school activities than their non-athletic peers.

Kamal et al. (1985) paint a profile of the athlete as being success-oriented, self-contained, tough minded, ambitious and a good leader. These traits seem to characterise the athletes and differentiate them from individuals who do not participate in sport.

In conclusion it is evident that the conditions under which the sporting experience takes place is of paramount importance. The sporting experience can have both negative and

positive consequences for the individual, depending on the sporting environment and the quality of leadership. If the environment is characterised by concern, encouragement, attention and approval for the child's effort rather than the outcome, it has been shown that emotional and social development will occur, in addition to the increased moral reasoning and self-esteem, as well as decreased aggressive behaviour.

If, on the other hand, the sporting experience is characterised by disapproving criticism, hostility and rejection, and if the variables of the group sport interaction have not been manipulated for the benefit of the child, then the experience will be negative, with negative consequences such as increased aggression, anxiety and feelings of incompetence.



1.6 CONCLUSION

Cardiovascular diseases are the leading cause of death in South Africa, and this is predicted to increase by the year 2020 (Murray & Lopez, 1996). Often the cause of cardiovascular disease is a lifestyle that includes obesity, high cholesterol, inactivity and smoking. In addition to these lifestyle risk factors, a behavioural pattern known as Type A is also said to be a risk factor - in fact, an independent risk factor for cardiovascular disease. Friedman & Rosenman (1974) believe that in the absence of the TABP, CHD almost never occurs before seventy years of age, regardless of the fatty foods eaten, cigarettes smoked or lack of exercise. Type A behaviour is characterised by excessive competitive drive, impatience, hostility and a sense of time urgency.

Because this behaviour pattern has already been identified in childhood, interventions should aim to reduce Type A behaviour while it is still malleable, as it becomes increasingly difficult to change behaviour in adulthood, when patterns are firmly entrenched.

Since sport is an extension of play, and since play is a behaviour that comes naturally to most children, sports will be a familiar, comfortable and enjoyable environment in which an intervention for children can take place. Provided the sporting environment is a positive one with a strong leader who knows how to encourage the child, and provided the variables of the group are manipulated positively, the child will feel relaxed and happy and behaviour change should follow.

The literature has shown that group sport participation is associated with emotional and social development, decreased aggression and improved moral reasoning and self-esteem.

The decrease of aggression is an important benefit of sport for this study, since aggression is a component of Type A behaviour. In addition to this the increase in self-esteem is also pertinent. According to Keltikangas-Jarvinen et al. (1991) and Friedman & Rosenman (1974), low self-esteem and low self-security was compensated by a need to strive for competence and achievement. Therefore, if aggression has a positive outlet such as sport, it stands to reason that the aggressive component of TABP will decrease. Similarly, if self-esteem is improved, the child will not feel the intense need to strive for achievement, and this achievement striving component will be reduced, thereby reducing another component of the Type A behaviour pattern. Based on the above literature, the aim of the study was to reduce Type A behaviour in children, using an intervention of group sport.

RESEARCH HYPOTHESES

1. A group of pupils subjected to participation in group sport will show fewer measurable Type A behaviour characteristics than a control group.
2. Participation in a group sport program will affect non-Type A health-related behaviour in primary school children.
3. A group of children subjected to participation in group sport will show lower indices of aggression than a control group.
4. A group of children subjected to participation in group sport will show lower indices of anxiety than a control group.

CHAPTER TWO

METHODOLOGY

2.1 INTRODUCTION

"When you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind."

(Carron, preface)

Although intervention programs have been successful in reducing the CHD rate, it still remains a number one killer. A possible reason for this is that the CHD prevention programs have focused on lifestyle factors, rather than the risk factor Type A behaviour (Whalen & Henker, 1986), which is an independent and established risk factor of Heart Disease (Matthews et al., 1984).

Type A behaviour can be identified rather early on in life and shows an unexpected degree of stability over a period of 14 years (Bergman & Magnusson, 1986).

Siegel (1984) believes that because children and adolescents rarely manifest symptoms of CHD, it has not been considered a practical research strategy to gather end-point data as a means of validating the Type A construct in the young. Efforts have, however, been directed at determining whether young Type As behaved and responded physiologically like their counterparts. According to Siegel (1984), accumulation of evidence is striking in showing similarities in self-reports, overt behaviours and physiology among young and adult Type As.

Recently, specific attempts have been made to alter risk factors for CHD in Type A individuals (Blumenthal, 1980). Among others, Friedman and Rosenman (1974) have described a comprehensive treatment program involving group therapy, and such behavioural techniques as relaxation training and environmental self-management.

Whereas previous studies have focused on modification of risk factors in adulthood (Rosenman, 1991; Kelly & Stone, 1987; Sheridan & Rademacher, 1992), this thesis will focus on modification of Type A risk factors in childhood.

The hypotheses of this study are the following:

1. A group of pupils subjected to participation in group sport will show fewer measurable Type A behaviour characteristics than a control group.
2. Participation in a group sport program will affect non-Type A health related behaviour in primary school children.
3. A group of children subjected to participation in group sport will show lower indices of aggression than a control group.
4. A group of children subjected to participation in group sport will show lower indices of anxiety than a control group.

2.2 SUBJECTS

Subjects were recruited from a primary school in the Gauteng province. They were students from standards two to five, their ages ranging from nine to thirteen years of age. The parents of these children were requested permission in order for their children to be tested and for a number of them (those who were Type As) to participate in the intervention group sport program. The ratio of boys to girls was two boys to every one girl, and all the subjects were Caucasian.

In addition to the subjects, the class teacher also had to participate in the program in order to complete some of the questionnaires. Teachers were considered the adequate raters because they have extensive experience with a range of children's personalities.

Two teachers from each standard, from standard two to standard five, completed the Matthews Youth Test for Health (MYTH) questionnaire. Once it was established which of the children tested according to the MYTH were Type A, it was then determined which of those children attended the after-care program provided by the school.

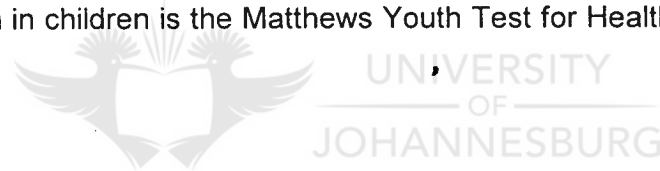
The Type A children who did not attend the after-care program and who did not want to partake in the group sport intervention were then excluded from the program. The children partaking in the experimental group totaled 20 ($n=20$) and those children who were not part of the intervention, the control group, totaled 10 subjects ($n=10$). The subject sample therefore consisted of a total of 30 subjects.

2.3 MEASURING DEVICES

The instruments utilised in this study included the Matthews Youth Test for Health (MYTH) Scale to measure the Type A Behaviour Pattern (TABP); the Health Resources Inventory (HRI) which measured the social and personal competency of children in junior primary; the Aggression, Moodiness and Learning Questionnaire (AML) was used to determine maladaptation within the school context. The teacher completed the above three tests. The Children's Manifest Anxiety Scale (CMAS) was used to determine the anxiety levels of a child and was completed by the child him/herself.

2.3.1 Matthews Youth Test for Health (MYTH)

One of the most frequently used rating scales, used in the assessment of the Type A Behaviour Pattern in children is the Matthews Youth Test for Health (Matthews & Angulo, 1980).



The MYTH FORM 0 is an observational scale intended to be completed by the child's caretaker. The scale consists of 19 items which were selected as best describing Type A behaviour in children. Items were coded on a five-point scale, from 1 (extremely uncharacteristic) to 5 (extremely characteristic). The questionnaire is scored by summing the weights assigned to each item, with items 5, 11 and 13 being coded in reverse.

These items were selected from a pool of potential items and standardised on teachers of a group of 485 children. Test-retest reliability correlation of $r = 0,82$ was demonstrated, with internal consistency as tested by the Cronbach's alpha coefficient of 0.90. Corrigan and Moskowitz (1983), during a subsequent study, found a test-retest reliability of $r = 0.99$.

When the total pool of items were factor-analysed two factors emerged, these being competitiveness and impatience-aggression. From the factor structure, two sub-scales were extracted measuring these two factors. Test-retest correlations and internal consistency coefficients in excess of 0.79 were also demonstrated for these scores (Matthews & Angulo, 1980).

Matthews (1978) remarks that it is extremely difficult to provide statements about the validity of children's measures of Type A behaviour. In the case of adults, criterion validity may be established in a number of ways, including the extent of atherosclerosis in the coronary arteries, clinical CHD, and a repeat of myocardial infarction (Matthews, 1978). In children, the only way in which measures can be validated is in terms of face and construct validity, based on the current consensus as to what constitutes the TABP among children.



Corrigan and Moskowitz (1983), using convergent and discriminate validity evidence based on teacher ratings of impatience and aggressiveness, intelligence test scores and a reaction time task, demonstrated adequate construct validity for the MYTH. It would not be appropriate to repeat the convergent and discriminate correlations here, but these may be found in Corrigan and Moskowitz (1983, p. 1518).

Significant difference was also found between boys and girls, but the difference, though statistically significant, was small in practice (boys' mean score was 52.4, girls 46.7). In the present study, in view of the small sample size, it was therefore considered more practical to group boys and girls together.

A questionnaire like MYTH has some obvious advantages. It is economical to administer. The scores are not based on children's self-perceptions, since children have difficulties completing such inventories. The reliability and validity of the MYTH was also demonstrated for the South African condition by Viljoen (1985).

2.3.2 The Health Resources Inventory (HRI) (Gesten, 1974)

The HRI was constructed by Gesten (1976) to measure the social and personal competency of children in junior primary. The evaluations are done by the teacher.

The Scale measures the following dimensions:

1. Good student - includes items relating to effective learning ability.
2. Gutsy - includes items reflecting adaptive assertiveness.
3. Peer sociability - consists of items reflecting effective interpersonal functioning.
4. Rules - includes items which depict the child's ability to function within the limits of the school setting.
5. Frustration tolerance - includes items which measure the child's ability to handle misfortunes.

The teacher evaluates each of the eight items on a 5-point scale where (1) = never and (5) = most. This is an observational scale.

This instrument also discriminates between normal and maladjusted children.

Factor analysis has shown that the instrument has satisfactory factor structure (Gesten, 1976). The test-retest reliability for the test as a whole is 0.87 (Gesten, 1976). For South

Africa, Claassen (1980) found both reliability and validity to be satisfactory (Claassen, 1984).

2.3.3 The Aggression, Moodiness, Learning Scale (AML)

The AML developed by Cowen et al., (1973) is an 11 item, 3 factor (A = Aggression, M = Moodiness; L = Learning) screening device for early maladaptation, and consists of teacher ratings of a subject on 11 "behavioural problems'. The teacher rates all 11 behavioural problem items on a 5-point frequency scale, that varies from (1) = 'never' to (4) = 'most of the time'. Low scores indicate a good adaptation whereas high scores reflect school maladaptation.

Factor A comprises five items that assess aggression, Factor M comprises five items that assess moodiness and Factor L comprises one item indicating learning problems.

The test's retest reliability is:

A Scale (aggression)	=	0.86
M Scale (withdrawn-moodiness)	=	0.80
L Scale (learning problems)	=	0.83

The ability test's retest reliability for total AML (the whole scale) was 0.85 (Cowen et al., 1973). The scale's reliability is satisfactory (Cowen et al., 1973) and Claassens (1980) found this test to be valid and reliable for South African conditions.

2.3.4 The Revised form of the Children's Manifest Anxiety Scale (R-CMAS) (Reynolds & Richmond, 1978)

Since the development of the Children's Manifest Anxiety Scale by Castameda et al., (1956, cited in Burke 1994), this scale has been used in a number of studies. Reynolds and Richmond (1978) revised the scale and omitted certain items, added some and rearranged the items to improve psychometric features of the scale (Burke, 1992).

The scale comprises a pencil-and-paper test of 37 items, and each item is answered with a Yes or No response (Reynolds & Reynolds, 1978). One mark is allocated for each Yes response, and no marks for a No response. A maximum of 37 marks can be achieved, and a minimum of zero. The more anxiety the child experiences, the higher the mark achieved on the scale. Reynolds and Paget (1981) and Reynolds (1981) found the scale to have satisfactory construct validity (Burke, 1992).

Poggenpoel (1972) used the original scale in a study in South Africa. However, according to Burke (1992), it appears that to date the revised scale has not been used in South Africa.

2.4 EXPERIMENTAL PROCEDURE

The principal of a local primary school was contacted and permission was granted by him to test for Type A Behaviour amongst his pupils and then to conduct a sport program with the Type A children who attended after-care, after the completion of the school day.

Class lists were obtained and permission and information forms were then handed out to children to give to parents who would grant permission for children to be tested.

Once the permission forms were in, the teachers of children from standards two to five, two classes in each standard, completed the Matthews Youth Test for Health. From those questionnaires it was established which children could be identified as demonstrating Type A behaviour.

These Type A personality children were then called back to a meeting, where it was established which of these children attended after-care and which children went home after school. A brief outline of the program was explained to those children, and those children who did not attend after-care were given permission to join the program if they so wished. Further tests were also completed by the teachers and the children themselves.

The program aimed to reduce the intensity of Type A behaviour characteristics in those children identified as Type A, to channel their aggressive, competitive and impatient tendencies in a positive manner. Group co-operation and respect for fellow team members was emphasised and actions such as patience, helpfulness and kindness

instead of winning were rewarded. They were rewarded by, for example being allowed to bat first, by being captain of the team, with praise, etc.

The experimental subjects participated in an eight-week sport program, which was held three times a week for three quarters of an hour a session. Each session consisted of a "warm up" for 10 minutes, where they did stretching and ran around the field two or three times, followed by half an hour of group sport physical activity in which two teams played against one another. These teams were changed every week.

After the eight-week sport program, both the experimental and control subjects were re-tested with the same tests used previously.

The nature of subject selection, the non-randomness of the sample and the nature of the tests necessitated the use of non-parametric tests, to test the significance of change scores from pre- to post-test for the experimental and control groups. The sign test was utilised for this purpose.

Due to the fact that children get bored easily with a monotonous routine, the group sport intervention consisted of a combination of different team sports such as relay races, cricket, netball and stingers. The children were committed to the program as a result of the emphasis placed on fun and on co-operating and being part of a team.

The aim of the intervention, in addition to the reduction of Type A behaviour, was for the children to enjoy themselves. For more detail of the program, please see appendix.

CHAPTER THREE

RESULTS

3.1 INTRODUCTION

It is known that Type A behaviour is often learned in childhood. According to Matthews (1977), child-rearing practices are likely to play a critical role in the development of Type A. Furthermore, it has been found that Type A adults and children respond similarly to modest losses of control. If this is indeed so - that Type A behaviour is learned in childhood - this behaviour should be changed in childhood, therefore precluding the development of the deleterious physiological consequences of Type A. Physiological consequences of the Type A behaviour pattern include coronary occlusion and in many cases coronary heart disease (Dimsdale et al., 1980) in response to stressful and challenging stimuli.

Recent attempts have been made to alter risk factors for CHD in Type A individuals. Intervention programs with Type A behaviour personalities have ranged from anxiety management training and visuomotor rehearsal to behavioural treatment programs.

As previously discussed, Blumenthal et al. (1980) found that participation in a regular exercise program modified the Type A behaviour pattern.

Although several studies have shown positive results in modifying Type A behaviour, these interventions have all been conducted in adulthood.

The aim of this study was to investigate whether the group sport intervention would be successful in reducing the Type A behaviour pattern in childhood and preadolescence.

Of importance is that sport is often seen as a venue to improve health-related behaviour and it was postulated that sport, especially in a group format would be an ideal avenue for changing Type A behaviour by decreasing it through the co-operative components of group sport.

Does the Type A child benefit from the interaction with other children? Will anxiety and aggression be reduced by the positive outlet of pent-up emotions that group sport and exercise allows the child? These are some of the questions that require answers.

This project therefore poses the following hypotheses:

1. A group of pupils subjected to participation in group sport will show fewer measurable Type A behaviour characteristics than a control group.
2. A group of Type A children subjected to participation in group sport will show lower indices of aggression than a control group.
3. A group of Type A children subjected to participation in group sport will show lower indices of anxiety than a control group.
4. Participation in group sport will affect non-Type A health related behaviour in primary school children.

3.2 SUMMARY OF METHOD

This study utilised a pre-post experimental control group design. At the outset of the project the children were tested on the Matthews Youth Test for Health Scale to determine which children possessed the Type A behaviour. Once this test had been conducted, those children who were classified as Type A were subjected to a battery of psychometric tests to assess their current behaviour status in addition to their being Type A. Those children who attended after-care, including those Type A children who wished to attend the program, made up the experimental group and those Type A children who did not attend after-care made up the control group.

Following this assessment and evaluation, the experimental group underwent the sport program intervention consisting of 45 minutes of sport and exercise participation, three times a week for eight weeks. The control group did not participate in this sport program. At the termination of the intervention sport program, both experimental and control groups were reassessed with the original assessment battery.

3.3 OVERVIEW OF STATISTICAL ANALYSES

Sign tests were performed to determine whether the intervention of sport participation produced changes in the Type A behaviour pattern of the experimental group.

Results will be presented per assessment instrument.

3.3.1 Children's Manifest Anxiety Scale (CMAS)

In order to assess the significance of differences between the experimental and control group for the CMAS, sign tests for changes in frequencies for the experimental and control group were conducted for individual items of the test.

The test was divided into sub-components of anxiety, namely cognitive anxiety, emotional anxiety, physical symptoms of anxiety and social anxiety.

Table 1: Percentage Distribution of Responses for Children's Manifest Anxiety Scale (CMAS) Questionnaire - Sub-component Cognitive Anxiety

Experimental - Cognitive Anxiety							
	Q 1	Q 10	Q 14	Q 22	Q 30	Q 31	Q 37
Yes to No	10	10	0	15	0	5	5
No to Change	90	85	100	85	89.5	85	95
No to Yes	0	5	0	0	10.5	10	0
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Control - Cognitive Anxiety							
	Q 1	Q 10	Q 14	Q 22	Q 30	Q 31	Q 37
Yes to No	20	10	30	30	10	0	20
No to Change	80	70	40	70	90	100	70
No to Yes	0	20	30	30	0	0	10
P - Value	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "cognitive anxiety" from the CMAS, using a sign test, no significant differences were found from pre-test to post-test for both the experimental and control group ($p > 0.95$) (See table 1).

Table 2: Percentage Distribution of Responses for the CMAS Questionnaire for Emotional Anxiety

Experimental - Emotional Anxiety								
	Q 2	Q 6	Q 7	Q 9	Q 15	Q 18	Q 29	Q 34
Yes to No	20	.	5	10	0	10.5	0	15
No to Change	75	.	85	90	100	84.2	89.5	80
No to Yes	5	.	10	0	0	5.3	10.5	5
P - Value	>0.05	.	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Control - Emotional Anxiety								
	Q 1	Q 10	Q 14	Q 22	Q 30	Q 31	Q 29	Q 37
Yes to No	30	.	10	20	0	20	30	20
No to Change	70	.	90	80	90	70	60	80
No to Yes	0	.	0	0	10	10	10	0
P - Value	>0.05	.	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "emotional anxiety" from the CMAS using a sign test, no significant differences were found from pre-test to post-test for both the experimental and control group ($p > 0.05$) (See table 2).

Table 3 Percentage Distribution of Responses for the CMAS Questionnaire for "Physical Symptoms of Anxiety"

Experimental - Physical Symptoms of Anxiety							
	Q 5	Q 13	Q 17	Q 19	Q 21	Q 25	Q 33
Yes to No	5	5.3	10	10	10.5	10	5
No to Change	75	94.7	100	80	89.5	85	95
No to Yes	20	0	5	10	0	5	0
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Control - Physical Symptoms of Anxiety							
	Q 5	Q 13	Q 17	Q 19	Q 21	Q 25	Q 33
Yes to No	0	0	0	0	10	20	10
No to Change	100	70	100	100	80	70	60
No to Yes	0	30	0	0	10	10	30
P - Value	.	>0.05	.	.	>0.05	>0.05	>0.05

Using a sign test in an analysis of the sub-components "physical symptoms of anxiety", no significant differences were found from pre-test to post-test for both the experimental and control group ($p>0.05$) (See table 3).

Table 4 Percentage Distribution of Responses for the CMAS Questionnaire for "Social Anxiety" for items 3 to 20 in the experimental group

Experimental - Social Anxiety							
	Q 3	Q 14	Q 8	Q 11	Q 12	Q 16	Q 20
Yes to No	15	10	15.8	5	10	10	10.5
No to Change	85	90	78.8	85	85	80	78.9
No to Yes	0	0	5.3	10	5	10	10.5
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "social anxiety" from the CMAS for items 3, 14, 8, 11, 12, 16 and 20 using a sign test, no significant differences were found from pre-test to post-test in the experimental group ($p>0.05$) (See table 4)

Table 5: Percentage Distribution of Responses for the CMAS Questionnaire for "Social Anxiety" for items 23 to 36 in the Experimental Group

Experimental - Social Anxiety							
	Q 23	Q 24	Q 26	Q 27	Q 28	Q 35	Q 36
Yes to No	5	10	15	5	5	5	5.3
No to Change	95	90	85	95	90	95	89.3
No to Yes	0	0	0	0	5	0	5.3
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "social anxiety" from the CMAS for items 23, 24, 26, 27, 28, 35 and 36 and using a sign test, no significant differences were found from pre-test to post-test in the experimental group ($p>0.05$) (See table 5)

Table 6: Percentage Distribution of Responses for the CMAS Questionnaire for "Social Anxiety" for items 3 to 20 in the Control Group

Control - Social Anxiety							
	Q 3	Q 14	Q 8	Q 11	Q 12	Q 16	Q 20
Yes to No	0	10	20	20	30	10	40
No to Change	100	80	60	60	70	90	50
No to Yes	0	10	20	20	0	0	10
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "social anxiety" from the CMAS for items 3, 14, 8, 11, 12, 16 and 20 and using a sign test, no significant differences were found from pre-test to post-test in the experimental group ($p>0.05$) (See table 6)

Table 7: Percentage Distribution of Responses for the CMAS Questionnaire for "Social Anxiety" for items 23 to 36 in the Control Group

Control - Social Anxiety							
	Q 23	Q 24	Q 26	Q 27	Q 28	Q 35	Q 36
Yes to No	10	0	20	10	10	20	20
No to Change	90	90	60	80	80	70	80
No to Yes	0	10	20	10	10	10	0
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05

In an analysis of the sub-component "social anxiety" from the CMAS for items 23, 24, 26, 27, 28, 35 and 36 and using a sign test, no significant differences were found from pre-test to post-test in the experimental group ($p>0.05$) (See table 7)

3.3.2 Matthews Youth Test for Health (MYTH)

A sign test was used in order to assess the significance of differences between individual items of the experimental and control group for the MYTH Questionnaire

Table 8: Significance of Changes in the Experimental Group for Questions 1 to 8 of the Matthews Youth Test for Health (MYTH)

Experimental - Myth								
	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8
Yes to No	35	15	10	40	15	.	10.5	20
No to Change	40	60	80	60	50	.	73.7	75
No to Yes	25	25	10	0	35	.	15.8	5
P - Value	>0.05	> 0.05	>0.05	<0.05	>0.05	.	>0.05	>0.05

The analysis of items 1 to 8 in the MYTH Questionnaire for significance of differences in changes from pre-test to post-test for the experimental group, a significant change was observed for item 4 ($P < 0.05$). This significant item indicates that teachers observed that 40 percent of the experimental group do not do things in a hurry after the experimental intervention. (See table 8).

Table 9: Significance of Changes in the Experimental Group for Questions 9 to 17 for the MYTH

Experimental - Myth									
	Q 9	Q 10	Q 11	Q 12	Q 13	Q 14	Q 15	Q 16	Q 17
Yes to No	25	35	40	40	30	45	20	20	26.4
No Change	50	55	55	40	60	45	55	65	68.4
No to Yes	25	10	5	20	10	10	25	15	5.3
P - Value	>0.05	> 0.05	<0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

The analysis of items 9 to 17 in the MYTH Questionnaire for significance of differences in changes from pre-test to post-test for the experimental group, a significant change was

observed for item 11 (<0.05). This significant item indicates that teachers rated 40 percent of the experimental group to be less patient when working with children who are slower than he/she is, after the experimental intervention. (See table 9).

Table 10: Significance of Changes in the Control Group for Questions 1 to 8 of the MYTH

Control - Myth								
	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8
Yes to No	11.1	0	44.4	33.3	22	.	0	33.3
No Change	33.3	44.4	22.2	22.2	44.4	.	66.7	33.3
No to Yes	55.1	55.5	33.3	33.3	33.3	.	33.3	33.3
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	.	>0.05	>0.05

In an analysis of items 1 to 8 in the MYTH Questionnaire for significance of differences in changes from pre-test to post-test for the control group, no significant differences were found ($p >0.05$). (See table 10).

Table 11: Significance of Changes in the Control Group for Questions 9 to 17 of the MYTH

Control - Myth									
	Q 9	Q 10	Q 11	Q 12	Q 13	Q 14	Q 15	Q 16	Q 17
Yes to No	11.1	44.4	22.2	33.3	22	22.2	22.2	11.1	11.1
No Change	66.7	33.3	44.4	44.4	44	33.3	33.3	33.3	66.7
No to Yes	22.2	22.2	33.3	22.2	33.3	44.4	44.4	55.5	11.1
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

The analysis of items 9 to 17 in the MYTH Questionnaire for significance of differences in changes from pre-test to post-test for the experimental group, no significant differences were found ($p >0.05$). (See table 11).

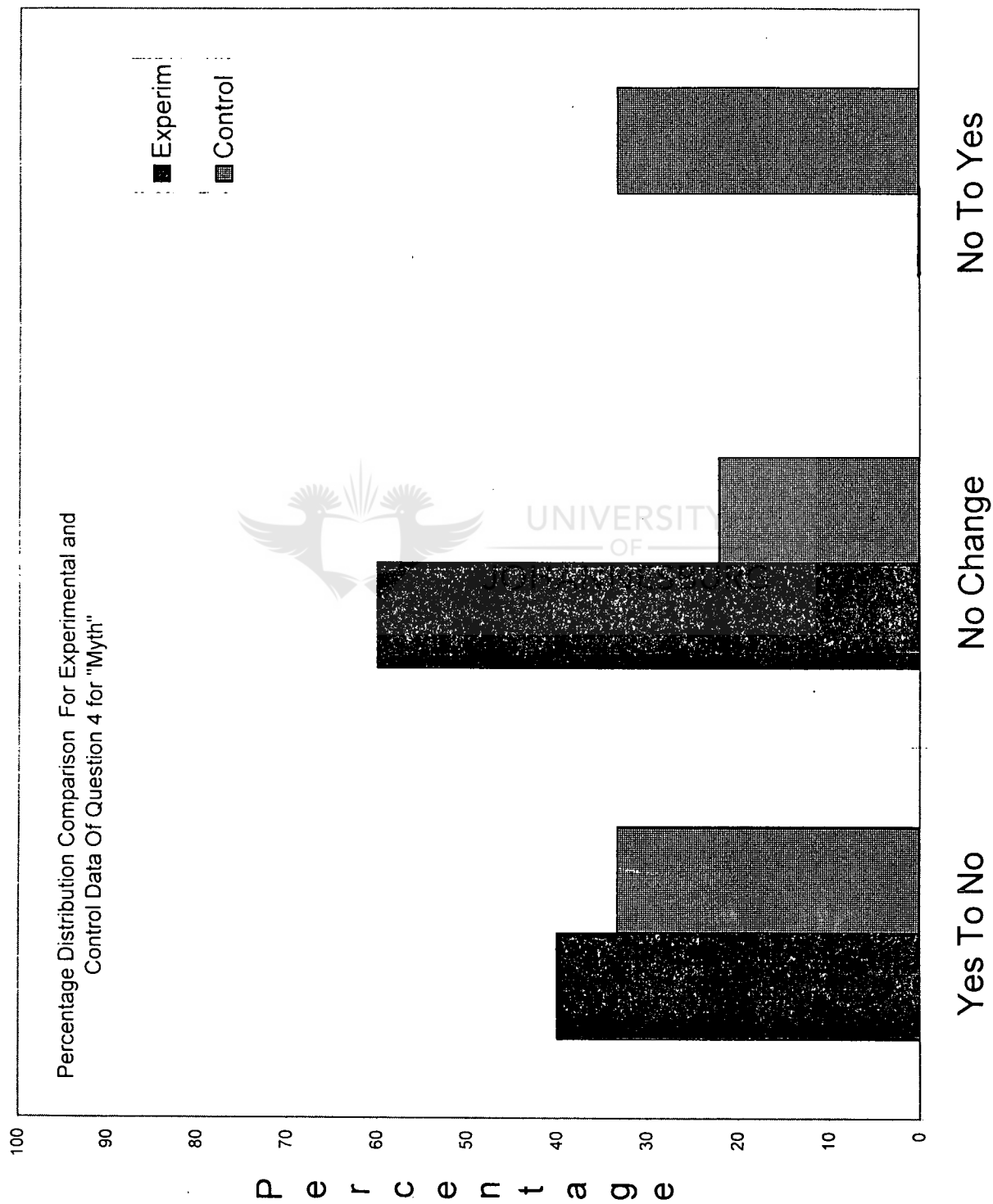
A graph (see Graph 1, p.86 a) is presented for the significant item, item 4 for the MYTH Questionnaire.

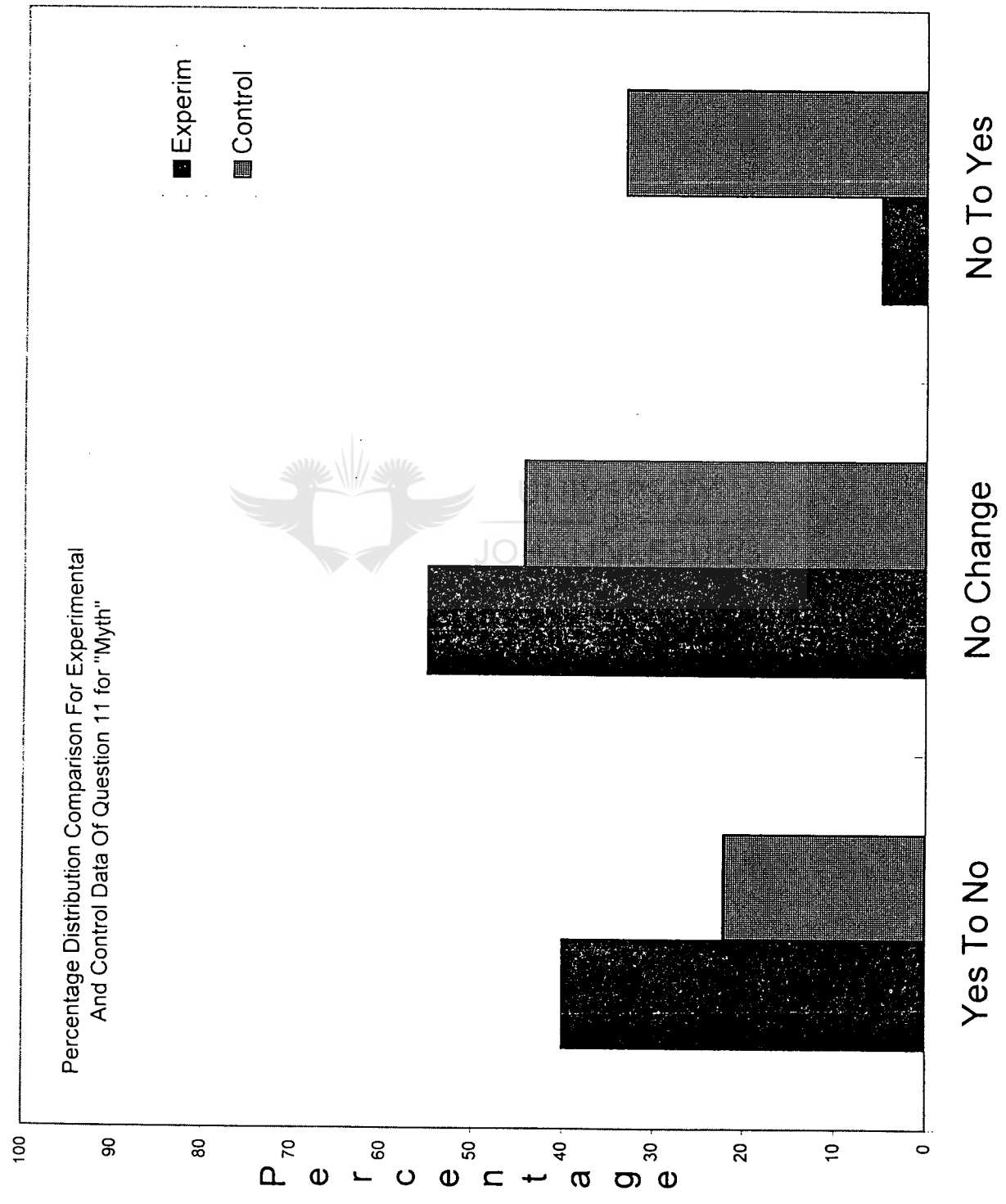
Item 4 stated that "this child does things in a hurry". The graph indicates that for the experimental group, 60% did not change in their response, yet 40% of the experimental group's response did change.

There were no observations in the category "No to Yes" for the experimental group. An even distribution for the three categories was observed in the control group.

Graph 2 (See page 86 b) represents a percentage distribution comparison for Experimental and Control Data of Question 11 for the MYTH questionnaire which stated that "This child is patient when working with children who are slower than he or she is". This graph indicates that the experimental group showed a 40% change from "yes" to "no", that is they became more impatient with children who are slower than they are.

There were no observations in the category "No to Yes" for the Experimental Group. An even distribution for the three categories was observed in the control group.





3.3.3. Aggression, Moodiness and Learning (AML) Scale

A sign test was used in order to assess the significance of differences between individual items of the experimental and control group for the AML Scale.

Table 13: Significance of Changes in the Experimental Group for Questions 1 to 5 of the AML

Experimental - AML					
	Q 1	Q 2	Q 3	Q 4	Q 5
Yes to No	23.8	28.6	33.3	33.3	23.8
No Change	52.4	52.4	52.4	61.9	66.7
No to Yes	23.8	19.1	14.3	4.8	9.5
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05

In an analysis of the significance of changes in responses for questions 1 to 5, no significant changes were observed ($p > 0.05$) (See table 13)

Table 14: Significance of Changes in the Experimental Group for Questions 16 to 11 of the AML

Experimental - AML						
	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11
Yes to No	.	28.6	42.8	47	33.3	33.4
No Change	.	47.6	38.1	42.9	42.9	61.9
No to Yes	.	23.8	19	9.6	23.8	4.8
P - Value	.	>0.05	> 0.05	<0.05	>0.05	>0.05

In an analysis of the items 6 to 11 in the AML Test for significance of changes from pre-test to post-test for the experimental group, a significant change was observed for item 9. The teachers observed 47 percent of the experimental group to have changed from being impulsive prior to the experimental intervention to not being impulsive after the

experimental intervention. No other significant changes were observed for items 6, 7, 8, 9 and 10. (See table 14).

Table 15: Significance of Changes in the Control Group for Questions 1 to 5 of the AML

Experimental - AML					
	Q 1	Q 2	Q 3	Q 4	Q 5
Yes to No	20	50	50	70	30
No Change	40	50	40	30	70
No to Yes	40	0	10	0	0
P - Value	>0.05	> 0.05	>0.05	<0.05	>0.05

In an analysis of the items 1 to 5 in the AML Test for significance of changes from pre-test to post-test for the control group, a significant change was observed for item 4. From a 70 percent incidence of being unhappy and depressed on the pre-test to not being unhappy and depressed when re-tested on the post-test. (See table 15).

Table 16: Significance of Changes in the Control Group for Questions 6 to 11 of the AML

Experimental - AML						
	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11
Yes to No	.	50	40	50	30	30
No Change	.	30	20	50	50	70
No to Yes	.	20	40	0	20	0
P - Value	.	>0.05	> 0.05	>0.05	>0.05	>0.05

In an analysis of the significance of changes in responses for questions 6 to 11, no significant changes were observed ($p>0.05$) (See table 16)

3.3.4 The "Health Resources Inventory" (HRI)

In order to determine the significance of changes in questions 4, 6, 10, 22, 25, 27, 34 and 36 of the HRI of the experimental and control group, a sign test was performed.

Table 17: Percentage Distribution of Responses for the Health Resources Index (HRI) for the Experimental Group

Experimental HRI								
	Q 4	Q 6	Q 10	Q 22	Q 25	Q 27	Q 34	Q 36
Yes to No	30	35	10	15	15	.	15	5
No Change	60	50	65	80	55	.	65	80
No to Yes	10	15	25	5	30	.	20	15
P - Value	>0.05	> 0.05	>0.05	>0.05	>0.05	.	>0.05	>0.05

An analysis of the items in the HRI Test for significance of changes from pre-test to post-test by means of the sign test showed no significant changes ($p>0.05$).

Table 18: Percentage Distribution of Responses for Health Resources Index for the Control Group

Control - HRI								
	Q 4	Q 6	Q 10	Q 22	Q 25	Q 27	Q 34	Q 36
Yes to No	80	50	30	20	20	.	10	20
No Change	20	20	40	60	60	.	70	40
No to Yes	0	30	30	20	20	.	20	40
P - Value	<0.05	> 0.05	>0.05	>0.05	>0.05	.	>0.05	>0.05

A significant change was observed for item 4. In 80 percent of the subjects the teacher found the subjects changed from having a good nature to not having a good nature.

There were no other changes for the control group.

CHAPTER 4

DISCUSSION

4.1 INTRODUCTION

Coronary Heart Disease (CHD) is one of the major causes of death in South Africa, and is identifiable relatively early in life (Berenson et al., 1982; Harlan, 1984).

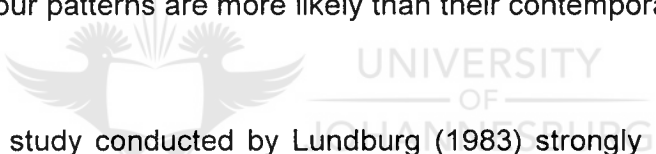
According to MacIennan (1994), CHD is not only associated with high mortality rates in South Africa, a sufficient enough reason to consider it a health problem, but it is also associated with loss of productivity and increased health expenditure. A recent study emanating from the School of Economics at the University of Cape Town and the Chronic Diseases of Lifestyle Programme at the Medical Research Council (MRC) revealed the following:

1. The estimated cost of cardiovascular disease in South Africa in 1991 was between R4,135 and R5,035 billion, not including rehabilitation and follow-up costs of CHD.
2. The direct health care costs were $\pm 42\%$ of the total costs. The indirect cost reflects the balance and includes the loss of productivity and earnings lost as a result of premature death.
3. CHD mortality costs amounted to $\pm R1,864$ million and morbidity $\pm R999,2$ million.
4. The expenditure on CHD in state hospitals was $\pm R461,3$ million.

It therefore appears obvious that prevention of CHD would be the approach of choice for this health problem, instead of having to treat CHD once it has occurred.

As advocates of the "new perspective of health" maintain, improvement in the health status of populations will be made predominantly through primary prevention and health promotion (Downey et al., 1989).

One of the main causal factors that have been identified as contributing to the development of CHD falls into the category of psycho-social causation and is referred to as the Type A behaviour pattern (Maclennan, 1994). According to Whalen and Henker (1986) the Type A behaviour pattern is considered an independent risk factor for cardiovascular disease in adults. Prospective studies have shown the predictive validity of Type A behaviour pattern with other risk factors such as hypertension, cigarette smoking and family history of cardiovascular disease held constant, individuals exhibiting the Type A behaviour patterns are more likely than their contemporaries to develop CHD.

The logo of the University of Johannesburg is centered in the background. It features two stylized birds facing each other with their wings spread, positioned above an open book. To the right of the birds and book, the text "UNIVERSITY OF JOHANNESBURG" is written in a serif font, with "UNIVERSITY" on the top line, "OF" in the middle, and "JOHANNESBURG" on the bottom line.

The results of the study conducted by Lundburg (1983) strongly indicated that Type A characteristics are present in young children. Given the seriousness of the health problem associated with pattern A by adults and the resistance to change Type A behaviour pattern in adulthood, because of reasons mentioned previously, it seems worthwhile to explore the origins of Pattern A behaviour in childhood (Matthews & Angulo, 1980). According to Whalen & Henker (1986) it is easier to halt or reverse disease processes at an early stage because behaviours may be more malleable during childhood before habitual patterns become entrenched.

As discussed before, the Recurrent Coronary Prevention Program was launched as a preventative program for persons who had suffered from a coronary event. The results were highly commendable and proved the program effective (Powell et al., 1984).

The intervention of Blumenthal et al. (1980) on the other hand utilised subjects who were extreme Type As but who had not suffered from a coronary event. The results of Blumenthal et al's. study provide evidence that the Type A behaviour pattern may be modified by participation in a regular exercise program.

It was hypothesised if this could be done in adulthood through exercise, the Type A behaviour pattern could be modified in childhood through group sport, since while containing physical exercise and physical activity, group sport also has the potential to impart desirable educational, social, and personal values (MacMahon, 1990).

Several researchers have contended that organisational activities such as sports teams contribute strongly to the development of the quantity and quality of social networks and social support mechanisms (Chambers, 1991). According to Cartwright and Zander (1968) a correct understanding of group dynamics permits the possibility that desirable consequences from groups can be deliberately enhanced. With this in mind the present study put forward the following hypotheses:

1. A group of pupils subjected to participation in group sport will show fewer measurable Type A behaviour characteristics than a control group.
2. A group of Type A children subjected to participation in group sport will show lower indices of aggression than a control group.
3. A group of Type A children subjected to participation in group sport will show lower indices of anxiety than a control group.
4. Participation in group sport will affect non-Type A health related behaviour in primary school children.

4.2 THE EFFECT OF GROUP SPORT PARTICIPATION ON TYPE A BEHAVIOUR

Zander (1982) points out the following: in groups, members converse freely; identify the collective as "we" and other collectives as "they"; attend and actively participate in group functions; are not primarily interested in personal accomplishment; are interested in the achievement of the collective; assist and receive assistance from others; are concerned with the activities of others and are seldom absent.

Similarly Carron (1980) found that if group cohesiveness is evident in a group, there is increased task and social interactions and communications; enhanced group stability; greater acceptance and conformity to group norms; reduced anxiety; greater self-esteem; trust; feelings of security and willingness to change and increased willingness to share responsibilities for group outcome.

It was hypothesised therefore that because of the nature of group sport, being cooperative and team focused rather than individually focused, to reduce Type A characteristics in an experimental group exposed *ab initio* to group sport.

The hypothesis was supported for one of the items in the MYTH test. On the one significant item after the intervention, the child in the experimental group did not do things in a hurry, but on the other significant item, children in the experimental group were more impatient with children who were slower than them after the experimental intervention.

The significant change in the experimental group from pre- to post-intervention in being more impatient with slower children could be indicative of the development of the interpersonal characteristic of Type A behaviour of cynical hostility. Because of the MYTH having 17 items it could be expected that one of the items would be significant on a chance or spurious level. However, the fact that two items, related to Type A behaviour changed for the experimental group and not the control group, indicated that the intervention had at least been partially if not more successful.

The finding provides partial support for the hypothesis that a group sport program will decrease Type A behaviour in primary school children.

The sign test performed to establish differences in aggression between the experimental and control groups after the group sport intervention, yielded one significant result in the experimental group and one significant result in the control group. The significant finding in the control group was contrary to expectations, since no changes were expected in the control group.

The significant item in the experimental group was on item 9, where teachers observed 47 percent of the experimental group to have changed from being impulsive prior to the experimental intervention to not being impulsive after the experimental intervention.

As a result of the contradictory findings, the hypothesis that participation in group sport will decrease the aggression tendency of the child, cannot be found to be significant.

Of note and importance is the fact that the relevant items on both the MYTH and the AML point to personal Type A characteristics of hastiness and impulsivity, rather than the interpersonal characteristics of competitive and aggressive behaviour.

If Type A behaviour in children is considered merely a downward extension of Type A behaviour in adults, as Matthews and Angulo (1980) found, this would mean that the health-endangering characteristics of this behavioural constellation had not changed due to the intervention.

If, on the other hand, the Type A constellation of behaviour in children is viewed as a phenomenon, specifically and socially learnt behaviour based on vicarious conditioning by predominantly Type A adults, it is possible - and ever probable - that hastiness and impulsiveness could be the first learnt behaviours of this constellation.

This is demonstrated by the results of Glass's (1977) study which found in 97 dizygotic sets of twins that modelling processes and child-rearing practices may contribute to the development of pattern A.

The nature of group sport participation however is not only considered to be Type A reductive, but by virtue of the aspects inherent in it, it could also be considered to be Type A inductive. In the context of the discussion below, hostility is defined as a complex set of attitudes that motivate aggressive behaviour (Chesney & Rosenman, 1985) and aggressiveness in the Type A literature, is most often related to hostility and competitiveness (Glass, 1977). The literature that follows is literature which demonstrates that group sport induces aggressive behaviour.

Nelson, Gelfand and Hartman (1969) conducted a laboratory experiment with 5 and 6 year old children who observed either an aggressive or a non-aggressive model and then participated in a competitive game with experimentally controlled outcomes. It was found that competition increased aggression even above levels expected from modelling alone. This laboratory finding is consistent with several field studies in which aggression was observed to increase in conjunction with participation in competitive games or sports (Bredemeier et al., 1986).

According to Cahill and Pearl (1993) critics of youth sports have suggested that sport inevitably affects the mental health of the child athlete, comparing levels of stress experienced by these children to that of soldiers in combat.

If this is the case, it could perhaps explain the change in the child from being patient to impatient. It would therefore, contrary to expectation, indicate that participation in group sport engenders the cynically hostile component of Type A behaviour in children, as was demonstrated above by Nelson, Gelfand and Hartman (1969).

Similarly, the results of the experiment conducted by Barnett et al. (1979) which tested the notion that competitive feelings should distract one from the feelings and needs of others, revealed that boys identified as competitive by six of the present eight myth competitive items were less empathic with other boys of the same age, and Kamal et al. (1985) identified athletes as egocentric and selfish.

4.3 THE EFFECT OF GROUP SPORT PARTICIPATION ON NON-TYPE A HEALTH RELATED BEHAVIOUR

"Sport experiences can result in sinners as well as Saints." (Smith 1989, p.5)

Group sport can be both beneficial and non-beneficial to the child depending on the individual and the circumstances in which the sport experience takes place. According to Wankel and Berger (1983) sport has the potential for fostering desirable values as well as social integration. For these positive outcomes to be realised, however, the focus of the importance of winning needs to be kept in perspective, and a positive, enjoyable youth sport experience which facilitates the development of desirable skills, and behavioural practices needs to be emphasised (Wankel & Berger, 1983).

According to Carron and Spink (1993) cohesion in a group/team has a number of consequences for the individual. The individual member experiences less anxiety and greater self-esteem; shows greater trust, feelings of security and willingness to change; and more readily shares responsibilities for group outcomes (Carron, 1980).

However, on the Health Resources Index, no personal character change in the experimental group was found. In the control group, however, there was a change on the items "unhappy and depressed" to "happy and not depressed" and from having a "good nature" to "not having a good nature".

These are contradictory findings, as no change was expected in the control group. However, given that the significant items represent two out of 54 items, they could have been significant out of a statistical chance factor of 5 percent. These findings, given that

they are mutually exclusive, as well as being possibly spurious on statistical artefacts, will thus not be interpreted. Thus, the hypotheses for a change in non-Type A but health related personal factors were therefore not supported.

The results of the CMAS also yielded results of which none of the items were significant. Therefore, the hypothesis for a reduction in the anxiety of children partaking in a group sport intervention was not supported.

On the interpersonal level, one significant finding was obtained for the experimental group, but none for the control group. This significant finding related to both a Type A behaviour pattern, being impatience, and also reflects interpersonal functioning in the sense that this child is selfish, not empathic and inconsiderate towards children who are slower than he or she is. However, the result of only this one significant finding is again in keeping with the above argument of statistical chance factor appearing in large numbers of statistical tests, and therefore should also be discarded as a significant finding. The hypothesis for a change in non-Type A, but health related interpersonal factors was therefore also not supported.

Although Carron and Spink (1993) hold that group sport is associated with a reduction in anxiety, Feltz (1986) on the other hand holds that participation in youth sports has the potential to be stressful to children because of the situational demands imposed on the players. Scanlan and Passer (1978), in their test of youth soccer players, found about 20 percent of children reported high levels of stress before the game, and many reported levels of stress after the game which their teams lost.

Harter (1982) demonstrated that subjects self perceptions of their athletic and scholastic competence, physical appearance, and global self-worth increased from pre- to post-season. The work of Lydon and Cheefers (1984) on the other hand found that participation in physical education did not enhance global self-concept of their subjects (Petrakis & Bahls, 1991).

According to Keltikangas-Jarvinen et al. (1991), low self-security in pre-adolescence may explain the high competitiveness in young adulthood, lack of self-esteem was compensated for the need to strive for competence and according to their study "hard-driving" was found to be the factor most consistently related to CHD risk factor level. It was therefore hypothesised in the present study that, by improving self-esteem, the hard-driving, competitive aspects of the individual's personality (and two of the five components of Global TAB) would be reduced.

However, as was discussed above, no personal character change was found in the experimental group. Contrary to expectation, two items yielded significant results in the control group, however they could have been significant out of a statistical chance of 5 percent. The inability to support the hypothesis of this thesis is in accordance with McPherson and Brown (1988, cited in Cahill & Pearl, 1993) who believe there is little empirical support for the many beliefs and hypotheses concerning the positive or negative outcomes for character and personality development that are alleged to be derived from involvement in competitive sport.

As previously mentioned, the hypothesis for a change in non-Type A, health-related interpersonal factors is also rejected. These results are in keeping with Loy et al. (1968) who found that there is little evidence that participation in organised sport is an important or essential element in the socialisation process, or that involvement in sport teachers or results in character building, moral development, a co-operative orientation, good citizenship or certain valued personal traits.

Therefore contrary to ones expectations, it can be concluded that participation in group sport seems to have had a nil effect on the interpersonal and personal functioning of children in this intervention, in addition to there being no decrease in the anxiety of the experimental group.



4.4 CRITIQUE

Though the experimental group were thought to have had previous sport participation equally distributed and thus experimentally controlled, it could have overridden any significant findings in the experimental group.

Zaharopoulos and Hodge (1991) conducted a study which examined the assumption that sport participation enhances self-concept: In their study due to logistical reasons, non-athletes were defined as students who were not currently participating in formal sport. However, according to these researches, their definition of non-athlete did not account for the possibility that a person may have been highly involved in formal sport in the past, or that they may have been presently involved in social informal sport, or that they may participate in regular physical exercise. Thus although athletes may be considered a relatively homogenous group, according to Zaharopoulos and Hodge (1991), the non-athletic group can be extremely heterogeneous. This could have been the case in the present study, where the control group was participating in sport outside of the group-sport intervention.

Another shortcoming is that the level of activity of the child in the experimental or control group was not evaluated before the intervention and therefore exercise might not necessarily reflect a change of physical activity. There is also the possibility that although the subjects were randomly chosen for the experimental group from those children who attended aftercare, and were identified as having Type A behaviour patterns, it was not compulsory for them to attend the intervention program, and likewise for the control group they were given permission to attend the program if they so wished. It is possible as Coakley (1978 cited in Diamant, 1991) suggested that organised youth sport

programs attract young people with certain characteristics (e.g. advanced physical skills) that ensure their success and in contrast, young people, with undesirable skills or traits withdraw from teams.

This may have been the case in this study where subjects who were physically advanced and thus often participated in group sports volunteered to take part in this study, and therefore did not benefit fully from the sport intervention.

The subjects had to answer the Children's Manifest Anxiety Scale questionnaire, which focused on different types of anxiety that the child might be experiencing. Honest answers to such a questionnaire might have left the child feeling rather exposed. As Whalen and Henker (1986) suggest, "Boys at these ages are known neither for candour, particularly regarding socially undesirable or embarrassing behaviours" (p.697).

This potential threat to obtaining valid results from survey research is called social desirability bias (Edmundson et al., 1996), and this phenomenon might explain the absence of significant items in the CMAS questionnaire.

The difference on sex was not explored in this study. Matthews and Angulo (1980) found sex difference, the mean MYTH score of boys was higher than that of girls. Research is thus essential on aggressiveness, competitiveness, impatience and sex difference (Matla, 1994).

The intervention in the school setting may have been less successful, than an intervention that was held in a non-school setting. It might be that students in school

equate physical fitness with a regular requirement of the curriculum and therefore participate with reluctance (Carlson, 1990).



4.5 IMPLICATIONS FOR FUTURE RESEARCH AND INTERVENTION

The South African Sporting Arena is an extremely competitive environment for its players as well as its spectators (Scholtz & Willemse, 1991).

A "win-at-all-costs" attitude exists in the psyche of South Africans and this bodes very badly for sport. Children should be taught that the emphasis in sport should be on fun not only winning, and sport should be regarded as a health-related behaviour instead of the competitive activity that it is. It is furthermore important that adults involved in youth sports teach children that success does not require winning games and that losing does not mean one is a failure.

As Cartwright and Zander (1968) point out, if we wish "to understand or to improve human behaviour, it is necessary to know a great deal about the nature of groups" (p. 4). Perhaps a more thorough understanding of the nature of groups will in the future, allow for better planning of a group sport intervention.

In addition, planning physical activities for children requires an understanding of the unique natures of their bodies - since many of these activities are organised and supervised by adults, expectations from children may be adult expectations. Pressure, stress, and competition can cause enjoyable activities to become disastrous experiences that discourage continued physical activity.

Disapproval or loss of approval is conceptually analogous to a loss of control (Dembroski, 1978) and according to Glass (1977) efforts to control lie behind Type A behaviour. Lyness (1993) proposed that Type As may be especially vulnerable to

criticism. With this in mind coaches and parents must be sensitive to this, especially when conducting a group sport intervention aimed at reducing Type A behaviour characteristics.

A longitudinal study should be conducted in order to ascertain if there is a long-term effect of the intervention. As mentioned before, a program carried out over more than eight weeks and in a bigger sample may be beneficial to receiving more significant results in future research.

Perhaps there is a need for a paradigm shift in terms of the way sport is viewed. Maybe sport should just be viewed as sport. That is, an activity which is fun, which is a diversion from the monotony of everyday life, an activity in which people co-operate as a team towards a common goal, rather than as a means to improve concentration, self-esteem, decrease aggression, anxiety and TAB.

4.6 CONCLUSION

Despite successful efforts to reduce CHD, it still remains a number one killer in South Africa and other westernised countries. A number of interventions have aimed at reducing the traditional risk factors for CHD, such as smoking, inactivity, obesity, high blood pressure and cholesterol in adulthood.

Interventions that have focused their attention on the reduction of risk factors for CHD, have often failed to focus on the behavioural risk factor of Type A behaviour. This is perhaps a possible explanation for the continued high rate of CHD.

The majority of literature that has discussed the link between CHD and the TABP has done so in adult population. This makes sense, since CHD usually only manifests itself in adulthood. However, TAB has already been identified in childhood and the aim of interventions should therefore be to modify or to halt the development of this behaviour pattern in childhood before it leads to CHD in adulthood. The method that should be practised therefore is one of "prevention rather than cure".

The goal of this study was to modify TAB in childhood through group sport. However, the results have been largely insignificant. There is therefore a need to find an intervention that will result in the modification of Type A behaviour in childhood, thereby preventing the Type A behaviour pattern from resulting in CHD in adulthood.

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APPENDIX

Activities

a) Warm-up

This consisted of 10 minutes of laps around the field and stretching:

Laps around the field involved making the children run around all four rugby posts of the field. It was a distance of approximately 200m. They would have to do 2 laps of this course. One of the students would run with them to ensure that put in a maximum effort.

The stretching involved all body parts i.e. neck, shoulders, arms and legs.

The warm-up was conducted for 10 minutes before each session.

b) Relay race

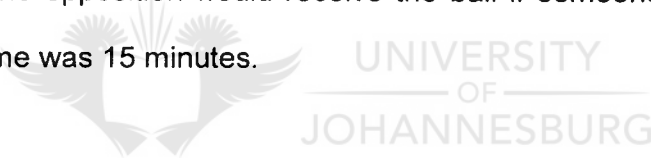
The sample was split into 2 teams. Half of each team stood on one side of the field and the other half on the other side. The teams would then have to race against one another. Runner from team 1 would start at the same time as runner 1 from team 2. They would have to run across the field to their teammates. As soon as the team member arrived, runner 2 from each team could start running. The fact that the two teams were competing with one another in this exercise ensured that they put in sufficient effort.

c) Cricket

In this version of cricket, one of the students would bowl. Each team would have a chance to bat and field. The student would bowl under-arm. As soon as the ball was hit, the batter would have to run 5m around a stump. The fielders would field the ball and return it to the student who would then throw at the stumps immediately, regardless of where the batsman was. The fact that the game was competitive ensured that the kids gave 100%.

d) Netball

In this version of netball, the game was played on a rugby field. In order to score a goal, the kids had to hit a small target from less than 5 meters away. They were, however, not allowed to run with the ball. The children had to run into a position to receive a pass. The opposition would receive the ball if someone dropped it. The duration of this game was 15 minutes.

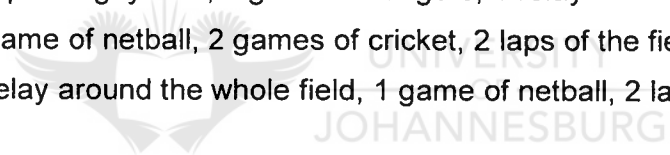


e) Stingers

In this game the object is for the person who is "on" to throw the tennis ball, so that it hits someone else. If a person is hit, then they become "on" as well. This game involved a great deal of running as it was played on two rugby fields.

- Week 1** 2 laps of rugby field, relay, 2 laps of rugby field
 2 laps of rugby field, 2 relays, 1 lap of rugby field
 1 lap of rugby field, stingers, relay
- Week 2** 2 relays, 1 lap of field, 1 game of netball
 1 game of cricket, 1 relay, 1 game of stingers, 2 laps of field
 2 laps of fields, 1 game of netball, 1 game of stingers
- Week 3** 1 relay, 1 game of stingers, 2 laps of field
 1 game of stingers, 1 lap of field, 2 relays, 1 lap of field
 1 game of netball, 2 games of cricket, 2 laps of field

- Week 4** 1 lap of field, 1 game of stingers, 1 relay around whole field
1 relay around whole field, 1 game of netball, 2 laps of field
1 game of netball, 1 game of stingers, 1 relay
- Week 5** 1 game of cricket, 1 lap of field, 1 relay
2 laps of field, 1 game of netball, 1 game of stingers
1 game of cricket, 1 relay, 1 game of stingers, 2 laps of field
- Week 6** 1 game of cricket, 1 game of netball, 1 game of stingers
1 lap of rugby field, 1 game of stingers, 1 relay
1 game of netball, 2 games of cricket, 2 laps of the field
- Week 7** 2 laps of rugby field, 2 relays, 1 lap of rugby field
2 relays, 1 lap of field, 1 game of netball
1 game of cricket, 1 relay, 1 game of stingers, 2 laps of field
- Week 8** 1 lap of rugby field, 1 game of stingers, 1 relay
1 game of netball, 2 games of cricket, 2 laps of the field
1 relay around the whole field, 1 game of netball, 2 laps of the field



MATTHEWS (1980)
GESONDHEIDSTOETS VIR DIE JEUG
(MITEVORM O)

Kind se naam:

Klas:

Evalueer bogenoemde kind asseblief aan die hand van dié volgende items. Maak asseblief seker dat u elke vraag beantwoord deur van onderstaande skaal gebruik te maak:

"0"	Geheel en al nie karakteristiek vir dié kind nie.
"1"	Heeltemal strydig met dié kind se karakter.
"2"	Strydig met dié kind se karakter.
"3"	Tussenin.
"4"	Tipies van dié kind.
"5"	'n Uiters raak beskrywing van dié kind se geaardheid.

1.	Wanneer dié kind speletjies speel, is hy/sy mededingend.	0	1	2	3	4	5
2.	Hierdie kind gaan vinnig en doeltreffend, eerder as stadig en omsigtig te werk.	0	1	2	3	4	5
3.	Wanneer hierdie kind vir ander moet wag, raak hy/sy ongeduldig.	0	1	2	3	4	5
4.	Hierdie kind gaan haastig of halsoorkop te werk.	0	1	2	3	4	5
5.	Hierdie kind word nie gou vir sy/haar klasmaats kwaad nie.	0	1	2	3	4	5
6.	Hierdie kind val ander kinders in die rede.	0	1	2	3	4	5
7.	Hierdie kind neem in verskeie aktiwiteite die leiding.	0	1	2	3	4	5
8.	Hierdie kind raak gou geïrriteerd.	0	1	2	3	4	5
9.	Hierdie kind blyk beter te presteer wanneer hy/sy met ander kinders meeding.	0	1	2	3	4	5
10.	Hierdie kind hou daarvan om in argumente betrokke te raak of oor onderwerpe te debatteer.	0	1	2	3	4	5
11.	Hierdie kind bewaar sy/haar geduld wanneer hy/sy met ander kinders moet saamwerk wat stadiger as hy-/sysel self is.	0	1	2	3	4	5
12.	Wanneer hierdie kind werk of speel, probeer hy/sy om beter as ander kinders te presteer.	0	1	2	3	4	5
13.	Hierdie kind kan vir lang rukke stilsit.	0	1	2	3	4	5
14.	Dit is vir hierdie kind belangriker om te wen as om met speletjies of skoolwerk pret te hê.	0	1	2	3	4	5
15.	Ander kinders sien tot hierdie kind op vir leiding.	0	1	2	3	4	5
16.	Hierdie kind is mededingend.	0	1	2	3	4	5
17.	Hierdie kind is geneig om in bakleiery betrokke te raak.	0	1	2	3	4	5

A M L

NAAM: -----

GESLAG: -----

Beantwoord asseblief die volgende vrae oor die kind wie se naam hierbo ingevul is.

<u>Waargenome gedrag</u>	<u>Nooit</u>	<u>Selde</u>	<u>Taamlik Dikwels</u>	<u>Dikwels</u>	<u>Meestal</u>
1. Baklei of stry met ander leerlinge	-----	-----	-----	-----	-----
2. Moet gesoebat of gedurig gedwing word om te werk of met ander leerlinge te speel.	-----	-----	-----	-----	-----
3. Is rusteloos.	-----	-----	-----	-----	-----
4. Is ongelukkig of terneergedruk.	-----	-----	-----	-----	-----
5. Verstuur dissipline in klas.	-----	-----	-----	-----	-----
6. Word siek wanneer 'n moeilike probleem of toestand by die skool ontstaan.	-----	-----	-----	-----	-----
7. Is hardkopplig.	-----	-----	-----	-----	-----
8. Voel seergemaak wanneer gekritiseer word.	-----	-----	-----	-----	-----
9. Is impulsief.	-----	-----	-----	-----	-----
10. Is buierig.	-----	-----	-----	-----	-----
11. Ondervind probleme om te leer	-----	-----	-----	-----	-----

H R I

NAAM: -----

GESLAG: -----

Beantwoord asseblief die volgende vrae oor die kind wie se naam hierbo ingevul is.

PUNTE

HOE GOED BESKRYF ELKE ITEM DIE KIND?

- | | |
|----|-----------------|
| 1. | Hoegenaamd nie. |
| 2. | Redelik swak. |
| 3. | Gemiddeld. |
| 4. | Redelik goed. |
| 5. | Uitstekend. |

I T E M S

4. Het 'n goeie humorsin.

1	2	3	4	5
---	---	---	---	---

6. Deel met ander.

1	2	3	4	5
---	---	---	---	---

10. Is 'n gelukkige kind.

1	2	3	4	5
---	---	---	---	---

22. Is toegeneë teenoor ander.

1	2	3	4	5
---	---	---	---	---

25. Speel met oorgawe of geesdrif.

1	2	3	4	5
---	---	---	---	---

27. Het 'n lewendige belangstelling in sy omgewing.

1	2	3	4	5
---	---	---	---	---

34. Is gewild by klasmaats.

1	2	3	4	5
---	---	---	---	---

36. Probeer om ander te help.

1	2	3	4	5
---	---	---	---	---