Self-concept and attraction to physical activity: The effectiveness of an intervention programme to enhance children's level of physical activity

Barbara M. Howard

Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses

Part of the Education Commons

Recommended Citation

This Thesis is posted at Research Online.
https://ro.ecu.edu.au/theses/38
Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

• Copyright owners are entitled to take legal action against persons who infringe their copyright.

• A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author’s moral rights contained in Part IX of the Copyright Act 1968 (Cth).

• Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
Self-concept and attraction to physical activity: The effectiveness of an intervention programme to enhance children’s level of physical activity.

by

Barbara Michelle Howard

Supervisor

Dr Elizabeth Rose

School of Exercise, Biomedical, and Health Sciences

Edith Cowan University
USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.
Abstract

According to motivational theory physical self-perceptions are crucial to the intrinsic desire to engage in physical activity through play, games, and sport. While there has been prolific research with middle primary and older children little is known of the importance of young children’s physical self-concept and their motivation to engage in physical activity. This study had three major purposes. Firstly it aimed to examine the relationship between children’s self-concept, their attraction to physical activity, and level of physical activity. The second purpose of the study was to examine differences between boys’ and girls’ self-concept, attraction to physical activity and level of physical activity. The third purpose was to examine the effectiveness of an intervention programme designed to enhance children’s level of physical activity. In individual interviews children aged 6 – 8 years (N=334) completed the Self-Description Questionnaire - 1 (SDQ-1) and the Children’s Attraction to Physical Activity (CAPA). This study also measured children’s level of physical activity with the use of pedometers. Control and experimental groups were assigned and a 24 week intervention programme was implemented to the experimental groups.

Results revealed low to moderate relationships among the self-concept and attraction to physical activity variables. There were sex differences in the relationship among the variables. Girls showed a positive relationship between liking of games, and sports and level of physical activity. For the boys these variables were negatively related. Post intervention results have shown that girls reported an increased liking of physical exertion and exercise and vigorous physical activity while boys showed an increase in their level of physical activity. These findings have practical implications for teachers and child health professionals that will provide direction for facilitation of positive self-concept and the increase of physical activity levels.
Declaration

I certify that this thesis does not to the best of my knowledge and belief:

(i) incorporate without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education;

(ii) contain any material previously published or written by another person except where due reference is made in the text; or

(iii) contain any defamatory material.

I also grant permission for the Library at Edith Cowan University to make duplicate copies of my thesis as required.

Signature…………………………………………

Date………………………………………….
Acknowledgements

Firstly I wish to thank my supervisor Dr Elizabeth Rose. Thankyou so much for your patience, encouragement, and motivation throughout the entire study.

A very special appreciation is made to the following people for providing me with great support and assistance at different stages of the study; Dr. Dawne Larkin – you are a truly amazing woman, and Associate Professor Beth Hands – for allowing me to be part of the big picture, and Dr. Gordon Woodbine – the world’s greatest Duke.

A big thank you to my two very good friends and colleagues, Tegan Robinson and Rolanda Geneff who were there with me all the way.

To Rachel and James, thanks for putting up with me during this time in my life. I love you both very much and hope that I have inspired you both to set goals and go out there and achieve them. You are both wonderful and amazing kids.

Mike, well what can I say? Thanks for everything. Thanks for the huge amount of love and support you have provided me throughout the whole process. Thanks for your input along the way and always keeping me positive. Thanks so much for being my best friend and husband. I love you!

This ones’ for you Granddad….. Au revoir! I miss you!

And finally to my Lord and Saviour Jesus Christ, without you nothing is possible!
Table of Contents

ABSTRACT ..................................................................................................................3
DECLARATION .............................................................................................................4
ACKNOWLEDGEMENTS ...............................................................................................5
TABLE OF CONTENTS ................................................................................................6
LIST OF FIGURES .......................................................................................................9
LIST OF TABLES .........................................................................................................9

CHAPTER ONE

Introduction ..............................................................................................................11
Purpose of the study .................................................................................................13
Significance of study ...............................................................................................13
Research Questions .................................................................................................14
Limitations of study .................................................................................................16
Delimitations of study .............................................................................................17
Definition of terms ..................................................................................................18

CHAPTER TWO

LITERATURE REVIEW

Introduction ..............................................................................................................23

PART ONE OF THE STUDY

Motivational Theory .................................................................................................25
Self-concept ...............................................................................................................29
Attraction to Physical Activity .................................................................................37
Physical Activity ......................................................................................................40
Theoretical Framework for the First Part of the Study ...........................................42
CHAPTER FIVE

DISCUSSION

Overview ........................................................................................................... 83
Question 1 ........................................................................................................ 84
Question 2 ........................................................................................................ 90
Question 3 ........................................................................................................ 93
Question 4 ........................................................................................................ 94
Question 5 ........................................................................................................ 95
Question 6 ........................................................................................................ 99
Conclusion ...................................................................................................... 101

CHAPTER SIX

SUMMARY, CONCLUSION AND IMPLICATIONS

Summary and Conclusion ............................................................................... 102
Implications .................................................................................................. 103
REFERENCES ............................................................................................... 105

APPENDICES

Appendix A  Sample letter and passive consent forms ......................... 118
Appendix B  Sample of measures – SDQ1 and CAPA ......................... 125
Appendix C  Play 5 games and activity instructions .......................... 132
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Theoretical framework for the part one of this study</td>
</tr>
<tr>
<td>2</td>
<td>Theoretical framework for the part two of this study</td>
</tr>
<tr>
<td>3</td>
<td>Sample question from the physical ability subscale from the SDQ-1 (Marsh, Craven, &amp; Debus, 1991)</td>
</tr>
<tr>
<td>4</td>
<td>Sample item from the original CAPA scale from the liking of vigorous physical activity subscale.</td>
</tr>
<tr>
<td>5</td>
<td>Sample question from the modified CAPA scale (Brustad, 1993)</td>
</tr>
<tr>
<td>6</td>
<td>Mean scores for boys and girls responses from the SDQ-1 at baseline</td>
</tr>
<tr>
<td>7</td>
<td>Mean scores for boys and girls responses from the CAPA at baseline</td>
</tr>
<tr>
<td>8</td>
<td>Pre to post results for level of physical activity for boys and girls</td>
</tr>
</tbody>
</table>

List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breakdown of number of participants for each part of the study</td>
</tr>
<tr>
<td>2</td>
<td>Internal Consistency Reliabilities for the current study and Marsh et al., (1991) on the SDQ-1 version for young children.</td>
</tr>
<tr>
<td>3</td>
<td>A comparison of Internal Consistency Reliabilities for Brustad (1993) and the present study</td>
</tr>
<tr>
<td>4</td>
<td>Illustration of research design, including research questions</td>
</tr>
<tr>
<td>5</td>
<td>Correlations between children’s self-concept, attraction to physical activity and level of physical activity</td>
</tr>
</tbody>
</table>
6 Relationships among self-concept, attraction to physical activity, & level of physical activity for boys and girls.

7 Means and standard deviations for boys, girls, & overall sample.

8 Descriptive statistics for pre to post perceptions of physical ability for girls and boys.

9 Summary of time, condition, and sex effects (% Variance Explained) on raw scale for each of the CAPA subscales.

10 Pre to post means for all children from both groups on the CAPA subscales
CHAPTER ONE
INTRODUCTION
Background

In recent years there has been increasing concern about children’s decline in physical activity, with the latest research (Gill, MacDougall, & Taylor, 2004) indicating that children as young as 4 years of age are missing out on the health related benefits of engagement in play and games at home and in the playground. Recent reports indicate alarming revelations stating that Australian children as young as 6 are exhibiting health conditions predominantly recognised within older adults. Not only are there medical problems developing at such a young age, but psycho-social problems also may emerge (Obese Kids Stalked, 2006). In order to maximise participation and adherence to physical activity Weiss (2000) stresses the importance of increasing understanding of children’s self-perceptions that are crucial to psycho-social health and closely linked with the intrinsic desire to engage in play and games. Weiss emphasizes that the importance of having a thorough knowledge of the psycho-social influences that underpin children’s attraction towards physical activity can enhance the effectiveness of programmes designed for children.

Areas that have been identified as crucial to a child’s psycho-social health and desire to participate in physical activity are; a) self-esteem/self concept (particularly in the physical domain), b) attraction towards physical activity and, c) support from significant others. According to Weiss, (2000) and other prominent sport psychologists (Brustad, 1993; Lintunen, 1987; Sonstroem, 1978) children’s judgments of their physical ability
influence their desire to participate in physical activity. Leading motivational theorists such as (Bandura, 1977; Deci & Ryan, 1989; Harter, 1999; Nicholls, 1984) found that within the sporting domain middle childhood and adolescents that have high self-perceptions of athletic competence are more likely to be related to the attraction to physical activity. Furthermore prominent leaders in this field, for example Weiss (2000), proposed that programmes are more likely to be effective if self-esteem enhancement is accompanied by the support of significant adults such as parents and teachers. It is important to consider the domain specificity of self-esteem in addressing children’s motivation and adherence to physical activity. According to Fox (2000), Harter (1999), and Marsh (1991) self-esteem is viewed as multidimensional and domain specific. Whilst not disregarding all areas of self-esteem research it is important to focus on perceptions of athletic competence or physical ability. Considering that self-perceptions in the physical domain differ in physical self-perceptions for girls and boys in middle primary and later grads (Fox, 2000; Harter, 1999; & Marsh, 1991), it is surprising that such differences in self-perceptions and attraction to physical activity have not been addressed by researchers.

Whilst there has been considerable anecdotal and empirical support for the tenets of motivational theory with middle to upper primary (Brustad, 1993) and secondary school children (Horn & Weiss, 1991; Paxton, Estabrooks, & Dzewaltowski, 2004), little is known of the centrality of self-perceptions in the young child’s attraction towards physical activity. Considering the recent reports that young children’s engagement in physical activity is declining (Gill, MacDougall, & Taylor, 2004) and the importance of early intervention in developing positive patterns of behaviour and positive self-perceptions it is crucial that this gap be addressed.
Purposes of the Study

This study was developed independently from a larger study database from which data was drawn on for this study.

There were three main research purposes of the study:

1. To examine the relationship between children’s self-concept, their attraction to physical activity, and level of physical activity.
2. To examine differences between boys’ and girls’ self-concept, attraction to physical activity, and level of physical activity.
3. To examine the pre to post changes in boys’ and girls’ perceptions of physical ability, attraction to physical activity, and level of physical activity following an intervention programme specifically designed to increase level of physical activity.

Significance of the Study

This study was significant for the following reasons:

1. There is an increased awareness by parents, teachers, and policy makers concerning the declining physical activity levels in young children and with the associated health problems. Health experts are blaming television and computers for the decrease in physical activity and increasing risk of health related problems (Get Out and Play, 2005). Increasingly sedentary children appear to be less attracted to activity in play, games, and sport. Parents are increasingly cautious about allowing their children to play outside and there is a greater concern for money constraints and less family time (Why Our Kids, 2005).

2. This study is also addresses the need to examine the possibility of differences in boys’ and girls’ self-concept that in the past have not been
examined extensively in young children. These may be crucial in planning for inclusivity in play, games and sport.

3. This study is based on theoretical frameworks and empirical findings. The areas being addressed, i.e., perceptions of physical ability, attraction to physical activity, and support of significant others are crucial if teachers and child health workers are to better understand children’s physical activity participation.

4. The instruments used in this study have been designed and validated as, a) developmentally appropriate, b) based on the multidimensional nature of the constructs, and c) the procedures for administrations are designed and validated specially for the use with young children. As a result the study may enable us to enhance levels of physical activity within a group that has largely been ignored.

Research Questions

There were 6 research questions emanating from the 3 main purposes. Questions one, two, and three are related to the first two purposes of the study using baseline data.

*Research Question One:*

Is there a relationship among children’s self-concept (physical ability, physical appearance, peer relationships, parental relationship, and global self-concept), their attraction to physical activity (peer acceptance, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity) and their level of physical activity?
Research Question Two:

Do boys and girls differ in:

a) Self-concepts - (physical ability, physical appearance, peer relationships, parental relationships, and global self-concept).

b) Attraction to physical activity – (peer acceptance, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity).

Research Question Three:

Do boys and girls differ in their level of physical activity?

The third purpose relates to the pre to post changes following an intervention study. Questions 4, 5, and 6 emanated from this purpose:

Research Question Four:

Were there pre-to-post changes in children’s perceptions of physical ability?

Research Question Five:

Were there pre-to-post changes in children’s attraction to physical activity (peer acceptance, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity)?
Research Question Six:

Were there pre-to-post changes in children’s level of physical activity?

Limitations of the Study

1. Data was collected from participants at 28 co-educational schools. The findings cannot be generalised to the general population of primary school students, but rather to the perceptions of the children who participated in the study.
2. A range of physical, social, and cultural aspects are likely to influence children’s self-concept and attraction to physical activity. Whilst the scope of this study did not allow examination of parents attitude or parents education towards physical activity.
3. Any significant relationships revealed between children’s self-concept, attraction to physical activity, and level of physical activity does not imply causality but a mediatory effect.
4. The intervention was child-centred in that it relies on parental support for daily diary entries throughout the 24 weeks. It also relied on teacher encouragement and motivation to utilise equipment and resources provided. It is recognised that there may be variation at home with potential parental influences and differences between teachers attitude towards physical activity that are not measurable within the scope of this study.
5. This study does not utilise any qualitative research methods. Thoughts and feelings of the children and thinking at the moment of questioning are examined by quantitative methods.
6. When stating studies involving young children authors may vary in their definition of
the age range. Most journal articles provided specific ages of their studies, however in general literature specific ages are often not referred. It is also important to note that chronological age is not the best indicator as developmental age.

7. External influences affecting children’s perceptions and physical activity level cannot be controlled for within the control groups.

Delimitations of the Study

1. As this study targeted the younger age group of primary school this research project was limited to Year 2 children whose ages range from 6 to 7 years.

2. Children who were not continuing at the school for the remainder of the year were excluded from the questionnaires as follow up interviews are required for pre-to-post data collection.

3. The primary schools participating in the study were selected from a broad geographical and socioeconomic range from the Perth metropolitan region.

4. The pedometer is limited to certain activities only and does not enable the participants record water activities or very vigorous activity that would break or tamper with the pedometer.
Definitions of Terms

**Self-Esteem / Self-Concept/ Self-Perceptions**

Harter (1999) defines self-esteem as an evaluative indicator of the self and distinguishes it from self-concept which she views as self-descriptions. Marsh (1989) uses the terms self-concept and self-descriptions in his extensive research in measurement of this construct. While it is recognised there are varying views on definitions, for the purpose of this study self-esteem and self-concept will be used interchangeably. In each case of the definition self-esteem/self-concept/self-perceptions is accepted as a multidimensional construct made up of domain specific perceptions of self (physical, social, and cognitive). In addition there is general self-concept (Marsh, 1989) or global self-worth that (Harter, 1999) that is separate from the other domains. Self-perceptions range from specific focus to general thoughts and emotions (Fox, 2000).

**Self-concept/Perceptions of Physical ability**

Perceptions of physical ability refer to how children rate oneself on their ability in the physical domain (Marsh, Barnes, Cairns, & Tidman, 1984). It is the cognitive judgment one gives regarding one’s physical self in relation to a certain area or skill level (Vanden Auweele, Bakker, Biddle, Durand, & Seiler, 1999).

**Self-concept/Perceptions of Physical appearance**

Perceptions of physical appearance refer to how children evaluate their own appearance or attractiveness. In forming perceptions of physical appearance children compare themselves to others and how they think their peers evaluate their appearance
Harter (1999) considers perceptions of physical appearance as a major influence on global self-worth referring to it as “the portable self”.

**Self-concept/Perceptions of peer relationships**

Perceptions of peer relationships refer to children’s evaluation of the positive and negative aspects of a close friendship (Cleary, Ray, LoBello, & Zachar, 2002). It includes how children rate their ability to make friends and maintain friendships and popularity (Marsh, Barnes, Cairns, & Tidman, 1984).

**Self-concept/Perceptions of parental relationships**

Perception of parental relationships refers to how children assess their relationship with their parents. They determine to what degree they get along with their parents and how easy it is to talk and discuss certain issues with them (Marsh, Barnes, Cairns, & Tidman, 1984).

**General self-concept**

“General self-concept is stable, but as one descends the hierarchy, self-concept becomes increasingly situation specific and as a consequence less stable” (Marsh & Shavelson, 1985, p. 107).

**Children’s Attraction to Physical Activity**

Attraction is defined as an expression of positive feelings regarding a skill or subject. For the purpose of this study the examining of subscales that fall under the banner of attraction to physical activity. These are a) peer acceptance in games and sports,
b) importance of exercise, c) liking of games and sports, d) liking of physical exertion and exercise, and, e) liking of vigorous physical activity (Brustad, 1993, p. 213).

Peer acceptance in games and sports

Peer acceptance is defined as how children view themselves among their peers and to what degree they are liked by other children (Harter, 1999). For the current study peer acceptance is defined as children’s perceptions of their popularity with their peers throughout their involvement in games and sports (Brustad, 1993, p. 215).

Importance of physical activity

This aspect of attraction to physical activity relates to children’s cognitions about the importance of exercise to physical health, (Brustad, 1993, p. 214). An example is the level of importance a child places on exercise for health or body shape.

Liking of physical exertion and exercise

This component to attraction of physical activity is associated with the child’s view on whether they like or dislike a certain aspect of exercise. For example feelings of breathlessness or being sweaty are indicators of liking of physical exertion (Brustad, 1993, p. 216).

Liking of vigorous physical activity exercise

According to Brustad (1993, p. 215) this dimension of attraction to physical activity relates to the child’s feelings of being involved in vigorous exercise, for example, playing hard or feelings of tiredness after exercise.
Intrinsic Motivation

In relation to this study intrinsic motivation is defined as the involvement in physical activity for the internal pleasure and enjoyment for its own sake with the absence of external rewards or pressures (Vanden Auweele, Bakker, Biddle, Durand, & Seiler, 1999). Aspects of the attraction to physical activity in this study are closely related to intrinsic motivation and show overlapping aspects. Extrinsic motivation is defined as the need to participate in physical activity in order to receive approval and/or obtain external reward (Duda, 1998).

Physical Activity

For the purpose of this study children’s physical activity is regarded as being both structured activity (organised sport or physical education) and incidental activity (spontaneous and after school play) (Brustad, 1993, p. 210).

Level of physical activity

For this study level of physical activity is defined as the amount of physical activity children participate in within a seven day period. This will be measured using pedometers and a recording sheet for a period of seven days including the weekend.

Gender/Sex

According to Pryzgoda and Chrisler (2000) gender typically refers to the social and behavioural features of men and women. Sex has been defined as the biological characteristics of being male and female. For the purpose of this study gender and sex will be used interchangeably where research has mentioned gender in the study.
Young Children

For the purpose of this study the term young children refers to chronological age of children between the ages of six to eleven years. According to Berk (1999) this age group is also referred to as middle childhood.
CHAPTER TWO

Literature Review

Introduction

Physical activity is an essential part of life and is especially important in the experience of the child. It is now alarmingly evident that as early as 3-4 years of age (Gill, MacDougall, & Taylor, 2004; Shephard, 2005) children are being negatively affected by lifestyles that discourage physical activity and are missing out on the benefits reaped by active lifestyles. Physical activity participation across the lifespan has been promoted as a means to not only reduce physiological health issues but also psychological health-related problems.

Early theoretical perspectives Erikson (1950), and Piaget (1927) acknowledged the centrality of movement within active play environments and physical and psychosocial health. Erik Erikson (1902-1994), viewed play as important for development during the early years. Biddle and Armstrong (1992) also stress the importance of physical activity on children’s physical and mental health. Play activities involving various motor skills help children to develop self-esteem and autonomy allowing children opportunities to master skills (Tsao, 2002).

While there is a sound theoretical basis for researching young children’s attraction to physical activity in the play/games environment, empirical research with the younger age groups remains scarce. Both theoretical basis and empirical reports reveal that within children’s motivation to engage in physical activity there is strong consensus among leaders in this field (Harter, 1999; Weiss, 2000) that self-perceptions are crucial to the intrinsic desire to engage in physical activity. In Harter’s (1999) Competence Motivation Theory she proposes that any intervention programme must take into account the centrality of self-perceptions in an individual attraction to a task. According to Wang and
Biddle (2001) it is not only significant for the child to enhance their physical health through physical activity participation but, also, to develop their social and psychological well-being.

This study was grounded within the Social Cognitive Theory in which it is proposed that positive self-perceptions will be closely linked to a child’s attraction to physical activity, which in turn is likely to increase levels of physical activity. While the general consensus among motivational theorists (Bandura, 1977; Deci & Ryan, 1985; Harter, 1978; Nicholls, 1984) consider the importance of the development of self-perceptions and attitudes towards physical activity in children it is surprising that self-perceptions and attitude with young children have received so little attention. This is especially surprising when attitudes towards physical activity are formed so early in life.

The literature on the psycho-social implications affecting boys and girls engagement of physical activity covers a number of determinants. This review of literature will be presented under the following headings:

1. Motivational theory
2. Self-concept
3. Attraction to physical activity
4. Physical activity
5. Theoretical framework for the first part of the study
6. Intervention programmes
7. Theoretical framework for the second part of the Study
8. Summary of literature review
Motivational Theory

The focus on this study is on children’s self-concept, attraction to physical activity, and their level of physical activity. In order to understand these constructs and relationships it is important to discuss major motivational perspectives from within which these variables may be examined.

For example, it has been repeatedly demonstrated with primary age children that self-perceptions and intrinsic motivation are closely linked (Deci & Ryan, 1985; Weiss, 2000). Weiss (2000) acknowledges the importance of understanding why children remain interested in physical activity and the importance of enjoyment in their intrinsic desire to participate and come back for more. The studies of such prominent researchers have been largely based on several motivational theories and have many themes in common.

Harter’s (1982) Competence Motivation Theory predicts that individuals perceiving high competence in a domain (physical activity) are more likely to engage in physical activities than individuals who perceive low perceptions of competence. Such individuals are motivated to make a change in their own environment and engage in mastery attempts. If the attempt is successful an individual can experience intrinsic motivation leading them to further enhance their competence. However, if the attempt fails then the motivation for further attempts are decreased thus projecting negative self-perceptions. It is important for children to be encouraged to have mastery attempts at their goals simply for the process of achieving a positive response intrinsically rather than extrinsically (Shapiro, Yun, & Ulrich, 2000).

The Self-Determination Theory is the psychological structure that brings meaning to the global concept of motivation. Deci and Ryan (1985) propose that intrinsic motivation is depended on perceptions of competence. Biddle and Mutrie (2002) view Self-Determination Theory is an ideal framework from within which to study exercise.
motivation. Fox (1997), for example suggests that if a child’s perception of competence is low intrinsic motivation is reduced; conversely if perceptions are positive then intrinsic motivation will be enhanced. Social factors determine the belief one has about oneself and it is these psychological factors that determine an individual’s motivation. Within Self-determination Theory, Deci and Ryan propose three innate needs for self-determination; competence, autonomy, and relatedness. Most research tends to be based on perceived competence as the principal determinant for physical activity participation. Although it is evident that competence is an important aspect in the development of intrinsic motivation; self-determination cannot be without autonomy. Deci and Ryan (1985) also view autonomy as an important aspect when determining the motivational influences and physical activity behaviour. Intrinsically motivated circumstances must involve both perceived competence and autonomy in assessing motivational behaviour. The third need for self-determination is relatedness, that is an individual’s desire for basic human interaction. Deci and Ryan propose that along with competence and autonomy, relatedness is important for an individual to appreciate their full capabilities as a person. In adapted physical activity Sherrill (2000) notes that social, physical and emotional factors can directly affect both perceptions of competence and behaviour of a person with disabilities. Thus, when an individual perceives higher competence and greater self-determination the greater their intrinsic motivation will be to engage in physical activity.

The Social Cognitive Theory Bandura (1977) offers a broad framework for examining motivation in physical activity contexts. It provides an ideal framework from within which teachers might plan settings that encourage the development of positive self-perceptions (Vanden Auweele, Bakker, Biddle, Durand, & Seiler, 1999). Falling directly within this overall framework is Self-efficacy Theory in which Bandura proposed that an individual’s judgments of ability affect how performance is accomplished. Central to self-
efficacy is one’s self-evaluation of ability to execute the skilled movement. According to Bandura the important contributors to self-efficacy are (a) successful performance, (b) vicarious experience, (c) verbal persuasion, and (d) emotional arousal. Each has important implications for adherence to behaviour in physical activity contexts. According to this theory if individuals perceive (a) the ability to be successful at the task, (b) that the task is relevant to their experiences, (c) support from significant others, and (d) enjoyment and challenge as opposed to fear in performing the task, then they are likely to participate in that task.

There are important similarities between Bandura’s Self-Efficacy Theory and Harter’s Competence Motivation Theory. Both view “personal mastery of skills” as important in the motivation to be involved in an event. Perceptions of past achievements or disappointments can determine efficacy expectations. Prior successes can lead to positive self-efficacy guiding a way to positive outcomes of actual performance.

Considering that this thesis was concerned with children’s self-perceptions of physical ability, attraction to physical activity, and level of engagement in physical activity, Social Cognitive Theory as a broad framework is highly relevant. Specific components of the theories proposed by Bandura and Harter such as perceptions of success, enjoyment, feelings of control, and intrinsic motivation to participate were particularly relevant.

On their own, as well as combined, these prominent theories provide a sound basis for examining the relationship between self-perceptions, attraction to physical activity, and level of participation in physical activity. Collective aspects of the theories of self have been drawn for this current study. In the current study motivation is defined as a behavioural choice. A number of characteristics provide understanding into the motivation and adherence into physical activity. These are, the desire that leads an individual to participate in an activity, and the desire to continue with the activity in an
effort to improve. It is also important to understand what keeps individuals from ceasing their involvement (Haywood & Getchell, 2001). Weiss and Petlichkoff (1989) found that the reasons for continuing with sport involvement may not be the same as the initial reason for participation. When considering children’s participation in physical activity it is necessary to understand more about why they participate and what motivates them to continue.

According to Barber, Sukhi, and White (1999) and Smoll, Magill, and Ash (1988) there are several motives for sport involvement among children. These include improving skills, socialisation, excitement, experiencing success, enhanced physical fitness, and having fun. These findings are all related to intrinsic motivation. When promoting physical activity it is understood that intrinsic motivation is the major key to long-lasting involvement. Theory predicts that positive and successful mastery attempts in areas that challenge our environment will in turn be an intrinsic motivator that in turn leads to continuing that behaviour. Biddle and Mutrie (2002) point out that intrinsic motivation forms the basis for life long behaviours and is the source of an individual’s attraction to physical activity. They noted that while extrinsic motivation can be a successful motivator in some circumstances, the effect can be transient.

A study by Weinberg et al., (2000) noted that factors such as fun, skill improvement and enjoying challenges were intrinsic motivators while determinants such as popularity and rewards were seen as extrinsic motivators for physical activity participation.
Self-concept is used as an umbrella term as an evaluative indicator of self. Self-concept is referred to as one’s assessment of competence, attributes and characteristics that are viewed in comparisons with others (Gallahue & Ozmun, 2002). Hierarchical models of self-concept have assisted in the understanding of self-concept as a multidimensional construct rather than the formally believed one-dimensional construct. Shavelson, Hubner, & Stanton (1976) as quoted by Gill (2000, p. 73) present a multidimensional model of self-concept beginning with general or global self-concept at the top of a hierarchy. Academic self-concept, social self-concept, emotional self-concept, and physical self-concept are at the next level. Each component encompasses subscales based on the judgment of the one’s performance. For the purpose of the present study the components; physical self-concept (physical ability and physical appearance), social self-concept (peer relationships and parental relationships), and the general self-concept subscales were examined.

Self-concept is established through the connection with others (Gallahue & Ozmun, 2002). Teachers, parents, and peers are significant others that play an important role in the development of self-concept. The development of positive self-concept in the physical domain is a primary goal for children’s participation in physical activity. Gallahue and Ozmun (2002) stress the importance of self-concept development in the physical domain as children place much importance on their ability and are an important factor in children’s general self-concept. It is important to create positive self-concepts in children early as once self-concept is firmly established it is difficult to change.

Measurement issues in the assessment of self-concept have posed questions on the validity and reliability of certain measures. Valid measures used for self-concept analysis will be
discussed further in this chapter. For the purpose of this study self-concept and self-esteem will be used interchangeably.

Physical ability and physical appearance

Self-concepts of physical ability and physical appearance are important determinants in the promotion of the increasing levels of physical activity. Sonstroem (1984) is quoted by Biddle and Mutrie, (2002, p. 184) as identifying two approaches to physical activity and self-esteem. Firstly the motivation approach, in which he proposes that self-esteem, is a motivational factor of physical activity. Individuals high in self-esteem within the physical activity domain are more likely to participate in physical activity. Secondly the personal development approach proposes that self-esteem can be varied through positive or negative outcomes from the of mastery or skill development and refers to self-esteem as being the result in physical activity participation.

According to Watkinson, Dwyer, and Nielsen (2005) achievement motivation proposes that a child’s desire to participate and succeed at an activity greatly depends on their perceptions and beliefs on how successful they will be in a particular pursuit. Weiss and Horn (1990) suggest that children who have high perceptions of physical ability enjoy higher levels of motivation and participation than those who are lower in their perceptions of physical ability. A child who perceives his/herself as low in physical self-competence at a young age may never improve in skill level thus decline in their physical activity participation. It is essential, therefore, for the assessment of perceptions at young ages to ensure continued involvement in physical activity. Some researchers have shown that physical ability is closely linked to motor ability and physical fitness
There are limitations when attempting to assess young children’s self-competence. According to Rudisill, Mahar, and Meaney (1993) young children who are unaware of their actual competence may over or underestimate their perception of competence. Children’s answers to the questions are often misconstrued. According to Harter (1999) children of this age often do not have the understanding of good or bad, with no middle ground. They believe that their abilities may change at a later time. What they may be good at now they may be bad at, at a later date. This being the case it is important to note that the children may have been in an unpredictable moment and perception of a particular variable may be representative of the child’s current or past performance.

According to Stein (1988) children between the ages of 5 and 8 years are also developing the formation of self concept and body image. This stage provides research an ideal opportunity to tap into the children’s awareness and examine their self-concept and feelings towards physical activity. Harter (1999) sees a strong link between physical appearance and general self-concept. She refers to perceptions of physical appearance as “the portable self”. Unlike other physical domains, physical appearance is carried with the person and is difficult to discount. Even at the age of 4 -7 Harter (1999) found that findings among young children revealed relationships between physical appearance and global self-worth. This being the case it is important to examine relationships between these variables in order the understand how young children feel and interact with their environment. Conversely, Marsh, Ellis, and Craven (2002) found with Australian children that the physical appearance factor may be more related to the social acceptance than being physically competent. Whilst, there has been much research on how adolescent children judge their physical appearance and its importance but little is known about self-
concept in the physical appearance domain in young children. Interestingly a study carried out by the British Heart Foundation (2004) found that if children perceive their physical ability and appearance to be unsuitable to an activity they will believe that they are not good enough to participate in the particular activity or sport.

Peer relationships and parents relationships

Peers are considered important due to their significance in a child’s development of cognitive, social, behavioural, and emotional skills (Cleary, Ray, LoBello, & Zachar, 2002; Weiss & Smith). According to a study by McNamara-Barry and Wentzel (2006) children are more likely to make observations and comparisons of their close personal friends rather than their non-friends behaviour. Through play, games, and sport children make interpretation and comparisons not only about themselves but also regarding their peers (Salmivalli & Isaacs, 2005). With very young children, Harter and Pike (1984) found that the understanding of peer relationships takes time to develop and that at a such a young age children have not gained the knowledge to be able to make peer comparisons.

Peer relationships are also a major determinant contributing to why children drop out or avoid being involved in sport or physical activity. Motivational theory predicts that a child’s desire to partake or pursue an activity depends upon factors such as perceptions, desires, positive feelings, and attitudes over a period of time. Weiss and Smith (2002) state that children who have positive peer relationships will demonstrate positive experiences in the physical domain. There is seen to be a strong correlation between peer acceptance and physical activity. According to Chase and Dummer (1992) findings among American children between the ages of 8 and 13 years revealed that to achieve positive peer relationships they must be physical attractive or be good at sports.
In Self-Determination Theory (Deci & Ryan, 1985), it is proposed that intrinsic motivation is driven by variables that deal with one's environment. It is therefore important to understand how these variables motivate children into being involved in physical activity. It is also noted that findings by Mulvihill, Rivers, and Aggleton (2000) indicated that peers and friendships among English children to be the major influence in sport participation outside of the school environment.

According to Harter and Pike (1984), young children who are new to a school showed lower peer acceptance to those children who were not new comers to the school. Not only are peer relationships seem to be important but peer social contacts also play a role in children’s social development. According to Weiss and Smith (2002) the quality of peer acceptance in the physical activity domain relates to important motivational factors in children’s physical activity. Studies with older European American children have shown that the quality of peers and or social acceptance is associated with the enjoyment and continuance of engaging in activities (Patrick, Ryan, & Alfreld-Liro, 1999).

Social support of parents and significant other such as coaches and teachers, is vital in the motivation and adherence in physical activity. It has been recognised that parents have a strong influence over their child’s activity experiences whether it is simple play or organised sporting activities. Withdrawal from sport has often been linked with the lack of support from significant others (Biddle & Mutrie, 1991). Parents play an central role in the promotion of certain behaviours in their everyday life. According to Weiss (2004) parents have an obligation to set an example by providing opportunities and encouragement to be physical active. This view is reinforced by Aarnio (2003) and Sallis et al., (1992) who emphasise the importance of parents on a children’s activity pattern. In young children parental support and feedback is very influential to the involvement in physical activity. As children get older they become more reliant on peer
support and comparisons (Weiss & Duncan, 1991; Patrick, Ryan, & Alfreld-Liro, 1999). It is in the early years that gender socialisation patterns also may have an influence on a child’s perceptions of physical ability, attraction to physical activity and level of physical activity (Biddle & Armstrong, 1992).

According to Gagne (2003) significant others such as teachers and coaches also play a principle role in establishing psychologically healthy opportunities for children to participate in physical activity. It is crucial that the quality of social support or interaction with significant others is appropriate as this can affect the degree to which a child will feel about their competence within a certain activity.

Differences between boys and girls in physical and social self-concepts

Research by Klomsten, Marsh, and Shaalvik (2005) have found older Norwegian boys and girls aged 14 years to exhibit varying opinions on being stereotyped into physical activity involvement. They also demonstrate traditional gender appropriateness in their perceptions about physical ability. It was indicated that girls prefer sports such as dancing, gymnastics, and aerobics, while boys tend to perceive soccer, boxing, and motor cross to be more suited to them. Freedman-Doan et al., (2000) assessed age and sex differences of American children in academic and non academic domains. They found that boys and girls had differences in the sport domain which showed a significant difference between boys and girls in team competitive sports and individual sports. Overall both boys and girls were seen to participate in a similar number of sports. The main differences were in their perceptions ability particularly types of physical activity in which they felt highly competent. Studies on gender differences in the physical and social self-concepts have been generally consistent with older children. However, it is not known if these are evident in younger age groups.
One reason for this is that research with the younger age group is difficult to pursue. It is time consuming and adaptation of questionnaires would need to be redesigned to suit the significant problems linked with reading. Biddle and Armstrong (1992) recommend this be addressed but few advances have been made.

Significant differences between boys and girls have also been found with regards to their physical appearance. According to Piek, Baynam, and Barrett (2006) perceptions of physical appearance make a significant input on self-concept. Young girls rate physical appearance according to being pretty and having a nice looking body while young boys rate physical appearance high if they are being athletic, sporty, and handsome. Therefore for girls athletic ability has less to do with athletic competence. Findings by Kломsten, Marsh, and Shaalvik (2005) with girls aged 14 years indicate that appearance, good looks, slimness, and femininity as are more important physical appearance factors than boys for where strength is more important. Both boys and girls however agreed that girls should maintain a sexy, slender body, while boys should exhibit well defined arms and a strong body.

Perceptions of peer relationships also differ between boys and girls. Findings by Cleary, Ray, LoBello, and Zachar (2002) found that with their American sample girls identify friendships more positively than the boys. Girls convey more intimacy and support in the relationships with their peers than the boys. Biddle and Armstrong demonstrated that girls’ motivational orientation to participate in physical activity relied heavily on a peer support network.
Planinsec and Fosnaric (2005) found no gender differences in general self-worth with Slovenian children aged 6 years. This contrasts with Harter (1999) who reported gender differences in global self-worth that widens with development and is consistently lower in females. Although the gap between what is traditionally a male or female activity is decreasing there is still evidence that sex differences and perceptions still exists. Klomsten, Marsh, and Shaalvik (2005, p. 632) have found that although girls show an increase in the participation of “male dominated” sports boys tend to stay with the preferred stereotypical behaviour and participated in gender role orientated activities.

**Measurement of self-concept**

The widely held view of self-concept as a multi-dimensional construct has necessitated appropriate measures in the assessment of self that reflect this structure. It is now considered that assessment of self-concept be administered through the implementation of a multidimensional tools. Rudisill, Mahar, and Meaney (1997) stress the importance of measuring perceived competence in children at such a young age, as this is such a vital factor in achievement motivation. Confirmation for the use of the multidimensional structure and self-concept judgments come from the administration of measures that draw on a number of separate domains of self-concept. Leading experts in the measurement of the self construct such as Harter (1999) and Marsh (1991) have led the way in this respect.

Harter (1999) provides instruments for use with young children through to adulthood. The Pictorial Scale of Perceived Competence and Social acceptance for Young Children (Harter & Pike, 1984) evaluates judgments in five domains of self-concept. These scales measure perceptions of cognitive competence, physical competence, physical
appearance, social appearance, and behavioural conduct. In addition there is a measure of general self-worth.

The Physical Self-Perception Profile (PSPP) (Fox, 1997) incorporates five domains including sport competence, physical strength, physical conditioning, body attractiveness and physical self-worth which present a multidimensional model of the physical self. The PSPP has been proven to be a useful tool in the measurement of physical self-perception among older children and adults but is limited in its delivery to young children.

Marsh, Craven and Debus’ (1991) Self-Description Questionnaire (SDQ-1) was selected in the present study for two reasons. It incorporates the required multidimensional constructs for the assessment of children’s self-concepts and secondly the SDQ-1 has been adapted for young children aged 5 – 8 years through interview on a one-on-one interview options. This measure assesses academic and non-academic aspects of self-concept and general self-concept. For the purpose of this study the following subscales were used; physical ability, physical appearance, peer relationships, parental relationships, and general self-concept.

Attraction to Physical Activity

The development of physically active lifestyles and the enhancement of positive attitudes to physical activity have been considered to be the major determinant of preventive medicine that should start in early childhood. Macdonald, Rodger, Abbott, Zivinani, and Jones (2005) and O’Brien Cousins (1997) support the view and state that attitudes towards physical activity are behaviours that are tracked from childhood right through to adulthood. Reasons for engagement in physical activity are a primary focus on
Researchers are concerned with what motivates or attracts people to be physically active. Many adult and older children studies have been conducted to understand and evaluate participation motives. However, little is known about young children and their attraction to physical activity. According to Brustad (1991), attitudes towards physical activity can be somewhat highly developed at a young age. These attitudes may persist across the lifespan unless an intervention is put into place to change or encourage more positive attitudes.

Understanding attraction and attitude to physical activity will provide physical educators and parents with information on how to promote active lifestyles and motivate young children through making play, games, and sports attractive. According to Hagger, Cale, and Almond (1997), understanding the relationship between physical activity behavior and attitude to physical activity is an important issue. The type of attitude or attraction to physical activity may be important in maintaining children’s positive motivation in physical activity. Children who exhibit positive attitudes for intrinsic enjoyment or for the “love” of being physically active may be more active than those who do not (Hagger, Cale, & Almond, 1997). Research by Watkinson, Dwyer, and Nielsen (2005) on Canadian children from grades 1 – 4 found that enjoyment was the highest placed value that children put on physical activity. This was found to be the most important reason for playground participation.

Differences between boy’s and girls’ attraction to physical activity.

Studies showed that boys place higher emphasis on achievement and status whereas girls, age 10-12 years rated fitness and friendships more important for participation (Gill, Gross, & Huddleston, 1983; Gould, Feltz, & Weiss, 1985). Morris, Clayton, Power, and Jin Song (1996) found boys to be motivated by ego-orientated goals.
such as the competition and status while girls were motivated by task-orientated goals for example learning skills and cooperation. Hagger, Cale, and Almond (1997) found that young English children between the ages of 9 – 11 years show similar attitudes towards physical activity. Girls tend to be more extrinsically motivated to be physically active than boys relying on adults or peers for their motivation. Girls reported preference for less challenging tasks but enjoyed previously mastered skills. Boys on the other hand reported a need to satisfy curiosity and attempt challenging and new skills for their own sake (Biddle & Armstrong, 1992; Rose, Larkin, & Berger, 1998). In a study with 13 year old Greek children Zahariadis, Tsorbatzoudis, and Grouiou (2005) found that boys are much more intrinsically motivated to participate in physical activity than girls.

These differences indicate the need to explore possible difference in motivational orientations between boys and girls and to provide appropriate interventions for the increase in physical activity for both.

**Measurement of attraction to physical activity**

The Children’s Attitudes Towards Physical Activity (CATPA) (Simon & Smoll, 1974) was designed to evaluate differences among children’s interests in physical activity. However, problems evolved from this measure and it was recommended that this scale not be used for the assessment of children’s physical activity attitudes (Duda, 1998, p. 464). Brustad (1993) recognised the importance to develop a measure that not only would be multidimensional but also would identify different aspects of the attraction to physical activity. In developing the new scale he expressed the need for incorporating cognitive and affective dimensions to the scale. The Children’s Attraction to Physical Activity (CAPA) scale was designed to assess children’s interest and attitude towards physical activity that tapped into 5 domains. These were; peer acceptance in games and sports,
importance of exercise, liking of games and sports, liking of physical exertion and exercise, and liking of vigorous physical activity. Of the five subscales the peer acceptance in games and sports is closely related to the SDQ-1 perceptions of peer relationships subscale. The importance of exercise subscale focuses on the cognitive thoughts children’s attraction to physical activity and the three liking subscales relate to the enjoyment and fun element of children’s attraction to physical activity.

Brustad later developed the scale for use with young children including 81 fourth grade American students. For the purpose of this study the CAPA has been modified to examine young children’s attraction to physical activity.

**Physical Activity**

Physical activity and exercise are sometimes used interchangeably. However for this study physical activity was used as the preferred term. Physical activity is any bodily movement produced by the muscles resulting in energy consumption (Zwiren, 2001, cited in Kerner, 2005, p. 29). Exercise is restricted to purposeful activity whereas physical activity includes active daily living as well as sport. According to Brustad (1993) physical activity is seen as any structured (organised sports) or incidental movement (walking, playtime).

*Differences between boys and girls*

Much research has seen sex differences in levels of physical activity participation, notably with middle primary and older children. Among young Australian children, Burke et al., (2005) discovered that young girls exhibit more sedentary behaviour than the boys. This has also been found by Loucaides and Chedzoy (2005) report that gender is constantly being noted as a factor associated with physical activity with boys being more
physically active than the girls. Conversely results from a study by Hagger, Cale, and Almond, (1997) indicate that boys and girls aged 9 – 11 years generally participate in the same amount of physical activity.

Despite equal opportunities and an increase in traditionally male sports becoming socially acceptable for females studies by Crocker, Eklund, and Kowalski (2000) revealed interesting findings among 10 – 14 year old Canadian children. They found that the girls still prefer not to participate in as many sporting activities as boys. Girls are seen to engage in activities traditionally female activities such as walking, aerobics and dance. Crocker and colleagues noted that although the boys tend to be more physically active than the girls they both maintain similar relationships between physical self-perceptions and levels of physical activity. It can often be seen that gender role expectations determine the choices that girls have concerning physical activity participation. Macdonald, Rodger, Abbott, Ziviani, and Jones (2005) found that gendered patterns appeared among Australian children as young as 7 years of age make gender orientated choices in their preferred activity.

*Measurement in levels of physical activity*

Many measures have been used to establish levels and intensity of physical activity. However, for the assessment with young children few are considered valid and reliable instruments. While some may be very accurate they can be difficult to use, by contrast some that are easy to use may not be as accurate.

_Pedometers._

For the purpose of assessing level of physical activity Tudor-Locke and Bassett, (2004) suggest the use of pedometers or step counters. Pedometers are uncomplicated and low-cost body worn movement sensors that researchers use to assess physical activity
These devices are said to be useful in validating self-report measures of physical activity (Dishman, Wahburn, & Schoeller, 2001). Measurements from the pedometer correlate well with oxygen consumption in children indicating its validity as a measure of physical activity. However, there are limitations to children wearing this device. Outside of a controlled environment problems such as losing, breaking or forgetting to wear the device can result in loss of data.

**Self Reports.**

This form of assessment is commonly used for the gaining of information regarding how one views their level, intensity and mode of physical activity. This can involve questionnaires to attain feelings or perceptions of physical ability or physical competence (Robinson & Reed, 1998). Ordinarily it is not suitable to use this form of assessment as it is has been suggested that children under the age of 10 years can only give a limited account of their physical activity (Cale, 1994).

**Theoretical Framework for part one of the study**

*The relationships among self-concept, attraction to physical activity and level of physical activity*

In this study it is proposed that positive self-concept is related to one’s intrinsic motivation and attraction to engage in domain specific behaviour. This perspective stems from several motivational theories that fall under the Social Cognitive Theory. The model upon which part one of this study is based is presented in Figure 1. It illustrates the positive relationship between the domain specific self-concepts, attraction to physical activity, and level of physical activity. By exploring how children perceive their level of self-concept and attraction to physical activity it is possible for researchers to identify the
importance of children’s self-perception, the motivation for participation, and adherence to physical activity.

![Self-Concept Diagram]

**Self-Concept**
- Past experiences
- Parents
- Peers
- Actual ability
- Other self-concepts

**Physical Activity Levels**
- Participation

**Attraction to Physical Activity**
- Skills
- Fun / enjoyment
- Gender role expectation
- Getting sweaty
- Success / excitement

*Figure 1. Theoretical framework for part one of this study.*

**Intervention Programmes**

There has been an increased concern over the obesity epidemic among children. This has been especially noted among young children with alarming statistics not only about their physical activity levels but the health related benefits that accompany physical activity (Obese Kids Stalked, 2006). With the knowledge that behavioural patterns begin at a very young age it makes intervention programmes early in life are likely to be more effective.

Schools have been seen as having a key role in promoting physical activity in young children. According to Verstraete, Cardon, De Clercq, and De Bourdeaudhuil (2006) schools are an ideal environment for the promotion of physical activity. The opportunities are greater than in the home setting and they provide increased possibilities.
to implement interventions. Cale and Harris (2006) have also found that significant improvements in physical activity have been reported following school based interventions. Not only are the increases in physical activity essential but just as importantly is the production of positive attitudes towards participation. Thus intervention programmes should not only focus on physiological result but affective consequences such as attitude and cognitive outcomes.

Loucaides and Chedzoy (2005) emphasises the need for the implementation of intervention programmes that aim to increase children’s physical activity levels. They believe that intervention programmes not only need to implemented through the school system but be given to smaller groups such as the family unit to help promote adhesion and positive attitudes to physical activity. In implementing any intervention programme within the family setting Sääkslahti et al., (2004) emphasises the importance of family counselling and assistance in order for the intervention to be effective in the increase of young children’s physical activity.

Intervention programmes designed to increase physical activity in children have seen positive results. Sallis et al., (1992) states that understanding the factors of physical activity can facilitate the development of successful activity promotion interventions. Mulvihill, Rivers, and Aggleton (2000) have found that children tend to decline in physical activity levels during the late primary school age this decline continues into adolescence and older. This sounds a clear warning to draw attention to the importance of intervention programmes. There is clearly a need for positive physical activity behavioural patterns to be established within young children in the early years of primary school.

Some intervention programmes have focused on increasing self-perceptions and motivation by utilising mastery climate verses performance climate. For example
Theeboom, De Knop, and Weiss (1995) studied the effectiveness of a three week programme examining a performance versus mastery orientated teaching programme. The variables measured were children’s enjoyment, perceived competence, intrinsic motivation, and motor skill development. Results showed that children in the mastery orientated teaching programme had higher levels of enjoyment and better motor skills than the performance group. Basing their study on Harter’s (1999) Competence Motivation Theory they were able to establish the importance of mastery of skills factor when implementing physical activity education to children.

More recently Pangrazi, Beighle, Vehige, and Vack, (2003) developed PLAY (Promoting Lifestyle Activity for Youth), a school-based intervention programme designed to increase older children’s levels of physical activity. Participants were divided into four groups; a) play and physical education, b) physical education only, c) play only and d) no treatment groups. The play and physical education group and the play only group engaged in the intervention study over a period of 12 weeks. These two groups participated in play behaviour lessons and encouraged to be self-directed in their activity. To assess differences in physical activity pedometers and body mass indexes (BMI) were used. The results showed significant differences between groups among the girls but not so for the boys. Reports of the PLAY study suggested that the findings may have been more significant with a longer intervention.

With the increased awareness that children are becoming sedentary at a younger age researchers need to establish structure for children to follow in order to create positive lifestyle behaviours. To be successful, programmes must be developmentally appropriate and enjoyable if any changes are to be lasting. The study by Sääkslahti et al., (2004) was based on the view that physical activity habits were formed much earlier in life than previously thought. This draws attention to the need to promote healthy life styles even
before school. In a three year study within the home setting with full support from parents, findings indicated that not only did children in the experimental group increase their physical activity intensity but there was a significant increase in their amount of outdoor activity. There remains however, few researchers who have responded to the challenge of testing the effectiveness of intervention programmes for young children.

In the current study the second main purpose was to examine the effectiveness of an intervention programme designed to enhance children’s level of physical activity. It was also predicted that changes in psycho-social aspects would emerge as a result of the programme.

Play 5

The premise upon which the Play 5 programme is based is that young children have the capacity to self-direct and regulate their behaviour. In the Play 5 programme children were encouraged to organise and control their own physical activity through play, games, and sports. The intervention programme, Play 5, involved primary school teachers implementing teaching and learning experiences that support the child to be in charge of their activity levels by encouraging children to participate in at least five physical activities per day and record their experiences in a diary. The Play 5 intervention adopted motivational and self-directed viewpoint with self-perceptions viewed as a crucial indicator of physical activity in young children.

The Australian Guidelines (DOHA, 2004) recommend that children be actively involved in physical activity for at least 60 minutes per day. The Play 5 programmes objective is to encourage children to participate in moderate to vigorous active for about 5 – 10 minutes 5 times a day. There were three important objectives to the programme; 1. To design and assess a child intervention package that would be applied to young
children by teachers, early childhood professionals and parents. Social support from parents and teachers provide appropriate opportunities for children to make choices in their play and that the main concept is the element of fun.

2. To validate that an intervention has had a positive effect on children’s level of physical activity, increased self-concept and perceptions of the importance of exercise.

3. To establish positive relationships between young children, schools and families.

The 24 week intervention encouraged children to not only increase their level of physical activity but to learn positive behaviours about the enjoyment and importance of physical activity as a part of their daily practice. As they continue to Play 5 times a day it was proposed that children will continue to make further mastery attempts at activities which in turn increase perceptions of competence. Harter (1999) proposes that as competence motivation increases so too will the motivation to continue participation.

In addition to the intervention, the Play 5 project team developed educational information for teachers and parents to assist in creating surroundings that will enable the health messages to be received by young children.

Theoretical Framework for part two of the study

Pre-post changes in children’s’ perceptions of physical ability, attraction to physical activity and level of physical activity following an intervention

Through the implementation of the Play 5 intervention it was proposed that children in the experimental groups would have; higher levels of physical activity, higher perceptions of physical ability, and a greater attraction to physical activity.

The model employed for the second part of this study (Figure 2) presents the proposed pre
to post changes in children perceptions of physical ability, attraction to physical activity, and level of physical activity. The model also proposes that children from the control groups will not show any significant increases in their perceptions of physical ability, attraction to physical activity, and level of physical activity.

### Figure 2. Theoretical framework for part two of this study.

<table>
<thead>
<tr>
<th>Pre</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of physical ability</td>
<td></td>
</tr>
<tr>
<td>Attraction to physical activity</td>
<td></td>
</tr>
<tr>
<td>- Peer acceptance</td>
<td></td>
</tr>
<tr>
<td>- Importance of exercise</td>
<td></td>
</tr>
<tr>
<td>- Liking of games and sport</td>
<td></td>
</tr>
<tr>
<td>- Liking of physical exertion</td>
<td></td>
</tr>
<tr>
<td>- Liking of vigorous activity</td>
<td></td>
</tr>
<tr>
<td>Level of physical activity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control—No Intervention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of physical ability</td>
<td></td>
</tr>
<tr>
<td>Attraction to physical activity</td>
<td></td>
</tr>
<tr>
<td>- Peer acceptance</td>
<td></td>
</tr>
<tr>
<td>- Importance of exercise</td>
<td></td>
</tr>
<tr>
<td>- Liking of games and sport</td>
<td></td>
</tr>
<tr>
<td>- Liking of physical exertion</td>
<td></td>
</tr>
<tr>
<td>- Liking of vigorous activity</td>
<td></td>
</tr>
<tr>
<td>Level of physical activity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention—&quot;Play 5&quot;</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of physical ability</td>
<td></td>
</tr>
<tr>
<td>Attraction to physical activity</td>
<td></td>
</tr>
<tr>
<td>- Peer acceptance</td>
<td></td>
</tr>
<tr>
<td>- Importance of exercise</td>
<td></td>
</tr>
<tr>
<td>- Liking of games and sport</td>
<td></td>
</tr>
<tr>
<td>- Liking of physical exertion</td>
<td></td>
</tr>
<tr>
<td>- Liking of vigorous activity</td>
<td></td>
</tr>
<tr>
<td>Level of physical activity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of physical ability</td>
<td></td>
</tr>
<tr>
<td>Attraction to physical activity</td>
<td></td>
</tr>
<tr>
<td>- Peer acceptance</td>
<td></td>
</tr>
<tr>
<td>- Importance of exercise</td>
<td></td>
</tr>
<tr>
<td>- Liking of games and sport</td>
<td></td>
</tr>
<tr>
<td>- Liking of physical exertion</td>
<td></td>
</tr>
<tr>
<td>- Liking of vigorous activity</td>
<td></td>
</tr>
<tr>
<td>Level of physical activity</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 2. Theoretical framework for part two of this study.*
Summary of Literature review

In order to increase children’s level of physical activity, theory and research with middle and upper primary children indicate the importance of psychosocial variables. The literature reviewed in this chapter reveals support of this view. However, it is clear that attention is needed to address the serious problem of inactivity in younger children. According to Barber, Sukhi, and White (1999) it is often the case that what motivates someone to begin participating in physical activity may not be the same reason for the continued desire to participate. Thus an important reason to determine the influencing factors that will encourage children’s participation in physical activity. Increasing children’s level of physical activity is not only important to ensure future developments in their health and fitness levels but more importantly to ensure that positive outcomes are revealed in order for the continuation with a positive attitude towards physical activity.
CHAPTER THREE

METHOD

This study was part of a larger project in which a range of physical, social and psychological variables were examined in relation to an intervention programme designed to enhance children’s level of participation in physical activity.

The purpose of the present study was three-fold. The first purpose was to examine the relationship among children’s’ a) self-concept (physical ability, physical appearance, peer relationships, parental relationships, and general self-concept, b) attraction to physical activity (peer acceptance, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and liking of vigorous physical exercise), and c) level of physical activity.

The second purpose was to investigate differences between boys’ and girls’ a) self-concept (physical ability, physical appearance, peer relationships, parental relationships, and general self-concept; b) attraction to physical activity (peer acceptance, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and liking of vigorous physical exercise); and c) level of physical activity.

The third purpose was to evaluate the effectiveness of an intervention programme designed to enhance children’s’ level of physical activity. It examined pre to post changes in girls’ and boys’ a) perceptions of physical ability b) attraction to physical activity, and c) level of physical activity

The methods used within this research were approved by Ethics Committees of two universities. The researcher developed research questions for this study independently from the wider project entitled “Play 5” in which a broader range of physiological and psychological variables were examined. For this current study the main
variables examined are a) self-concept, b) attraction to physical activity, and c) level of physical activity. Differences between boys and girls were also investigated.

Participants

Participants were Australian boys and girls from year 2 with ages ranging from 6 and 8 years ($M = 6.7, SD = .74$). All participants were part of the Play 5 study that involved an intervention programme designed to increase levels of physical activity. A summary of breakdown of number of participants in each part of the study is provided in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Breakdown of Number of Participants for Each Part of the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N$</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Initial SDQ-1 (Marsh, 1989) data collection</td>
</tr>
<tr>
<td>Initial CAPA (Brustad, 1996) data collection</td>
</tr>
<tr>
<td>Completed all 3 variables pre</td>
</tr>
<tr>
<td>Completed all 3 variables post</td>
</tr>
</tbody>
</table>
Measures

The measures for the collection of data for this study were: a) The Self Description Questionnaire – 1 (SDQ-1) (Marsh, Craven, & Debus, 1991) for pre adolescence, 5 to 8 years, b) Children’s Attraction to Physical Activity scale (Brustad, 1993), and c) Yamax SW-401 pedometers.

_Self-Description Questionnaire 1 – (SDQ-1) - (Pre-adolescent primary school)_

The original Self Description Questionnaire 1 (SDQ-1) (Marsh, 1989) is a multi-dimensional measure of self-concept which is used for children ranging in age from 7 to 14 years and was designed to be administered to children in groups. The SDQ-1 (Marsh, 1989) evaluates both academic and non academic self-concepts incorporating 8 subscales; a) reading, b) mathematics, c) general school competence, d) physical ability, e) physical appearance, f) peer relationships, g) parental relationships, and h) general self-concept. For the purpose of this research the SDQ-1 non-academic subscales were examined.

The SDQ-1 was later adapted for use on an individual basis with young children aged 5 – 8 years by Marsh, Craven, & Debus (1991). Each item consists of a simple statement (e.g. ‘I have a nice looking face’) which the interviewer reads out and asks the child to answer with a yes or no. The child is then asked to respond with a “yes always” or a “yes sometimes” or a “no always” or a “no sometimes”. The SDQ-1 is scored on a likert scale by the interviewer after the participant responds to each question. If the child could not respond to a question the interviewer indicates a 2.5 on the likert scale. However, in this study this option is not made known to the child and is rarely used by the children during the interview process. The items from each of the 5 non-academic subscales from the SDQ-1 were scored from 1 – 4 on a likert scale. For the purpose of
analysis the mean score from each subscale were used. Figure 3 presents a sample item from the SDQ-1 physical ability subscale. A full example of the measure used is available in Appendix B.

I enjoy sports and games

<table>
<thead>
<tr>
<th>No Always</th>
<th>No Sometimes</th>
<th>Child understands sentence but does not state yes or no</th>
<th>Yes Sometimes</th>
<th>Yes Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Figure 3.* Sample question from the physical ability subscale from the SDQ-1 (Marsh, Craven, & Debus, 1991).

The Internal consistency reliabilities for the SDQ-1 reported by Marsh, Craven, and Debus (1991) and for the present study are presented in Table 2. Marsh et al., (1991) also provide evidence of the factor stability in each of the 5 non-academic subscales in the SDQ-1 used within this study. The reliability and validity for the 5 non academic subscales for the present study are at an acceptable level for analysis.
Table 2  
*Internal Consistency Reliabilities for the Current Study and Marsh et. al (1991) on the SDQ-1 Version For Young Children*

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Current Study</th>
<th>Marsh, Craven and Debus (1991)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
</tr>
<tr>
<td>Physical ability</td>
<td>.74</td>
<td>.85</td>
</tr>
<tr>
<td>Physical appearance</td>
<td>.64</td>
<td>.90</td>
</tr>
<tr>
<td>Peer acceptance</td>
<td>.78</td>
<td>.86</td>
</tr>
<tr>
<td>Parental acceptance</td>
<td>.71</td>
<td>.86</td>
</tr>
<tr>
<td>General self-concept</td>
<td>.70</td>
<td>.83</td>
</tr>
</tbody>
</table>

*Children’s Attraction to Physical Activity Scale*

Children’s attraction to physical activity was assessed using the 25–item Children’s Attraction to Physical Activity Scale (CAPA) (Brustad, 1996). This multi-dimensional scale was designed to measure dimensions (cognitive and emotional states) identified by Brustad that evaluate a child’s attraction to physical activity. The original questionnaire was designed for group administration for North American children with a mean age of ten years and structured in an alternative question format (Figure 4).
Really true for me  Sort of true for me  Sort of true for me  Really true for me
1. _____  _____  Some kids don’t like to exercise very much  BUT  Other kids like to exercise a whole lot  _____  _____

Figure 4. Sample item from the original CAPA scale from the liking of vigorous physical activity subscale (Brustad, 1993).

The structured alternative format was designed to reduce socially desirable responses in children. At times, however younger children have difficulty in understanding this format if they do not receive sufficient explanation of the format. It also has been recommended (Marsh, Craven & Debus, 1991) that young children need to be administered the measures on an individual basis by an interviewer who presents the items verbally to the respondent.

Adaptation of the CAPA scale for use with younger children was approved by the author (Brustad, personal communication, January 2005). The scale was modified with the structured alternate format being replaced with a likert format. This measure comprises of 5 sub scales. These are; a) peer acceptance in sports and games, b) importance of exercise, c) liking of games and sports, d) liking of physical exertion and exercise, and e) liking of vigorous physical activity. Administration of the CAPA was conducted in the same format as the SDQ-1 i.e. on an individual basis with verbal questioning and responses. The questions from each of the 5 subscales from the modified CAPA were scored from 1 – 4 on a likert scale. For the purpose of analysis the mean score from each subscale were used. A sample item from the liking of physical
exertion and exercise subscale from the modified version of the CAPA is presented in
Figure 5. A full scale of the modified CAPA is presented in Appendix B.

I like getting sweaty when I exercise or play hard

<table>
<thead>
<tr>
<th>No always</th>
<th>No sometimes</th>
<th>Yes sometimes</th>
<th>Yes always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Figure 5. Sample item from the modified CAPA (Brustad, 1993).*

Internal consistency reliabilities reported by Brustad (1996) were acceptable on four of
the subscales; peer acceptance in sports and games, liking of games and sports, liking of
physical exertion and exercise, and liking of vigorous physical activity. Internal
consistency reliabilities for the subscales used in this study were acceptable for three of
the dimensions; importance of exercise, liking of games and sports, and liking physical
exertion and exercise.

With the age group in this study, negatively worded items reduced the internal
consistency of two of the subscales, peer acceptance in sports and games, and liking of
vigorous physical exercise. When the negative items were removed the Cronbach’s alpha
increased from .54 to .75 for the liking of vigorous physical exercise, and from .30 to .55
for the peer acceptance subscale. This level was considered acceptable for these subscales
to be included in the study. Comparisons of internal consistency reliabilities reported by
Brustad (1993) and for this study are presented in Table 3.
Table 3  
*A Comparison of Internal Consistency Reliability for Brustad (1993) and the Present Study*

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Present Study</th>
<th>Brustad (1993)</th>
</tr>
</thead>
<tbody>
<tr>
<td>r</td>
<td></td>
<td>r</td>
</tr>
<tr>
<td>Peer acceptance in sports and games</td>
<td>.55 (.30)</td>
<td>.72</td>
</tr>
<tr>
<td>Importance of exercise</td>
<td>.72</td>
<td>-</td>
</tr>
<tr>
<td>Liking of games and sport</td>
<td>.75</td>
<td>.70</td>
</tr>
<tr>
<td>Liking of physical exertion and exercise</td>
<td>.67</td>
<td>.74</td>
</tr>
<tr>
<td>Liking of vigorous physical activity</td>
<td>.75 (.54)</td>
<td>.74</td>
</tr>
</tbody>
</table>

*Note.* Number in the bracket is the internal consistency reliability prior to the removal of the negatively worded questions.

*Level of Physical Activity*

*Pedometers*

The pedometer used for the study was the Yamax Digiwalker (SW-401). Pedometers are used to measure the number of steps taken by each participant over 7 days including the weekend. Pedometers are simple and inexpensive devices that are easy for children to use and to collect data within this study. The participants attached the pedometers on their clothing with the help from their parents. These were sealed with a sticker and removed at the end of each day (Locke, 2001). With parental guidance the pedometer step counts were recorded on recording sheet and collected at the end of the week. Reliability and validity has been demonstrated for this measure of physical activity (Dishman, Washburn, & Schoeller, 2001).
Procedures

Ethics

Approval to carry out the research was granted by ethics committees of the two universities involved in the project. The researcher and research assistants strictly adhered to guidelines, policies and Ethical Conduct of Research Involving Humans. All collected data was stored appropriately and protected against loss, mishandling and unauthorised access (National Health & Medical Research Council, 1999) and participants’ information was adhered to by strict confidentiality and anonymity guidelines. All participants had the right to withdraw from the study at any time without prejudice.

Training of researchers

Procedures were consistent for pre and post intervention data collection. Each research assistant gained a police clearance from the Department of Education and Training Screening Unit. For the pre and post intervention data collection each member from the research team was trained by an experienced research officer. Each research assistant adhered to strict protocol regarding the behaviour, language and techniques when interviewing to ensure the reliability of data collection. During a training session each interviewer practiced the questionnaire on a child of appropriate age and returned for a brief and brainstorm of possible problems occurring. Interviewers participating in the second round of data collection participated in refresher training session to ensure correct procedures for the post data collection. New interviewers participating in the second data collection engaged in a training session to ensure uniformity. Procedures were consistent in all schools.
Recruitment

Contact with the schools

This stage was completed by the project officers of the Play 5 project. They contacted the regional directors, school principals, and teachers who were provided with information regarding the study. The participants for the present study were recruited from twenty six middle socio economic primary schools from the Perth metropolitan area. Thirteen schools participated in an intervention program designed to increase physical activity level and thirteen demographically matched primary schools acted as a control. The Western Australian Education Department provided information regarding socio-economic banding of all Perth Metropolitan schools to the project coordinator. This information provided approximate household earnings and property value for each suburb. From this information paired schools were randomly chosen from each band.

Permission was granted from the principals of each school for the Play 5 research project prior to recruitment of participants. In the case of the schools having more than one year two class the principal randomly selected a class that would participate in the study. After the initial information sessions, the project director provided principals and teachers packages with the information of the project and information forms for each child (see Appendix A). The package included information regarding Play 5, the purpose of the research project, and procedures for data collection. All ethical considerations have been explained to each principal and how recruitment of participants was to be obtained. Once consent from the schools was established participant recruitment took place. Dates and times were established for data collection.
Parents permission

All parents received information on the Play 5 project, its objectives, and details regarding data collection. Parents who did not wish for their child/children to be involved in the study were asked to return the signed consent form back to the school. This was the procedure for all children from both the experimental and control schools. A copy of the parents’ information booklet and consent form is presented in Appendix A. All participants were allocated an identification number with individualised coding to ensure confidentiality and privacy. This number is used throughout the entire data collection process. The researcher informed principals, teachers and parents that all participants’ information would be kept confidential throughout the entire procedure of the interviewing process.

Collection of data – Pre intervention

Self-concept and attraction to physical activity

The participants completed the questionnaires in their regular school time in a quiet area, away from teachers and peers. This was so that they were not distracted and to avoid any feelings of threat or evaluation of peers. The questionnaires took approximately 15 minutes each to complete.

Prior to the administration of the SDQ-1 and the CAPA scales, the researcher gave details of the procedure of administration to the participants. The researcher explained that the questions were related only to themselves and no one else would know these answers. The participants also were informed that the procedure was a survey not a test or exam and that there are no right or wrong answers. Each participant completed practice questions to clarify any difficulties in understanding.

Following the practice questions the participants responded to the questions from
the main questionnaire. Firstly the researcher administered the forty item SDQ-1 questionnaire. Each child answered the statement with a yes or no answer. The child was then asked to respond with a “yes always” or a “yes sometimes” or a “no always” or a “no sometimes”. The researcher circled the response on the questionnaire once the participant gave an answer. For the SDQ-1 scale if the child was unable to give an answer the researcher repeated the statement again and asked whether the participant understood the question. The researcher made a reminder mark next to any statement that could not be answered by the participant and returned to the statement at the end of the survey. The researcher circled number 2.5 (the child understands the question but does no state yes or no) if the participant still could not answer the question. This 2.5 response was not given as an option to the child and was only used if the child was completely uncertain to responding to the question.

Secondly, the participants were given a short break where the children were able to stand up and/or walk about and stretch (depending on space and area allocation) for a period of one minute led by the researcher. Thirdly, the participants were then administered the twenty five item CAPA questionnaires. For consistency the children were given one practice question followed by the main CAPA questionnaire. The procedure was directed similarly to the SDQ-1 with scores recorded as 1, 2, 3, or 4.

**Level of physical activity**

Following completion of the questionnaires, the children were given an explanation on how to wear and use the pedometers. Each child received a pack containing a pedometer, pedometer recording sheet, and a parent’s information sheet. The researcher explained the purpose of the pedometer, how it worked, and important guidelines for its use. Participants then handled and practiced using their own pedometer
to become familiar with how it worked. Each participant was shown how to wear his/her own pedometer and a piece of sticky paper was put over the pedometer catch to ensure that the participants were not tempted to open their pedometer during the procedure.

Following the dispensation of the pedometers each participant received a recording sheet and shown where to record his/her daily step count they were once again had the guidelines reinforced to them regarding the care of the pedometers. Each participant had a referring number on their pedometer to ensure safe return.

Parents assisted the children each day with the wearing of the pedometers and the recording of their daily step count on their recording sheet. This was completed for a period of seven days including the weekend.

Administration of Intervention – Play 5

The teachers of the children in the experimental groups were provided a folder containing extensive information about the Play 5 programme. This folder contained a number of extra curricular activities which involved an element of physical activity with the ability for easy implementation into the class room setting at their own discretion. The teachers were encouraged to utilise this file and to document each time an activity was executed to assist with further research with the Play 5 research team relating to the wider study. These activities and suggested games were provided to assist in the administration of the Play 5 programme throughout the twenty six week programme. Findings for research conducted by McKenzie et al., (2004) indicate the importance of teacher education programmes and interventions for primary teachers in the encouragement and increase of young children’s physical activity.

The intervention programme Play 5 was carried out by three trained research
assistants and included whole classrooms involvement. During the start of the intervention week the Play 5 researcher assistants introduced the intervention into the 13 experimental schools. During the first half hour of the session the children discussed how they felt about play and physical activity and the children were encouraged to verbalise their involvement in physically active play, games or sport. These ideas were summarised on the board for the children to view.

Following the discussion the research assistants explained the Play 5 programme and were told the importance of being physically active and how the Play 5 programme was to encourage each of the children to be involved in five play, games or sport activities each day. Play 5 encourages children to be physically active 5 times a day for “as long as recess”. This is due to the fact that young children have little concept of time periods and often have not developed the skill of time telling. Studies by Watkinson, Dwyer and Nielsen (2005) indicate that recess was an avenue for children to work on their achievement and physical performance goals. At recess children are given recognition by peers on their achievement and they value recess as an opportunity to demonstrate and enhance competence.

Twenty minutes after the classroom interaction time the research assistants took the children outside to the playground where they implemented four fun activities and fitness games for the children to participate in their own time, during school times or in an organised fitness class. Games provided and taught to the children were: Queenie, Hop Scotch, Duck Duck Goose, and Letters (see Appendix C). These games included activities that included fundamental motor skills, cardiovascular fitness, muscle endurance, and were based on age appropriateness and easily accomplished activities. Each of the classes was given play equipment (fantastic elastic, a skipping rope and coloured chalk) to aid in their new class fitness activities. The experimental schools were
all provided chalk to encourage markings however, it is unknown if this was continued once the chalk had run out. Many of the schools that were part of the study did not have any playground markings.

Research conducted by Verstraete, Cardon, De Clercq, and De Bourdeaudhuil (2006) has shown that providing extra play or game equipment for the classroom is an effective way of increasing children’s physical activity in the playground. They reported that young children engaged in higher levels of moderate to vigorous levels of physical activity after the intervention. Playground markings have a positive influence on children’s level of physical activity (Stratton, 2000).

Following the introduction of the playground experience, the children from each of the experimental schools received Play 5 diaries to complete on a daily basis for a period of twenty six weeks. The purpose of the diaries was to allow children to record and monitor their own physical activity. The diary provided space for the children to record information regarding amount of physical activity and types of play, games, and sport the participants are involved in. It also doubled as a fun colouring-in and drawing book. The diary was to be implemented as “homework” and incorporated the fun element into it through colour and drawing. The diaries were not to be included in the data entry for the present study but for further analysis in the larger overall project.

The parents were invited to attend a presentation of the Play 5 programme and the importance of physical activity in young children. The research assistants remained at the experimental schools after the intervention for a questions and answers information session.
Follow-up to Experimental Schools

During week 12 of the 24 week intervention, a team of three Play 5 research assistants returned to the 13 experimental schools to provide some more new fun games and physical activity ideas for the entire classroom to be involved in. This was also an opportunity for the teachers to be able to gain more information and or ideas to impart into the school curricular it was also an avenue to ensure that the teachers were continuing with the encouragement of the Play 5 programme and to answer any questions that the teacher may have.

The research assistants took the children into the playground and were introduced to some more games to assist in their Play 5 activities these games taught during this time were: human noughts and crosses, skipping games, and fantastic elastics (see Appendix C).

Collection of data – Post intervention

Six months after the first administration of the questionnaires, the team of research assistants administered the SDQ-1, CAPA, and the pedometer data collection to the participants. The research assistants revised all procedures according to the protocol for each measure in the post intervention data collection.
Data Analysis

All data was entered into SPSS version 13 (2004) for windows. The results of all analyses were recorded and all hardcopies of the data and computer disks were available to primary researchers only. All data will be stored in a locked cabinet at Notre Dame University and all data will be destroyed after a period of five years.

A summary provided in Table 4 shows a detailed break down of the research questions and analysis of data. For all analysis the $p$ value was set at $<.05$. 
<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Variables</th>
<th>Instrument</th>
<th>Measures</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level of Physical Activity</td>
<td>Yamax Pedometers</td>
<td>Level of physical activity</td>
<td></td>
</tr>
<tr>
<td>a) self-concept</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) attraction to physical activity</td>
<td></td>
<td>CAPA Brustad (1993)</td>
<td>Attraction to physical activity subscales: - Peer acceptance - Importance of exercise - Liking of games &amp; sport - Liking of physical exertion - Liking of vigorous activity</td>
<td>2 (sex) x 5 (attraction to physical activity)</td>
</tr>
<tr>
<td>3. Do girls and boys differ in their level of physical activity?</td>
<td>Level of physical activity</td>
<td>Yamax Pedometers</td>
<td>Level of physical Activity</td>
<td>Repeated measures ANOVA 2 (sex) x 1 (physical activity)</td>
</tr>
<tr>
<td>4. Were the pre-post changes in children’s perception of physical ability?</td>
<td>Perception of physical ability</td>
<td>SDQ-I Marsh, Craven &amp; Debus (1991)</td>
<td>Physical ability Pre-to-post</td>
<td>Repeated measures ANOVAs 2 (sex) x 2 (time)x 2 (condition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention / control</td>
<td></td>
</tr>
<tr>
<td>5. Were the pre-post changes in children’s attraction to physical activity?</td>
<td>Attraction to physical activity</td>
<td>CAPA Brustad (1993)</td>
<td>Attraction to physical activity subscales: - Peer acceptance - Importance of exercise - Liking of games &amp; sport - Liking of physical exertion - Liking of vigorous activity</td>
<td>Repeated measures ANOVAs 2 (sex) x 2 (time)x 2 (condition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-to-post</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention / control</td>
<td></td>
</tr>
<tr>
<td>6. Were the pre-post changes in children’s level of physical activity?</td>
<td>Level of physical activity</td>
<td>Yamax Pedometers</td>
<td>Level of physical Activity Pre-to-post</td>
<td>Repeated measures ANOVAs 2 (sex) x 2 (time)x 2 (condition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention / control</td>
<td></td>
</tr>
</tbody>
</table>
This chapter presents results from data pertaining to the six research questions that guided this study. The first part of the study examined relationships among children’s self-concept (physical ability, physical appearance, peer relationships, parental relationships, and general self-concept), b) attraction to physical activity (peer acceptance in sports and games, importance of exercise, liking of games and sports, liking of physical exertion, and exercise, and the liking of vigorous physical activity) and c) level of physical activity. The first part of the study also examined differences in a) boys’ and girls’ self-concept (physical ability, physical appearance, peer relationship, parental relationship, and general self-concept), b) attraction to physical activity (peer acceptance in sports and games, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity) and c) level of physical activity.

The second part of the study examined pre to post changes in each of the variables; a) perceptions of physical ability, b) attraction to physical activity (peer acceptance in sports and games, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity); and c) level of physical activity following the intervention study designed to enhanced children’s level of engagement in physical activity and self-perceptions in the physical activity domain.

This study was based upon data which has been collected using Self-Description Questionnaire 1 (SDQ-1) (Marsh, Craven & Debus, 1991) and Attraction to Physical Activity Scale (CAPA) (Brustad, 1993). Levels of physical activity were collected from Yamax pedometers. The information from the SDQ-1, CAPA, and pedometer readings enabled the researcher to answer the research questions.
The results will be presented under each of the research questions;

1. Is there a relationship among children’s self-concept, attraction to physical activity, and level of physical activity?
2. Do boys and girls differ in self-concept and their attraction to physical activity?
3. Do boys and girls differ in their level of physical activity?
4. Are there differences in boys’ and girls’ pre to post self-concept?
5. Are there differences in boys’ and girls’ pre to post attraction to physical activity?
6. Are there differences in boys’ and girls’ pre to post level of physical activity?

**Question 1**

Is there a relationship among children’s self-concept (physical ability, physical appearance, peer relationships, parental relationships, and general self-worth); their attraction to physical activity (peer acceptance in sports and games, importance of exercise, liking of games and sport, liking of physical exertion and exercise, and the liking of vigorous physical activity), and level of physical activity?

For further analysis the questions of sex differences in each of the variables was asked. Initially the data was collectively analysed combined samples of boys and girls. In order to answer research question number one a Pearson’s bivariate correlation analysis was conducted. This was to examine any relationships between children’s self-concept, attraction to physical activity and level of physical activity. Table 5 shows results of the
Pearsons r in which low positive relationships fall among all subscales of the self-concept variable and all subscales of the attraction to physical activity variable.

Correlation Coefficient (Pearson’s r) revealed no relationship between level of physical activity and any of the self-concept subscales or attraction to physical activity subscales.

Table 5
Correlations Between Children’s Self-Concept, Attraction to Physical Activity, and Level of Physical Activity

<table>
<thead>
<tr>
<th></th>
<th>Level of physical activity</th>
<th>CAPA Peer acceptance</th>
<th>CAPA Importance of exercise</th>
<th>CAPA Liking of games &amp; sport</th>
<th>CAPA Liking of exertion &amp; exercise</th>
<th>CAPA Liking of vigorous activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of physical activity</td>
<td>1</td>
<td>-0.045</td>
<td>0.072</td>
<td>-0.017</td>
<td>-0.52</td>
<td>0.098</td>
</tr>
<tr>
<td>SDQ-1 Physical ability</td>
<td>0.037</td>
<td>0.44 (**)</td>
<td>0.18 (*)</td>
<td>0.44 (**)</td>
<td>0.56 (**)</td>
<td>0.49 (**)</td>
</tr>
<tr>
<td>SDQ-1 Physical appearance</td>
<td>-0.020</td>
<td>0.40 (**)</td>
<td>0.25 (**)</td>
<td>0.25 (**)</td>
<td>0.41 (**)</td>
<td>0.36 (**)</td>
</tr>
<tr>
<td>SDQ-1 Peer relationships</td>
<td>0.063</td>
<td>0.52 (**)</td>
<td>0.28 (**)</td>
<td>0.40 (**)</td>
<td>0.53 (**)</td>
<td>0.38 (**)</td>
</tr>
<tr>
<td>SDQ-1 Parental relationships</td>
<td>0.035</td>
<td>0.39 (**)</td>
<td>0.27 (**)</td>
<td>0.27 (**)</td>
<td>0.38 (**)</td>
<td>0.37 (**)</td>
</tr>
<tr>
<td>SDQ-1 General self-concept</td>
<td>0.030</td>
<td>0.43 (**)</td>
<td>0.39 (**)</td>
<td>0.39 (**)</td>
<td>0.44 (**)</td>
<td>0.46 (**)</td>
</tr>
</tbody>
</table>

** p < 0.01
* p < 0.05
The data was analysed to examine any differences between boy’s and girls’ self-concept, attraction to physical activity, and level of physical activity correlations. Results presented in Table 6 indicate the significant results that show sex differences among certain variables. The patterns of correlations indicate differences among boys and girls in comparison to the collectively analysed data. The results for the girls revealed a positive relationship between the level of physical activity and the importance of exercise. Although the correlation coefficient was low it is interesting to note that for the same two variables there was a negative relationship ($r = -.299, p < 0.01$) for the boys. With the girls there was a positive relationship between physical appearance and the importance of exercise, liking of games and sports, and liking of vigorous physical activity. For the boys there were no relationships among these variables.
Table 6
*Relationships Among Self-Concept, Attraction to Physical Activity, & Level of Physical Activity for Boys and Girls*

<table>
<thead>
<tr>
<th></th>
<th>SDQ-1 Phys Ability</th>
<th>SDQ-1 Phys Appearance</th>
<th>Level of PA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDQ-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of Exercise</td>
<td>.174</td>
<td>.412 (**)</td>
<td>.104</td>
</tr>
<tr>
<td>Liking Games &amp; Sport</td>
<td>.504 (**)</td>
<td>.336 (**)</td>
<td>.246 (**)</td>
</tr>
<tr>
<td>Liking Vigorous Activity</td>
<td>.546 (**)</td>
<td>.472 (**)</td>
<td>.190</td>
</tr>
</tbody>
</table>

** p < 0.01
* p < 0.05

**Question 2**

Are there differences between boys’ and girls’ a) children’s self-concept (physical ability, physical appearance, peer relationship, parental relationship, and general self-concept), b) attraction to physical activity; (peer acceptance in sports and games, importance of exercise, liking of games and sports, liking of physical exertion and exercise, and the liking of vigorous physical activity)?
2a. Are There Differences in Boys’ and Girls’ Self-Concept as Reported by Mean Scores on the SDQ-1?

Sex differences among children’s self-concept was established using an ANOVA 2 (sex) x 5 (self-concept). Any differences revealed between sexes were to be controlled for in subsequent analysis. Means values for the differences in boys’ and girls’ self-concept are presented in Figure 6. An ANOVA showed a low significance among boys and girls differences for the self-concept variables for peer relationship and parental relationship.

*Figure 6. Mean scores for boys and girls responses from the SDQ-1 at baseline.*
2b. Are There Differences in Boys’ and Girls’ Attraction to Physical Activity as Reported by Mean Scores on the CAPA?

ANOVA 2 (sex) x 5 (attraction to physical activity) revealed no significant differences in boys’ and girls’ attraction to physical activity. However, the subscales of liking of physical exertion and exercise ($p = .062$), and importance of exercise ($p = .094$) approached significance. The mean scores for boys’ and girls’ attraction to physical activity subscales are presented in Figure 7.

Figure 7. Mean scores for boys and girls responses from the CAPA at baseline.
Question 3

Are there differences in boys’ and girls’ level of physical activity as reported by the average daily step count of the Yamax pedometers?

The results of the ANOVA 2 (sex) x 1(level of physical activity) showed no significant differences between boys’ and girls’ level of physical activity. Means and standard deviations are presented in Table 7. The number of step counts for a period of seven days for both boys and girls were almost identical.

Table 7
Mean and Standard Deviations for Boys, Girls, and Overall Sample on the Level of Physical Activity

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>(n = 57)</td>
<td>11626.51</td>
<td>(3353.12)</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>(n = 68)</td>
<td>11685.21</td>
<td>(3827.64)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>(N = 125)</td>
<td>11658.44</td>
<td>(3604.82)</td>
<td>.090</td>
</tr>
</tbody>
</table>

Note: Number equals the average daily step count.
Is there a difference in boys’ and girls’ pre to post perceptions of physical ability?

There were no significant changes for sex and condition over time. Follow up analysis revealed no significant differences in the mean scores for boys and girls from both the control and experimental groups. The mean scores for the boys and girls in the experimental group move in a predicted direction with small improvements. However, boys from the control groups showed a decrease and the girls from the control group showed no difference. Table 8 presents means score values for boys’ and girls’ perceptions of physical ability pre to post intervention.

Table 8
Descriptive Statistics for Pre to Post SDQ-1 Physical Ability Subscale

<table>
<thead>
<tr>
<th>Condition</th>
<th>pre</th>
<th>post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>3.39</td>
<td>3.50</td>
</tr>
<tr>
<td>Control</td>
<td>3.58</td>
<td>3.50</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>3.39</td>
<td>3.53</td>
</tr>
<tr>
<td>Control</td>
<td>3.42</td>
<td>3.46</td>
</tr>
</tbody>
</table>
Question 5

Is there a difference in boys’ and girls’ attraction to physical activity from pre to post intervention?

A repeated measures ANOVA 2 (sex) x 2 (time) x 2(condition) was used to assess the effects for sex, condition and time across the five CAPA scales measure with the individually administered response.

There was a significant effect of time for the CAPA subscales; peer acceptance in games and sport, importance of exercise, and the liking of physical exertion and exercise. For the liking of games and sports, effect for time approached significance ($p = .087$).

Table 9 presents main and interaction effects for boys and girls responses to the attraction to physical activity variable.

There was a significant main effect for condition for the subscales of a) peer acceptance in games and sport, b) importance of exercise, and c) the liking of games and sports. For the liking of physical exertion and exercise and liking of vigorous physical exercise subscales the effect of condition approached significance ($p = .061, p = .066$ respectively).

For the liking of physical exertion and exercise subscale the repeated measures ANOVA revealed a two way interaction effect for time and condition. An interaction effect of time and sex approached significance ($p = .058$). For the liking of games and sports and liking of vigorous physical activity the repeated measures ANOVA revealed a significant two way interaction effects for sex and condition.

There were no significant effects for sex in three of the CAPA subscales.
However, for the subscales importance of exercise, and liking of vigorous physical activity a main effect for sex approached significance ($p = .085$, $p = .084$ respectively).

There were no significant three way interaction effects for time, sex and condition. However the peer acceptance in games and sports subscale showed an interaction effect for sex, time and condition approaching significance ($p = .074$).

Follow up analysis revealed significant results for all groups in their attraction to physical activity for the subscale peer acceptance in sports and games with a decrease in their mean scores over time. Table 10 presents the mean scores for children’s pre to post responses to the CAPA subscales. Results also showed significant changes in mean values for the girls in the control group over time for both the liking of physical exertion and exercise, and the liking of vigorous physical exercise.
### Table 9
**Summary of Time, Condition and Sex Effects (% Variance Explained) on Raw Scale for Each of the CAPA subscales**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Main Effects</th>
<th>Interaction effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time</td>
<td>Sex</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Peer acceptance in games and sport</td>
<td>34.1 *</td>
<td>1.3</td>
</tr>
<tr>
<td>Importance of exercise</td>
<td>4.9 **</td>
<td>2.8 a</td>
</tr>
<tr>
<td>Liking of games and sport</td>
<td>2.7 a</td>
<td>1.8</td>
</tr>
<tr>
<td>Liking of physical exertion and exercise</td>
<td>13 *</td>
<td>1.4</td>
</tr>
<tr>
<td>Liking of vigorous physical exercise</td>
<td>0.9</td>
<td>2.8 a</td>
</tr>
</tbody>
</table>

Note. General Linear Model analysis was conducted in which the each subscale was used to test the effects of time, sex and condition and the time x gender x condition interaction. Effect sizes (the percentages of variance explained – i.e. eta squared x 100%) are all based on 1,107 degrees of freedom.

a Effect approaches significance.

* p < 0.01

** p < 0.05
Table 10
Pre to Post Means for All Children from Both Groups on the CAPA Subscales

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th></th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>pre</td>
<td>post</td>
<td>pre</td>
<td>post</td>
<td>pre</td>
</tr>
<tr>
<td>Liking of physical exertion and</td>
<td>3.11</td>
<td>2.85</td>
<td>3.58</td>
<td>2.92</td>
<td>3.40</td>
</tr>
<tr>
<td>exercise</td>
<td>3.49</td>
<td>3.62</td>
<td>3.72</td>
<td>3.65</td>
<td>3.72</td>
</tr>
<tr>
<td>Importance of exercise</td>
<td>3.26</td>
<td>3.11</td>
<td>3.71</td>
<td>3.65</td>
<td>3.56</td>
</tr>
<tr>
<td>Liking of games and sport</td>
<td>3.20</td>
<td>3.38</td>
<td>3.51</td>
<td>3.53</td>
<td>3.02</td>
</tr>
<tr>
<td>Liking of vigorous physical activity</td>
<td>3.26</td>
<td>3.32</td>
<td>3.66</td>
<td>3.56</td>
<td>3.53</td>
</tr>
<tr>
<td>Peer acceptance in sports and games</td>
<td>3.11</td>
<td>2.85</td>
<td>3.58</td>
<td>2.92</td>
<td>3.40</td>
</tr>
<tr>
<td></td>
<td>3.49</td>
<td>3.62</td>
<td>3.72</td>
<td>3.65</td>
<td>3.72</td>
</tr>
<tr>
<td></td>
<td>3.26</td>
<td>3.11</td>
<td>3.71</td>
<td>3.65</td>
<td>3.56</td>
</tr>
<tr>
<td></td>
<td>3.20</td>
<td>3.38</td>
<td>3.51</td>
<td>3.53</td>
<td>3.02</td>
</tr>
<tr>
<td></td>
<td>3.26</td>
<td>3.32</td>
<td>3.66</td>
<td>3.56</td>
<td>3.53</td>
</tr>
</tbody>
</table>
Question 6

Is There a Difference in Boys’ and Girls’ Pre to Post Level of Physical Activity?

Changes in children’s level of physical activity measured with pedometers are presented in Figure 8. Results from repeated measures ANOVA 2 (sex) x 2 (time) x 1 (physical activity) revealed an increase in step count for the boys from the experimental groups. Although these results are not significant the results move in the predicted direction with level of physical activity increasing after an intervention programme. Both the control groups show no changes in their step count while the girls from the experimental groups decreased in the amount of steps taken post intervention.

Based on the analysis from repeated measures ANOVA results reveal a significant time effect on the level of physical activity ($p = 0.01$). No interaction effect of condition and sex was discovered.

Figure 8. Pre to post level of physical activity for boys and girls.
Motivational theorists (Bandura, 1977; Deci and Ryan, 1985; Harter, 1999; Nicholls, 1984) have proposed that perceptions of competence or domain specific self-concepts are closely linked to an individual’s attraction towards specific behaviours. These perspectives have strong implications for children’s attitude and level of physical activity. They underline the importance of developing children positive self-concepts and attitudes in developing programmes in which children choose to be physically active. It was previously thought that children younger than eight years were unable to clearly differentiate between the domains of self-concept. However, in the last two decades research (Marsh et al., 1991; Harter, 1999) has confirmed by confirmatory factor analysis that even at a young age children are able to distinguish between the different aspects of self-concept. This study provides a clearer picture of 6 – 8 year old children’s self-concept and attraction to physical activity. This study had three main purposes. First it examined relationships between children’s self-concept, attraction to physical activity, and their level of physical activity. Secondly it examined differences between boys’ and girls’ self-concept, attraction to physical activity, and level of physical activity, and thirdly it examined the effectiveness of an intervention programme designed to enhance children’s level of physical activity.
There were six research questions that directed this study. The discussion section will be presented under the following headings;

1. Is there a relationship among children’s a) self-concept b) attraction to physical activity, and c) level of physical activity?

2. Do boys and girls differ in their a) self-concept, and b) attraction to physical activity?

3. Do boys and girls differ in their level of physical activity?

4. Were there pre-to post changes in children’s perceptions of physical ability?

5. Were there pre-to-post changes in children’s attraction to physical activity?

6. Were there pre-to-post changes in children’s level of physical activity?

Is there a relationship among children’s a) self-concept b) attraction to physical activity, and c) level of physical activity?

The results indicated that while there were significant relationships among self-concept (physical ability, physical appearance, peer relationship, parental relationship, and general self-concept) and attraction to physical activity (peer acceptance in games and sport, importance of exercise, liking of games and sport, liking of physical exertion and exercise, liking of vigorous physical activity) they were on the whole small.

Current results are consistent with previous research. In a study with 9–14 year old children, Paxton, Estabrooks, and Dzewaltowski (2004) reported significant yet low relationships between attraction to physical activity, and perceived competence. They conclude that both perceived competence and physical activity behavior is interceded by attraction to physical activity. Brustad (1993, 1996) also found positive relationships between perceived physical competence and attraction to physical activity in older
children. Additionally, Gibson, Cooke and Mahoney (2005) reported associations between self-concepts and sport participation in an adolescent population, indicating that a higher level of self-concept led to a higher level of attraction to physical activity.

Although only low, the three strongest relationships that were between a) perceptions of physical ability and the liking of physical exertion and exercise, b) perceptions of peer relationships and peer acceptance in games and sports, and c) perceptions of peer relationships and the liking of physical exertion and exercise.

The strongest of these three relationships was between perception of physical ability and the liking of physical exertion and exercise. Positive responses to questions such as ‘I like to burn lots of energy by playing hard’ and ‘I feel good when I run hard’ may indicate that as children increase in their self-concept of physical ability their attraction to physical activity is mediated in areas specific to the intensity of physical activity they engage in. These findings are consistent with research examining motivational orientations in children in middle primary school (Rose et al., 1998) that reported children with higher physical self-concept were more likely to seek out challenges in movement as measured by the Motivational Orientation in Sport Scale (MOSS) (Weiss, Bredemeier, & Shewchuk, 1985). Although the MOSS was different to the CAPA used in the current study there were similarities in items that asked about challenge. Items used within the CAPA for the subscale of liking of physical exertion and exercise reflected pleasures in being challenged by exertion.
The relationship between perception of peer relationships and peer acceptance were expected since items for each of the measures showed aspects in common. For example the perceptions of peer relationship read ‘I am popular with kids of my own age’ while the peer acceptance in games and sports question asked ‘I am popular when I play games and sports’. Horn and Hasbrook (cited in Weiss & Gould, 1986, p. 82) assert that children from as young as 5 years of age begin to judge their own competence by comparison to their peers, illustrating the importance of outside influences on the process of self-concept development. It was surprising however, that the relationship between these 2 subscales was not stronger. This may be an indication that the children were able to differentiate between being popular in general, as measured by the SDQ-1 and being popular in the context of play, games, and sport, as measured by the CAPA.

The relationship between perceptions of peer relationship and the liking of physical exertion and exercise may be an indication that the children link physical activity intensity with peer relationships and popularity. It seems that peer acceptance in sport and games and perceptions of physical ability are both connected to children’s attraction to the intensity aspect of physical activity. Being good at sports has been found by Chase and Dummer (1992) to be one of the strongest determinants for popularity among upper primary aged children. In a study with children aged 8-13, Weiss and Duncan (1991) found a strong correlation between children’s physical competence and peer acceptance. There is a need to increase understanding of the types of activity that lead to positive perceptions of peer relationships. Therefore future research needs to examine relationships between engagement in physical activity and social relationships of children.
There were no relationships found between physical activity and any of the variables measured by the SDQ-1 and the CAPA. This was not predicted, as theory and previous research findings (Crocker, Eklund, & Kowalski, 2000; Harter, 1999) suggest that children’s self-concept and attraction to physical activity would indeed be related to their actual level of physical activity. One explanation could be the pedometers used in the current study. According to Welk, Corbin and Dale (2000) physical activity measurement issues are common with children of this age. It is likely that children of this age may be better with another form of evaluation such as qualitative questioning or observation.

Although not a central focus of the present study responses by children in the sample provide an opportunity to evaluate sex differences in the relationship among the variables. When data was examined separately for boys and girls there were different findings.

Girls who reported liking of games and sports had higher levels of physical activity. The unexpected and less explicable finding is that for the boys this relationship was negative. Boys who reported liking of games and sports more had the lower levels of physical activity. One possible explanation for this opposite trend may be due to gender socialization. Coakley (2007) suggests that there is a higher social expectation on boys to participate and excel in sporting endeavours. This may place pressure on boys, even from a young age, to show more interest and attraction to games and sports, even if they are not actually intrinsically motivated to engage in them. If the boys were giving socially desirable answers to the liking of games and sports subscale of the CAPA their actual levels of participation would not reflect their answers and this may be why the correlation is negative. This finding is perplexing as literature has shown that even at a young age that boys are more intrinsically motivated to be physically active (Zahariadis,
Tsorbatzoudis, & Grouiou, 2005). Therefore it is interesting to find such a large discrepancy between boys and girls in this result.

Another explanation possibly may be that as children develop cognitively they begin to develop more realistic views about physical activity. With this in mind girls may be in fact making a more realistic link between the attraction to physical activity and level of physical activity.

The implications for this finding may be ensuring that children’s physical activity contains an element of enjoyment. Wiersma (2001) emphasises the importance of maximising enjoyment and motivation in children and youth. Including enjoyment within the physical activity domain is an extremely important factor for children’s continuance of physical activity participation. Extrinsic rewarding also assists in the continued participation and whilst children, particularly as they progress to adolescence, enjoy extrinsic rewards, these must be applied with caution (Cox, 2007).

Probably the most interesting finding among gender differences is the relationships found between perception of physical appearance and three of the CAPA subscales a) importance of exercise, b) liking of games and sports and, c) liking of vigorous physical activity. Collectively the results revealed very low relationship. However, when the data was analysed separately the girls showed a much higher relationship among those variables. It appears from this study that girls as young as 6 years of age link the importance of exercise with their perceptions of physical appearance. This is consistent with the literature Harter (1999) maintains that perception of physical appearance is clearly linked to self esteem and even in children as young as 4 – 7 years of age, note that physical appearance is the most important indicator of self-esteem. She implies that even
at a young age children are affected by cultural pressure about what represents attractiveness.

There are likely to be many explanations that impact young girls’ perception of physical appearance. These are gender appropriate merchandise, peer and parental influences, and the media. Gender appropriate merchandise is said to influence the way young girls perceives their appearance. Dittmar, Halliwell, and Ive (2006) and Kuther and McDonald (2004) found that dolls such as Barbie may affect a young girls’ developing self-concept and body image. This was more evident among girls up to 7 years of age. Recent studies by Dohnt and Tiggemann (2006) have found an increase in the desire to be thin in girls as young as 6 years of age.

Peer pressure and familial issues have a great influence on behaviours embracing the ideal body image. According to Kimiecik, Horn, and Shurin (1996) the role of the family is a most significant factor in a child’s world influencing their behavior in the development of health values and health related judgments. All of these factors then are probable as to the bearing on young girl’s perceptions on physical appearance. These gender differences are also consistent with findings from Shapiro, Newcomb, and Loeb (1997). They conducted a study with children aged 8-10 years to determine the fear of fat. They found that girls were more distressed about becoming fat and were more aware of the importance of the social cultural preference for the need to be of a certain body type compared to young boys.

According to Dohnt and Tiggemann (2006) and Skemp-Arlt (2006) media is consistently endorsing thinness as a sign of beauty and health which is represented to young children throughout television and magazine and that girls who viewed women’s magazines had a greater unhappiness with their appearance. Children from a young age are taught that being overweight is socially unacceptable. Magazines are also constantly
promoting physical activity as one of the main tools for weight loss. With this in mind it is evident that young girls are relating physical appearance with the importance of exercise.

In order to answer the second question the discussion will be presented in two parts; a) do boys and girls differ in their self-concept, and b) do boys and girls differ in their attraction to physical activity.

Do boys and girls differ in their self-concept?

The sub domains of self-concept examined for this study were a) physical self-concept (physical ability and physical appearance), b) social self-concept (peer relationships and parental relationships), and c) general self-concept.

Physical self-concept.

The results of this study revealed no significant differences between boys and girls on their perceptions of physical ability or physical appearance. These findings are consistent with Planinsec & Fosnaric (2005) who found similar results with 6 year old Slovenian children; and Ziviani, Macdonald, Jenkins, and Rodger (2006) who also found no gender differences in young children. However, these findings are not consistent with these reported by Marsh (2002) who found gender differences in perception of physical appearance for children of different ages. For a sample group aged 10 to adulthood Marsh (2002) found that girls had lower perceptions of physical appearance than boys. However, among children aged from preschool to 8 years of age girls had higher perceptions of physical appearance. Marsh (1989) also found that grade 2 boys exhibit significantly higher perceptions of physical ability than the girls. Marsh and Ayotte (2003) also found
that there were minor gender differences in children between the ages of 7 and 11 years in their physical self-concept and academic self-concepts. According to Cantell, Smyth, & Ahonen (1994) young children are able to make reliable judgments of their self-concept within the physical, cognitive and social domains however, at this age they judgments are not yet distinguished. It is not until middle school age that children are able to differentiate between their self-concept and domain specific competencies. This being the case it can be suggested that this is the reason for no significant differences being noted within these subscales for the younger children.

*Social self-concept.*

The results for this study showed a significant difference between boys and girls in their perceptions of peer relationships and perceptions of parental relationships. For both peer and parental relationships the girls have shown significantly higher perceptions than did the boys. This is consistent with research findings from Marsh, Ellis, and Craven (2002) where preschool children showed similar results on the peer and parental subscales. Marsh, Craven and Debus (1991) also found results were in favour of the 5-7 year old girls on these two subscales. However, results with children aged 7 – 13 years (Marsh, 1989) found that boys showed somewhat higher peers scores on the SDQ-1 compared to the girls. These results could be explained through the development of peer socializations. According to research (Cleary et al., (2002); Weiss & Duncan, 1991) girls are more likely to form close personal friendships while boys feel that being part of a larger group is a positive peer relationship. Another reason for such contrast in results could be explained in that young children have the inability to develop accurate judgments of social acceptance knowledge to correctly judge relationships in the social domain (Harter & Pike, 1981).
General self-concept.

The findings for the current study for general self-concept as consistent with those reported by Marsh (1991) that is in grade two children there were no significant differences between boys and girls. Marsh (1991) warrants the need to assess young children’s perceptions by multidimensional measures which enables children to differentiate among the self-concept variables.

Do boys and girls differ in their attraction to physical activity?

The subscales of attraction to physical activity examined for this study were a) peer acceptance in games and sports, b) importance of exercise, c) liking of games and sports, d) liking of physical exertion and exercise, and e) liking of vigorous physical activity.

The findings of this study suggest that both boys and girls have positive attitudes towards physical activity, yet there were no significant differences between boys and girls. Reports in the literature vary. For example Hagger, Cale, and Almond (1997) found no gender differences between 9 and 11 year old boys and girls in their attitudes towards physical activity. However, the children had positive attitudes on all of the Children’s Attitude Towards Physical Activity (CAPTA) subscales. In contrast Brustad (1993, 1996) reports gender differences in children’s attitude to physical activity. He found that the greatest differences between boys’ and girls’ attraction to physical activity was in the liking of physical exertion and exercise. As mentioned earlier in the literature review the CAPTA had previous problems concerning the measurement of children’s attitude towards physical activity. With the development of CAPA (Brustad, 1993) the identification of different aspects of attraction to physical activity can be measured more
accurately. For future study, the current findings warrant the need to look at the
modification of the CAPA to ensure a greater sensitivity to clearly determine the influence
of the attitude to physical activity variables in the assessment of younger children.

\textit{Do boys and girls differ in their level of physical activity?}

Results for children’s level of physical activity revealed no significant gender
differences among boys and girls. Although this has been shown to be the case with this
study reports in the literature by Flour, Todd, and Tudor-Locke (2006) found significant
gender differences among young adolescent boys and girls. With younger children
differences in level of physical activity do not emerge until early adolescence where
children begin to fulfil gender role expectations. It is not until boys and girls reach middle
childhood that the play, games, and sports become more differentiated and they begin to
feel that they must participate in what is socially appropriate (Gallahue & Ozmun, 2002).
For children in the present study showed that sex did not have an effect on level of
physical activity.

This study employed quantitative methodology preventing us from suggesting patterns
of behaviour. The pedometer only allows step counts and does not permit assessment of
intensity and mode of exercise. It is suggested that children in this age group tend to have
more spontaneous and intermittent play rather than periods of continuous play (McKee,
Boreham, Murphy, & Nevill, 2005; Welk, Corbin, & Dale, 2000) and pedometers do not
have an appraise facility which provides details on the intensity of an activity. For future
research it would be necessary to validate levels of physical activity with diaries or details
of what type of exercise the children are participating in. It may also be necessary to
incorporate other forms of measurements such as direct observation to evaluate the
behavioural aspects of physical activity.
The remainder of this discussion will focus on results pertaining to the research questions regarding the effectiveness of an intervention programme, Play 5, designed to enhance children’s level of physical activity.

*Were there pre-to post changes in children’s perceptions of physical ability?*

Perceptions of ability or perceptions of competence have been seen to be one of the most important factors in physical activity adherence. The results from this study revealed no significant changes in children’s perceptions of physical ability. There was no effect of time, sex, or condition found. Therefore the results suggest that the intervention had no affect on the children’s perception of physical ability.

This result was to be expected as children younger than 7 or 8 years naturally show unrealistic views of self-concept and that as children get older they are more realistic in their answers. Jacobs, Lanza, Osgood, Eccles, and Wigfield (2002); and Marsh (1989) suggest that young children have extremely high self-concepts and with experience children start to learn strength and weakness and therefore their self-concepts decline with age. According to Rudisill, Mahar, and Meaney (1993) young children who are unaware of their actual competence may over or underestimate their perception of physical ability. This being the case it is important to note that although the SDQ-1 was validated for use with young Australian children it is possible that the measure is not appropriate for this sample group as the mean scores for the children were all very high to begin with pre intervention. This makes it difficult to see improvements. For future study it would be suggested that comparison of age groups as well as lengthier periods of time may show a difference in perceptions of ability as maturity develops for this age group.
Were there pre-to-post changes in children’s attraction to physical activity?

In order to determine pre-to-post changes in children’s attraction to physical activity the following areas was investigated; a) peer acceptance in sports and games, b) the importance of exercise, c) the liking of games and sports; d) the liking of physical exertion and exercise, and e) the liking of vigorous physical activity.

Peer acceptance in games and sports

The results uncovered main effects for both time and condition. These effects are particularly relevant to the present study. Firstly it was important to attain whether these effects were positive due to the intervention. Interestingly the results have shown a decline in the mean scores for all of the children from both condition groups.

One such explanation postulated for this finding is in the stages in which the data was collected. During the beginning of the school term children are still developing their peer associations. School class rotation policy may also mean that the children may not have been together before and although they may still have friendships established outside of their current class the long Christmas holiday break may have caused associations to be lost. Scores for peer acceptance in games and sport may show high results as the children have had insufficient time to develop friendships or form peer groups at this early stage. With time the children may have had the opportunity to establish friendships and be more aware of classroom and peer group acceptance. This may have provided a more accurate assessment of where they belong in the overall picture of peer acceptance, specifically in sports and games. It is also interesting to note that of all the CAPA subscales the peer acceptance in sports and games is linked closer to self-perceptions rather than the liking or enjoyment of physical activity. This being the case research shows that self-perceptions
decline over time giving a reasonable explanation to the children’s decrease in mean scores. According to Salmivalli and Issacs (2005) self-perception changes can take time to eventuate. They propose, however, that peer perceptions can change more rapidly often resulting in a negative change.

It is important to note that the questionnaire was designed to ensure that children answered questions about overall peers rather than just focusing on one special or particular friend. There were also a number of related questions for provisions of a general understanding of the children’s answers. The questions were also randomly asked throughout the data collection so that they did not formulate similar answers consecutively.

Children’s friendships and peer groups are important to their cognitive, social, and emotional development (Cleary, Ray, LoBello, & Zachar, 2002; Xie, Li, Boucher, Hutchins, & Cairns, 2006). Therefore deciphering how peer relationships associate with physical activity levels and attraction to physical activity is an issue of discussion in children’s development. McNamara-Barry and Wentzel (2006) state that young children are less dependant on peers than adolescent children. It has been suggested that longitudinal studies may help to clarify this more and it would be interesting to see if children’s perceptions of peer acceptance not only drops but whether there are observable decreases in children’s general self concept as a result.
Importance of exercise

Results for the importance of exercise subscale revealed main effects for time and condition. The main effect for time is revealed in the total mean scores for the overall sample (pre = 3.67, post = 3.77). The main effect for condition with was contributable to the girls in the control group. This significant finding was perplexing as this was not an expected outcome. A sample question from the importance of exercise subscale was “I think exercise is very important for my health”. This form of questioning is more cognitive rather than affective in nature. It does not tap perceptions of enjoyment. One such explanation could be that the questions were closely related to class room educational messages on health and fitness and with this in mind it is impossible to identify what is happening in the classroom setting. As it was the girls from the control group that increased in their views on the importance of exercise over time it is clear that the intervention had no affect on the experimental groups.

Liking of games and sports

According to motivational theorists Harter (1978), Bandura (1977), and Nicholls (1976) the feelings of competence, pleasure, joy, and efficacy are experienced when performance or participation outcomes are positive. The results for the liking of games and sports revealed a significant main effect for condition and a significant two–way interaction effect between gender and condition. These results are interesting as there were no significant changes in mean scores for boys and girls from either group. Both group of boys decreased in their mean scores while both groups of girls increased. It is interesting to note that the boys from the experimental group had a lower mean score than the control group prior to any intervention. However over time while both groups of boys decreased the experimental group showed a greater decreased contributing to the effect for
condition. It is also interesting to note that the girls from both groups started with a higher mean score than the boys post intervention and over time both girls groups increased thus contributing to a two way interaction effect for gender and condition. The result is perplexing as it was not anticipated that boys would have a decline in their attraction to physical activity on this subscale.

Although only speculation, it is possible that the seasonal changes may have had an impact on how the children viewed games and sport. During the post intervention data collection new games and sports for the winter season had just begun. It is possible that the boys and girls were still learning the new skills involved in the new sports and made their opinions on the liking of games and sports fixed. For future studies qualitative research may be beneficial to assess behavioural aspects of children’s physical activity patterns to assist in explaining the changes over time.

_Liking of physical exertion and exercise_

Results for the liking of physical exertion and exercise revealed some interesting findings. A significant main effect was revealed for time. The total mean score for the overall sample can be explained for the main effect for time (pre = 3.24, post = 3.44). The results also found a significant two-way interaction effect for time by condition. This effect was contributable to the girls in the experimental group as this was the only group that showed a significant increase in mean scores over time. These findings could suggest that the intervention has had an impact on how girls view more liking for exertion in physical activity. It is interesting to note that the intervention has not had an effect on the boys from the experimental group. A sample question from the liking of physical exertion and exercise is “I like getting sweaty when I exercise or play hard”. This result
was positive for the girls as the trend for this age group tends to be that girls are not encouraged to use physical exertion when being physically active and are encouraged to play in a more gender appropriate manner (Coakley, 2007). Further research requires examine how to encourage boys to be more attracted to physical exertion and exercise over time.

$Liking$ of vigorous physical exercise

Results have revealed a significant two-way interaction effect for gender by condition. These results showed very similar findings to those from the liking of physical exertion and exercise with the girls from the experimental group exhibiting positive significant improvements after an intervention. Girls from the experimental group again were the only group that showed a significant increase over time. Nevertheless this is a positive finding as it was proposed that an intervention programme could contribute to encouraging outcomes for the experimental groups. The results, however, revealed that the boys from the experimental group did not show any significant changes over time. An example of the questions used for the liking of vigorous physical activity is “I think I will feel really good after I play hard”. In the same pattern as the liking of physical exertion and exercise, it is proposed that boys are already playing in this manner and that the intervention has shown that girls are now playing in the same fashion. There is an apparent lack of research into young children in their attraction to physical activity and effective interventions. Additional investigation into the CAPA and the validity of subscales in an Australian population is recommended.
Were there pre-to-post changes in children’s level of physical activity?

The intervention was designed to encourage and enhance physical activity in young children. Results have revealed a significant main effect for time. This was contributed to the combined results of boys and girls. However, the results have revealed varied differences in levels of physical activity for both groups. An expected result was found for both boys and girls from the control groups showing no increases in their level of physical activity over time. However, the boys from the experimental group reported positive changes in their level of physical activity following the intervention programme. On the other hand the girls from the experimental group showed negative changes in their level of physical activity. The intervention has shown to have a positive impact on the boys from the experimental group.

There are several possible explanations for such findings. On such explanation could be due to the seasonal changes. The pre intervention data was obtained during the summer season with plenty of day light and appropriate weather conditions for extended play times. The post intervention data was attained during the winter season with less day light and more inclement weather patterns. However, the boys from the experimental groups have showed that this is not a confounding factor. There is an increase in the amount of organised sport available to boys during the winter season. Soccer, Australian Rules football and rugby are just a few examples. Although these sports are predominately male orientated is it important to note that provisions are made for girls to participate in these sports. It may be that peer influences may affect why girls do not participate in these sports. Winter sports for boys have higher step counts during the game and young children tend to play organised sport in a more unstructured manner rather than waiting in the specific game structured position. Young children “flock” to the ball rather than play positional. This being the case boys may execute higher numbers of step counts
during a regular game. Young girls are often only provided with smaller options of winter activities such as netball. Netball contrasts with the male dominated sports in which court positioning is part of the rules. This being the case girls may do far less steps within a regular game of netball than a typical soccer game.

Conclusion

As positive self-concepts and attraction to physical activity are important in developing positive habitual patterns in young children’s level of physical activity findings from this study have strong implications for teachers and early childhood professionals. Increasingly they are required to respond to the demand to implement health education through the increased levels of physical activity. Understanding gender differences and the impact of peer relationships on young children can assist not only in enhancing physical activity for all but also in the enhancing of psychosocial health.

Further investigation of the determinants affecting young children’s level of physical activity warrants the need to include qualitative research to enable a more in depth approach to reasons for physical activity involvement and behavioural patterns.
This study with young children provides empirical support for many of the findings reported in the literature that relate to physical self-concept, attraction to physical activity, and level of engagement in physical activity. There also is considerable support for the views of motivational theorists that physical self-perceptions are important in a child’s intrinsic desire to interact in the contexts of play, games, and sports. Findings of sex differences in some of the variables examined also reflected those previously reported in the literature. These results provide clear implications for practice and future research.

This study had four major findings. Firstly there were sex differences in relationships among children’s self-concept, attraction to physical activity, and level of physical activity. Secondly girls and boys differ in their perceptions of peer relationships and parent relationships. Thirdly, all children, regardless of intervention in the Play 5 programme, decreased in their perceptions of peer acceptance. Lastly, the results indicated that only the girls in the intervention group increased their liking of physical exertion and their liking vigorous activity, whereas the boys did not.

It appears from this study that psycho-social processes that underlie experiences in the physical activity context might operate differently in girls than they do for boys. There is clearly a need to consider these differences when providing programmes that encourage positive self-perceptions and attitudes in physical activity, so that experiences are optimized for all children. It also is apparent, that in order to provide a clearer picture of why children do or do not engage in physical activity it is necessary to examine both self-concept and attraction to physical activity.
Implications

Teachers and child health professionals need to concentrate on the psycho-social implications of self-concept and attraction to physical activity. They should provide early intervention programmes that are specific to the purpose of increasing self-concept and attraction to physical activity in order to see development of an increase of physical activity involvement.

The sex differences found among the variables warrant the need for further exploration. Qualitative research into the affects of gender socialization would add knowledge to this area. It is recommended that any follow up research include qualitative and observational measures to provide a more accurate indication of children’s actual level of physical activity.

Finally, it is recommended that researchers continue to address the issue of declining levels of physical activity in children, not only for the sake of their physical health but for their psycho-social wellbeing. This is clear in research findings and repeatedly documented by the popular media that this is reaching crisis levels. Parents and teachers must continue to identify that the joy of participation, the friendships, and the feelings children have about themselves are important outcomes in making physical activity attractive to all children.

The findings from this study have identified some practical pathways for future research. The results from the variables examined in this study; self-perceptions, and attraction to physical activity were found to be important to the intervention and that the final results of the wider Play 5 study may reveal further components of value from designing a holistic programme.
Intervention programmes that target positive self-concept and attraction to physical activity rather than just focusing on enhancing physical activity levels should be developed.

The lack of expected findings for likely pre to post intervention changes point to the need to examine the appropriateness of relying solely on quantitative methodology such as questionnaires and pedometers without the utilization of qualitative techniques.
References


Appendix A

Information and Consent forms for school principals and parents/guardians
Appendix B

1 Self-description Questionnaire (SDQ-I).

2 Children’s Attraction to Physical Activity (CAPA)
PLAY 5: PROMOTING HIGHER LEVELS OF PHYSICAL ACTIVITY IN YOUNG CHILDREN

School Principal Information

Research suggests that in recent times Australian children have become less active and one consequence is the increase in overweight and obesity levels in young children. Together, these factors could put their health and physical development at risk. It is imperative therefore, that effective interventions and preventative strategies commence earlier rather than later.

Currently, most recommendations for sufficient physical activity levels in children are couched in adult language i.e. “at least 60 minutes”. Conceptually, this has little meaning for young children and thus the responsibility for their activity levels remains with the parent, caregivers or teacher.

For the purposes of this study, we would like to work with Year 2 children, their teachers and their parents. We are interested in guiding them to learn how to self manage and monitor their own physical activity levels – and ultimately their health. Just as they have learnt to adhere to the ‘no hat, no play’ policy, it is hoped that they could also learn to ‘be active 5 times a day’.

Given the variable nature of young children’s movement patterns, accurate measurement is difficult. This study will involve the collection of data over 3 phases. Baseline measures will be taken before, immediately after and 6 months after the intervention which take 20 weeks. The data will be collected using questionnaires, teacher checklists and student diaries. A selected group of students will also wear an activity monitor called a pedometer (this instrument is quite unobtrusive and the children find them comfortable to wear).

Would you and your school like to help us by participating in this project?

An extensive resource pack will be made available to the teachers involved in the project. It will highlight the ways in which they might be able to incorporate the ‘PLAY 5’ message into their existing school curriculum.

Your school is under no obligation to participate - but if you are willing to help us with this study, we ask you to complete the consent form below.

You can be assured that this information will be treated confidentially and that your children’s data will remain anonymous.

If you have any questions regarding this research please do not hesitate to telephone Dr Beth Hands (Project Director) on ph - 9433 0206, fax 9433 0210 or by email bhands@nd.edu.au.
Informed Consent for School Principal

I (Principal) ______________________________________________________ of
(School)______________________________________________________________

hereby consent to the children attending the school being volunteer participants in the above project.

- I have read the Information Sheet and any questions have been answered to my satisfaction. I agree that the children may participate in this study, realising that I, or the children, may withdraw at any time without prejudice.

- I understand that all information gathered is treated as strictly confidential and will not be released by the investigator unless required to do so by law.

- I agree that research data gathered for the study may be published provided the children’s name or other identifying information is not used.

Signed (Principal): ______________________________________________

Date: _______________________

The Human Research Ethics Committee at the University of Notre Dame requires that all participants are informed that, if they have any complaint regarding the manner in which a research project is conducted, it may be given to the researcher, or please contact the Dean of Research, Professor Tony Ryan, Centre for Research and Graduate Studies. 9433 0868 or tryan@nd.edu.au.
PLAY 5: PROMOTING HIGHER LEVELS OF PHYSICAL ACTIVITY IN YOUNG CHILDREN (Control school)

Parent / Guardian Information

Research suggests that in recent times Australian children have become less active and one consequence is the increase in overweight and obesity levels in young children. Together, these factors could put their health and physical development at risk. Therefore, it is imperative that effective interventions and preventative strategies commence earlier rather than later.

We are interested in developing methods to help children enjoy and value physical activity as a means to developing a healthy lifestyle. More importantly – we want to teach them how to do this for themselves!

Currently, most recommendations for sufficient physical activity levels in children are couched in adult language i.e. “at least 60 minutes every day”. Conceptually, this has little meaning for young children and thus the responsibility for their activity levels remains with the parent, caregivers or teacher.

For the purposes of this study, we would like to work with Year 2 children. Children in another school (Intervention school) will learn a number of strategies to enhance their physical activity level. Children at your school will be a comparison group. In this way we will be able to evaluate the effectiveness of the program. At the end of the research phase we will share the Play5 program with your school and your child.

Would you and your child like to help us by participating in this project?

If your child participates in the study, you will be asked to complete a questionnaire on 3 separate occasions. The first one around February/March, with a follow up questionnaire in July/August and the final questionnaire will be held February/March 2006. Your child may also be asked to wear a pedometer around their waist for a period of 7 days (except while sleeping, participating in water activities and bathing) and record their activities in a simple diary. The pedometer is quite unobtrusive and the children will find them comfortable to wear.

You and your child are under no obligation to participate but we would love to have both you and your child involved in this project. You can be assured that any information will be treated confidentially and that your child’s data will remain anonymous.

If you have any questions regarding this research please do not hesitate to telephone Dr Beth Hands on 9433 0206 during business hours.

As this is a school based project only return the form below if you do not wish your child to be involved.
PLAY 5: PROMOTING HIGHER LEVELS OF PHYSICAL ACTIVITY IN YOUNG CHILDREN

Informed Consent for Parent / Guardian

I (parent/guardian’s name)_______________________________________________

Of (address)__________________________________________________________

Hereby do not give consent for my child (insert child’s name)
_____________________________________________________________________

__________________________________________

to be a volunteer participant in the above project.

Signed: (Parent/Guardian): ________________________________

The Human Research Ethics Committee at the University of Notre Dame requires that all participants are informed that, if they have any complaint regarding the manner in which a research project is conducted, it may be given to the researcher, or please contact the Dean of Research, Professor Jennifer Nicol, Centre for Research and Graduate Studies. 9433 0846 or jnicol@nd.edu.au.
PLAY 5: PROMOTING HIGHER LEVELS OF PHYSICAL ACTIVITY IN YOUNG CHILDREN

Parent / Guardian Information (experimental)

Research suggests that in recent times Australian children have become less active and one consequence is the increase in overweight and obesity levels in young children. Together, these factors could put their health and physical development at risk. Therefore, it is imperative that effective interventions and preventative strategies commence earlier rather than later.

We are interested in developing methods to help children enjoy and value physical activity as a means to developing a healthy lifestyle. More importantly – we want to teach them how to do this for themselves!

Currently, most recommendations for sufficient physical activity levels in children are couched in adult language i.e. “at least 60 minutes every day”. Conceptually, this has little meaning for young children and thus the responsibility for their activity levels remains with the parent, caregivers or teacher.

For the purposes of this study, we would like to work with Year 2 children. We are interested in guiding them to learn how to self manage and monitor their own physical activity levels – and ultimately their health. Just as they have learnt to adhere to the ‘no hat, no play’ policy, it is hoped that they could also learn to ‘be active 5 times a day’.

Would you and your child like to help us by participating in this project?

If your child participates in the study, you will be asked to complete a questionnaire on 3 separate occasions. The first questionnaire in February/March, a follow up in July/August and the final one in February/March 2006. Your child may also wear a pedometer (step counter) around their waist for a period of 7 days (except while sleeping, participating in water activities and bathing) and record their activities over that time in a simple diary. The pedometer is quite unobtrusive and children find them comfortable to wear.

One week after baseline information has been gathered, we will be introducing your child to the “Play 5” intervention program. Your child will be shown a range of strategies to help them increase their daily physical activity. They will be given a 24 week diary to fill out each day and we ask that you assist your child in this. We will be conducting a parent information session for you to attend to ask any questions, you will be advised of this date and time through your child’s teacher.

You and your child are under no obligation to participate but we would love to have both you and your child involved in this project. You can be assured that any information will be treated confidentially and that your child’s data will remain anonymous. If you have any questions regarding this research please do not hesitate to telephone Dr Beth Hands on 9433 0206 during business hours.

As this is a school based project only return the form below if you do not wish your child to be involved.
Informed Consent for Parent / Guardian

I (parent/guardian’s name)  

Of (address)  

Hereby do not give consent for my child (insert child’s name) to be a volunteer participant in the above project.

Signed: (Parent/Guardian):  

The Human Research Ethics Committee at the University of Notre Dame requires that all participants are informed that, if they have any complaint regarding the manner in which a research project is conducted, it may be given to the researcher, or please contact the Dean of Research, Professor Jennifer Nicol, Centre for Research and Graduate Studies. 9433 0846 or jnicol@nd.edu.au
SELF DESCRIPTION QUESTIONNAIRE (SDQ1)

Identification Number ________________________

<table>
<thead>
<tr>
<th>No always</th>
<th>No sometimes</th>
<th>Child understands sentence but does not state yes or no</th>
<th>Yes sometimes</th>
<th>Yes always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. I can run fast.
   - | | | 3 | 4 | 5 |

2. I am good looking.
   - | | | 3 | 4 | 5 |

3. I have lots of friends.
   - | | | 3 | 4 | 5 |

4. My parents understand me (Explain as “know me” for this first encounter).
   - | | | 3 | 4 | 5 |

5. I do lots of important things (Explain as “special” for this first encounter).
   - | | | 3 | 4 | 5 |

6. I like to run and play hard.
   - | | | 3 | 4 | 5 |

7. I like the way I look.
   - | | | 3 | 4 | 5 |

8. I make friends easily.
   - | | | 3 | 4 | 5 |

9. I like my parents.
   - | | | 3 | 4 | 5 |

10. I like being the way I am.
    - | | | 3 | 4 | 5 |

11. I enjoy sports and games.
    - | | | 3 | 4 | 5 |

12. I have a nice looking face.
    - | | | 3 | 4 | 5 |
13. I get along with other kids easily.
   
14. My parents like me.
   
15. I have lots of things to be proud of.
   
16. I have good muscles.
   
17. I am a nice looking person.
   
18. I am easy to like.
   
19. If I have kids I would bring them up the same way my parents raised me.
   
20. I can do things as well as most people.
   
21. I am good at sports.
   
22. Other kids think I am good looking.
   
23. Other kids want me to be their friend.
   
24. My parents and I spend a lot of time together.
   
25. A lot of things about me are good.
   
26. I can run a long way without stopping.
   
27. I have a good looking body.
28. I have more friends than most other kids.
   1 2 3 4 5

29. My parents and easy to talk to.
   1 2 3 4 5

30. I’m as good as most other people.
   1 2 3 4 5

31. I am a good **athlete** (Explain as “sports person” for this first and only encounter).
   1 2 3 4 5

32. I’m better looking than most of my friends.
   1 2 3 4 5

33. I am **popular** with kids of my own age (“liked by kids” if they don’t understand).
   1 2 3 4 5

34. I get along well with my parents.
   1 2 3 4 5

35. Other people think I am a good person.
   1 2 3 4 5

36. I’m good at throwing a ball.
   1 2 3 4 5

37. I have nice features like nose and eyes and hair.
   1 2 3 4 5

38. Most other kids like me.
   1 2 3 4 5

39. My parents and I have a lot of fun together.
   1 2 3 4 5

40. When I do something, I do it well.
   1 2 3 4 5

Time for a break..................................................................................................................
**Children’s Attitude to Physical Activity Scale (CAPA)**

*Modified for K 1 – 3*

<table>
<thead>
<tr>
<th>No Always</th>
<th>No Sometimes</th>
<th>Yes Sometimes</th>
<th>Yes Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Eg. I like to eat ice cream more than anything else.

| 1 | 2 | 3 | 4 |

1. I like playing outdoor games and sports.

| 1 | 2 | 3 | 4 |

2. I like getting sweaty when I exercise or play hard.

| 1 | 2 | 3 | 4 |

3. I have more fun playing games and sports than anything else.

| 1 | 2 | 3 | 4 |

4. I like to exercise lots.

| 1 | 2 | 3 | 4 |

5. I am told that I am good at games and sports.

| 1 | 2 | 3 | 4 |

6. I feel really tired after I play games and sports.

| 1 | 2 | 3 | 4 |

7. I get nervous and worried about playing games and sports.

| 1 | 2 | 3 | 4 |

8. I get teased by other kids when I play games and sports.

| 1 | 2 | 3 | 4 |

9. I think that the more exercise you get, the better.

| 1 | 2 | 3 | 4 |

10. I make a lot of friends when I play games and sports.

| 1 | 2 | 3 | 4 |

11. I enjoy exercise a lot.

| 1 | 2 | 3 | 4 |
12. I try to stay in good **shape**. (Explain as having a good looking body)
   
   | 1 | 2 | 3 | 4 |

13. I wish I could play more games and sports.
   
   | 1 | 2 | 3 | 4 |

14. I think that I will feel really good after I play hard.
   
   | 1 | 2 | 3 | 4 |

15. I don’t mind getting out of breath after I play hard.
   
   | 1 | 2 | 3 | 4 |

16. I think it is very important to always be in good shape.
   
   | 1 | 2 | 3 | 4 |

17. Playing games and sports is my favourite thing.
   
   | 1 | 2 | 3 | 4 |

18. I really like to run a lot.
   
   | 1 | 2 | 3 | 4 |

19. I think exercise is very important for my **health**. (Explain as being well & strong)
   
   | 1 | 2 | 3 | 4 |

20. I look forward to playing games and sports.
   
   | 1 | 2 | 3 | 4 |

21. I like to burn lots of energy by playing hard.
   
   | 1 | 2 | 3 | 4 |

22. I think that exercise is the most important thing for god health.
   
   | 1 | 2 | 3 | 4 |

23. I really like to exercise.
   
   | 1 | 2 | 3 | 4 |

24. I feel good when I run hard.
   
   | 1 | 2 | 3 | 4 |

25. I am popular when I play games and sports.
   
   | 1 | 2 | 3 | 4 |
With a partner, stand facing one another in the middle of 2 lines (or agreed markers).

Take it in turns at saying “duck”.

Once someone says "goose" the other person must turn and run to an agreed upon line without being tagged by the person who said “goose”.

Go back to the middle and have another go!
DUCK.....DUCK.....GOOSE

Duck....

......Goose

Run

Run

Run

Run
Two players hold the loop of elastic around their legs and the jumper plays in the middle.

Start with the elastic around the ankles

Player jumps inside the loop, jumps outside the loop, jumps on the loop, then jumps off and outside the loop without tripping. The holders then move the elastic up the knees, then the thighs.

**VARIATION - Wiggly elastics**

Played like fantastic elastics but the holders make the loop wiggle by plucking it with their fingers
FANTASTIC ELASTICS
Hopscotch is a hopping game that can be played on the ground or on a floor indoors.

Use chalk to draw a hopscotch pattern on the ground or use masking tape on a floor.

Number each square (the example has 8)

Each player has a marker such as a beanbag, shell, button, etc. The first player stands behind the starting line and throws their marker in square 1.

Hop over square 1 to square 2 and then continue up to square 8, turn around, and come back again. Stop in square 2 to pick up the marker, hop in square 1, and then out. (Hop in the single squares, jump into the double squares – 1 foot in each square)

If playing with two or more players, the second player has a turn.

Continue by throwing the stone in square 2. (A player must always hop over any square where the marker is).
VARIATION

Sometimes a dome-shaped "rest area" is added on one end of the hopscotch pattern where the player can rest before hopping back through.
Draw a grid on the ground. One player is a naught (O), the other is a cross (X).

Both players take it in turns at placing a body part (hand, foot, elbow, knee, bottom...) into a square, trying to get three body parts in a line.
NOUGHTS AND CROSSES
The leader “Queenie”, stands with his/her back to the players and throws a ball over his/her head. If a player catches the ball without it bouncing, they become “Queenie”. If the ball bounces first, the player who gets it hides it behind their back. Players then call out “Queenie, queenie, who’s got the ball?”. Queenie than has 3 tries (or more if you want) to guess who has the ball. If Queenie guesses correctly, he or she has another turn. If not, the player hiding the ball becomes Queenie.
QUEENIE

Queenie, Queenie who’s got the ball?
Two players hold the rope and everyone else takes it in turn to skip.

Bumper car, bumper car
Number forty-eight
Whizzed around the coooooorner
Skipper leaves the rope and runs around one end and back in.
And slammed on the brakes
Skipper traps the rope between their legs then moves both to one side of rope ready to skip again
Brakes didn’t work
Slid down the hill
Landed in the duck pond
And then stood still.
How many fish can you see?
Skipping starts again
One, two, three, four, five,....
Skipper with the highest number of fish before tripping wins the game.
VARIATION

All in together, this fine weather

I spy Jack, peeping though a crack

One two three, busy, busy, bee

Nineteen twenty, leave the rope empty

January, February, March, April, May, June, July, August,
September, October, November, December

Two players hold the rope. Everyone else skips, jumping out on the birthday month.