

RESPONSIBILITY FOR CHILDREN'S PHYSICAL ACTIVITY

Keri-Michele Cox

A thesis submitted to the Auckland University of Technology in
fulfilment of the degree of Doctor of Philosophy

2012

School of Sport and Recreation

Primary Supervisor: Grant Schofield

Table of Contents

Table of Contents	i
Attestation of Authorship	vi
Co-authored Works	vii
Research Outputs	viii
List of Tables	x
List of Figures	xi
Abbreviations	xii
Acknowledgements	xiii
Abstract	xv
CHAPTER ONE - INTRODUCTION.....	1
Background	1
Benefits of Physical Activity for Children	2
Recommended Physical Activity Levels for Children	10
Measurement of Children’s Physical Activity Levels.....	14
Physical Activity Prevalence in Children	22
Settings for Changing Children’s Physical Activity Levels	27
Responsibility for Children’s Physical Activity	37
Thesis Rationale	57
Conceptual Approach	62
Thesis Delimitations	73
Thesis Organisation	75

CHAPTER TWO – PEDOMETER STEPS IN PRIMARY SCHOOL-AGED

CHILDREN	78
Preface	78
Abstract	82
Introduction	83
Methods	86
Results	88
Discussion	93

CHAPTER THREE – RESPONSIBILITY FOR CHILDREN’S PHYSICAL

ACTIVITY	98
Preface	98
Abstract	100
Introduction	101
Methods	103
Results	105
Discussion	113

CHAPTER FOUR – ATTRIBUTION OF RESPONSIBILITY FOR CHILDREN’S

PHYSICAL ACTIVITY	117
Preface	117
Abstract	118
Introduction	119
Methods	121
Results	123
Discussion	131

CHAPTER FIVE – RESPONSIBILITY IN FOOTBALL FOR CHILDREN’S

PHYSICAL ACTIVITY	135
Preface	135
Abstract	136
Introduction	136
Methods	142
Results	144
Discussion	157
CHAPTER SIX – GENERAL DISCUSSION.....	162
Summary	162
Significance of Findings	164
Limitations	168
Future Directions	170
Conclusions	173
References	176
Appendix A : Published Journal Articles	194
Appendix B : Ethics Approval (Chapter 3 & 4)	208
Appendix C : School Contact Letter (Chapter 3 & 4)	209
Appendix D : School Consent Form (Chapter 3 & 4)	210
Appendix E : Parent & Participant Information & Consent Sheet (Chapter 3 & 4)	211
Appendix F : Child Assent Form (Chapter 3 & 4)	214
Appendix G : Focus Group Questions (Chapter 3 & 4)	216
Appendix H : Ethics Approval (Chapter 5)	220
Appendix I : Participant Information Sheet (Chapter 5)	221

Appendix J : Participant Consent Sheet (Chapter 5)223
Appendix K : Interview Schedule (Chapter 5)225

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.



Keri-Michele Cox

Co-authored Works

Chapter 2-5 of this thesis are comprised of scientific papers that are either published or under review. The percentage contribution of each author is presented below.

Chapter Two: Pedometer Steps in Primary-School Aged Children

Keri-Michele Cox.....	80%	
Grant Schofield	10%	
Gregory Kolt	5%	
N. Greasley	5%	

Chapter Three: Responsibility in Children's Physical Activity

Keri-Michele Cox.....	85%	
Grant Schofield	10%	
Gregory Kolt	5%	

Chapter Four: Attribution of Responsibility for Children's Physical Activity

Keri-Michele Cox.....	85%	
Grant Schofield	10%	
Gregory Kolt	5%	

Chapter Five: Responsibility in Football for Children's Physical Activity

Keri-Michele Cox.....	80%	
Grant Schofield	10%	
Geoff Dickson	10%	

Research Outputs

Listed below are the peer-reviewed publications and conference presentations that have resulted from this thesis, in addition to the publications currently under review. The original published versions of all the papers are presented in Appendix A.

Peer-reviewed Publications

Cox, M., Schofield, G., & Dickson, G. (2012). Taking responsibility for children's physical activity: Institutional norms in football. *Sport Management Review* [In Submission].

Cox, M., Schofield, G., & Kolt, G.S. (2011). The attribution of responsibility for children's physical activity. *Asia-Pacific Journal of Health, Sport and Physical Education* [Under Review].

Cox, M., Schofield, G., & Kolt, G.S. (2010). Responsibility in children's physical activity: Parental, child, and teacher perspectives. *Journal of Science and Medicine in Sport*, 3(1), 46-52.

Cox, M., Schofield, G., Kolt, G.S., & Greasley, N. (2006). Pedometer steps in primary school-aged children: A comparison between school-based and out-of-school activity. *Journal of Science and Medicine in Sport*, 9(1-2), 91-97.

Cox, M., Schofield, G., Greasley, N., & Kolt, G.S. (2005). [Abstract] Home and school pedometer steps in primary school-aged children. *Journal of Science and Medicine in Sport*, 8(Suppl. 4), 144.

Conference Presentations

Cox, M., Schofield, G., Greasley, N., & Kolt, G.S. (2005). *Home and school pedometer steps in primary school-aged children*. Paper presented at the Australian Conference of Science and Medicine in Sport. Melbourne, Australia.

List of Tables

Table 1 – 1.	NASPE (2004) physical activity guidelines for children 5-12 years	11
Table 1 – 2.	Schematic presentation of Tudor-Locke et al. (2008) potential steps per day youth zone groupings and associated descriptive categories.....	14
Table 1 – 3.	Subjective measures used to assess children’s physical activity.....	16
Table 1 – 4.	Objective measures used to assess children’s physical activity.....	18
Table 1 – 5.	IOC recommendations for NSO promotion of children’s physical activity	36
Table 2 – 1.	Means and standard deviations for daily steps by sex and year level.....	89
Table 2 – 2.	Mean in-school and out-of-school steps for males, females, and total sample	90
Table 2 – 3.	Significant differences in mean daily steps by year level and location	92
Table 3 – 1.	Categories of personal responsibility in children’s physical activity...	107
Table 3 – 2.	Categories of parental responsibility in children’s physical activity ...	109
Table 3 – 3.	Categories of third party responsibility in children’s physical activity.....	112

List of Figures

Figure 1 – 1. Overview of thesis organisation	77
Figure 2 – 1. In-school and out-of-school steps for each school year level	91
Figure 2 – 2. In-school and out-of-school steps for the most and least active groups	93

List of Abbreviations

BMI	Body Mass Index
FIFA	Fédération Internationale de Football Association
IOC	International Olympic Committee
MVPA	Moderate-to-Vigorous-Intensity Physical Activity
NASPE	National Association For Sport and Physical Education
NFA	National Football Association
NGO	Non-Governmental Organisation
NSO	National Sport Organisation
RST	Regional Sports Trust
SES	Socioeconomic Status
SPARC	Sport and Recreation New Zealand
SNZ	Sport New Zealand
UEFA	Union of European Football Associations
WHO	World Health Organization

Acknowledgements

This research in this thesis was funded by the Division of Sport and Recreation, Auckland University of Technology. Financial support from a Faculty of Health PhD Scholarship during the first two years of full-time study is also gratefully acknowledged.

Ethics approval for the studies described in Chapters 3 and 4, and Chapter 5 were obtained from the Auckland University of Technology Ethics Committee (05/180) on 12 September 2005 and 8 July 2008 respectively (08/136). The ethics approval for the study in Chapter 2 has not been included, as the data was inherited from an abandoned study by a student who left the university.

I would like to express my sincere thanks and appreciation to the people who have made the completion of this thesis possible under the trying circumstances of studying remotely from Switzerland and in conjunction with a demanding work schedule:

To Prof Grant Schofield - the best primary supervisor anyone could be lucky enough to find – for his guidance, support, positivity, and patience. And for always keeping me believing that I could get to the finish line despite my outside commitments.

To Prof Geoff Dickson for his valued contribution and expertise in the latter stages of my research and for also being a huge support in terms of motivation and focus on the task at hand. For guidance and input in the earlier stages of my studies, particularly in relation to the preparation of publications, I would like also to thank Prof Gregory Kolt.

Last but not least, I would like to thank my family (Roy, Barbara, Tara, Craig and Urs) for continually ‘reinforcing’ how important my studies are and for their on-going support and encouragement. And to my much loved niece, Trinity and nephew, Lawson – this is all about your future so I dedicate this thesis to you.

Abstract

As a consequence of the potential individual and social benefit associated with children being physically active, many large scale physical activity campaigns have been developed and implemented with the purpose of increasing children's physical activity. By nature of the wording of the key messages in many of these campaigns, an underlying notion of personal responsibility is implied in changing physical activity behaviour. However, despite responsibility being the predominant message also in wider health campaigns, there is little research on what constitutes responsible behaviour in relation to children's physical activity. Furthermore, research suggests that a lack of clarity exists as to who exactly is responsible for children's physical activity, in both in- and out-of-school environments. The overall aim of this thesis was therefore to explore the perception and attributions of responsibility for children's physical activity in key influencers over children's physical activity behaviour. Three studies were conducted to achieve this aim: a preliminary quantitative study investigating in- and out-of-school pedometer steps in primary school-aged-children, followed by a descriptive qualitative study investigating children's, parents', and teachers' perceptions and attributions of responsibility for children's physical activity, and lastly a further descriptive qualitative study with leaders of National Football Associations (NFAs) exploring the position of their organisations in relation to responsibility for children's physical activity.

The preliminary study provided the first pedometer-based measures of primary school-aged children in New Zealand. Yamax Digiwalker SW-200 pedometers were worn over a three-day period by a sample of 91 Auckland-based children aged between 5-11 years to record school-based and out-of-school steps. Mean daily steps for the overall sample

were 14,333. Mean daily steps for boys (15,606) and girls (13,031) were similar to other studies in New Zealand (Duncan, Schofield, & Duncan, 2006), with the former group's steps being significantly higher than the latter. With the exception of Year 5 boys, mean steps were higher with increasing school year for both boys and girls. Most notably however, steps taken out-of-school made up the highest proportion of daily steps (52.4%), with the most active third of the sample completing significantly more steps out-of-school (57.1%) than their least active counterparts (46.8%). There was no significant difference between the most and least active groups in their steps taken during school hours, suggesting that physical activity undertaken in after-school hours is a key contributor to children's overall physical activity levels.

With the finding in the first study highlighting the importance of key influences over children's physical activity behaviour in the out-of-school environment, parents along with teachers and children were included in the first main study of the thesis examining their perspectives on the meaning of responsibility in children's physical activity. Eight focus groups, comprising children aged 11-12 years (four groups; n=32), their parents (two groups; n=13), and teachers (two groups; n=15) from two upper primary (intermediate) schools in Auckland, New Zealand were conducted, with ensuing transcripts being analysed thereafter using thematic induction methodology. The first reported analysis of this data revealed a number of commonly identified behaviours indicative of personal, parental, and third party responsibility for children's physical activity. These behaviours formed natural groups with common themes that were mostly not affected by socio-economic status or gender, and often linked to established correlates of children's physical activity such as healthy diet, access to facilities/programmes/equipment, fewer perceived barriers, intention to be active, support from others including parents, and use of active transport. One key area where

there was disagreement between the socio-economic groups was in the importance placed on parents being good role models – an area where research is also indeterminate. Low decile children were less likely to refer to importance of their parents being physically active, which combined with low decile parents frequently mentioning the sacrifices they must make to ensure their children are physically active and their reluctance to encourage children into activities they could not provide logistic and financial support for, it may mean that children recognise this parental dilemma and instead place more importance on parents prioritising their children's physical activity needs.

After determining that responsibility is indeed a concept that can be related to children's physical activity, the second interpretation of the first main study of the thesis explored the attribution of responsibility by the parental, child, and teacher groups. The results highlighted that children and their parents attribute primary responsibility internally for the physical activity behaviour of children, while teachers see this more as a shared responsibility with parents. All groups readily accepted that they play a part in ensuring children are physically active, with the Government being seen as a key determinant in whether their respective responsibilities could be fulfilled. Given their potential to help impact on children's physical activity levels in the after-school period, National Sports Organisations (NSOs) were surprisingly rarely attributed responsibility for children's physical activity. This finding in particular was significant in light of the New Zealand Government's recent policy leaning towards more direct support of schools and organisations within the community (such as NSOs) which provide children with access to opportunities for physical activity and sport.

Given the proposal of the Government to work more closely with NSOs in order to get children more physically active, the second major study of the thesis was also timely in that it explored the position of National Football Associations (NFAs), as organisations which could significantly impact on the after-school activity levels of children due to their reach and low barriers to accessibility, in taking responsibility for children's physical activity. Using the framework provided by institutional theory, this study aimed to develop greater insight into the current norms, beliefs, values and underlying sources of resistance that impact on football organisations increasing their involvement in the physical activity agenda. Thematic induction methodology was used to analyse transcripts from semi-structured interviews with key decision makers in eight NFAs from around the world. The findings suggested that while the awareness of the importance of engaging in initiatives related to children's physical activity is growing, there are significant institutional barriers preventing strong NFA involvement in this area – the main one being the focus on elite versus grassroots football as a result of the perception of a legitimate NFA being one that is highly successful through the internationally credible performance of its national teams. Such findings will be helpful in the design of strategies for ensuring maximal uptake and benefit of support provided to NSOs by government entities for increasing children's physical activity levels.

Taking into account the main limitation of this study relating to the sample size and representation in each of the three constituent studies, the results presented in this thesis highlighted the important concept of shared responsibility, that is, all agents who have a role in ensuring children are physically active accepting and meeting their respective responsibilities, particularly in the out-of-school environment which was identified in this study as critical for the overall physical activity levels of children. This study identified the individuals and organisations deemed responsible for ensuring children

are physically active and the types of behaviour that are considered responsible for each of the key stakeholders accordingly. The findings also highlighted that while all of these groups are willing to accept responsibility for the physical activity behaviour of children under their care, the Government was seen as having a critical enabling role for schools and parents, in turn reinforcing the importance of providing more direct support to schools, sporting and community organisations that offer opportunities for children to engage in physical activity behaviour.

This thesis also offered an explanation of the potential barriers that may exist for sporting organisations (NFAs in this case) potentially working alongside government agencies and community organisations to raise the physical activity levels of children. For football organisations, a strong institutional norm that equates legitimacy with successful national teams helps to preserve the focus on elite football and hinders a wider and increased uptake of programmes and initiatives that could potentially assist in the achievement of organisational goals and also in substantially increasing the physical activity levels of children.

In closing, the scope of this thesis was therefore vast, utilising both quantitative and qualitative methodologies, different conceptual frameworks, and participant groups ranging from New Zealand children aged 5-13 years to key decision makers in the biggest NFAs in the world. As well as its practical application to the new sport and physical activity policy environment in New Zealand, this research offers a new contribution to the body of literature in both physical activity and sport. The application of institutional theory to physical activity and general health behaviours is new, and based on the clear findings in this study, very appropriate for use in the future. Additionally, although corporate social responsibility has been a widely investigated topic in football and sport in general, the specific exploration of NFA responsibility for

children's physical activity is also a new application and provides more understanding for both NFA and those agencies such as government entities looking to partner with them to increase children's physical activity levels on potential issues that they may face in doing so.

CHAPTER 1

INTRODUCTION

Background

Physical activity for adults is commonly defined as the movement of large skeletal muscles resulting in energy expenditure (Caspersen, Powell, & Christensen, 1985). With most research in the physical activity area focusing on repetitive use of large muscle groups in endurance type physical activities such as walking and cycling (US Department of Health and Human Services, 1996), it is important to note that children have considerably different movement and physical activity behavioural patterns to adults. Typically children engage in intermittent and spontaneous activity rather than lengthy and sustained bouts of physical activity, provided through active play, physical education in the school environment, organised and non-organised sport, transport-related activity, chores and other incidental activities (Pangrazi, Corbin, & Welk, 1997). As children grow older, a shift away from informal active play towards the types of physical activity performed by adults occurs alongside corresponding changes in physical development, independence and the social environment (Salmon & Timperio, 2007).

For both child and adult populations, physical inactivity has become a global issue with the World Health Organization (WHO) classifying insufficient physical activity as the fourth leading risk factor for global mortality from non-communicable diseases and responsible for 5.5% of all deaths (WHO, 2009; WHO, 2011). On a domestic level, physical activity also has a key role to play in reducing the social and economic impact of disease. In New Zealand, physical inactivity is 7th in the top 20 causes of death by risk factor in New

Zealand (Tobias, 2004), contributing to 2,600 deaths and is second only to smoking as a negative health behaviour (Ministry of Health, 2003a). It is conservatively estimated that a 5% increase in physical activity could result in health savings of NZD \$25 million, with \$160 million saved if all New Zealanders were active in sport (Sport and Recreation New Zealand (SPARC), 2003a).

Research focused specifically on young people indicates that the current situation in relation to physical inactivity may only become more serious. Scientific evidence suggests that patterns of sedentary behaviour potentially track into adulthood (Biddle, Pearson, & Ross, 2010), and furthermore that the physical activity levels of young people moving from childhood through to adolescence appear to be declining (Nader, Bradley, & Houts, 2008). With studies already showing that physical inactivity is adversely affecting the health and health trajectory of young people (Janssen & Leblanc, 2010), it is clear that the attainment of sufficient levels of physical activity is required for children to be conferred with a wide range of associated physical, psychological and social benefits that in turn will contribute to the wider scale prevention of non-communicable diseases and their significant burden on society.

Benefits of Physical Activity for Children

While an inverse relationship between all cause mortality and physical activity is present for all age groups and populations in different countries (Bauman et al., 2002), there is little direct evidence linking physical activity to improved childhood health outcomes (Department of Health, 2004). Chronic, lifestyle diseases, such as cancer, osteoporosis, diabetes and cardiovascular disease are rarely evident in children, as these types of diseases

require long incubation periods (Biddle, Gorely, & Stensel, 2004). Although normal markers for morbidity and mortality may therefore not be present in children, they can exhibit high levels of a range of risk factors for diseases which can be used as an indication of association instead (Salmon & Timperio, 2007). However, it must be acknowledged that the use of risk factors such as low bone density, obesity, and adverse lipid profiles may provide a less robust analysis. Combined with the increased difficulty in measuring children's physical activity, weaker relationships may be produced than would be when examining directly the relationship between physical activity behaviour and the actual disease itself (Boreham & Riddoch, 2001).

In spite of these problems, the general conclusion is that it is beneficial to promote physical activity in children (Biddle, Gorely, & Stensel, 2004). Key areas where research has identified potential benefit for children being sufficiently physically active relate to obesity, bone health, cardiovascular and metabolic health, psychosocial outcomes, injury risk, and tracking of activity levels into adulthood.

Obesity

One of the most commonly cited benefits of physical activity is its potential role in reducing the increasing worldwide prevalence of childhood obesity (Wang & Lobstein, 2006). In the United States, the percentage of young people who are overweight has doubled since 1980 (National Centre for Chronic Disease Prevention and Health Promotion, 2004), with approximately 11% of youth presently being considered overweight or obese in the United States (Vincent et al., 2003). The corresponding figures in Australia are reported as being between 19% and 23% (Vincent et al., 2003), and in several Western

European countries the prevalence rose from around 10% in the early 1980s to around 20% by the end of the 1990s (WHO, 2005).

In New Zealand, a study of Hawkes Bay children aged 11-12 years showed a doubling in the percentage of overweight children, and a quadrupling of obese children between 1989 and 2000 (Turnbull et al., 2004). Results from the National Children's Nutrition Survey 2002 (Ministry of Health, 2003b) also showed that 21.3% of children in New Zealand between the ages of 5 and 15 were overweight, and a further 9.8% were obese. These findings were relatively consistent with the results of the National Survey of Children and Young People's Physical and Dietary Behaviors in New Zealand 2008/09 where the combined prevalence of overweight and obesity for five to 24-year olds was 36% (Ministry of Health, 2010).

Evidence suggests that obese children are less physically active than their peers (Colley et al., 2011), although as most of the studies in this area are cross-sectional, it is difficult to ascertain whether physical inactivity is a cause or consequence of obesity (Kurpad, Swaminathan, & Bhat, 2004). While longitudinal studies undertaken with adults have found links between low energy expenditure and obesity in adults (Weinsier et al., 2002), the relationship in children is less clear, with some studies comparing obese and non-obese children showing higher physical activity levels in non-obese children, and others showing little or no relationship (US Department of Health and Human Services, 1996).

The mixed results of these studies make it unclear as to whether physical inactivity is causally related to childhood obesity. However, a number of trends would suggest that it

would be sensible to promote physical activity behaviour in youth in an attempt to reduce the prevalence of obesity in children before intervention studies confirm whether or not physical inactivity plays a key role in the development and maintenance of obesity: the first relates to the much higher probability that the increase in obesity on a worldwide scale has resulted from changes in diet and exercise rather than in the gene pool (Goran & Treuth, 2001); and the second to the significantly lower energy expenditure of children now as opposed to 50 years ago (Durnin, 1992).

Bone health

There is a growing body of evidence to suggest that physical activity in childhood may also be linked to increases in bone density, thereby preventing osteoporosis later in life (Warden et al., 2007). Studies of young athletes engaged in weight bearing activities (for example, jumping, walking, and weight lifting) across a range of sports have demonstrated augmented bone mass compared to their non-athletic peers (Mathews et al., 2006; Vicente-Rodriguez et al., 2003) and increases of up to 30% (but more typically between 5 and 15%) in bone density due to weight bearing physical activity (Bass, 2000).

While more research is required on the optimal type and volume of physical activity for maximising bone health in children is required, it is probable that activities involving high strain, developed rapidly and distributed unevenly throughout movement (for example, aerobics, volleyball, basketball and racket sports) are most osteogenic (Lanyon, 1996). With a significant element of high impact provided being provided by skipping, chasing, and climbing, it would therefore suggest that the natural play activities of children may be optimal for health (Boreham & Riddoch, 2001).

In light of approximately one quarter of final adult bone being accumulated during the two years surrounding peak bone velocity (13.5-14 years in boys and 12.5 years in girls), Bass (2000) suggested that the early pubertal period may provide a window of opportunity when the bone is most responsive to physical activity, due to the optimum amounts of growth hormone present during this time. Physical activity therefore appears to be an essential stimulus for bone structure, potentially increasing peak bone mass in children within the limits set by genetic, nutritional and hormonal differences and accordingly reducing the risk of osteoporosis and associated fractures longer term (Boreham & Riddoch, 2001).

Cardiovascular and metabolic health

In addition to benefits relating to bone health in children, current scientific literature suggests that lower levels of physical activity are associated with higher levels of hypertension and cardiovascular risk factors, including increased instances of metabolic syndrome (Mountjoy et al, 2011).

While little effect on blood pressure has been found in studies examining the impact of exercise training interventions of normotensive youth, positive effects have resulted from prolonged programmes involving hypertensive youth (Andersen et al., 2006; Bell et al., 2007; Kelley, Kelley, & Tran, 2003). With further observational studies noting a relationship between blood pressure and aerobic fitness levels (Andersen, 1994; Nielsen & Andersen, 2003), it can be concluded that blood pressure in youth can be effectively reduced by physical activity of at least 30 minutes in duration, three times per week at an intensity sufficient enough to increase aerobic fitness (Mountjoy et al, 2011). Additionally, studies of the relationship between blood lipid levels and physical activity in young people

(Andersen, 1994; Bell et al., 2007; Janssen & Leblanc, 2010) suggest that a minimum of 40 minutes per day, five days per week over a duration of at least four months is required to achieve noted improvements in lipid and lipoprotein levels.

Hypertension and increased levels of inflammatory markers, as well as abdominal obesity and Type II diabetes, belong to a constellation of risk factors for cardiovascular disease or metabolic syndrome. A close link has been found between metabolic syndrome and lower levels of physical activity in youth (Pan & Pratt, 2008) along with improvements in aspects of metabolic syndrome with increased physical activity in both obese and non-obese youth (Rizzo et al., 2007). This suggests physical activity can potentially play a key role in reducing the increasing prevalence of metabolic syndrome elements currently existing in between 3-14% of the youth population (Weiss et al., 2004).

Injury risk

Alongside prevention of other physical health problems, adequate levels of physical activity also lower the risk of injury in sport that may result over time from a lack of physical fitness (Comstock et al., 2006). Lack of physical fitness is linked strongly to sports injury and young people (Smith, Andrish, & Micheli, 1993) and has been identified as a potentially modifiable risk factor (Emery, 2005). Correspondingly, a decline in sports injuries, particularly in the previously less active participants, was demonstrated in a series of studies in which young people in the Netherlands were exposed to a fitness education and classroom training programme (Collard et al., 2009; Collard et al, 2010).

Psychosocial outcomes

Physical activity is also generally thought to have psychosocial benefits for children, including self-esteem, mood, moral behaviour, and cognitive functioning. However, the research in this area is not extensive and conclusions have been drawn mainly from findings with adults and adolescents (Biddle, Gorely, & Stensel, 2004). Large scale studies of adolescents (Hendry, Shucksmith, & Cross, 1989; Steptoe & Butler, 1996) have found a positive association between emotional well-being and participation in vigorous recreation and sport, and a positive relationship between physical activity and anxiety reduction was reported in another meta-analysis (Petruzzello et al., 1991). While one study also showed a relationship between physical activity and reduction in depression (North, McCullagh, & Tran, 1990), effect sizes were lower for under 18s than for all ages, suggesting that mental benefits are slightly less for younger people. The beneficial effects of physical activity on reducing anxiety and depression are however comparable with psychosocial interventions (Larun et al., 2006).

Of those studies conducted with young people, one review concluded that those who are physically active are less likely to suffer problems relating to mental health (Murtie & Parfitt, 1998). The review also summarised that physical activity is related to positive mental health outcomes, in particular for self-esteem which was reinforced in a later study by Ekeland et al (2004). In turn, through its effects on mental health, physical activity may then increase children's capacity for learning. Reviews of physical activity and cognitive functioning (Keeley & Fox, 2009) have provided evidence that improved cognitive performance, classroom behaviour, and academic achievement in young people can be linked to routine physical activity, although the associations are generally small.

Furthermore, academic performance is not affected by the additional time allocated to physical activity at the expense of academic class time.

As well as promoting mental health, physical activity may enhance social well-being among children. Skills such as teamwork, self-discipline, sportsmanship, leadership, and socialisation can be developed through participation in physical activity programmes and sport (National Centre for Chronic Disease Prevention and Health Promotion, 2000). Studies have also shown that children who participate school sport are more likely to stay in school, to have good conduct and high academic achievement (Zill, Nord, & Loomis, 1995), and are less likely to be regular or heavy smokers or users of drugs (Escobedo et al., 1993).

Tracking of physical activity levels into adulthood

Taking into account the positive benefits associated with children being more physically active, it is logical to ascertain whether childhood activity and physical patterns are linked to those in adulthood. The small number of studies examining this issue have collectively found that while physical activity appears to track over periods of three to five years, there is little evidence of tracking over longer periods of time (Trost & Pate, 1999). However, a study by Telama et al (1997) showed childhood physical inactivity patterns tracking into adulthood (Telama et al., 1997). A later study of more than 1500 Finnish children and adolescents (Telama et al., 2005) also found that those who were persistently more active were significantly more likely to be active as adults even though physical activity declined in general over a 21-year period – a trend commonly found in longitudinal studies focusing on levels of physical activity (Sallis, 1998). While the lack of a confident linkage between

physical activity in childhood and adulthood means there is a clear need to promote physical activity throughout the lifespan, it is also important that children, and those who are in varying capacities responsible for them (such as parents, teachers and medical practitioners), are additionally informed of how much physical activity children should be undertaking for their health and well-being.

Recommended Physical Activity Levels for Children

General recommendations

Prior to the 1990s, guidelines for adults were generally used to determine whether children's physical activity levels were adequate (President's Council on Physical Fitness and Sports, 2004). In line with the 1996 United States Surgeon General's Report on Physical Activity and Health (US Department of Health and Human Services, 1996), 30 minutes of moderate activity on most, preferably all, days of the week was adopted as the recommended standard for children's physical activity in most countries, including New Zealand (SPARC, 2005).

In 1998, the National Association for Sport and Physical Education (NASPE) (NASPE, 1998) and the Health Education Authority in the United Kingdom (Health Education Authority, 1998) developed further physical activity guidelines for children aged 5-12 years. NASPE revised their physical activity guidelines for children (NASPE, 2004) in 2004 to reflect the statements shown in Table 1 – 1.

Table 1 – 1. NASPE (2004) physical activity guidelines for children 5-12 yrs.

1. Children should accumulate at least 60 minutes, up to several hours, of age-appropriate physical activity on most if not all days of the week. This daily accumulation should include moderate and vigorous physical activity with the majority of time being spent in activity that is intermittent in nature.
2. Children should participate in several bouts of physical activity lasting 15 minutes or more each day.
3. Children should participate each day in age-appropriate physical activities designed to achieve optimum health, wellness, fitness, and performance benefits.
4. Extended periods of inactivity (periods of two or more hours) are discouraged for children, especially during the daylight hours.

Guidelines have subsequently been developed in many countries including the UK (Department of Health, 2004), Australia (Commonwealth of Australia Department of Health and Ageing, 2004), and New Zealand (Ministry of Health, 2007) which are mostly consistent with the recommendation of at least one hour of Moderate-to-Vigorous Physical Activity (MVPA) each day for children, whether this be through continuous activity or intermittent throughout the day. A systematic review of over 850 articles and papers has also reinforced the importance of school-aged youth participating in 60 minutes or more of MVPA daily that is developmentally appropriate, enjoyable and involves a variety of activities (Strong et al., 2005). There has also been increased support for children accumulating physical activity in shorter bouts of 10 minutes or more (Department of Health, 2004). In addition to reflecting children's natural activity patterns, this may help them to become more active in the long term without losing any of the positive effects generated by a single bout of longer activity equivalent in volume. This is important as the

protective effect of physical activity is transient and benefits are lost if physical activity is not maintained (Department of Health, 2004).

Many guidelines have also addressed the issue of reducing sedentary type activities, in particular limiting the use of electronic media (for example, television viewing, computer games, internet browsing) to no more than two hours per day (Commonwealth of Australia Department of Health and Ageing, 2004; Ministry of Health, 2007; NASPE, 2004). Alternatively, Canadian guidelines promoted a 30 minute decrease in use of electronic media and a corresponding increase of 30 minutes of MVPA per day (Health Canada, 2002). However a recent review of health benefits of physical activity and fitness in school-aged children (Janssen & Leblanc, 2010) recommended that these guidelines should be changed to encourage children to accumulate at least 60 minutes per day of MVPA. While the authors also recommended that aerobic activities should make up the majority of children's physical activity, they additionally noted the need to include muscle and bone strengthening activities on at least three days of the week – a point which has been included in other guideline recommendations (Department of Health, 2004).

Recommendations Based on Steps Per Day

In addition to time and intensity specifications, physical activity recommendations have also been framed as a number of steps that should be completed over the day. The most commonly referenced standard (originally designed for cardiovascular disease prevention) has been 10,000 steps per day, with 1000 steps equating to 10 minutes of brisk walking – a minimum length considered long enough for cardio-respiratory benefit (Tudor-Locke & Bassett Jr, 2004). However, this one size fits all approach fails to take into account

substantial individual differences between people based on age and gender (Cuddihy, Pangrazi, & Tomson, 2005). The Presidential Lifestyle Award (President's Council on Physical Fitness and Sports, 2001) therefore sought to provide gender-based recommendations of 11,000 steps per day for girls, and 13,000 for steps per day for boys based on norm-referenced standards determined from a US sample. However, these recommendations still do not remove difficulties arising from the predisposition of some individuals to be more active than others and therefore achieve step criteria more easily.

To allow for individual variation, a baseline and goal-setting technique has been developed whereby students determine their average daily activity (or baseline) from four consecutive days of monitoring step counts, and then set personal goals using reference points such as a 10% increase in steps (Cuddihy, Pangrazi, & Tomson, 2005). Other methods have since opted to use health-based criteria (such as coronary heart disease, diabetes, and cancer) to determine step recommendations. For example, one study provided Body Mass Index (BMI) referenced standards for recommended pedometer steps per day in children (Tudor-Locke & Bassett Jr, 2004). The selected cut points for 6-12 year-olds in this study were 12,000 steps per day for girls and 15,000 steps per day for boys, meaning that children with step counts lower than these cut points were more likely to be classified as overweight or obese. A later study based in New Zealand (Duncan, Schofield & Duncan, 2007) which incorporated also weekend step counts with percentage body fat as the criterion reference, found that the optimal step count targets for reducing excess body fat in children were 1000 steps/day higher (13,000 for girls; 16,000 for boys) than previously recommended.

While criterion-referenced approaches to step per day recommendations may be more favourable to the more common norm-referenced approaches, their main limitation is that they are based on cross-sectional data that must be verified by other study designs. To help address issues relating to the validity of pedometer cut-off points and at the same time meet needs relating to the classification and tracking of populations while retaining the sense of motivation for those striving to improve their levels of physical activity, Tudor Locke et al. (2008) proposed a zone-based hierarchy for children's physical activity based on emerging criterion-based evidence. Table 1 - 2 outlines the preliminary schematics of the youth zones for which the authors envisaged further refinement.

Table 1 – 2. Schematic presentation of Tudor-Locke et al. (2008) potential steps/day youth zone groupings and associated descriptive categories.

Girls (6-12yrs)		Boys (6-12 yrs)	
Steps/Day Zone	Category	Steps/Day Zone	Category
		≥17,500	Platinum
≥14,500	Platinum	15,000-17,499	Gold
12,000-14,499	Gold	12,500-14,499	Silver
9500-11,999	Silver	10,000-12,499	Bronze
7000-9499	Bronze	<10,000	Copper
<7000	Copper		

Measurement of Children's Physical Activity Levels

Categories of measures for children's physical activity

As with the existence of different guidelines for recommended levels of children's physical activity, variations in the way physical activity is measured make it difficult to make any

solid conclusions about physical activity levels in children. Assessment methods most commonly used for physical activity can be divided into subjective and objective methods, with the former group comprising questionnaires, activity diaries, interviews, and direct observation. The specific features of each technique as well as relevant advantages and disadvantages when assessing the physical activity levels of children are outlined in Table 1 - 3.

While direct observation can be appropriately used in controlled situations and as a validation criterion, the invasion of the study participant's environment and considerable investigator burden make it unsuitable for free-living use (Corder et al, 2008). Researchers have therefore traditionally opted for survey methods as a convenient way to assess physical activity levels in large populations because they are relatively inexpensive and maintain low experimenter and respondent burden (Sirard & Pate, 2001). However, the accuracy of information acquired by subjective methods may be compromised by the ability to accurately recall all relevant details retrospectively, and also by the opinion or perception of the participant, investigator or proxy (Corder et al, 2008). In comparison to adults, children's lower cognitive functioning reduces their ability to recall intensity, frequency, and duration of activity accurately (Sirard & Pate, 2001). The sporadic nature of children's physical activity also makes recall, classification and interpretation of data difficult (Bailey, Olsen, & Pepper, 1995).

Table 1 – 3. Subjective measures used to assess children’s physical activity

Subjective Measure	Examples	Features	Advantages/Disadvantages
Self-report questionnaires	PDPAR PAC-Q CAAL	Respondents asked to recall activity completed over a representative period of time. Minutes of physical activity established.	Inexpensive Low experimenter and subject burden Bias due to reliance on response of the participant Need to account for normal daily variation in physical activity through data collection over a number of days
Interviewer administered questionnaires	7-day physical activity recall	Minutes of physical activity established as well as further physical activity dimensions. Trained administrators ask questions regarding participant’s activity over a particular time period and record responses.	Improvement in reliability due to presence of trained interviewers Interviewer bias introduced Increased cost and effort
Computer delivered questionnaires	Activitygramm Fitnessgramm	Conceptually similar to self-report measures but response is via a computer.	Fun for participants Use of visual stimuli or beepers may improve recall May also provide detail on intensity, amount and type of activity, as well as time profiling Over reporting is a possibility due to children being distracted and/or confused
Proxy reports		Child’s physical activity levels are reported by parents or teachers.	Avoid recall errors linked to the cognitive limitations of children Bias from proxy respondents introduced
Direct observation	Children’s Activity Rating Scale (CARS) Fargo Time Activity	Use observational recoding techniques to collect data Specify codes in which behaviour occurs	High level of detail provided Can be used in a variety of settings Potential for reactivity High experimenter burden and cost
Diaries	Bouchard 3-day activity log	Subjects record their own details	High participant burden Not recommended for children

Note: Table adapted from Sirard and Pate (2001)

In contrast to subjective methods for assessing physical activity, objective methods use the measurement of physiological or biomechanical parameters and then utilise this information to estimate outcomes relating to physical activity (Corder et al., 2008). Methods that can be included in this category are: pedometry, accelerometry, heart rate monitoring, and combined sensors. The specific features of each technique as well as relevant advantages and disadvantages when assessing the physical activity levels of children are outlined in Table 1 – 4.

Selection of an instrument for measuring physical activity in children

In the selection of an appropriate tool for measuring physical activity in children, a number of factors stemming from the unique behavioural and developmental aspects of children need to be taken into consideration. As outlined previously, less developed cognitive skills reduce children's ability to use self-report measures effectively, and the short, intermittent bouts of vigorous activity with frequent rest periods of longer duration that characterise children's activity patterns also require different intervals of assessment and outcome measures to assess their physical activity levels appropriately. The large variability between children's physical activity behaviour make generalising information from group data challenging, as does the tendency of children's activity patterns to be positively skewed (Welk, Corbin, & Dale, 2000). Median and inter-quartile ranges should therefore be included in data, as well as descriptive statistics, to provide a more detailed view of activity patterns that may be biased by a few children performing a lot of physical activity or a lot performing very little (Welk, Corbin, & Dale, 2000).

Table 1 – 4. Objective measures used to assess children’s physical activity

Objective Measure	Examples	Features	Advantages/Disadvantages
Heart rate monitors	Polar	Provide an indication of heart rate which has a linear relationship to energy expenditure in steady state exercise.	Unobtrusive Cost effective in small to medium size studies Minimal experimenter and participant burden Heart rate influenced by factors such as stress, body size, and age Heart rate shown to be inactive during inactive periods The relationship between heart rate and oxygen consumption is not clear when assessing physical activity at the low end of the spectrum Subject to signal interruptions/interference
Accelerometers	Tritrac-R3D CSA 7164 Caltrac	Use transducers or microprocessors to convert a recorded acceleration to a quantifiable digital signal referred to as a count.	Capable of detecting intermittent activity typical of children Re-useable Non-reactive Minimal subject burden Limited sensitivity to certain types of activity, for example, cycling, activities with limited torso movement, locomotion on a gradient May underestimate activity levels due to cut-points used
Pedometers	Yamax Digiwalker	Use spring mechanisms to detect bodily movement, giving an indication of the number of steps taken or mileage walked.	Inexpensive Re-useable Non-reactive Provide estimate of activity performed over time Insensitive to non-locomotor forms of movement and water-based activity Unable to provide detail on frequency or intensity of activity Pedometer steps are influenced by speed of locomotion and body size, and thus difficult to use with children with different levels of maturation

Note: Table adapted from Sirard and Pate (2001)

Along with the problems in interpreting physical activity data stemming from inter-individual variability and positively skewed data, the trade off between accuracy and practicality is also more challenging with children. The ability to capitalise on the cost-effectiveness of self-report measures in large scale studies requiring less precision is reduced with children, being less likely to produce accurate assessments. Proxy measures offer a useful alternative for assessing children's physical activity levels, although are susceptible to problems relating to the difficulty for adults in recalling children's physical activity (Pate, 1993).

While requiring considerably more effort on behalf of the researcher, the most effective way to assess physical activity in children to account for the flaws which exist in all measures maybe to engage a number of methods. As no one measure can be identified as the best option, the selection of the appropriate instrument (or instruments) will depend largely upon the specific research question being addressed and which errors are the most important to minimise. However, due the issues in measurement accuracy with children, it is recommended that researchers focus on the daily volume of physical activity (for example, steps per day or min.24 h^{-1}) instead of categories based on intensity level (Beets, Patton, & Edwards, 2005). For this reason, pedometers have garnered increasing international support for measurement of physical activity in this age group (Tudor-Locke et al., 2002).

Pedometers

Pedometers are simple electronic devices that usually comprise a horizontal spring-suspended lever arm that moves with the vertical acceleration of the hips during ambulation

(Corder et al., 2008). An objective indicator of mileage walked, or step counts taken, is provided by pedometers through counting either the number of zero crossings in the acceleration waveform (piezoelectronic pedometers) or the number of times a certain acceleration threshold is exceeded (mechanical pedometers) (Corder et al., 2008).

While pedometers provide an estimate of relative volume of activity performed over a period of time, an assumption is made in their use that individuals generally accumulate physical activity through ambulatory activity on land, as they are insensitive to non-locomotor forms of movement (for example, cycling, weight training and skateboarding). Additionally pedometers must be removed for water-based activities such as swimming (Cuddihy, Pangrazi, & Tomson, 2005). They are also unable to record the magnitude of movement detected, for example, a single movement above a given threshold is recorded as a step regardless of whether it occurred during walking, jumping, or running (Troost, 2001). In addition, pedometers cannot provide detail on frequency and intensity of physical activity because they generally do not have time sampling capabilities (Welk, Corbin, & Dale, 2000). However, newer pedometers are able to store a daily value of seven days (Stryker et al., 2007), with some storing further information relating to the time when the sensor was in motion, providing a more detailed view of children's physical activity behaviour (Beighle & Pangrazi, 2006).

Caution also needs to be exercised in using pedometers in studies with growing children or groups of children with different levels of maturation because pedometer steps are influenced by factors such as speed of locomotion and body size (Troost, 2001). One study found that pedometers are less accurate when people move slowly or with an uneven gait

(Crouter et al., 2003), and consistent with adult findings, another study using children found step counts to be underestimated during slow walking (Beets, Patton, & Edwards, 2005). Underestimation of actual distance may also occur with highly obese children due to the orientation of the pedometer being turned away from the vertical plane and towards the horizontal plane by excess fat around the waist area (Cuddihy, Pangrazi, & Tomson, 2005). Keeping the pedometer in line with the upright plane of the body is necessary for measurement accuracy. The best placement for pedometers is therefore at the waistband directly in line with the midpoint at the front of the thigh and kneecap (Cuddihy, Pangrazi, & Tomson, 2005).

Despite their drawbacks, pedometers are relatively inexpensive, re-useable, objective, non-reactive, and can account for the majority of children's physical activity behaviour (Sirard & Pate, 2001). They are also small, unobtrusive, and easily attached to the waistband of children's clothing (Cuddihy, Pangrazi, & Tomson, 2005). Another key advantage of pedometers is that their use can also be integrated easily into a school curriculum (Cuddihy, Pangrazi, & Tomson, 2005). For example, pedometer use can be integrated into maths, social studies and English by using step counts to plot an imaginary journey across a specified region.

While validation studies assessing the relationship between step frequency and energy expenditure between walking, running and other forms of biomechanically different activities have shown some variance (Corder et al., 2008), the results trend towards favourable validity for children wearing pedometers. One study discovered correlations greater than 0.95 between directly observing physical activity in children and pedometer

steps per minute (Kilanowski, Consalvi, & Epstein, 1999), while another observed a correlation of 0.92 between scaled oxygen consumption during unstructured play activities and steps taken during treadmill walking/running recorded by a pedometer in children aged 8 to 10 years (Easton, Rowlands, & Ingledew, 1998). Another study by Crouter et al (2003) evaluated the accuracy of ten different pedometers, concluding that they were indeed valid measures of children's physical activity levels.

There have been few free-living validation studies assessing pedometers use with children (Corder et al., 2008). Only one study assessed pedometers against doubly labelled water (Ramirez-Marrero et al., 2005) – a highly accurate method for assessing energy expenditure through the measure of carbon dioxide production (Welk, Corbin, & Dale, 2000). With 58% of the variance in daily physical activity energy expenditure being accounted for by daily pedometer counts, the findings of this study with doubly labelled water were comparable to results from accelerometer validation studies. Taking these findings into consideration, pedometers are appropriate for use in studies where the objective is to record relative changes in physical activity or to rank order groups of children on physical activity participation, particularly in population-based assessments.

Physical Activity Prevalence in Children

Global rates

As pedometers and many other different instruments and criteria have been used to measure physical activity in children in the past, it is difficult to compare changes in prevalence over time. Despite insufficient direct physiological and behavioural data, and the results of a recent review of self-report and accelerometry measures in youth physical activity

concluding that available evidence does not firmly support the notion of a decline in youth physical activity (Ekelund, Tomkinson, & Armstrong, 2011), it is frequently assumed that young people are less active today than in previous generations (Biddle, Gorely, & Stensel, 2004) – a reflection of other changes that have taken place in society. In addition to increased access to television, computers, and other sedentary activities that attract children, there is greater use of cars to transport children regardless of journey length (Department of Health, 2004). Parental reluctance to let children play outdoors may be an indication of the increase in perceived dangers within the physical environment including stranger danger and traffic risks (Department of Health, 2004). There is evidence that parents are less willing to allow children to act independently away from home at later ages than they were a generation ago (Hillman, Adams, & Whiteleg, 1991).

Children are more physically active than adults, although it is unclear whether they participate in enough activity to achieve beneficial health effects (Department of Health, 2004). Self-reported measures suggests that 30-40% of young people satisfy current health-related physical activity guidelines, with sport participation contributing to higher levels of physical activity (Ekelund, Tomkinson, & Armstrong, 2011). However, as mentioned, self-report instruments have low criterion validity with correlation coefficients usually between 0.3 to 0.4 and a tendency to overestimate intensity and duration of physical activity and sport participation (Mountjoy et al., 2011). Some nationally representative studies (US Department of Health and Human Services, 1996; WHO, 2000) have also used vigorous activity or older age groups, making it difficult to comment on the proportion of children who are insufficiently active.

The practicalities of such large studies have generally necessitated the use of self-report measures, which as mentioned previously offer many limitations when measuring children's physical activity. Recent large scale studies have subsequently also moved to using objective methods of monitoring of physical activity. One study of over 2,000 European children aged 9-15 years using accelerometers found that virtually all boys and girls in Denmark, Estonia, Poland and Norway achieved 60 minutes of activity per day (Riddoch & et al., 2004). Although the results of the accelerometry data are generally more variable, results indicate that less than 25% of young people reach physical activity intensity thresholds above 3000 counts per minute (broad equivalent to brisk walking) (Mountjoy et al., 2011).

Pedometers have also been increasingly employed to measure physical activity levels of children at a population level, allowing the compilation of comparative, global cross-sectional data on youth physical activity patterns. One study of Australian primary-school aged children found that around 61% of boys and 23% of girls are achieving the recommended levels of physical activity for children (Pangrazi, Corbin, & Welk, 1996), while a review by Beets et al. (2010) examining 43 studies representing young people in 13 countries (N = 14,200) identified considerable variation within and between countries in steps per day. Boys and girls from Canada and the United States had significantly lower step counts than those from the European and Western Pacific (including New Zealand) regions. Significantly higher steps per day were also estimated for boys compared to girls in studies that combined weekdays and weekends in comparison to weekdays only.

New Zealand rates

New Zealand's physical activity levels appear to be favourable by international standards (Beets et al., 2010; Biddle et al., 2004). The recent National Survey of Children and Young People's Physical Activity and Behaviors in New Zealand: 2008/2009 (Ministry of Health, 2010) found that 67.1% of young people (aged 5-24 year-olds) met the recommended guidelines for physical activity of 60 minutes per day. Despite a higher physical activity target and wider age bracket, these figures are relatively consistent with a previous population based survey in 2000-2001 where the percentage of active (more than 2.5 hours of physical activity per week) 5-17 year-olds was 66%, having dropped from 69% in 1997-1998 (SPARC, 2003b).

A pedometer study (Duncan, Schofield, & Duncan, 2006) examining the weekday and weekend physical activity levels in a multi-ethnic sample of New Zealand children aged 5-12 years also found mean step counts towards the top end of recommended levels for both boys ($16,133 \pm 3,864$) and girls ($14,124 \pm 3,286$) on weekdays, with weekday counts being significantly higher than for those recorded on the weekend ($12,702 \pm 5,048$) and girls ($11,158 \pm 4,309$). This was consistent with the National Survey of Children and Young People's Physical Activity and Behaviors in New Zealand: 2008/2009 findings (Ministry of Health, 2010) where children and young people participated in 104 minutes per day of MVPA on average, with more time on spent in MVPA on weekdays (104 minutes) compared to weekend days (66 minutes).

The findings of the National Survey of Children and Young People's Physical Activity and Behaviors in New Zealand: 2008/2009 (Ministry of Health, 2010) also highlighted an age-

related decline in the proportion of children and young people meeting the physical activity guidelines. While also almost all 5-9 year-olds met the 60 minutes per day recommendation in the 2008/2009 National Survey, only 15% of 20-24 year olds met the adult guidelines of 30 minutes per day of physical activity (Ministry of Health, 2010).

Based on an activity curve synthesized by Rowland (1990) from heart rate data showing indications of a decline in activity levels of children aged from 6-12 years, it is commonly accepted as mentioned previously that children's physical activity levels decrease prior to adolescence, and that boys are more active than girls (Rowland, 1990). Population-based studies of New Zealand children in the past appear to concur with these findings, with physical activity levels declining as children get older, with 16 and 17 year-olds being the least active group (SPARC, 2003a) and 5-14 year old boys being more likely to be physically active than girls in the same age group (Ministry of Health, 2003b). Boys were also generally more physically active than girls in the National Survey of Children and Young People's Physical Activity and Behaviors in New Zealand: 2008/2009 (Ministry of Health, 2010).

While the finding that boys are more active than girls is consistent internationally (Biddle et al., 2004), studies from 1990 onwards have shown that patterns of physical activity according to age vary considerably according what method of assessment is used (The President's Council on Fitness and Sports, 2004).

Settings for Changing Children's Physical Activity Levels

Physical activity in school settings

Options to change the physical activity behaviour of both girls and boys is influenced by a number of ecological levels. With children spending around six hours per day, 40 weeks of the year at school, and the availability of appropriate infrastructure and context, schools have been a logical choice to deliver programmes to promote physical activity in children (Michaud Tomson & Davidson, 2003). There are many opportunities for school-based intervention including the promotion of extra curricular physical activity, increasing and re-orienting physical education curricula, and promoting walking/cycling to school (Ministry of Health, 2003a).

A recent review of school-based interventions by Kriemler et al. (2011) involving an analysis of four reviews and a systematic review on studies published between January 2007 and December 2010, found that 47%-65% of trials conducted in the school environment were effective, with the effect evidenced mostly in school-related physical activity. Effects on out-of-school physical activity were often not assessed or observed. In multi-faceted intervention strategies, the school-based component was the most consistently promising intervention, while the most variability was found in effectiveness of elements relating to focus on at risk populations, or duration and intensity of the intervention, and family involvement. Additionally, in the systematic review of 20 current trials involving children (≤ 12 years) and a multi-component programme with the involvement of families conducted by Kriemler et al. (2011), all trials demonstrated a positive effect in 9/10 studies on in- and out-of-school as well as overall physical activity.

The findings of Kriemler et al.'s (2011) review suggest that school-based interventions are indeed effective - a notion that needs to be reinforced alongside further education of school teachers and administrators that physical activity in schools is not detrimental to the academic performance of children, and should not be pushed aside when concern arises about performance in core academic subjects (Baker, 2005). In New Zealand, The Ministerial Taskforce on Sport, Fitness, and Leisure was highly critical in The Graham Report 2001 of the education sector's commitment to physical activity and sport (SPARC, 2003c). The report highlighted that while there are many opportunities within this sector to significantly increase participation in physical activity, the amount of physical education taught had declined and mandates for compulsory physical education had not been supported (SPARC, 2003c). These findings were supported by a study of New Zealand children which found one in five 5-10 year-olds and one in ten 1-14 year-olds had no physical education classes in the previous seven days (Parnell et al., 2003). Nelson (2005) also noted that the amount of physical activity being taught in schools was declining in New Zealand despite a WHO recommendation that daily physical activity should be part of the school curriculum.

As a result of the criticism of the education sector's commitment to physical activity, SPARC and the Ministry of Education formed a strategic partnership which resulted in projects such as Pilot Primary Physical Activity - a project involving the provision of physical activity co-ordinators in schools to support and co-ordinate opportunities for physical activity, and professional development initiatives to improve teacher's capability in planning and implementing physical education programmes (Ministry of Health, 2003a). The Ministry of Education also proposed a change in education regulations in late 2004 to

signal to schools that physical activity should be given priority in light of the decline in children's physical activity levels (New Zealand Government, 2004). Starting in 2006, new guidelines subsequently were introduced, recommending that each child be given one hour (additional to current health and physical education curriculum requirements) of meaningful and high quality physical activity a week, facilitated by a physical activity education specialist or teacher with extra training in the area (Ministry of Education, 2007).

In addition to the delivery of the curriculum, New Zealand schools have provided the setting for programmes with strong physical activity components including:

- a) Jump Jam – a resource kit for an aerobics programme to be delivered by teachers to primary and intermediate school children (Fairweather, 2009).
- b) The National Heart Foundation's Jump Rope for Heart – a programme designed for primary and intermediate school children which provides teaching modules containing sequential skipping skills for students to master, with lesson content and assessments that are linked to the curriculum (National Heart Foundation, 2011).
- c) Health Promoting Schools - a process and framework for promoting, well being, and educational goals in an area identified by the school, with physical activity being one of the key areas a school can target (Ministry of Health, 2003a).

As of 2011, increased support to New Zealand schools for getting children more involved in sport and physical activity through regular physical education classes, additional resource for sports equipment, referees and coaching, and promotion of links to sports clubs will be a core priority of Sport New Zealand (Key, 2011). The role of Sport New Zealand in children's physical activity in New Zealand will be discussed in the following section.

Physical activity in community and family settings

Schools, overseen by the education ministry or governmental agency equivalent, have been by far the most common setting for children's physical activity interventions. Some attention has also been focused on the family and community environment and its influence on childhood physical activity behaviour (Mountjoy et al., 2011). A study involving a review of reviews and an updated systematic review of studies from August 2007 to October 2010 (Van Sluijs, Kreimler, & McMinn, 2011) identified only 13 family studies and three community studies in the former category, and a further six family-based and four community-based interventions in the latter. This suggested a much more limited base of evidence regarding the success of physical activity promotions in these settings. However, based on the cumulative evidence to date, it appears that the most successful family-based interventions for increasing children's physical activity levels involve those that are set in the home, and include self-monitoring, goal setting, and the creation of safe environments in which young people can use active transport or engage in free play (Mountjoy et al., 2011).

In terms of working to provide optimal environments within the community setting in New Zealand, there are a number of institutions or organisations mandated to promote, encourage, and support children's physical activity in New Zealand. These entities will be identified in the following sections.

Sport New Zealand

Formed in 2002 after the merger of the Hillary Commission, the New Zealand Sports Foundation, and the policy arm of the Office of Tourism and Sport, SPARC was the

government agency mandated to lead physical activity promotion in New Zealand prior to 2011 (Ministry of Health, 2003a). Their mission was to make New Zealand the most active nation in the world (SPARC, 2003c), with children identified as one of the groups delivering most benefit through focus on physical activity (Ministry of Health, 2003a). For this purpose they instigated a number of physical activity initiatives targeting children as a distinct group or as part of the wider population including:

- a) Push Play – a national awareness campaign with supporting advertising, collateral, events, and promotion (including Push Play Day) encouraging New Zealanders to meet recommended levels of physical activity (SPARC, 2011a).
- b) Active Schools – a programme providing primary school children with physical activity opportunities and experiences through three main methods by: firstly, providing schools with a teaching resource outlining physical activity opportunities for children during school hours; secondly, working with teachers to ensure maximum benefit is derived from the Active Schools resource; and thirdly, providing support through collaborative school and community-wide planning (SPARC, 2011b). As well as encouraging children to be physically active, Active Schools has promoted the development of physical skills.
- c) Active Movement – an initiative aiming to get children under the age of five years-old more active through a series of brochures outlining how to incorporate physical activity (from balancing to climbing) into children’s lives (SPARC, 2010).
- d) He Oranga Poutama – a programme incorporating Maori children as a part of the wider population target, promoting physical activity, programmes, activities, and

events such as touch rugby, kapa haka, and taiaha in settings such as the marae (Ministry of Health, 2003a).

As National Sports Organisations (NSOs) play a key role in increasing participation of children in sport and thereby physical activity at regional community levels, SPARC also provided support and funding to over 80 national governing bodies to help achieve this purpose as well as their goals relating to high performance (SPARC, 2011d).

Coinciding with the change in name of SPARC to Sport New Zealand (SNZ) in 2011, the role of NSOs and their regional and local affiliates, in the promotion of physical activity for children is set to increase. There has been a strong government led policy shift away from population-based physical activity promotion to getting children more physically active through participation in sports teams and clubs (Key, 2008). One of SNZ's stated priorities is to help young New Zealanders develop an affinity for sport and recreation leading to lifelong participation through four core strategies:

- a) The provision of increased resources for primary schools to get more children into organised sport, including after-school programmes and a variety of school and club-based initiatives.
- b) The provision of more support for secondary schools to increase the involvement of students in organised sport and recreation.
- c) Increase support for clubs and grassroots providers to encourage young people to stay in sport after secondary school.

- d) Ensure that young people (aged 0 to 12) obtain the fundamental movement and basic sport skills to participate in lifelong sport and recreation (SPARC, 2011e).

Regional Sports Trusts

In addition to NSOs, SNZ works closely with a network of 17 Regional Sports Trusts (RSTs) around the country (SPARC, 2011c) to help achieve their mission of creating a sport and recreation environment where more New Zealanders participate, support and win (SPARC, 2011f). RSTs act as umbrella organisations, working with regional sports organisations, local councils, health agencies, education institutions, local businesses, and the media to facilitate the participation of individuals and community groups in physical activity (Ministry of Health, 2003a). These non-profit organisations provide a regional voice for sport and recreation communities and add value to SNZ's own regional investment by mobilising financial and in-kind resources within their local community (Ministry of Health, 2003a).

Other key government organisations

Along with SNZ and the Ministry of Education, the Ministry of Health was a member of a tripartite agreement signed in 2004 with the purpose of collaboratively improving the health and well-being of New Zealand children, particularly in the areas of physical activity and nutrition. This agreement was disbanded in 2007 (Hinkle, 2010), although school children were still identified as a key priority in Healthy Eating – Healthy Action, Oranga Kai – Oranga Pumau, the Ministry of Health's strategic framework for addressing nutrition, physical activity and obesity (Ministry of Health, 2003c). Public health units (for example, District Health Boards for regional populations, Te Hotu Manawa Maori, and Pacific

Heartbeat for Pacific Islanders) have therefore accounted for most of the activity relating to physical activity promotion within the health sector (Ministry of Health, 2003a). Personal health services have generally not been contracted to promote physical activity, although many practices have opted to join the SPARC Green Prescriptions scheme whereby physical activity is prescribed as a treatment for related illnesses or conditions, mostly for senior citizens (Ministry of Health, 2003a). This programme has not yet been adopted for children.

Outside of the Ministries of Health and Education, and SNZ, additional government organisations have targeted the improvement in children's physical activity levels either directly or as part of the wider population. These include local government (for example with Healthy Cities, Safer Routes to School), the Accident Compensation Corporation (Sport Smart: 10 point plan for injury prevention), the Land Transport Safety Authority (National Road Safety Strategy), Te Puni Kokiri (He Oranga Poutama with SNZ), and the Energy Efficiency Conservation Authority (Walking School Buses) (Ministry of Health, 2003a).

Concerned with duplication of roles in the delivery of public health services, including those relating to physical activity, the New Zealand Government recently announced reduction in the number of government agencies to improve the co-ordination across the state sector (Ryall, 2011). From 2011, a new health promotion agency will take over the functions relating to physical activity previously managed by the Health Sponsorship Council, Ministry of Health and SPARC.

Non-government organisations

Programmes delivering physical activity to children are also provided by non-governmental organisations (NGOs) such as the National Heart Foundation with the previously mentioned Jump Rope for Heart programme and the YMCA with their holiday and after-school initiatives. Other NGOs that include children as part of a broader target market for their programmes incorporating physical activity include Diabetes New Zealand, Asthma New Zealand and the Cancer Society (Ministry of Health, 2003a).

National sport organisations

As mentioned earlier, NSOs can play a key role in ensuring children reach recommended physical activity targets through their junior programmes in clubs, schools and community settings. Globally, organised sport participation rates vary from 50-60% in the United States and Australia to around 90% in the United Kingdom and New Zealand (Salmon & Timperio, 2007). While some surveys report small increases in participation rates (Australia Bureau of Statistics, 2004) or no change (Sport England, 2003), others have reported declines (Norton et al., 2001), most likely as a result of different definitions of participation and also methodology and instruments used. In New Zealand however, there was a reported decline in sport and active leisure between 1997 and 2001 from 93% to 89% (SPARC, 2003b). That these rates are still relatively high is supported by the more recent National Survey of Children and Young People's Physical and Dietary Behaviors in New Zealand: 2008/09 finding that young people spent an average of 29 minutes per day in organised sport (Ministry of Health, 2010). While those aged 10 to 14 years spent the most time in organised sport (42 minutes per day), the average dropped to 10 minutes per day for young people aged 20 to 24 years who spent the least amount of time in organised sport.

Females were also found to spend significantly less time in organised sport than males across all age groups.

While the participation rates of New Zealand children appear to be amongst the highest in the world, there is therefore still a lot of potential for NSOs to strengthen their role in the promotion of physical activity and sport for health and fitness of young people – particularly given the finding that sport participation contributes to higher levels of objectively measured time spent in MVPA by children (Ekelund et al., 2011). Some of the methods by which this could be achieved, as recommended by the IOC Consensus Statement on the Health and Fitness of Young People Through Physical Activity and Sport (Mountjoy et al., 2011) are outlined in Table 1 - 5.

Table 1 – 5. IOC recommendations for NSO promotion of children’s physical activity.

1. Ensure that sport programmes include youth-oriented activities to engage and retain young athletes.
2. Educate sport coaches to incorporate appropriate health-related fitness training in relation to growth and maturation.
3. Identify and lower the barriers to sport participation.
4. Collaborate with youth, parents, school personnel and community programmes to design and deliver sports programmes that attract and retain young people.
5. Foster collaboration with international, regional, and national physical activity promotion networks.
6. Evaluate and improve the quality and delivery of programmes for young athletes.
7. Encourage research into the efficacy and effectiveness of delivery of sport and physical activity of young people.

Responsibility for children's physical activity

As a consequence of the potential individual and social benefit, a number of current population-based interventions have been developed and implemented with the specific purpose of increasing physical activity levels of children. In 2002, a \$190 million VERB: It's What You Do campaign was launched throughout the United States with the aim of increasing and maintaining physical activity among 9-13 year-olds (National Centre for Chronic Disease Prevention and Health Promotion, 2003). This campaign encourages children to find VERBS (such as run, bowl, sing, or paint) that fit their personality and interests, and then use them as a launching pad to become active and make regular physical activity a lifetime pursuit. To reach young people, as well as their parents and adult influencers, in multi-cultural markets, the campaign utilises television, internet, print and radio advertisements to promote these motivational and informational messages relating to participation in physical activity.

Children in the United States were also targeted in a worldwide campaign sponsored by McDonalds to increase physical activity (McDonald's Corporation, 2005). The campaign involves past, present, and future sporting heroes visiting schools to demonstrate simple and fun activities that can add up to 60 minutes of physical activity a day and to give away free step counters. The sporting heroes also appeared in television advertisements promoting the key message of the campaign "It's what I eat and what I do".

Television and collateral advertising with the key message "30 minutes a day, you've got to Push Play" were also the main focus of the initial SNZ's Push Play physical activity awareness campaign. While not specifically targeting children, the campaign recommended

30 minutes a day of physical activity as a way to feel better and healthier for all New Zealanders (SPARC, n.d.). While research suggests that this campaign has been successful in increasing message recognition and intention to be active, no sustained changes in physical activity levels have been noted in serial evaluation surveys (Bauman et al., 2003).

By nature of the wording of the key messages in the aforementioned mass media campaigns, an underlying notion of personal responsibility is implied in changing physical activity behaviour. This concept has been the predominant message in health promotion campaigns spanning from physical activity to alcohol consumption and sexual practices (Kirkwood & Brown, 1995).

Personal Responsibility

Background to personal responsibility in physical activity and health promotion messages

The reason for the predominant emphasis on personal responsibility in physical activity and wider health promotion messages can be ascertained from historical shifts in health focus. In earlier days before the advent of antibiotics and other modern medical interventions, the approach to public health activity was primarily influenced by work against communicable diseases such as typhoid fever, smallpox and tuberculosis (Phillips, 2002). The public was encouraged to comply with the recommendations of professionals that focused on safe housing, water, food, and occupations rather than what people could do individually about their health (Breslow, 1998).

However, as environmental changes and social advance improved the physical conditions of life, chronic and degenerative diseases displaced acute, communicable diseases as the leading cause of mortality and morbidity (Breslow, 1998). Whereas one single act of immunisation could allegedly provide a lifetime of a protection against an infectious disease, it became evident that conditions such as coronary heart disease, chronic respiratory disease, diabetes and lung cancer were the result of a lifetime of behaviours such as physical inactivity, overeating, and smoking (Green & Kreuter, 1990). The focus in public health practice subsequently moved from the creation of safe living conditions to establishing an environment that favoured healthful, personal behaviour (Breslow, 1998).

The theme of personal responsibility has carried through to health messages imparted in recent times. The need for individual responsibility in making lifestyle changes in areas associated with reduced risk of premature morbidity, including physical exercise, was emphasised in a report on priorities for improving the health status of the world's population (US Department of Health and Human Services, 1990). The notion of personal responsibility was also reinforced in a campaign by the U.S. National Cancer Institute to increase the consumption of vegetables recommended appeals to personal responsibility (Kirkwood & Brown, 1995).

The Rational Choice model and victim blaming

In addition to the accumulation of research and epidemiological linking lifestyle factors to health and disease, the emphasis on personal responsibility in health campaigns may also be a reflection of an erosion of the concept of community in the industrialised West (Chin, Munroe, & Fiscella, 2000). In parallel, cultural values such as a belief in individualism,

rationality, and self-sufficiency underpin an assumption that an individual possesses the rationality to control his or her own fate and pursue private interests (Guttman & Ressler, 2001). The Theory of Reasoned Action (Ajzen & Fishbein, 1980), the Stages of Change Model (Prochaska & DiClemente, 1986), and the Health Behaviour Model (Becker, Drachman, & Kirscht, 1974) are all models of motivation and behaviour change, in which behaviour is seen as the psychological property of individuals who are influenced by consciously chosen goals. Collectively these models are referred to as the rational choice model (Chin, Munroe, & Fiscella, 2000).

The rational choice model and other appeals to personal responsibility in health care assume causal connections between people's deeds and health outcomes (Guttman & Ressler, 2001). For example, by saying that one needs to undertake a sufficient amount of physical activity to prevent cardiovascular disease and diabetes implies a causal connection between physical inactivity and illness. Correspondingly, the implication is made that people are culpable for adverse consequences if they do not adopt preventive measures, for example, a Push Play brochure states "inactive people are more likely to get sick" (Sport and Recreation New Zealand, n.d.). In turn they may therefore be held morally, or even legally accountable for their behaviour. An argument may then be made to withhold funding for health care resulting from behaviours deemed irresponsible, or to demand higher health insurance premiums from individuals considered irresponsible (Guttman & Ressler, 2001). This view is supported by findings from a British survey by Bowling (1996) that found 42% of respondents who agreed with the statement that "people who contribute to their own illness – for example, through smoking, obesity, or excessive drinking – should have lower priority for their health care than others" (Prioritisation Exercises

section, para. 3). Withholding services or charging more for them from individuals whose conditions may have been caused by their own actions has raised serious concerns among those who believe that, rather than being blamed for their illness as a result of perceived personal choice, individuals should receive care on the basis of need (Guttman & Ressler, 2001).

The assumption that individuals have the ability to make choices that are beneficial to their health is a major difficulty of the rational choice model, and other models underpinning personal responsibility in health, as they do not acknowledge that some people's choices are limited and others' are not (Chin, Munroe, & Fiscella, 2000). Individual choices are not made in a vacuum but instead reflect the availability of what is involved and the social context in which they occur (Breslow, 1990). For example, the results of one study suggest that social inequities in physical activity participation are likely to be reproduced across generations due to the social position of parents and their link between education and access to sports clubs (Wold & Hendry, 1998). Evidence also suggests that those who suffer the most from lifestyle illnesses and causes of death are the least likely, given their living conditions, to be able, motivated, or rewarded to make effective behavioural change (Green & Kreuter, 1990).

Despite the difficulties presented by the individual approach to health care, it is still the dominant paradigm in many Westernised countries (Chin, Munroe, & Fiscella, 2000). One study (Lynch, Kaplan, & Salonen, 1997) suggested that this is because the rational choice model helps the dominant class in these countries to preserve their position in terms of distribution of wealth and power. By promoting individualism, it blames the have-nots for

their plight and extols the haves for their success. In ignoring social structures and contexts that promote unhealthy behaviour, the government and society are relieved of responsibility for making change in the community (Chin, Munroe, & Fiscella, 2000).

Community focused versus individual focused approaches

In an attempt to address the problems arising from the approach appealing to personal responsibility in health, a community focused approach has been offered as an alternative (Green & Kreuter, 1990). This approach provides continuation of the early focus in public health on conditions of life that lead to disease (Breslow, 1990) and at its most extreme, includes national programmes of environmental and social policy that control mass media advertising, manufacturing of foods, and other factors influencing health-related behaviour (Green & Kreuter, 1990). In general, focus is placed on making improvements in the conditions of life for all people in the community rather than only trying to change the behaviour of individuals. In terms of physical activity, rather than solely encouraging individuals to complete the recommended levels of physical activity, this approach would also include integrating physical activity initiatives into the school curriculum, or ensuring roads and pathways are built in such a way as to encourage physical activity for example.

The main advantage of community health policy lies in the efficiency and effectiveness of trying to protect all people as opposed to seeking the protective behaviour of all people (Breslow, 1990). Herein however, lay one of the approach's major difficulties. Protectionist measures, such as making one hour of physical activity a week compulsory in schools, can be viewed as paternalistic and intrusive, and maybe also as a violation of rights (Breslow, 1990). In democratic societies where the notion of individual freedom is cherished,

collective action for health may encroach upon citizen's varying interpretations of freedom (Breslow, 1990). As well as the support of individuals, these approaches must win the support of multiple sectors in the health promotion (Breslow, 1990). Introducing compulsory physical activity into schools would require the support of the education sector for example. Anecdotal evidence suggests that this was indeed the situation in New Zealand, where SPARC's proposal to do this faced significant resistance from schools and some parents due to the displacement of more academically oriented content of the curriculum. For health issues to prevail over the interests of other sectors of society, it must be of paramount social importance (Breslow, 1990).

While the victim blaming inherent in health policies focusing on individual behaviour is unacceptable, so too is the system blaming implicit in some social reform proposals (Green & Kreuter, 1990). It is clear that a mid point between the two options needs to be adopted for promotion of health behaviours, including physical activity, to be effective. Particularly in pluralistic, democratic societies, the value-laden, culturally and ethnically defined nature of physical activity and other lifestyle behaviours, makes it impossible for central government to develop one-size fits all type measures. With many of these pursuits, such as physical inactivity, being private in nature, they are in any case, largely inaccessible to surveillance and regulation (Green & Kreuter 1990).

While the significance of individual responsibility must be recognised by communities endeavouring to advance the health of its citizens, it does not however, remove the obligation for social responsibility in health (Breslow, 1998). In addition to measures designed to improve the living conditions of the populace, societies need to adopt measures

which allow an individual the opportunity to make appropriate decisions for the benefit of their health (Breslow, 1998). Physical environment variables, for example, the provision of green areas and playgrounds for the purpose of physical activity and socio-cultural factors such as the ability of the poor to access these facilities, are important predictors and modifiers of physical activity (Yancey et al., 2004). Indeed, one study (Bar-Eli, 1996) found that external conditions, such as physical proximity to the exercise area significantly affected observer's (both exercise adherers and non-adherers) perceptions of an actor's attributions of freedom, choice, control, and responsibility. Individual responsibility for health reached through personal action can therefore only reach its maximum potential when society assures its citizens have access to professional services, a safe physical environment, and education relating to safe health practices.

The influence of biological capacity

With regard to individual choice in personal health decisions, biological capacity - a fundamental limiting factor in actions affecting health - must be acknowledged (Breslow, 1990). While the focus on individual responsibility, alongside scientific research on the placebo effect, challenged the long-standing belief that biological conditions are beyond the control of the individual, ignoring the influence of biological factors on health, including the ability to be physically active, would also be erroneous (Kirkwood & Brown, 1995). For example, disabled individuals may wish to be physically active, but their physical incapacity may greatly restrict their options for exercising. Young children also do not make decisions about their health due to their limited cognitive and physical abilities (Hart et al., 2003). If a mother or father opts to take an infant swimming for example, the child has no choice in the matter. In this regard, children are dependent on others, especially their

families, not only for their health status at birth and their overall growth development, but also for preventative health care options.

Additionally, children have also been shown to perceive little threat of ill health (Watt & Sheiham, 1997) and therefore lack the perceived need required to facilitate healthy behaviours. For these reasons, an indirect approach to behaviour modification has been identified as necessary in the case of children (Hart et al., 2003). Parents have been identified as potential intermediaries as a result of their ability to impact on their children's developing behaviours and attitudes through the behaviours they reinforce, the information they impart, the opinions they express and the opportunities they control (Hart et al., 2003).

Parental Responsibility

Interventions targeting parental responsibility

Due to the influence they have over their offspring, parents have been targeted in campaigns to change physical activity and other health behaviours in children. Under the umbrella of the SPARC Push Play initiative, Sport Auckland (an Auckland-based RST) conducted an Active Families programme in which parents could participate with their child in free, fun-based activities run by a qualified health professional in a community location (Sport Auckland, n.d.). Parents were targeted through online and local media communications which ask questions such as "Is your child overweight?", "Do they watch too much TV or play too much playstation?", and "Are you concerned about their health and wellbeing?". Similarly, the VERB: It's What You Do campaign contains a distinct parental component in which the benefit of physical activity for the child's long term health and for positive family functioning is strongly promoted by messages such as "Physical

activity builds a great foundation for a healthy life”, “Kids need to play. And so do you”, “Physical activity can make the connection”, and “Experience the fun together” (National Centre for Chronic Disease Prevention and Health Promotion, 2003).

In terms of wider health behaviours, an evaluation of multi-media campaigns designed to raise awareness among Australian parents of the importance of providing adequate sun protection for their children showed acceptance of parental responsibility for their child’s sun protection to be one of four factors accounting for 49% of variance in this objective (Smith et al., 2002). The campaign, run over three summers, promoted a key message to parents - that unprotected exposure to sun during the first 15 years of a child’s life more than doubles their chance of getting skin cancer later on (Smith et al., 2002). Furthermore, with the words “Don’t let this happen to them! Give your consent for Meningococcal B immunisation” accompanying a picture of a sick child in a hospital bed hooked up to a multiple wires and a respirator, the New Zealand Meningococcal B - Be Wise, Immunise campaign (Ministry of Health, n.d.) is more direct in implying parental responsibility and subsequent blame for child ill-health.

Background to parental responsibility

Historically, mothers have been given responsibility as to how their children turn out (Penfold, 1985). Before World War I, education of mothers for the purpose of reproduction and maintaining healthy children was of paramount importance. Maternal ignorance and neglect was blamed for death and illness in children with little acknowledgment of environmental factors such as overcrowding and unsafe water supply (Penfold, 1985). With the immense loss of life during World War I, the role of mothers in producing healthy

children was accorded even more importance, and scientific motherhood was advocated by experts and child-rearing books to ensure that children were trained to be neat, polite, clean, well-disciplined, precise, and efficient (Penfold, 1985). This ideology surrounding motherhood continued on after World War II when it was temporarily suspended to allow women into the workforce (Penfold, 1985).

During the post-World War II period, recommended child-rearing practices moved away from rigid regimes to satisfaction of children's instinctual needs by their mothers as proposed by the work Freud (Penfold, 1985). In Freud's theories, children's behaviour and personality was portrayed as being entirely dependent on the quality of the mother-child relationship during the first few years of life. Therefore, while the role of the mother was idealised, an undercurrent of blame was emerging, with mothers being blamed for a wide range of children's problems (Penfold, 1985).

More recent literature on parental perspectives suggests that this notion of blame has continued, with parents often feeling blamed by mental health providers for their children's behavioural and emotional problems (Johnson et al., 2000). A study of social workers (Rubin et al., 1998) found that 57% of respondents agreed that parental dysfunction was the primary cause of serious mental illness in children, and half believed that therapy should enable family members to understand how their family dynamics have influenced their family member's mental illness. A further study (Johnson et al., 2000) reported that one-fifth of the mental health professionals surveyed were unequivocal in assigning responsibility to parents, with approximately half of the respondents including parents in a mixture of blame factor items.

The involvement of fathers

While fathers were attributed some responsibility as part of the parental mix in these studies, the importance of fatherhood was virtually ignored until the 1970s and 1980s when the influence of genetic and environmental factors in child-rearing practices were more readily acknowledged (McBride & Mills, 1993). The influence of fathers has since become a common topic of professional publications and books, exploring areas beyond maternal feeding, weaning and toilet training to topics such as parental support and interaction (Penfold, 1985). With evidence suggesting that fathers can have a positive influence on all aspects of their children's development, men have since been encouraged to adopt more active roles in raising their children (McBride & Mills, 1993).

While the roles of fathers have changed, a study by McBride & Mills (1993) examining variation in involvement of mothers and fathers in the rearing of their children aged between three and five years still found paternal responsibility to be limited. Levels of responsibility were assessed through use of a composite version of the Parental Responsibility Scale (PRS) (Baruch & Barnett, 1981), with scores for fathers and mothers suggesting that both genders perceived very little participation by men in this category of involvement. In the time that they did spend with children, fathers in the study were found to spend a significantly greater proportion of their interaction time in play activities. These findings reinforced the maintenance of traditional patterns of parental labour distribution, with mothers assuming the leadership role in raising children, and fathers, if involved, playing with their children (McBride & Mills, 1993). Later studies, such as one by Craig and Sawriker (2009) drawing on two nationally representative Australian data sets, also

found that women maintain more responsibility for child care than men, despite the increasing involvement of women in the workplace.

Studies of parental responsibility in physical activity

More recent qualitative studies also suggest that parental attribution of responsibility for their children's health behaviours extends to physical activity. One study (Shaw & Dawson, 2001) using discourse analysis to explore the meanings of family leisure for Canadian parents of preteen children (10-12 years) found many parents, especially mothers, wanted to ensure that their children were physically active and fit. Additionally, parents wanted to encourage healthy and active lifestyles that would continue into adulthood, and talked about the sense of responsibility they felt for this in the context of providing opportunities for family leisure. This sense of parental responsibility came through when parents talked about how they ensured family participation in recreational activities did occur, for example, through planning, organising, or setting aside specific times for activities to occur. While both mothers and fathers talked about responsibility, it tended to be mothers who discussed planning and organising activities.

Another study exploring the attitudes and beliefs in low income families about children's physical activity and wider health behaviours identified feelings of responsibility as the key motivator for health behaviour change (Birkett, 2004). Consistent with the findings of Shaw and Dawson (2001), parents often discussed responsibility together with health benefits and perceived themselves to be role models for their children. Parents felt responsibility for their children's health in areas such as weight, obesity, cholesterol level, diabetes, hypertension, and immunity, especially if they identified these issues as their own health

concerns. For example, if parents were overweight or obese, they were more likely to feel responsible for ensuring their child did not also become obese than a parent who was not overweight or obese.

In relation to obesity, a study investigating lay perceptions of its causes and prevention among primary school children (Hardus et al., 2003), reported parental responsibility as the most important cause, accounting for 23.37% of variance in the principle components analysis. As well as items related to parental influence over eating behaviours, this factor contained two items relating to physical activity: “Parents don’t know how to promote physical activity” and “Parents don’t care about being physically active”.

Increased feelings parental responsibility for their child’s physical activity behaviour may also be implied by findings in the previously mentioned Bar-Eli study (1996). The study investigated the extent to which perceptions of external conditions and disposition-behaviour congruity affect observer’s perceptions on personal causation of exercise adherers and non-adherers with regard to physical activity. In addition to reduced physical proximity of a behavioural option lowering the extent to which the observer rated the actor feeling responsible for his or her own choice, so too did incongruence between the actors disposition and the behavioural option. For example, if the actor was not sporty, they were perceived to feel less responsibility for their decision to go to a concert in the museum than for conducting exercise. In applying these findings to parents in their roles as significant others, it may be that they view their children as feeling less responsible for the choice to conduct physical activity if they are not physically active, and more responsible if they are. If this is indeed the case, parents may be inclined to either assume more responsibility

themselves for an inactive child's physical activity or view the child as a lost cause; the latter providing a significant barrier to the promotion of physical activity for their child.

Another qualitative study (Hart et al., 2003) using focus groups to investigate the barriers and benefits perceived by British parents to the provision of a healthy diet and adequate exercise for their children, revealed another barrier to children's physical activity. In terms of facilitating healthy behaviours in their children, responsibility for providing a healthy diet was unanimously accepted by parents, while responsibility for physical activity was less decisively accepted. Perceived parental control of children's levels of physical activity appeared to be diminished by an exaggeration of the influence of the school environment, with parents generally underestimating the malleability of their children's physical activity behaviour. Parents from lower socioeconomic status (SES) areas were less likely to attribute responsibility to the school, despite viewing its influence more positively. High SES groups generally believed that the school was the most influential third party and should therefore accept greater responsibility for improving children's physical activity levels. Schools were also deemed largely responsible for the lack of exercise in primary school-aged children due to a general belief that the school provided a negative environment for health behaviours.

Third party responsibility for children's physical activity

Health professionals

Schools were also designated primary responsibility for increasing children's physical activity and fitness in a study (Schneider, 1994) of family physicians and paediatricians from the New Jersey chapter of the American Academy of Family Physicians. The

participants were asked to rank public health goals for children for the year 2000, and among the highest ranked was improving physical activity and fitness. When assigning responsibility for implementation of these goals, the medical professionals in the study rated the school the highest (38%), followed by family (27%), individual (17%), federal government (9%), mass media (3%), other (3%), state government (2%), business and labour (1%), and local government (0%). Overall however, respondents assigned little responsibility to governmental agencies, and, with the exception of physical activity, to schools. The medical profession was ascribed no responsibility, not having been included as a category to which responsibility could be designated. This is an interesting premise in itself considering the potential influence it has over the two key areas that responsibility was generally assigned to by respondents - the individual and families.

Consistent with the findings of Schneider (1994), a study of the perceptions of British mental health nurses' perceptions of the role of physical activity as a therapeutic strategy within inpatient settings found that participants considered physical activity to be a lifestyle choice and an individual responsibility (Faulkner & Biddle, 2002). Medical practitioners have traditionally focused on individual patients and specific aspects of their health to enable assessment of the patient's health and the development of a path towards maintaining or improving health (Breslow, 1990). However, given the cost of physical inactivity and poor health to the individual and society at large, one author (Burry, 1999) argued that both parents and health professionals have a moral responsibility ensure individuals and their offspring are physically active.

Even if managing children's behaviours is primarily the responsibility of parents, health professionals can help parents be more effective managers by providing them with information and counselling on principles of behaviour modification, or by referring them to appropriate specialists where required (Wolraich, 1997). A postal survey of adults with cerebral palsy in Norway (Jahnsen et al., 2003) showed that learning to take personal responsibility for personal health from health professionals during childhood physiotherapy was the strongest predictive variable for regular physical activity as an adult. Furthermore, in a study of the aforementioned Green Prescriptions Scheme (Swinburn et al., 1998), exercise prescriptions in addition to verbal advice from general practitioners were shown to be useful tools in motivating patients to increase their levels of physical activity. Due to their routine interaction with children, as well as adults, health professionals may therefore be in a unique position to influence their physical activity behaviour.

Government agencies

Government agencies also have the potential to influence the physical activity behaviour of children, although research suggests that this sector has very specific views on its responsibility within physical activity promotion. A study utilising focus groups within six key departments of Rockhampton City Council in Queensland, Australia investigated the role and perceptions of local government in the promotion of physical activity (Steele & Caperchione, 2005). The findings suggested that physical activity was not considered to be a core business of local government, but that there was a clear understanding of the role that local government plays in supporting a community's ability to be active through the provision of facilities and infrastructure.

Comments were also raised in this study about the importance of community partnerships, particularly in relation to the sustainability of community/council initiatives and projects. Schools especially, were highlighted as needing to take a more active role in the promotion of physical activity (Steele & Caperchione, 2005). The local council forming partnerships with schools and other community organisations, as well as health professionals was a recommendation of the study. The authors stated that by utilising networks for communication and building capacity at local level through the harnessing of skills, knowledge and commitment in physical activity promotion, a whole community approach to physical activity that focuses on integrated processes for creating active communities would be enabled.

Attribution of responsibility for children's physical activity

To enable a whole community approach to physical activity, the various sectors comprising the community must each clearly understand and accept responsibility for their respective roles. As Schneider (1994) notes, the assignment of priority health goals is not useful unless someone takes responsibility for the goals being met, whether that be a person, agency or institution. However, when reviewing the few studies that are available on the association between responsibility and health behaviours - more specifically physical activity, it is evident that confusion exists within these sectors as to who is indeed responsible for children's physical activity, and exactly what they are responsible for.

In the present day, parents are confronted with a plethora of messages and advice from multiple sources such as relatives, friends, parenting books, the media, colleagues and experts. Many of these sources recognise the multi-dimensional origins of children's

behaviour but most still highlight parental behaviour as being of primary or overriding importance (Penfold, 1985). This, in conjunction with the predominance of biopsychosocial explanations for causation of individual health behaviour which do not clarify the assignment of responsibility, has resulted in much confusion around the appropriate attribution of responsibility for children's health behaviours. This notion is supported by studies mentioned previously (Hart et al., 2003; Schneider, 1994; Steele & Caperchione, 2005), and also by a study (Penfold, 1985) that found parents commonly described confusion about the origin of their child's problem and had often received conflicting advice from friends, relatives, teachers and professionals.

In addition to the confusion that exists around the attribution of responsibility for physical activity, very few studies have investigated the association between perceptions of responsibility and actual physical activity behaviour (Ziff, Conrad, & Lachman, 1995). As far as the author is aware, no studies have investigated this relationship in relation to children's physical activity levels, whether it may be in association with their own perceptions of responsibility or those of their parents. Despite the concept of personal and parental responsibility being deeply ingrained in physical activity and health promotion messages, it is not clear whether perceptions of responsibility actually lead to healthier levels of physical activity and better overall health. While one study showed that an increased sense of personal responsibility resulted in increased happiness and activity levels in nursing home residents (Langer & Rodin, 1976), another suggested that perceptions of personal responsibility can have a negative effect on well-being by adding the burden of guilt to illness or lack of fitness (Brownell, 1991).

Studies examining the relationship between other behaviours and perceived responsibility provide little additional insight into the area of physical activity (Ziff, Conrad, & Lachman, 1995). As these studies also mostly focus on strategies adopted by adults in the aftermath of an illness or adverse event such as rape, it is difficult to generalise findings to healthy and paediatric populations (Ziff, Conrad, & Lachman, 1995). While Ziff et al.'s (1995) study did comprise relatively healthy young and middle-aged employees of a technology company, their finding that perceptions of personal responsibility did not contribute significantly to variance in exercise and other health behaviours may have been influenced by their assessment of perceptions of responsibility for well-being (a multiple construct including different areas of life such as work, family and health) rather than for health per se. This limitation, in conjunction with perceived personal responsibility being significantly correlated with self-ratings of health, led the authors to conclude that further research on the influence of perceptions of responsibility on health behaviour is warranted.

If findings of future studies are consistent of with those of Ziff et al. (1995) and there is no association between feelings of personal responsibility and physical activity levels, it is likely that predominant policy initiatives emphasising personal responsibility in physical activity will be unsuccessful. Given the scale of many of these interventions and the relevant growing cost of physical inactivity to society, it would be prudent to ensure that the correct messages are provided to appropriate target markets. In this regard, it is crucial to establish whether there is a relationship between responsibility and physical activity behaviour, particularly in relation to children for whom early patterns of physical activity may establish physical activity as a lifetime habit (Department of Health, 2004).

With children, it is also likely that the relationship between responsibility and physical activity behaviour is more complex than it is for adults. Children's limited physical and cognitive capabilities and subsequent dependence on caregivers, mean that if there is a link between the two variables, responsibility for their physical activity behaviour needs to be assumed by someone other than themselves. Historically, responsibility has been assumed by parents for their child's health behaviours (Johnson 2000), but with evidence suggesting schools may be attributed responsibility for children's physical activity behaviour (Hart et al., 2003; Schneider, 1994), there is a danger that responsibility is delegated to sources that are unaware of this role, or are unable or unwilling to accept it. For example, if a parent thinks the school is responsible for their child's physical activity levels, and school views the parent as responsible, a major barrier to facilitating behaviour change in the child is created as all of the key influencers on the child have absolved responsibility. There is a lack of research on the position of schools in terms of their responsibility for children's physical activity behaviour. However the lack of (albeit improving) focus on physical activity in current school curricula would suggest that schools are indeed reluctant to assume this responsibility, giving rise to major concern if parents readily attribute responsibility for their children's physical activity to them.

Thesis Rationale

To determine whether responsibility for children's physical activity is indeed falling through the cracks, the main aim of this thesis was therefore to identify exactly to whom responsibility for children's physical activity is being assigned and in what capacity. The results of Steele and Caperchione's study (2005) suggested that local government authorities have a very clear idea of their responsibility in this field but attributions are far

less apparent for health professionals and even more importantly, for parents, teachers and children themselves as the key influencers over children's behaviour. Establishing clarity in this area will assist greatly in the development and implementation of tailored physical activity messages and activities that are appropriate for each sector. For example, if parents are found to assign responsibility to schools that are unwilling to take on the role of promoting physical activity in their students, health promotion messages must make parents aware that they are indeed the key to their child's health in terms of physical activity, not the school. Likewise, it would then be helpful to provide schools with the means to identify and promote physical activity in those children whose parents are not assuming responsibility for this role.

Before investigating the attribution of responsibility for ensuring children are sufficiently physically active by key influencers over children's physical activity, given the lack of research on the relationship between children's physical activity and responsibility, it is necessary to examine whether responsibility is indeed a concept that can be applied appropriately to children's physical activity. If this is the case, how this concept is constructed in terms of what responsibility actually means in the context of children's physical activity also needs to be ascertained. A qualitative study (Study 2) addressing these two research questions was therefore conducted and is detailed in Chapters 3 and 4.

For the two studies detailed in Chapters 3 and 4, and throughout the research in general, a definition of responsibility commonly used in the health field was adopted – the belief that one has the pivotal power to prevent or provoke subjectively crucial negative outcomes which may be actual and/or at a moral level (Salkovskis et al., 1995). Adapted to the

context of children's physical activity, the operational definition of responsibility for this research then became: The belief that one possesses the ability to to provoke or prevent a child becoming physically inactive through the demonstration of traits or behaviours that are associated with increased levels of physical activity in children. In exploring these traits and behaviours that are associated responsibility for children's physical activity, Chapter 3 subsequently focuses on the issue of the meaning and application of responsibility in children's physical activity. Chapter 4 follows on with an investigation of the attribution of responsibility for children's physical activity in key influencers over children's physical activity behaviour.

Study 2 chronologically followed a preliminary study (Study 1) on children's in- and out-of-school physical activity which is outlined in Chapter 2. The data from Study 1 was, as previously mentioned, inherited from an abandoned study. However, Study 1 was completed by the author and included in this thesis because it highlighted the importance of influencing agents on children's physical activity outside of the school environment such as parents.

The critical contribution of after-school physical activity for children has also been reinforced by recent governmental policy shifts towards increasing children's physical activity through sport and after-school initiatives. Additionally, a study by Olds, Maher, and Ridley (2011) found large differences in MVPA between in participation between high-active and low-active Australian children on weekend days and from 4:00 to 6:30pm on school days – suggesting again the need to focus on the after-school period when addressing issues in relation to increasing children's physical activity levels.

Combined with the finding in Study 2 that NSOs were surprisingly rarely attributed responsibility for children's physical activity despite potentially being able to make a considerable impact in this regard, Study 1 also set the context for the third study (Study 3) detailed in Chapter 5. This study examined the position of National Football Associations (NFAs) in taking responsibility for children's physical activity. With out-of-school physical activity being found to make a significantly higher contribution to children's overall physical activity levels in Study 1, football was identified as being especially able to make a huge potential impact on the out-of-school physical activity levels (and thereby overall physical activity levels) of children due to its profile and reach as the largest junior sport in New Zealand (SPARC, 2003a) and many other countries (for example, England, Australia, USA, Singapore, Switzerland, Germany and Chile) where physical inactivity has been identified as a leading risk factor for public health (WHO, 2002) and football is a major national sport with over 4% of the total population participating in the game (Fédération Internationale de Football Association (FIFA), 2007a).

On a global scale, football is played by 265 million people (including 26 million women) in over 207 countries (FIFA, 2007b). Combined with the sport's low barriers to involvement, and profile and popularity worldwide, football therefore has a tremendous potential to positively influence international as well as domestic physical activity levels of children. Correspondingly, NFAs could also potentially gain considerable benefit by incorporating a physical activity agenda into their strategic planning and activity – through expanded revenue streams from government and non-governmental funding opportunities, organisational image enhancement as a result of being seen as a good corporate citizen in

assisting the community, and the widening of a player base that may in the future support the infrastructure of the sport through coaching, refereeing, and volunteering for example.

Football therefore has a huge mutually beneficial opportunity to assist traditional agencies in increasing physical activity levels of children in the after-school environment. Many NFAs appear anecdotally to have programmes targeting children, however it is not known whether these initiatives are clearly linked to the objective of increasing children's physical activity levels. For example, at the time the research was conducted the objectives of New Zealand Football's Small Whites programme targeting 5-12 year old boys and girls were to: a) reward participation and achievement in football in this age group; b) provide a fundamental coaching resource for parents; and c) profile male and female role models to whom Small Whites could aspire (New Zealand Football, 2007). New Zealand Football's strategic plan for the corresponding period (2006-2010) period also did not contain any reference to wider objectives around increasing physical activity levels of children at a national level (New Zealand Soccer, 2006).

In light of the significant benefits to be obtained from a widespread uptake of physical activity programmes for children by NFAs and the recent governmental focus on involving children in sport as a primary means to ensure sufficient levels of physical activity, it may be useful to develop tailored strategies to encourage these organisations to take responsibility for contributing to the delivery of public health goals in this area. To develop such strategies, it is firstly necessary to understand the reasons underlying the adoption (or lack thereof) of objectives relating to increasing physical activity levels of children through

football programmes by NFAs – constituting the purpose of the final study of this three-study thesis.

In summary, the final study exploring the position of NFAs in taking responsibility for children's physical activity provides a fitting ending to the overall aim of this thesis which was to investigate the perception and attribution of responsibility for children's physical activity in key influencers over children's physical activity behaviour particularly in the critical after-school period.

Conceptual Approach

To achieve the aim of better understanding the issue of responsibility for children's physical activity required an approach which transcended disciplinary boundaries and reached into many different domains such as education, sport organisation and the family unit. Additionally, various methodologies (for example, epidemiology and thematic induction methodology) were selected and utilised according to their relevance to the specific study topic being investigated. As no single methodology was engaged consistently throughout the research, the various methodologies are dealt with in the specific chapters relating to studies in which they were utilised. However, two key conceptual frameworks adopted at varying stages of the research were critical to delivery of the research objectives - Attribution Theory and Institutional Theory. The basic principles of these two frameworks are discussed as follows in addition to the background and experience of the author which has strong relevance to the research undertaken.

Attribution Theory

Attribution Theory refers to the study of perceived causation, with the central tenet being that people interpret behaviour in terms of its causes and that these interpretations play a critical role in determining reactions to that behaviour (Kelley & Michela, 1980). A temporal sequence is proposed to be undertaken by individuals, starting with an outcome interpreted as success or failure, followed by a causal search to establish why that particular outcome occurred - especially if it was negative or unexpected (Graham, 1997). Individuals therefore answer questions such as “Why did I not go for my run today as planned?”, making causal attributions about themselves which influence personal motivation, and about others which influence social motivation (Graham, 1997).

According to Attribution Theory, success and failure are often attributed to factors relating to ability, effort, mood, luck, family background, task difficulty, and assistance from others – with ability and effort being the most highly weighted (Graham, 1997). For example, if a child wins a tennis match, he or she would be more likely to conclude that “I am good at sport” or “I trained hard”, but with a loss would be more likely to say “I am not very good at sport” or “I didn’t practise enough”.

As attributional content varies between different motivational domains and individuals, the focus of attributional theory has been on the fundamental properties of attributions as opposed to specific causes per se (Graham, 1997). Three of these distinct properties, or causal dimensions, have subsequently been identified: a) stability determining whether a cause is constant or variable over time; b) controllability which establishes whether a cause is subject to volitional influence; and c) locus – whether a cause is internal or external to

the person (Weiner, 1985). Applying these dimensions to the context of physical activity, how fast one can run (ability) maybe typically seen as internal, uncontrollable, and stable whereas the effort to go for a run may still be seen as internal, but more unstable and under the individual's personal control.

Each of the three causal dimensions have been linked to both psychological and behavioural consequences. In particular, internal attributions have been linked to higher levels of physical activity in adults (Lox, Burns, & Treasure, et al., 1999; McAuley, 1991) with, for example, a greater sense of personal responsibility being correlated with higher self-ratings of health (Schoeneman & Curry, 1990), and to increased physical activity levels in nursing home residents (Langer & Rodin, 1976). However, there is no information in this area relating specifically to children's physical activity. The framework of Attribution Theory was therefore used to investigate whether the key influencers over children's physical activity behaviour attributed responsibility predominantly internally or externally for ensuring children under their care are sufficiently physical active. If responsibility was found to be attributed primarily externally (and hence largely absolved), a major barrier to facilitating increased physical activity in children would be identified.

Institutional Theory

Relationships among organisations and the fields in which they operate are the core components of Institutional Theory (Lawrence & Suddaby, 2006). Focus is placed on institutions – societal values, norms, and rules which dominate an organisation's external environment – which emanate from institutional forces such as the state or other large powerful organisations (Slack & Hinings, 1994). By conforming to these institutionally

prescribed values and beliefs, Institutional Theory suggests that organisations seek to receive and maintain legitimacy which is “a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system or norms, values, beliefs and definitions” (Suchman, 1995, p.574). The homogeneity created across organisations then results in field-wide values and practices (Danisman, Hinings, & Slack, 2006), with fields being defined as a community of organisations with a common meaning system and whose members interact with one another on a more regular basis than with those in other fields (Hoffman, 1999).

DiMaggio & Powell (1983) proposed that organisations become homogenous through at least one of three change mechanisms. Coercive isomorphism occurs when pressure is exerted on organisations by other organisations on which they may be dependent, for example, through the regulation of industry or fields by government or courts. Mimetic isomorphism results when organisations faced with uncertainty imitate successful organisations in a given field, while normative isomorphism occurs when certain practices are spread by professionals in equivalent positions throughout the industry (Cooney, 2007).

Through these processes, institutional theories offer an explanation of how organisations can adopt nonchoice behaviors through habit, convention, convenience, or social obligation that essentially serve against their best interests (Oliver, 1991). Institutional perspectives also highlight the causal impact of state, societal, and cultural pressures on organisational behaviour, as well as demonstrating how passive acquiescence (as opposed to strategic adaptation) to the external environment can contribute to the survival and legitimacy of an organisation (Oliver, 1991).

While many studies have documented evidence of isomorphic change across a variety of sectors and geographical contexts (Lawrence and Suddaby, 2006), Institutional Theory has increasingly come under fire for its focus on change in order to preserve organisational status quo. Correspondingly, the institutional perspective is perceived to overlook the function of resistance in organisational-environmental relations as well as the role of active agency and there has subsequently been a movement towards agreement that the practices of individuals cannot be overlooked in explanations of change within organisations (Hoffman, 1999; Oliver, 1991).

Oliver also highlighted the role of individual actors play in her accounts of organisational resistance to institutional pressures (1991) and the disruption of institutions through a process of deinstitutionalisation (1992). In the former article, Oliver applied convergent elements of institutional and resource dependency theories to show how organisational behaviour, rather than passively conforming to institutional pressures, varies in response to them depending on their nature and context. The author developed a typology of five strategic responses that varied from the most (acquiescence) to least (manipulation) passive, in turn linking them into a set of antecedent institutional conditions (relating to cause, constituents, content, control, and context) which predict the likelihood that an organisation will resist or conform to institutional pressures.

Oliver's 1992 article took organisational resistance one step further to outline the conditions of deinstitutionalisation. Defined as "the erosion or discontinuity of an institutionalised organisational practice or activity" (Oliver, 1991, p.563),

deinstitutionalisation was proposed to reverse the trend toward homogeneity and convergence in institutional fields through the replacement or transformation of cognitively legitimised practices. Instead of passive adoption of taken-for-granted assumptions, Oliver (1992) proposed that both pressures compete respectively within an organisation to either facilitate or impede the process of deinstitutionalisation.

Organisational responses are therefore posited to vary according to social, functional, and political pressures that are exerted on organisations. Predictors such as declining performance, increasing innovation pressures, and declining external dependence were proposed to increase the probability of deinstitutionalisation, while investments in fixed assets, internal co-ordination requirements, desire for predictability and consistency of purpose, or fears around associated costs and lack of expertise to implement deinstitutionalisation have been noted as factors that may contribute to organisational inertia (Oliver, 1992).

A number of studies have shown support for Oliver's findings, in particular a study of 36 Canadian NSO's by Slack & Hinings (1994). The authors found that although there was a shift towards homogeneity of these organisations in response to environmental pressures from the state agency to adopt a more bureaucratic and professional design, certain organisational characteristics do not change to the same extent as others. High impact systems - those values central to the existence of the organisation - tended to show little change. For example, while values about increasing professional staff were readily adopted, the NSO's actively defied the state by dismissing institutional pressures for reduced volunteer involvement. Slack & Hinings (1994) suggested that redefining the roles of

volunteers and altering the authority structure of these organisations confronted the values that were central to membership without having any significant benefit in terms of increased legitimacy or economic gain. Thereby the chance of adoption was minimised.

Support has also been demonstrated for Oliver's concept of deinstitutionalisation within the sport and physical activity context by a study of organisational change processes within the Queensland Rugby Union (QRU) (Skinner, Stewart, & Edwards, 1999). The study describes how in 1995, after years of strong reinforcement of amateur values by administrators and players, the International Rugby Football Union (IRFU) announced that the amateur principles the game had been founded on were to be repealed. To ensure future success, the QRU sought to align itself with the new professional environment through a process of deinstitutionalising amateur values.

The impact of the IRFU's move to professionalism constituted a significant environmental disturbance for those entities within its organisational field. Support for disruptive events as an antecedent to organisational change was also provided by Hoffman (1999) in his study of institutional changes within the U.S. chemical industry. Centering on the issue of corporate environmentalism, Hoffman was able to demonstrate that fields develop around issues in addition to common technologies and markets.

Market logic versus editorial logic comprised the two types of institutional logics used in a study by Thornton (2002) to predict institutional shifts in the publishing industry. Thornton's findings suggested that once an institutional logic becomes dominant, it affects an organisation's strategy by focusing the decision makers toward those issues that are

consistent with the logic and away from those that are not. This finding has implications on the support for different functional areas of organisations by leaders, who were found in a further study of Canadian NSO's (Danisman, Hinings, & Slack, 2006) to adopt institutional values and beliefs differentially. Functional subgroups emphasize and develop their own specific values and beliefs that cut across organisations in a particular field. For example, administrative staff were found to be more committed to administrative related values such as professionalisation, while athletes and coaches were committed to high performance related matters. Despite the variation between subgroups however, overall trend towards a high level of conformity to institutional values and norms reinforced the Oliver's (1991) position that a high level of interconnectedness facilitates the diffusion of values and norms throughout an organisational field. In contrast, highly fragmented, loosely coupled environments work in the opposite direction.

Danisman et al.'s (2006) findings can also be applied to the engagement of corporate social responsibility (CSR) - defined by Carrasco (2007) as an organisation's consideration of, and response to, social and environmental concerns in business operations and in interactions with stakeholders and incorporating programmes such as those designed to increase children's physical activity levels. One would expect the level of interconnectedness in an organisational field to positively influence its adoption by an organisation. In their multilevel theory of CSR, Aguilera et al. (2007) reported that organisational actors were indeed more likely to engage in CSR to emulate their peers – the purpose of which being to preserve their social legitimacy by ensuring the organisation's long-term survival and social license to operate as well as preventing negative perceptions.

Aguilera et al. (2007) categorised the need for legitimation, in addition to achieving balance among stakeholders, and long-term growth as relational motives (concerned with relationships among group members) pressuring firms to adopt CSR efforts. Other categories of motive were specified were instrumental (self-interest driven) and moral (concerned with moral principals and ethical standards). Instrumental motives included penalties due to non-compliance, pre-empting bad publicity, and institutional investor disinvestment. Moral motives, on the other hand, related to stewardship interests by instigating actions designed to bring about a better society and to personal morality based values brought into an organisation by individual actors. These organisational motives were proposed to work simultaneously, with some being more salient than others. The authors argued that instrumental interests of an organisation will always take precedence in order to ensure the organisation's survival. However, while research exists to demonstrate that socially responsible organisations can heighten their business success (Orlitzky, Schmidt, & Rynes, 2003), this may not always be evident to the organisation, particularly in light of conflict between long and short-term financial benefit. However if there is strong pressure from stakeholders or other organisations within the institutional field to enhance legitimacy via CSR (and thereby contribute to financial stability), to avoid social sanctions that may damage relationships with stakeholders, or simply to just 'do the right thing' morally, this may push the organisation towards greater CSR-based activity (Aguilera et al., 2007).

Through the realisation of the motive(s) employed for adopting CSR, sports organisations have the potential to gain through supporting social causes in their communities. Strong relations with local communities are essential for a sports organisation's success – through the ability to attract fans, secure partners, and to deal effectively with local and central

government (Babiak & Wolfe, 2006). It is therefore understandable that the concept of CSR is gaining momentum in football and the wider sports industry. As opposed to a decade ago when CSR issues played an insignificant role in sport, many large sports organisations now have community relations departments or outreach programmes (Babiak & Wolfe, 2006), for example, FIFA's Football for Hope programme promotes causes such as AIDS or anti-racism, and The FA's International Relations Division provides support for developing countries. Additionally, mega events such as the FIFA World Cup, the Olympics, and the Super Bowl implement socially responsible projects (Kott, 2005). FIFA President Joseph S. Blatter himself commented that the game of football had been developed and taken to the world, it was now time to make the world a better place through football (Smith & Westerbeek, 2007). Hence, FIFA's positioning statement "For the Game. For the World".

While there has been considerable growth in the adoption of CSR initiatives in sport, there is still contention that, due to its power as a communication mechanism, sport has conferred on it a strong responsibility to take on a higher profile role in effecting positive social outcomes (Davies, 2002). Certainly in terms of health, sport - and football in particular - occupies a unique position to tackle global and community level health challenges, including improving physical activity levels of children (Smith & Westerbeek, 2007). It therefore makes good sense to identify if, and why, there may be barriers to undertaking such programmes with more CSR focused objectives. The adoption of a framework guided by Institutional Theory enables this goal through the provision of opportunity for better understanding of current norms, beliefs and values and underlying sources of resistance within the institutional field for football for taking more responsibility for ensuring children are more physically active.

Researcher's Background

In addition to the utilisation of Institutional Theory and Attribution Theory, the author's background and experience should be highlighted as a potential lens through which the research can be viewed. The author started playing football in the early 1970's at the age of five when it was very rare for girls and women to play football, and progressed from there through the varying stages of regional representation to play for the New Zealand National Women's Football team and for a successful club team in Germany.

After retiring and a five year spell away from the game, the author was employed at New Zealand Football in 2005 as the Head of Women's Football and successful bid chief of the FIFA U-17 Women's World Cup 2008 New Zealand, working later as an Ambassador and Legacy Manager for the event. In 2005, the author was also engaged by FIFA as a Committee Member for Women's Football and the FIFA Women's World Cup as well as an Instructor. In early 2009, the role with FIFA was expanded to include the provision of consultancy services in football management to over 40 of FIFA's 200 plus Member Associations worldwide. The author is still active in this role at the time of writing as well as working as a Master Moderator for the Union of European Football Associations (UEFA) and as an Advisor to the FIFA Vice President, Prince Ali Bin Al Hussein.

Through this extensive experience in football both at a domestic and global level, the author has not only developed a deep understanding of the sport itself but of the potentially massive contribution the game can make to social development, and more specifically in the case of this research, to the physical activity levels and general health of children. This thesis represents the author's subsequent efforts to assist football entities and other sports,

alongside all other key influencers who can make a positive impact on children's physical activity levels, in better understanding their responsibilities and the potential barriers in the fulfillment of them.

Thesis Delimitations

The limitations pertaining to each of the four studies comprising this thesis are summarised in the general discussion in Chapter 6 as well as in the relevant chapters describing each specific study. However, in relation to the construction of the overall thesis, there were some significant barriers to overcome which should be alluded to prior to this point.

Work on this thesis began on a full-time basis in April 2005 with the analysis and interpretation of raw data from the incomplete pedometer study of children's in- and out-of-school physical activity described in the following chapter. Based on the findings of this study which demonstrated the importance of the after-school period for children's overall level of physical activity, the initial intention for the research topic of this thesis was to further investigate matters pertaining to parental correlates of children's physical activity. However, a review of the literature in this area uncovered dearth of information relating to both parental and personal responsibility in children's physical activity and the research focus subsequently changed in order to capitalise on the exploration of this largely untapped area in the body of physical activity literature.

The qualitative study exploring the meaning and attribution of responsibility in children's physical activity (described in Chapters 3 and 4) was therefore completed in 2005 with a view to providing a base of information from which an instrument measuring the

relationship between responsibility and children's physical activity levels could be developed. However, two factors combined to result in the evolution of the research topic for the concluding study of the thesis. The first was the finding that despite the importance of the after-school environment for children attaining higher levels of physical activity, there was very little responsibility attributed to NSOs by parents, teachers and children found in the study investigating who these groups thought was most responsible for getting children more physically active. The second factor was the author, as mentioned previously, moving to full-time employment in New Zealand Football in 2005 and later in 2009 to Zurich-based FIFA, and the subsequent realisation of a opportunity to provide research output that would not only potentially serve to benefit the global physical activity issue but also the day to day functioning of sporting organisations, in this case NFAs specifically.

The third and final study of this thesis therefore investigated the position of NFAs on taking responsibility for children's physical activity using qualitative methodology. With the use in the overall study of both qualitative and quantitative methodologies, different conceptual frameworks including institutional and attribution theories, internationally and domestically-based participants, and four separate but inter-related research topics, the area covered by this thesis is vast. Therein lies one of the studies limitations in that due to the wide scope of the research, there is considerable potential to explore each research topic in more depth but this was not feasible due to restrictions on time, thesis construction, and in the case of Study 3, cost.

Time generally, in addition to location, was also a challenge in the completion of this study. With the researcher moving from New Zealand to Switzerland, the study had to be conducted remotely from 2008-2011, with most communication with supervising Professors being carried out via Skype or email. In these years, as well as 2007, the researcher was also working full-time to support the professional development of NFAs in as many as 30 countries in one year. The demands of the work itself and constant travel meant the time needed to complete the thesis stretched over six years, resulting in a gap between the implementation of studies (in particular the first two of the three) and their publication. Accordingly, there has also been a requirement for constant review and updating of movements in the physical activity field since the initial development and implementation of the studies. Fortunately, these advances in the research, which have been noted previously in the introduction and in the prefaces of relevant chapters, have supported the findings of the earlier studies in this thesis.

Thesis Organisation

This thesis consists of six interrelated chapters, four of which (Chapters 2-5) have been submitted as scientific papers. Figure 1 - 1 depicts the the overall organisation of the thesis. Chapter 1 comprises an introduction of the literature and the thesis rationale. The data from Chapter 2 were obtained from a preliminary study, with the findings being used to inform the main studies of this thesis relating to responsibility in children's physical activity detailed in Chapters 3-5, concluding in a general discussion in Chapter 6.

Taking into account that Chapters 2-5 are comprised of scientific papers, there may be some duplication in the introduction and methods sections, as well as slight variation in

length and format in accordance with journal requirements. However, each chapter should be viewed as independent in principle, with its own dedicated literature review and discussion. A summary of the main points in each chapter and the limitations of the three studies comprising the thesis is provided in the general discussion in Chapter 6, along with the significance, future directions and conclusions from the overall research.

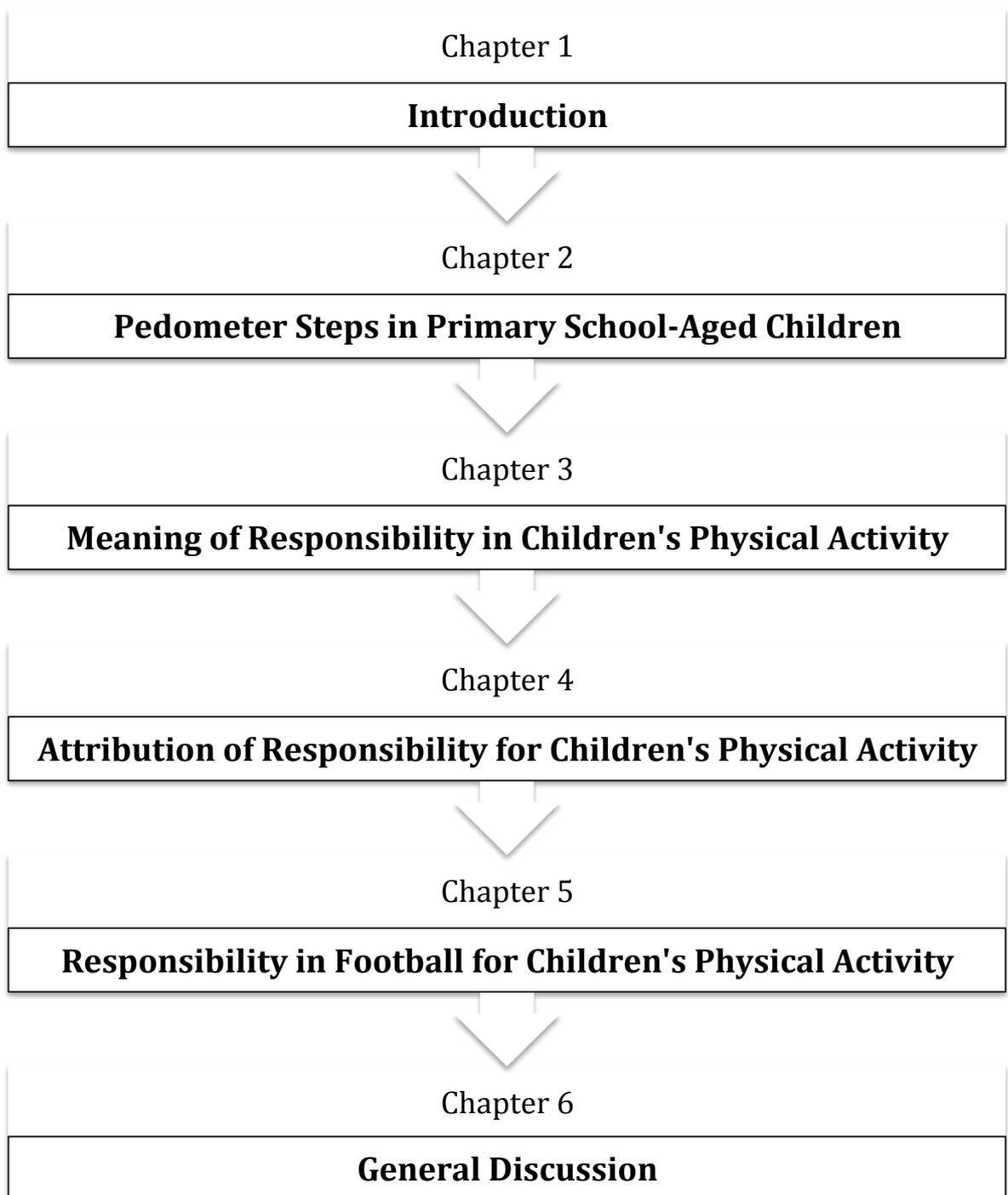


Figure 1 – 1. Overview of thesis organisation

CHAPTER 2

Pedometer Steps in Primary School-Aged Children

Preface

As mentioned previously, the raw data in this study were acquired from research undertaken in September 2004 but abandoned at the stage of analysis. The data were subsequently analysed and written up by the author over the course of mid-to-late 2005. The ensuing paper that comprises this chapter was accepted for publication on 21 November, 2005 and published in 2006 (Volume 9) in the *Journal of Science and Medicine in Sport* (Appendix A). It has been included in this thesis as the findings provide a fitting context to the two main studies on responsibility following this chapter. With the findings of this study showing that children's out-of-school physical activity is a crucial element in addressing efforts to increase children's overall levels of physical activity, the importance of looking beyond the school environment to include key influencers - most notably parents - over children's behaviour during the after-school period in the responsibility studies was highlighted.

It is important to note that since the implementation and publication of this study, there have been a number of further studies of children's physical activity levels in New Zealand and internationally. The study by Olds, Maher, & Ridley (2011) in particular has provided reinforcement of the critical contribution of children's after-school physical activity levels to overall physical activity levels. In their study of 1132 Australian children (aged 10-13 years) who completed a 24-hour activity recall diary on 2-4 occasions, there were also large

differences in MVPA between high- and low-active children from 4:00 – 6.30pm on weekdays and during the weekends. Girls were also found to have considerably lower MVPA than boys. Therefore, in addition to the paper comprising this chapter providing, at the time of publication, the first pedometer determined measures of physical activity in New Zealand primary school-aged children, it also set the context for the main studies of this thesis by providing evidence that parental and out-of-school components must be considered in any studies relating to responsibility for children's physical activity which has since been supported by more recent studies.

An additional issue that should be highlighted at this point relates to the limitation on journal space preventing further discussion on the methodology adopted in this study and in the studies in following chapters. This study on children's in- and out-of-school physical activity levels adopted a quantitative approach that entails beginning with a hypothesis (in this case primarily that differences would be found between children's physical activity levels in the during and after school periods) and testing for confirmation of that hypothesis (Newman & Benz, 1998). The central features of quantitative approaches are the use of instruments (such as the pedometers used in this particular study) to gather data, and the reliance on the probability theory to test statistical hypotheses that correspond to research questions (Harwell, 2011).

The testing of statistical hypotheses following the integral setting aside of personal experiences, perceptions, and biases, control of variables, randomisation, and use of valid and reliable measures that are required in the implementation of quantitative studies, enable general inferences about characteristics of the population to be formulated (Harwell, 2011).

This is a key advantage of the deductive nature of quantitative methods alongside the objectivity and replicability of the findings (Campbell & Stanley, 1963).

With the studies in chapters 3-5 being of an exploratory nature, more in-depth information was required to understand the research questions at hand, such as what was the meaning of responsibility in the context of children's physical activity or the position of NFAs on taking more responsibility for children's physical activity. Qualitative approaches, which focus on discovering and understanding the experiences, perspectives and thoughts of participants (Harwell, 2011), were therefore deemed more suitable for these studies.

Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter (Denzin and Lincoln, 1994). This enables the qualitative researcher to observe things in their natural settings and attempt to interpret phenomena in terms of the meaning people bring to them (Denzin and Lincoln, 1994).

To describe routine and problematic moments and meanings in individual's lives, qualitative research involves the studied use and collection of a variety of materials such as case studies, personal experience, introspective, life story, observational, historical, interactions, and visual texts (Denzin and Lincoln, 1994) as well as focus groups and interviews – the two methods of data collection utilised in Studies 2 and 3 respectively.

Focus groups were identified as appropriate for the two studies investigating responsibility and attribution of responsibility for children's physical activity because of their efficiency in enabling information to be gathered from many people in one session (Thomas, Nelson,

& Silverman, 2005). In contrast, in-depth interviewing was deemed more appropriate for the study involving NFAs in Chapter 5 because the burden that would have been placed on these organisations as a result of being asked to facilitate the organisation of focus groups (which would have been necessary due to the international scope of the research), may have resulted lack of interest to participate in the study or attrition at a later stage. With the participants of the study also being leaders or senior executives of the NFAs, it could also be assumed that, in keeping with the suggestion that qualitative interviewing begins with the perspective of others being meaningful and knowledgeable (Patton, 2002), they would provide strong insight into matters relating to children's physical activity and responsibility that may not be directly observed but experienced or felt.

Qualitative research methods involving focus groups and interviewing are generally described as inductive, meaning that the theory emerges from the data rather than is imposed on it and that the researcher constructs theories from details provided by participants (Patton, 2002). Grounded theory, which is utilised in both qualitative studies of this research, is an example of theory building. Grounded theory is developed by entering the field work without an hypothesis, describing what happens on the basis of observation, and formulating explanations about why that happens – it is therefore grounded in the data rather than being tentative or abstract (Glaser & Strauss, 1967).

According to Newman & Benz (1998), mixing qualitative methodologies (such as grounded theory) with those of a quantitative nature, and the researcher accordingly being open to a scientific method that is both inductive and deductive as well as objective and subjective, results in the design validity of research being more likely to be built into studies (Newman

& Benz, 1998). Johnson and Turner (2003) also supported the premise that the better paradigm to use is the one that best answers the research question. The authors argued that using collecting multiple kinds of data through different strategies and methods reflects complimentary strengths and weaknesses, allowing the provision of insights not possible when only qualitative or quantitative methods are used. Hence the adoption of quantitative methodology in this chapter versus the qualitative approach employed in the remaining studies of this thesis.

Abstract

While population-based studies of physical activity habits of New Zealand children have been carried out, the findings have been restricted by the use of proxy and self-report measures. Objective measurement of physical activity using pedometry in children is likely to provide more accurate data on overall habitual daily activity. To date, no such data are available for New Zealand children. In the present study, children from school years 1-6 (girls, $n = 46$; boys, $n = 45$) at a New Zealand primary school wore a Yamax Digiwalker SW-200 pedometer to record school-based and out-of-school steps over a three-day period. Mean daily steps for the overall sample were 14,333 ($SD = 4,101$). Boys ($X = 15,606$; $SD = 4,601$) were significantly more active than girls ($X = 13,031$; $SD = 3,079$) ($p = .002$). With the exception of Year 5 boys, mean steps were higher with increasing school year level for both boys and girls. Of note, for the overall sample, steps taken out of school made up 52.4% of total daily steps. Girls (53.6%) and boys (51.3%) took a similar proportion of their overall daily steps outside of the school environment. The most active third of the sample completed significantly more of their daily steps outside of school (57.1%) than did their least active (46.8%) counterparts ($p < .001$). In contrast, no significant difference was

found between the most and least active tertiles in steps taken during school hours ($p = .660$). These results suggest that physical activity outside of the school environment is a key contributor to a child's overall level of physical activity, reinforcing the need for interventions targeting the family and community as well as the school environment.

Introduction

Overwhelming research evidence demonstrates that physically active children are more likely to be conferred with a range of physical, psychological, and social health-related benefits (Department of Health, 2004). Further, active children are more likely to become active adults (US Department of Health and Human Services, 1996). It is therefore important that children engage in regular and frequent physical activity, not only for their own personal benefit, but longer term, for national economic and social welfare. Studies on the physical activity of primary-school aged children from England (Armstrong et al., 1996), Greece (Manios, Kafatos, & Codrington, 1999), and Australia (Pangrazi, Corbin, & Welk, 1996) suggest serious concern regarding the activity levels in this population. Consistent with international findings, two New Zealand population-based studies (Ministry of Health 2003b; SPARC, 2003a) have noted low levels of physical activity for children. In 2001, only 66% of young New Zealanders aged between 5-14 years reported being active as opposed to 69% in 1997 (SPARC, 2003a). Another study found that no weekend physical activity was undertaken by 12.5% of 5-14 year-old children (Ministry of Health, 2003b). Given that these New Zealand studies employed self-report and proxy report measures (SPARC, 2003a; Ministry of Health 2003b), their findings may be of even more concern, as self-report measures have been shown to overestimate children's physical activity levels (Sallis, Bauman, & Pratt, 1998). Children's tendency for recall bias and

social desirability have deemed self-report methods inappropriate for use with this age group (Beets, Patton, & Edwards, 2005) while proxy measures have also been found to introduce bias through the characteristics and perceptions of proxy respondents (Sirard & Pate, 2001). Despite this, no other data are available (Hamlin & Ross, 2005).

Pedometers have gathered increasing international support as a measure for the assessment of physical activity levels of children (Loucaides, Chedzoy, & Bennett, 2003; Rowlands, Eston, & Ingledew, 1999; Tudor-Locke et al, 2002). Most pedometer studies with children have found that between 11,000 and 16,000 steps per day is usual (Rowlands, Eston, & Ingledew, 1999; Tudor-Locke & Myers, 2001; Michaud-Tomson, Davidson, & Cuddihy, 2003), with recommended standards being 11,000 and 13,000 for boys and girls respectively (Vincent, & Pangrazi, 2002; President's Council on Physical Fitness and Sports, 2001). A study comparing physical activity levels and Body Mass Index (BMI) levels of 6-12 year-old children in three countries, however, found mean step counts varied with nationality (Vincent et al., 2003). Swedish children were significantly more active than both Australian, and American children who were the least active (Vincent et al., 2003).

Physical activity levels of boys as a group are usually higher than those of girls (Loucaides, Chedzoy, & Bennett, 2003). Differences according to age, however, are not as clear. It is commonly accepted that the amount of physical activity that children engage in decreases prior to adolescence. This has been highlighted in a study using self-report measures (Goran et al., 1998). However, a more recent pedometer study on children from the United States (Vincent & Pangrazi, 2002) that found no decline in the physical activity levels of 6-

12 year olds, despite a concurrent increase in stride length with age and subsequent decrease in step counts. Additionally, a somewhat level activity curve was found for preadolescent American, Swedish, and Australian children (Vincent & et al., 2003). It is therefore unclear as to what point, if any, that a decline in physical activity commences during childhood.

In addition to targeting key at-risk groups in terms of age, effective interventions will also need to take account of the environment in which the greatest potential for increase in physical activity will occur. Physical activity interventions have largely focused on schools, where both resources and facilities for promoting physical activity are readily available (Hamlin & Ross, 2005). In contrast to earlier findings from studies in Crete (Manios, Kafatos, & Codrington, 1999) and England (Sleap & Warburton, 1996), more recent studies suggest that there is greater opportunity to increase the overall level of physical activity in children by targeting physical activity in the home environment rather than at school. After dividing children's levels of physical activity into top and bottom quintiles, Vincent and Pangrazi (2002) concluded that major differences in activity level in 6-12 year old American children occur outside of the school environment. This notion was further supported by a study (Michaud-Tomson, Davidson, & Cuddihy, 2003) which found that the Australian children in Grades 4-7 had higher overall activity levels if they walked or cycled to school, and another investigation that found that the step counts of 11-12 year old Cypriot children were significantly higher in the after-school period than during school time (Loucaides, Chedzoy, & Bennett, 2003).

The purpose of this study was to examine physical activity of children aged 5-11 years in both the school and out-of-school environment. A further objective was to provide the first pedometer-determined measures of physical activity levels in New Zealand primary school children, and to compare physical activity according to age and gender for in-school and out-of-school environments.

Methods

Participants

The final sample comprised 91 children (boys, $n = 46$; girls, $n = 45$) from Years 1-6 at a metropolitan primary school in Auckland, New Zealand. New Zealand schools are classified by Decile (1-10), a proxy for socioeconomic status. The school investigated in the study is a Decile 7 school, indicating that the children come from a middle-high socioeconomic group. The ages of the children ranged from 5-11 years. Participants were randomly selected from the school's roll of 405 students, stratified by year and sex.

Measure

Yamax Digiwalker SW-200 pedometers were used to measure steps in this study. Pedometers measure vertical oscillations of body movement from the hip, providing a total count of accumulated ambulatory movements or steps taken (Vincent & Pangrazi, 2002). Pedometers are therefore insensitive to non-locomotor type activity, and to water-based sports (Loucaides, Chedzoy, & Bennett, 2003). Additionally, pedometers are not sensitive to changes in intensity, are less accurate when people move slowly or with an uneven gait, and with children who are obese (Cuddihy, Pangrazi, & Tomson, 2005). However, studies assessing the validity and reliability of the Yamax SW-200 have suggested that it is an

appropriate instrument for the measurement of children's physical activity levels, particularly in light of their low cost (Rowlands, Eston, & Ingledeu, 1999; Cuddihy, Pangrazi, & Tomson, 2005).

Procedures

The study was approved by the Auckland University of Technology Ethics Committee. Consultation was conducted through the school principal, and permission gained to seek informed consent from each child's parent, and verbal assent from each child. Of the initial sample of 100 children, 12 declined to participate, and were replaced by another child of the appropriate age and sex, randomly selected from the school roll.

Prior to distribution, all pedometers were checked for functionality, and then sealed to prevent accidental resetting and behaviour modification due to feedback. Pedometers were attached to the children by a researcher at the beginning of the school day. The units were then briefly removed at the end of the school day to record the number of steps taken during the school hours before being refitted to record out-of-school activity. This process was carried out on three consecutive weekdays in the month of September (commencement of Spring) 2004. No replacement of pedometers during the course of the study was required, although the data for nine children were removed from the analysis due to their absence from school at some stage over the measurement period, or data not being recorded.

Data Analysis

In-school, out-of-school, and total mean step counts and standard deviations were calculated for all participants who completed the three consecutive days of activity. To investigate differences in mean step counts between and among sexes and year levels, and between and among in school and out-of school steps (location) and year levels, 2 x 6 factorial ANOVAs were used. Differences in mean step counts for sex and location (in-school and out-of-school) were calculated using a 2 x 2 factorial ANOVA.

Mean step counts were divided into activity level tertiles (top, middle, and bottom third) to determine frequencies relating to age, gender, and in school and out-of-school steps. Differences between these variables were also examined with 3 (activity level) x 6 (year), 3 (activity level) x 2 (year), and 3 (activity level) x 2 (location) factorial ANOVA's respectively. The null hypothesis was assumed and probability values of $p \leq .05$ were used to determine significance unless otherwise noted.

Results

Total daily mean steps for the group were 14,333 (SD = 4,110). Daily mean steps by year and sex are shown in Table 2 – 1. Mean steps for boys were significantly higher than those for girls ($t = -3.13$, $p = .002$). This was the case in all age groups, with both boys' and girls' mean steps increasing with each year level. The only exception was for boys in Years 4 and 5 where step levels declined slightly but showed the greatest variance due to extremely low out-of-school step counts of two boys in Year 5. The differences in mean steps by year were found to be significant ($F_{(5,85)} = 14.79$, $p = .001$), with post hoc tests revealing significant differences between Year 1 and Years 4, 5, and 6, and between Years 2 and 6 at

the $p \leq .05$ level. No effect of interaction between year and sex on daily mean steps was found ($F_{(5,79)} = .35, p = .88$).

Table 2 -1. Means and standard deviations for daily steps by sex and year level.

Year level	N	Male Mean (SD)	N	Female Mean (SD)	N	Total group Mean (SD)
1	8	11,596 (3,697)	7	10,368 ^a (1,907)	15	11,023 (2,966)
2	7	14,854 (3,089)	8	10,991 ^a (2,237)	15	12,974 (3,251)
3	7	16,161 (4,162)	8	12,869 ^a (2,385)	15	14,405 (3,627)
4	8	16,339 (4,641)	7	14,047 ^a (3,898)	15	15,269 ^c (4,322)
5	8	16,253 (6,467)	8	14,831 ^a (2,507)	16	15,542 ^c (4,795)
6	8	18,406 (2,591)	7	15,140 ^a (2,510)	15	16,882 ^{cd} (2,984)
Total	46	15,606 (4,601)	45	13,031 ^a (3,079)	91	14,333 ^b (4,110)

^a Significant difference at $p \leq .05$ found with male group for that year level

^b Significant difference at $p \leq .05$ found between year levels

^c Significant difference at $p \leq .05$ found between year level and year 1

^d Significant difference at $p \leq .05$ found between year level and year 2

Significantly more steps were obtained outside of the school environment (52.4%) than during school hours (47.6%) for the total sample ($F_{(1,89)} = 4.10, p = .05$). Table 2 - 2 shows the mean steps by location for each sex. Boys achieved slightly more steps outside of the school environment than in school, with the difference being more pronounced for girls. Neither of these differences were significant ($F_{(1,89)} = .62, p = .43$). Significant differences were found between mean steps taken at school for boys and girls ($F_{(1,89)} = 14.87, p < .001$) but not for steps taken outside of school ($F_{(1,89)} = 2.36, p = .13$).

Table 2 – 2. Mean in-school and out-of-school steps for males, females, and total sample.

Sex	Measure	In-School	Out-of-School
Female	Mean	6,070 ^b	7,021
	Percentage	46.4	53.6
	N	45	45
	SD	1,586	2,865
Male	Mean	7,594	8,013
	Percentage	48.7	51.3
	N	46	46
	SD	2,137	3,274
Total	Mean	6,840	7,523 ^a
	Percentage	47.6	52.4
	N	91	91
	SD	2,025	3,102

^a Significant difference at $p \leq .05$ found with in-school steps for total group

^b Significant difference at $p \leq .05$ found with male group on in-school steps

Figure 2 - 1 illustrates in school and out-of school based steps for each school year level. Significant differences were found between year levels for steps taken within the school environment ($F_{(5,85)} = 8.17, p < .001$) and outside of school ($F_{(5,85)} = 7.10, p < .001$), with more out-of-school steps taken in Years 3, 4, and 6. In the remaining year levels, more steps were taken at school. Table 2 - 3 shows the year levels with significant differences in out-of-school and in-school steps as found by post hoc testing. The largest difference was found in Year 4 where out-of school steps were the highest (mean = 9,837, SD = 3,584) of all years and in-school steps were the lowest (mean = 5,088, SD = 1,822). This difference was significant ($t = -6.26, p < .001$), as was the difference between in-school and out-of-school steps in Year 1 ($t = 2.91, p = .01$).

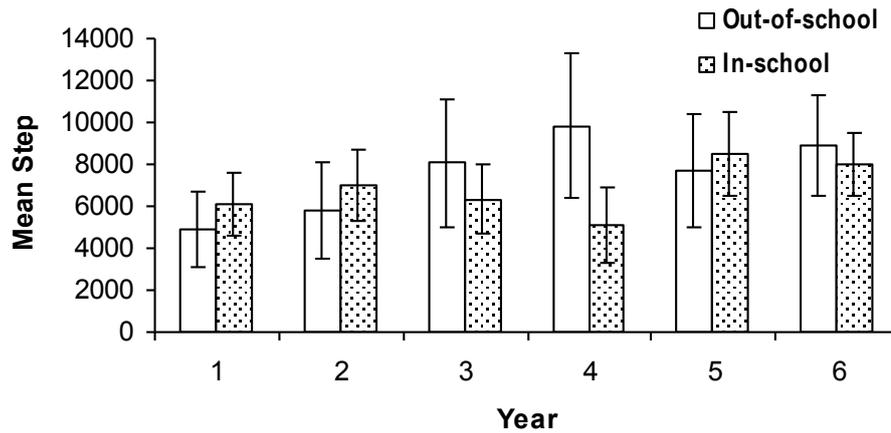


Figure 2 – 1. In-school and out-of-school steps for each school year level.

A MANOVA with location as the within-subjects factor, and year and sex as the between-subjects factors, revealed no interactive effect of age and year level between ($F_{(5,79)} = 1.13$, $p = .35$) or among ($F_{(5,79)} = .34$, $p = .89$) steps taken at school or outside of school.

Participants were divided into tertiles based on their mean daily step levels. The most active third comprised those children with step counts $\geq 23,776$ (mean = 17,822, SD = 3,748), the middle third with step counts $\geq 16,777$ and $< 23,776$ (mean = 12,794, SD = 1,955), and the least active third with step counts $< 16,777$ (mean = 11,647, SD = 3,198). A significant difference was found between the mean steps of the three groups ($F_{(2,88)} = 35.58$, $p < .001$), with post hoc tests revealing significant differences at the $p = .05$ level between the most active group and the other two groups. While 71% of the most active group were boys, the least active group comprised mainly girls (74%). This difference was not significant ($F_{(1,85)} = 1.33$, $p = 1.85$). There was, however, a significant difference between activity level groupings in year levels ($F_{(5,73)} = 6.48$, $p < .001$). Post hoc tests showed differences between

Table 2 – 3. Significant differences in mean daily steps by year level and location.

Dependent Variable	Year (A)	Year (B)	Mean Difference (A-B)	Std. Error	Significance (p ≤ .05)
In-School Mean	Year 1	Year 5	-2,365.41	615.39	.003
		Year 6	-1,860.27	625.23	.043
	Year 2	Year 4	-1,901.98	625.23	.036
		Year 3	-2,142.01	615.39	.010
	Year 4	Year 2	-1,901.98	625.23	.036
		Year 5	-3,380.23	615.39	.000
		Year 6	-2,875.09	625.23	.000
	Year 5	Year 1	2,365.41	615.39	.003
		Year 3	2,142.01	615.39	.010
		Year 4	3,380.23	615.39	.000
	Year 6	Year 1	1,860.27	625.23	.043
	Out-of School Mean	Year 1	Year 3	-3,158.53	978.86
Year 4			-4,032.49	978.86	.001
Year 2		Year 6	-2,974.11	978.86	.036
		Year 3	3,158.53	978.86	.021
Year 3		Year 1	4,916.44	978.86	.000
		Year 2	4,032.49	978.86	.001
Year 4		Year 1	3,858.07	978.86	.002
		Year 2	2,974.11	978.86	.036

the most active tertile and the other two groups at the $p = .05$ level. Older children were more likely to feature in the most active group, with 64.7% of children coming from the oldest three year levels (Years 4-6), and younger children in the least active group (55.6% came from Years 1-3).

Figure 2 - 2 shows a comparison between the most and least active groups for in- and out-of-school steps. In the most active group, 57.1% of total step counts took place outside of school (mean = 9,427, SD = 3,198), as opposed to 42.9% within the school environment (mean = 7,093, SD = 2,026). The reverse was found for the least active group in which the majority (53.2%) of steps took place during school (mean = 6,701, SD = 2,072), rather than

outside of school (mean = 5,893, SD = 2,928). While the difference between activity groups on in-school steps was not significant ($F_{(2,88)} = .42$, $p = .66$), out-of-school steps were significant ($F_{(2,88)} = 14.03$, $p < .001$), with post hoc testing showing significant differences between the most active group and the other two groups at the $p = .05$ level.

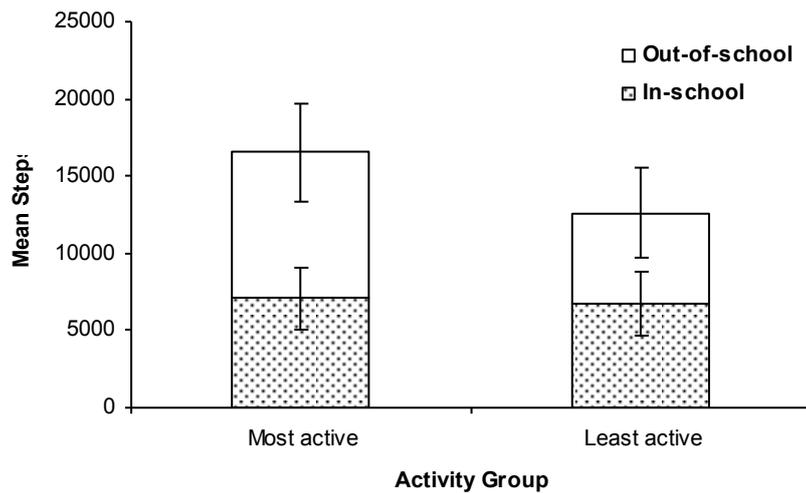


Figure 2 – 2. In-school and out-of-school steps for the most active and least active children

Discussion

In addition to providing the first pedometer determined measures of physical activity levels in New Zealand primary school-aged children, the main purpose of this study was to establish whether there are any differences in the physical activity levels within the school and non-school environments. In light of the continued focus on school-based interventions for increasing physical activity in this population group, and suggestions that New Zealand children are among the most active in the world (Biddle, Gorely, & Stensel, 2004; SPARC,

2003), the results of this investigation present some key issues relating to the development of effective interventions both in New Zealand and internationally.

In support of findings from recent studies (Michaud-Tomson, Davidson, & Cuddihy, 2003; Rowlands, Eston, & Ingledeu, 1999; Vincent & Pangrazi, 2002) children were found to accumulate the majority of their steps outside of the school environment. The contribution of out-of-school activity to a child's overall physical activity levels was also reinforced by findings showing that the most active children in the sample achieved a significantly higher proportion of their daily step counts outside of school hours compared with the least active group. There was however, no significant difference between the two groups on steps achieved within the school environment. These results make sense given that there is a ceiling on the amount of physical activity a child can achieve within structured physical education classes and organised sport, and the limited time available during breaks and lunchtime at school. The greater amount of time and flexibility provided in the hours outside of school, offer a child who is in an environment conducive to engaging in physical activity, much more opportunity to do so. Thus, it is crucial that parents and children understand the positive association between children's overall physical activity levels and their physical activity behaviour outside of the school environment.

Evidence from this study also suggests that future interventions need to target particular sub-groups within the primary school-aged population. In support of previous literature (Loucaides, Chedzoy, & Bennett, 2003; Michaud-Tomson, Davidson, & Cuddihy, 2003; Vincent & Pangrazi, 2002), girls were found to be significantly less active than boys, with a mean step difference of 2,575 steps. Mean step counts of these two groups both fell within

the expected 11,000 to 16,000 range (Rowlands, Eston, & Ingledew, 1999), and they were well above the recommended guidelines of 11,000 for girls and 13,000 for boys (Vincent & Pangrazi, 2002; President's Council on Physical Fitness and Sports, 2001). While this would appear to support the assertion that New Zealand children are relatively active (SPARC, 2003a; Biddle, Gorely, & Stensel, 2004), the range of mean scores for each sex across the year levels (boys, 11,596-18,406; girls, 10,368-15,140) show much greater variation than those reported for Swedish, Australian, and American children (Vincent et al., 2003). Combined with the large range in individual scores for each sex (boys, 7,431-26,413; girls, 7,007-19,650), these findings would indicate that the extremely high activity levels of some New Zealand children are masking a group of sedentary or insufficiently active children. This finding is consistent with population-based studies which have indicated that 32% of New Zealand children are inactive (SPARC, 2003a).

It is also apparent that girls need to be considered a priority for interventions designed to increase physical activity levels. Although not significantly different, the least active group of children in this study contained a disproportionate number of girls, and also a significantly greater number of younger children. Contrary to findings from previous studies (Vincent & Pangrazi, 2002; Goran et al., 1998; Sleaf & Warburton, 1996) both girls and boys in this study increased step counts as they advanced through school year levels. A possible explanation may be that younger New Zealand children are more limited in unsupervised play outside the home by their parents due to the risks associated with stranger danger and traffic (Hamlin & Ross, 2005). However, no interactive effect of year and location on activity level groupings was found. An alternative explanation may arise from the finding that pedometers have been shown to underestimate steps taken at lower

velocities (Le Masurier, & Tudor-Locke, 2003). Due to their smaller size, it may be that younger children move at slower velocities than older children and that their step counts are subsequently lower in comparison.

In addition to the difficulties associated with the use of pedometers presented earlier in this paper, the small size and homogeneity of the sample should be considered when generalising the findings from this investigation to wider populations. The wider application of results may also be limited by findings based on three consecutive weekdays of recorded daily step counts when four days of monitoring is commonly recommended as a sufficient length of time to determine habitual activity levels in children (Loucaides, Chedzoy, & Bennett, 2003).

The findings of this study highlight the importance of looking beyond the school environment when designing interventions to increase physical activity levels of children. With their requirement to fulfil the academic needs of children, schools are limited in their ability to provide and promote opportunities for children to become more physically active. While the opportunities schools do have should indeed be maximised, greater increments in overall physical activity levels may be obtained by targeting children through family-based and community-based interventions. The increased amount of time available and the possibility of a wider scope of activity outside of the school environment should offer much greater potential for children to increase the amount of physical activity they undertake. In order for interventions in this area to be successful, however, future research must focus on the clarification of correlates of physical activity outside of the school environment. While family members are thought to play an important role in the development of physical

activity behaviours, the mechanisms of parental influence still remain understudied and poorly understood (Troost et al., 2003).

The present study also highlights the importance of continued promotion of physical activity to primary school-aged children in all populations, even seemingly highly active ones. While the mean step counts found for the New Zealand children in this study are among the highest found internationally, the activity levels of some children, at as low as 7,007 steps per day, still give cause for concern. Future research should help clarify the demographic makeup of this group, although a good start point for interventions designed to increase physical activity levels may be with girls, who consistently demonstrate lower physical activity levels than boys. Age groups at which decline in activity levels commence should also be targeted, although the results of this study suggest that this does not occur within the 5-11 year-old childhood range.

CHAPTER 3

Responsibility in Children's Physical Activity

Preface

The initial intention of this research was to investigate parental correlates of children's physical activity following the results of the previous study of in- and out-of-school physical activity levels of children. Two key public debates surfaced in this time period however, to change the direction of this thesis. The first was a spate of legal cases in the United States against fast food and tobacco companies that led people to ask who was actually responsible for the health behaviour of individuals. Concurrently, in New Zealand there appeared to be a lot of finger pointing between the various sectors of society on who was responsible for ensuring children were sufficiently active as a result of the noted reluctance of schools to uptake an increased role in the physical education of children. For the author, it seemed reasonable to assume that if key influencers over children's physical activity behaviour were not identified and assuming their responsibilities, a major barrier to getting children more involved in physical activity would be created.

While a search of the literature revealed that the concept of responsibility has been incorporated into key messages of many large scale campaigns directed at increasing levels of physical activity, no definitions or descriptions of what constitutes responsible physical activity behaviour (particularly in relation to children) or direct linkage between perceptions of responsibility and actual physical activity behaviour could be found. The purpose of this study was therefore to investigate as a first step what constitutes the meaning of responsibility in the context of children's physical activity for key influencers

over children's behaviour so that appropriate tools measuring the relationship between the two variables can be developed in the future. As the findings of pedometer study described in the previous chapter highlight the importance of out-of-school activity contribution to children's overall physical activity levels, this study has expanded beyond the traditional school environment to include parents who have a strong impact on children's physical activity behaviour in the out-of-school environment. The paper resulting from this chapter was accepted on 19 February 2009 and published in Volume 13 of the *Journal of Science and Medicine in Sport* in 2010 (Appendix A).

Since this paper was published, it is also important to note is that there have been a change in policy direction in relation to the way that physical activity for children is delivered in New Zealand. Of particular relevance to the findings of this study, the New Zealand Government is now seeking to support schools more directly with resource that enables children to access opportunities for physical activity and sport, for example, through the provision of more sporting equipment or funding for coaches so that schools are able to form more teams. With the participants in the study strongly identifying the provision of accessibility, whether it be through finance, opportunities, or equipment and facilities, as responsible third party behaviour, it would suggest that these policy changes will align the Government's role in ensuring New Zealand children are more physically active closer to the perception of teachers, parents and children in terms of what constitutes responsible behaviour for children's physical activity on their part.

Abstract

Some large scale child physical activity campaigns have focused on the concept of responsibility or the belief that one has the pivotal power to prevent or provoke subjectively crucial negative outcomes which may be actual and/or at a moral level (Salkovskis et al., 1995). However, there are no measures which establish a link between responsible behaviour and physical activity levels. To provide the basis of information required for the development of relevant measurement tools, this study examined the meaning of personal, parental, and third party responsibility for children's physical activity. Eight focus groups, comprising children aged 11-12 years, their parents, and teachers from two upper primary schools in Auckland, New Zealand, were conducted. Children (four groups; n = 32), their parents (two groups; n = 13), and teachers (two groups; n = 15) were separated by socio-economic status, and children also by gender. The transcripts from the focus group interviews were then analysed using thematic induction methodology. Across the groups, participants commonly identified a number of behaviours that they felt were indicative of personal, parental, and third party responsibility for children's physical activity. These behaviours formed natural groups with common themes (e.g., self-management, safety), which in most cases were not impacted on by socio-economic status or gender. Responsibility was therefore found to be a concept that could be related to children's physical activity. It was suggested that these behaviours could be used as a starting point in understanding the relationship between responsibility and physical activity, and to assist with the development of measurement tools assessing the relationship between responsibility and levels of physical activity in the future. In turn, this may lead to the development of more targeted messages for large scale physical activity campaigns.

Introduction

As a consequence of the potential benefits of physical activity for children (NASPE, 1998; Department of Health, 2004; Malina, 1996) a number of population-based campaigns have been implemented with the purpose of increasing children's physical activity levels. By the nature of the wording of messages in many of these campaigns (McDonald's Corporation, 2005; National Centre for Chronic Disease Prevention and Health Promotion, 2003; SPARC, 2011a;), an underlying notion of personal responsibility is implied in changing physical activity behaviour. The concept of personal responsibility has also been the predominant message in wider health promotion messages (Kirkwood & Brown, 1995).

Due to children's limited physical and cognitive capabilities, responsibility for children's health behaviour has historically been assumed by parents, especially mothers (Johnson et al., 2000; Penfold, 1985). In relation to physical activity, parental responsibility could potentially be displayed through many of the identified correlates of physical activity such as modelling, instrumental/logistical support, direct help, and providing opportunities/equipment (Sallis, Prochaska, & Taylor, 2000). Parents have subsequently been targeted in campaigns to change the physical activity behaviours of their children – for example, Australia's *Get Moving* (Australian Government Department of Health and Ageing, 2007), New Zealand's *Push Play* (SPARC, 2011a), and USA's *VERB: It's What You Do* (National Centre for Chronic Disease Prevention and Health Promotion, 2003) campaigns.

There is also evidence suggesting that schools may be attributed responsibility for children's physical activity behaviours (Hart et al., 2003; Schneider, 1994). Responsibility

could be assumed in the school environment in a variety of ways (e.g., access to equipment/facilities, number of physical education hours, time outdoors, and trained/supportive staff) which have also been linked to improved physical activity behaviour in children (Robertson-Wilson, Lévesque, & Holden, 2007).

Regardless of who is being targeted to take responsibility for children's physical activity, it is not clear whether perceptions of responsibility are associated with healthier levels of physical activity and better health (Ziff, Conrad, & Lachman, 1995). Few studies have investigated this relationship. If there is no association, predominant policy initiatives emphasising responsibility in physical activity may be unsuccessful. Given the scale of many physical activity campaigns and the growing cost of physical inactivity to society, it would be prudent to ensure that the most efficacious messages are provided to appropriate target markets. It is therefore crucial to establish whether there is a relationship between responsibility and physical activity, particularly with children for whom early patterns of physical activity may establish a lifetime habit (Department of Health, 2004; Malina, 1996). At present, however, there are no existing measures to examine this relationship. Before such a measure can be developed, the meaning of responsibility in the context of children's physical activity needs to be clarified. A search of the literature identified only one study (McBride, & Mills, 1993) that provided a definition of responsibility and this was in the context of wider child care behaviours. This study therefore seeks to understand what responsibility in children's physical activity means to children, their parents, and teachers, as a first step to enable the development of appropriate measures in the future.

Methods

This study was approved by the Auckland University of Technology Ethics Committee (Appendix B). A descriptive qualitative approach was adopted. Participants in the semi-structured focus groups were children (boys and girls aged 11-12 years), and their parents and teachers, from one high and one low decile intermediate school in Auckland, New Zealand. With decile being a proxy for socio-economic status, School One (Decile 1) represented the low socio-economic group, while School Two (Decile 10) represented the high.

Principals of the schools were contacted via a letter (Appendix C) and follow-up phone call to explain the purpose and requirements of the study. Upon the Principal's consent (Appendix D) and consultation with them regarding potentially low response rates and bias resulting from initially proposed random selection methods, information packs (containing parental information sheets and consent forms (Appendix E), and child assent forms (Appendix F) were distributed to children selected by the Principal on the basis of: a) a wide range of activity levels; b) their parents being able to participate in the study; and c) greater likelihood that they would contribute verbally to the study (that is, they were not shy). All children selected returned forms and were included in the study along with their parents, as were teachers who filled in consent forms after reading information sheets provided to them through the Principal were also included in the study.

Four focus groups for children (separated by gender), two for parents, and two for teachers were conducted over two separate two-day periods in November/December 2005. Eight focus groups containing between 6-9 participants (60 in total) each were therefore carried

out. An interview schedule (Appendix G), which was pilot tested with a group of five physical activity experts, was used to guide the topics pertaining to whether one could be responsible for children's physical activity (as a child, parent or teacher), and if so, how this manifested itself.

All focus group discussions were audio taped and then transcribed verbatim. Once they were read several times, a general inductive approach was employed to analyse the transcripts to identify common, significant, and dominant themes occurring in the raw data. Coding was undertaken manually and peer evaluation to check its appropriateness and completeness was carried out separately by two expert academics in the field of physical activity and sport. Based on percentage agreement of randomly selected pages of coding, interrater reliability at 92% and 83% respectively, was deemed acceptable in both cases.

Results from the analysis were organised in such a way to enable the subsequent development of instruments measuring the relationship between various types of responsibility and children's physical activity levels. Participants' responses were consequently grouped in the first instance according to whether they related to individual, parental, or third party responsibility. In each of these three areas, dominant themes relating to the meaning of responsible behaviour in physical activity were identified within child, parent, and teacher groups. The main objective was to then identify themes common across all groups that could be potentially used as items in responsibility measures.

Results

In relation to **personal responsibility** for children's physical activity, children generally had a lot more to say than did adult participants, suggesting perhaps that children in this age group have a more developed concept of responsibility than adults perceive. This was reinforced by the variety and depth of behaviours and traits suggested by the children to indicate what constitutes responsible behaviour in their own physical activity.

In terms of proposed characteristics for personal responsibility in physical activity, across all groups there was little distinction in the views held between males and females, and between those from the different decile schools. It should be noted at this point however, that the parental group comprised only mothers, due to the lack of availability of fathers in both schools.

One theme came through strongly as an indicator of children's personal responsibility for their physical activity - self-directed behaviour. Other themes identified by adults only coincided with those of children when parents and teachers discussed personal responsibility in the context of their own physical activity, highlighting differences in adult's expectations of their own responsible behaviour versus children's. Commonalities then included the use of active transport, giving sport and physical activity a go, not over-exercising, and eating well to enable physical activity. Adults also agreed that children displayed personal responsibility if they showed sustained commitment to sport and physical activity, although this was not a strong theme amongst children.

After examination of all of the themes indicating personal responsibility for children's physical activity, natural groupings of related items were formed. These groupings, comprising Self-management, Nutrition, Consideration, Safety, Attitude, and Environment, are shown in Table 3 - 1 along with indicative types of behaviour falling into these categories and examples of related quotes arising from the focus groups.

In comparison to personal responsibility, there was more contribution and consensus between the three groups around **parental responsibility** in children's physical activity. Six themes (shown in Table 3 - 2) were identified including Logistical Support, Instrumental Support, Direction, Nutrition, Active Transport, and Child Prioritisation. Themes relating to Logistical Support and Instrumental Support were predominant. In relation to the latter, while children placed great importance on parents encouraging children into physical activity as being part of responsible parental behaviour, this theme was only apparent in the discussions of higher socio-economic groups of adults. Correspondingly, parents from the low decile schools often referred to a reluctance to encourage their children into sport and physical activities that required support in terms of transportation and finance that they could not provide.

Table 3 – 1. Categories of personal responsibility in children’s physical activity

Theme	Indicative types of responsible personal behaviour	Example verbatim quote
Self-management	Being active without having to be told by others	<i>You should be mature enough and responsible enough to do it yourself – not count on everyone else.</i> School 2 female student <i>They just don’t need to sit at home and do nothing.</i> School 2 female student <i>To be responsible [is] to keep your fitness.</i> School 2 female student
	Adopting strategies to ensure one is active	<i>They know what they should be doing but it’s just finding the thing that will keep you going. Some people it’s the gym. A lot of people fall by the wayside with the gym because you are the one who has to be responsible to get yourself there – it is the motivation. Whereas for me, I would rather belong to a team and have to turn up so I don’t let anyone down. That works for me better than anything else, and having to walk my dogs cause they’ll chew each other if I don’t walk them. Like having something I have to do.</i> School 2 teacher
	Prioritising time	<i>You know, it’s finding ways to put it into your day.</i> School 1 teacher
	Not procrastinating	<i>I’ll just have another glass of wine [when being irresponsible for physical activity].</i> School 2 teacher
Nutrition	Avoiding obesity	<i>You will just sit around and be [a] fat and unfit, and then you’ll go out and get hurt and you won’t be able to do anymore.</i> School 1 male student
	Optimising nutrition to enable physical activity	<i>You can’t eat bad foods and do running and stuff. You have to eat good food and do fitness at the same time.</i> School 2 female student
Consideration	Of other people	<i>On the plane over there, Dad was just sitting like that and it was like, Dad, just get up and walk around the plane. Be careful that you don’t get a dead leg.</i> School 2 male student
	Of other things	<i>Yes – they [pets] get arthritis and stuff if they don’t get exercise when they are young.</i> School 2 male student
Safety	Preventing injuries to oneself	<i>Do something and they say don’t do it. Then you can’t try sticking up for yourself cause you might injure yourself or break something.</i> School 2 male student
	Preventing injuries to others	<i>Just being responsible for what you are doing when you are doing PE. So like if you are running with spikes on, you would be careful not to go over somebody’s foot.</i> School 2 male student

Table 3 -1. Categories of personal responsibility in children's physical activity continued

Theme	Indicative types of responsible personal behaviour	Example verbatim quote
Attitude	Trying hard/giving things a go/making the most of opportunities	<i>And even if you come last – you can say at least tried. And if you continue doing it, you can come first instead of last. School 2 male student</i> <i>You should try and take as many as you possibly can do even though you might not be even able to play but you've never tried it. But you can give it a go. School 2 male student</i>
	Maintaining commitments	<i>I think also if the child shows their parent that they are committed, then the parent thinks it is my responsibility to get you there. So it is a two-way situation. School 2 parent</i>
Environment	Use of active transport	<i>You should walk to the gym instead of taking the car, even if it is far away. I reckon cars were invented because people were lazy and didn't like walking, and it's really bad for the environment as well. If the gym is far away and you need to go to the gym or dairy, you could just bus and save money and help the environment. School 2 female student</i>
	Dealing with the elements	<i>Because it is a hot day and there is lots of sun, you can't play outside for too long, and the sun is making you hot, you will want to come in. School 1 male student</i>

Table 3 – 2. Categories of parental responsibility in children’s physical activity

Theme	Indicative types of responsible parental behaviour	Example verbatim quote
Instrumental support	Positive reinforcement	<i>Like when you are at the end of a game and losing, they shout, “better luck next time”. School 1 male student</i>
	Not pushing children	<i>She came second in cross-country and she always came first in most things, and her Mum said, “Helen, you should have come first” and all that stuff. And she started crying and stuff because of that but I don’t know if it is a rumour or not, but it could be. Yeah, but her parents just can’t say that. School 2 male student</i>
	Remonstrating inactivity	<i>They are always telling me to do it (physical activity), and I don’t want to but then I have to do it. School 1 female student</i>
	Encouragement of physical activity	<i>And I think they should also help with your physical activity by encouraging you to do things, even though they haven’t done it before. School 2 female student</i>
Logistical support	Provision of transport	<i>... but when they become more interested in things like team sports, then they – obviously you have to provide the getting there and fit it into your life. School 2 parent</i>
	Financing of activities	<i>... the parents are still running around, still buying and working to support their extracurricular activities. School 2 parent</i>
Nutrition	Provision of good food to enable physical activity	<i>Having the right food so you can be active and play the sports you want to play. School 1 male student</i>
		<i>So you have got energy School 1 male student</i>
		<i>So do your parents say to you that you should eat the right food so you can play rugby properly? Facilitator Yes. (multiple) School 1 male students</i>
Child prioritisation	Safety first and foremost	<i>But I think the older my kids have got, the more physical they’ve got outside, because the longer their leash they have got from me and the further I have let them go. I’ll let them bike down to the village now. I’ve let them go and have hits at the cricket nets. They are doing a lot more of that stuff – physical activities which for three, or four, or five year olds, no way! School 2 parent</i>
	Financial distribution	<i>... financially, it’s a real struggle for me because I have got 4 kids and when they all want to join a club, I pick it. I have to pick and chose between who wants to really do it and age groups and things like that. School 1 parent</i>

Table 3 – 2. Categories of parental responsibility in children’s physical activity continued

Theme	Indicative types of responsible parental behaviour	Example verbatim quote
Child prioritisation continued	Time management	<i>When you are a woman and then a mother, it is the 363 things that go before you that you take responsibility for, and you are way at the end of that pecking order. School 2 parent</i>
Active transport	Encouragement of use	<i>... if you said, “let’s go for a walk”, they’d say “ohhh, we’ve got a car”. I’d say, “I’m paying for petrol - that is why we have to walk. School 1 parent</i>
Direction	Role Modelling	<i>And if you’re parents aren’t doing [anything], and you are not doing anything, you are like thinking “Oh yes, they don’t need to do it - since they are not doing it, you don’t need to do it. If they tell you to do it, you are like, “well, I don’t have to, cause you are not doing it”. Like, it is not a very good example. School 2 female student</i>
	Placing into the “right” activities	<i>If we were in the Sudan, I would see no purpose in spending a fortune on swimming lessons, but because we are in New Zealand, I see that as a priority. School 1 parent</i> <i>It is down to finding what is right for the children as well as what they are happy doing, what they are comfortable doing. School 2 parent</i>
	Education about the benefits of physical activity	<i>I think to be motivated you have to have education to learn [that] if you are not going to exercise then you will get like unhealthy, and you will get fat and stuff. So you need to be educated to know that. School 2 female student</i> <i>Who should educate you? Facilitator Your parents do but school as well. School 2 female student</i>

Another differing viewpoint between the two socio-economic groups was whether being an active role model constitutes responsible parental behaviour for children's physical activity. While adults from both socio-economic groups thought this was important, children from the lower decile school disagreed and instead placed more emphasis on support mechanisms as key determinants. Furthermore, parents in the low decile groups often referred to the financial sacrifice they had to make to ensure their children could join clubs or uptake physical activity, and in turn the consequence this had on their own options for physical activity.

While there was consensus amongst participant groups regarding Directive Behaviour, Nutrition, and Child Prioritisation, teachers and parents placed more focus on parental encouragement of Active Transport, than did children. Adults also emphasized that parental responsibility for children's physical activity involved consideration of their safety first and foremost.

Themes relating to parental or personal responsibility were far more common than those connected to **third party responsibility** (e.g., peers, schools, government, health profession, and the individuals within these groups such as teachers). The four themes identified (Access, Direction, Instrumental Support, Backstop) are shown in Table 3 - 3. Children generally had more to say about this area than did parents and teachers.

Table 3 – 3. Categories of third party responsibility in children’s physical activity

Theme	Indicative types of responsible third party behaviour	Example verbatim quote
Access	To facilities and equipment	<i>They always close up the PE shed to early and you can't get anything out. There is nothing to do so you just sit around.</i> School 2 female student
	To finance	<i>I think that they should give money for PE equipment – like with the shot put, we have only just enough for one class.</i> School 2 male student
	To opportunities	<i>I also think the school should be responsible for setting up activities, like we have lunch time sport and that encourages everyone to play.</i> School 2 female student
Direction	Education of physical activity benefits	<i>... the teacher and the coaching are as far away as A and Z on the alphabet but they are both heading for the same goal in the middle, which is to get the student to the highest point that you can teach, educate them.</i> School 1 teacher
	Role Modelling	<i>You've always got your friend who can help you out to do a sport or something. Plus your friends – it's fun to play games.</i> School 2 male student
		<i>Like when we run down to Narrow Neck Beach for Water Wise, Mrs Walker sometimes runs with us.</i> School 2 female student
Instrumental support	Encouragement	<i>They push you. When you are trying to reach your goal and you can't, they won't let you give up and they help you to try and reach that goal.</i> School 1 male student
	Prompting	<i>When we have PE, our teacher should remind us to bring our PE gear because if we don't have it, we can't do it.</i> School 2 female student
Backstop	Fallback if parents fail	<i>I think we do take responsibility for children whose parents don't spend the money on them. If they are a natural athlete, they don't end up in the clubs and it's the zone days that provide them with that opportunity. It's the school rugby team or whatever.</i> School 2 teacher

Themes emerging from children's focus groups centred on the responsibility of third parties to increase their Access to physical activity through the provision of equipment and facilities, and also opportunities to engage in a wide range of physical activities. Financial assistance, whether by lowering costs or subsidising of activities, or the straight donation of funds, was also a strong theme falling under this umbrella.

Children, as well as teachers, picked up on parental responsibility themes involving Direction and Instrumental Support and extended them to third party groups, particularly teachers and sport coaches. In contrast to the differing views between the two socio-economic groups of children on whether parents should be active role models to display responsibility, they were united that this was the case for third parties, naming teachers and peers specifically. While not a topic arising in children's discussions, adults believed that third parties, especially schools, had a responsibility to act as a Backstop where parents failed to act responsibly to ensure their children were physically active.

Discussion

While all groups found it difficult to define responsibility in physical activity, participants were able to identify types of behaviour that were indicative of personal responsibility in children's physical activity. This was also the case with parental and third party responsibility. As to be expected, many of these behaviours relate strongly to previously identified correlates of physical activity in children such as healthy diet (Nutrition), access to facilities/programmes/equipment (Access), fewer perceived barriers (Self-Management), intention to be active (Attitudinal) (Sallis, Prochaska, & Taylor, 2000), as well as support from others (Direction/Consideration), and parental support/direct help from parents (Instrumental/Logistical Support). There is also

evidence that those children who utilise active transport are more physically active overall (Environment/Active Transport) (Cooper et al., 2003).

Research is indeterminate on the effects of parental modelling (Sallis, Prochaska, & Taylor, 2000) – correspondingly a factor that was also one of the only sources of dispute between the two socio-economic groups of children. The lack of importance placed on parents being active role models by low decile children may be the result of having less resource at their disposal to enable physical activity. With low decile parents frequently referring to sacrifices they made to ensure their children were physically active and their reluctance to encourage children into activities they could not provide financial and logistical support for, it may be that children recognise this dilemma and place more importance instead on parents putting their children's needs for activity first (Child Prioritisation).

Prioritising children's needs as a responsible parental behaviour, interlinked with safety matters, may also explain why adults placed more emphasis on Active Transport than children. It may be that while parents believe that they should be encouraging their children to use various forms of active transport, the primary message children receive from parents is to use forms of transport that adults believe are safer (e.g., cars, buses rather than biking or walking).

While these findings suggest that responsibility is a concept that can be related to children's physical activity from both personal and parental perspectives, a number of factors limit the generalisability of the findings of this study. In particular, the absence of fathers in the parental focus groups, the non-inclusion of a mid socio-economic group, and the non-random selection of child participants may mean that the results are

biased to certain subgroups of the population – especially children whose selection based on ability to articulate may be related to higher general perceived competence (including for physical activity) and possibly greater intelligence – both of which could influence the level and nature of a child’s sense of responsibility. With results pointing to the presence of current correlates of children’s physical activity as an indicator of responsible behaviour. However, it is reasonable to assume that this study is a good starting point for understanding how the concept of responsibility applies to children’s physical activity. Further research which clarifies the viewpoints of other population sub-groups (e.g., fathers, mid-socio-economic and a random sample of children) and segments (such as government, sports organisations, churches, and health professionals) would be necessary before the presence or absence of behaviours identified in this study can be incorporated into a measurement tool to assess whether a person is sufficiently responsible for physical activity. From this point, it could be determined whether there is indeed a relationship between the degree to which a person is responsible and his/her physical activity levels as current physical activity campaigns suggest.

In summary, this study provides insight into how the concept of responsibility relates to physical activity - a relatively untapped area in physical activity research. Furthermore, a number of behaviours/traits indicative of being responsible in children’s physical activity from personal, parental, and third party perspectives have been identified, many of which are current correlates of children’s physical activity. These behaviours/traits should be used as a foundation for exploring further perspectives on responsibility for children’s physical activity in wider community groups (e.g., government and health professionals) and more representative samples of the population. Finally, this study suggests that future initiatives aimed at increasing children’s physical levels should ensure that those behaviours promoted for adoption are in line with those the target

market believe they are responsible for (e.g., as children feel a strong responsibility for their pets and parent's physical activity levels, campaigns could be focused around the child taking both for a walk in order to benefit all three groups). Particular attention should be paid to socio-economic differences around attitudes towards activities that require financing and logistical support (e.g. promoting children's gym and club memberships to low socio-economic parents may be futile and cause them distress).

CHAPTER 4

Attribution of Responsibility for Children's Physical Activity

Preface

The findings of the study detailed in the previous chapter suggest that responsibility or the belief that one has the pivotal power to prevent or provoke subjectively crucial negative outcomes which may be actual and/or at a moral level (Salkovskis et al., 1995) was indeed a concept that can be applied to children's physical activity through the demonstration of traits or behaviours identified by the study participants that are correlated with increased levels of physical activity in children. This study subsequently sought to explore to whom key influencers over children's physical activity behaviour in the in- and out-of-school environment attribute primary responsibility for getting children more active. This study thereby provides valuable information on which agencies or sectors in society are held accountable by parents, teachers, and children themselves for ensuring children are sufficiently active and in turn, identifying potential issues in uptake of this role if these entities are unaware of or unwilling to accept this responsibility. The paper resulting from this chapter was submitted to the *Asia-Pacific Journal of Health, Sport and Physical Education* in mid 2011 and is currently under review for publication.

Since the submission of the paper comprising this chapter for publication, the role of SPARC, the key crown agency for promoting physical activity, has changed significantly to focus more on support of sport and the relevant entities involved in its delivery. Reflected in the change of its name to Sport New Zealand, the organisation no

longer has a mandate for population-based physical activity promotion, with the Government intending to provide more direct support to schools and NSOs (incorporating its affiliate regional federations and clubs). The findings of this study are therefore highly relevant and indeed supportive of this shift in policy, with the participant groups attributing mechanisms such as the subsidising of memberships to sports clubs and access community facilities and provision of more sports coaches and equipment in schools as a key responsibility of the Government and as particularly enabling in helping parents and teachers to get children more physically active.

Abstract

To enable the successful implementation of multi-layered approaches to physical activity, participants at each level must understand and accept responsibility for their respective roles. This study examined who children, parents, and teachers attribute responsibility for getting children active and in what capacity. Focus groups were conducted with children aged 11-12 years, their parents and teachers from two primary schools in New Zealand. Transcripts were analysed using thematic induction methodology. Child and parent groups attributed primary responsibility internally for ensuring children were physically active, while teachers saw this responsibility as shared between themselves and parents. All groups accepted that they played a role in children's physical activity, with Government seen as a key determinant as to whether their responsibilities could be fulfilled. Recommendations are made to prioritise population-based initiatives that enhance the ability of children, parents and schools to fulfill their respective responsibilities for getting children more physically active.

Introduction

Physical activity has a key role to play in reducing the social and economic impact of disease in New Zealand (SPARC, 2003a) and global populations (WHO, 2002). Many population-based campaigns have consequently been implemented with the purpose of increasing physical activity levels (Huhman et al., 2007; SPARC, 2009; Australian Government Department of Health and Ageing, 2007). Children, for whom physical activity has been shown to confer a wide range of benefits (NASPE, 1998; Department of Health, 2004), have been the target of several such campaigns. For these initiatives to be successful, it is now recognised that intervention must occur at multiple levels in order to affect desired behavioural outcomes such as increased levels of physical activity (Ory, Jordan & Bazarre, 2002). The Ottawa Charter (WHO, 1986) and the Socio-Ecological Model (Bertrand, 2007) are specific examples of contemporary frameworks for health promotion that recognise the value of multi-level approaches.

Multi-level approaches make good sense and are well supported by health practitioners (Ory, Jordan & Bazarre, 2002) and successful community intervention research (Matsudo, Matsudo, & Andrade et al., 2002; Mummery, Schofield, & Hinchliffe et al., 2006). Yet little is known about how the participants integral to each level of approach view the responsibilities attributed to themselves and to others in these multi-level initiatives. To ensure their successful implementation, the key influencers at each level must clearly understand and accept responsibility for their respective roles. As Schneider (1994) noted, the assignment of priority health goals is not useful unless someone takes responsibility for the goals being met.

Research suggests that local government authorities have a clear idea of their responsibility of their role in the physical activity area (Steele & Caperchione, 2005),

but the position of other agencies is less apparent – especially for parents, schools, and children themselves as the key influencers over children’s physical activity behaviour. Because of children’s dependence on others, responsibility for children’s physical activity behaviour generally needs to be assumed by someone other than themselves. Historically this role has been attributed to parents, especially mothers (Johnson, Cournoyer, & Fisher et al, 2000; Penfold, 1985). However, with evidence showing schools may be attributed responsibility for children’s physical activity behaviours, including by parents (Schneider, 1994; Hart et al., 2003), there is a real risk that the attributions of responsibility made by key influencers over children’s physical activity behaviour are all focused externally, with no one taking ownership of the matter.

External versus internal locus of causality is one of the three distinct dimensions explaining success and failure in Attribution Theory, along with stability (stable or unstable) and controllability (controllable or uncontrollable) (Weiner, 1985). Internal attributions have been linked to higher levels of physical activity in adults (Lox, Burns, & Treasure, et al., 1999; McAuley, 1991) with, for example, a greater sense of personal responsibility being correlated with higher self-ratings of health (Schoeneman & Curry, 1990) and to increased physical activity levels in nursing home residents (Langer & Rodin, 1976). To date, there is no information in this area relating specifically to children’s physical activity. It follows that if all of the key influencers absolve responsibility over children’s physical activity behaviour - attributing it instead externally to others - a major barrier to facilitating increased physical activity in children is created. This study therefore aims to investigate to whom responsibility for children’s physical activity is being attributed and in what capacity, to gain a better understanding of potential barriers relating to responsibility for getting children more physically active.

Methods

This study was part of a wider descriptive qualitative study on the responsibility for children's physical activity (Cox, Schofield, & Kolt, 2010) approved by the Auckland University of Technology Ethics Committee (Appendix B).

Children (boys and girls aged 11-12 years), and their parents and teachers, from one high and one low Decile upper primary (elementary) school in Auckland, New Zealand participated in semi-structured focus groups. With Decile being a proxy for socio-economic status, School 1 (Decile 1, most deprived) and School 2 (Decile 10, least deprived) represented the low and high socioeconomic groups respectively, allowing for a wide range of perspectives on the attribution of responsibility for children's physical activity.

Principals from both schools were contacted via a letter (Appendix C) and follow-up phone call to explain the objectives and requirements of the study. Upon consent (Appendix D), Principals raised concerns regarding potentially low response rates and bias resulting from initially proposed random selection methods. Information packs (containing parental information sheets and consent forms (Appendix E), and child assent forms (Appendix F) were subsequently distributed to children selected by the Principal on the basis of: a) their parents being able to participate in the study; b) a wide range of activity levels; and c) the likelihood of the child being able to contribute verbally to the study (that is, that they would not be too shy to speak). All of the children selected returned forms and were included in the study along with their parents, as were the teachers who filled in consent forms after reading information sheets provided to them through the Principal.

Four focus groups for children (separated by gender), two for parents (which as mentioned previously comprised only mothers), and two for teachers were conducted over a two-day period in each school in November/December 2005. Eight focus groups containing between six to nine participants (60 in total) each were therefore carried out. An interview schedule (Appendix G), which was developed for the wider study and pilot tested with a group of five physical activity experts, was used to guide the questions related to who the different groups perceived to be responsible for children's physical activity and why.

Focus group discussions were audio taped and transcribed verbatim. To identify common, significant, and dominant themes occurring in the raw data, a general inductive approach was used to analyse the transcripts after they had been read several times. Coding was conducted manually. Peer evaluation to check for appropriateness and completeness was carried out separately by two expert academics in the field of physical activity and sport. Based on percentage agreement of randomly selected pages of coding, interrater reliability at 92% and 83% respectively, was deemed acceptable in both cases.

Data were organised firstly according to participant group (children, teacher and parent) so that common themes within these groups could be established. In turn, this allowed for the comparison of themes across groups to see whether any similarities or differences exist between the views of children, parents, and teachers on the attribution of responsibility for children's physical activity.

Results

Children's attributions

The focus of children in this study was internal – they saw themselves as being primarily responsible for their own physical activity and the early development of good behavioural patterns, with parents and schools playing a secondary role. Establishment of good behaviour patterns early in life was of overriding importance to children. Having less resource at one's disposal was not seen as a viable excuse for being inactive.

I think it is not really the people that do it for you. It is whether you have the motivation in yourself that can push yourself to do it. You don't need to be rich, you don't need to be poor. (School 2 female student)

Children also felt a degree of responsibility for their loved ones (including family members and pets), espousing a duty to intervene if they were sufficiently inactive. This concept was reinforced by the comments of a School 1 male student that “on the plane over here, Dad was just sitting like that, and it was like, Dad, get up and walk around the plane. Be careful you don't get a dead leg.”

After themselves, children rated parents and teachers (or schools) as those most responsible for their physical activity. This was followed by friends, the Government, and sports coaches, who were often grouped with teachers and were in many cases the same person. In terms of children's external attribution to these groups, parents were viewed as holding primary responsibility for younger children. This was due to the assumption of personal responsibility by children for their physical activity was thought to be a gradual process that starts at around intermediate school age (11-12 years),

increasing as one gets older. As one School 2 male student highlighted “I don’t think your parents are supposed to control your every move. As you get older, you basically become an adult – not always dependent on your parents. Like now we are getting older, it is more on us.”

For children of their age group and older, participants perceived a parent’s main role to be one of assisting children to be more responsible for their own physical activity – mainly through role modelling, encouragement of physical activity, prompting, and remonstrating of physical inactivity. For example, a School 2 male student noted that “your parents should encourage you to walk or bike to school.”

Schools were also designated some responsibility for getting their students active by children, with teachers/sports coaches identified as being particularly influential in providing direction and education in matters relating to physical activity. This perspective was highlighted by a School 2 male student who said “yes like learning mentally maths and stuff, you also need to learn the physical.” The provision of encouragement in matters relating to physical activity was also viewed by the children as being an important contribution of school teachers and school sports coaches. “Our PE teacher - he gets us into different sports and makes us try” said a School 1 female student when asked who demonstrated responsibility for children’s physical activity.

Schools were also seen as having an enabling role in accessing equipment/facilities and providing opportunities for physical activity. In turn, these themes were consistently linked to discussions relating to the Government, which while not attributed direct responsibility by children, was proposed to determine how much equipment the school had and how much opportunity for sport was available to them through governmental

policy and funding. The children in this study (aged 11-12 years) were surprisingly aware of how the Government distributed resources to schools. “They should give the lower schools – like the not so good schools – more money than the schools like us” said a male student from School 2. Children in the study also supported the favouring of financially disadvantaged socio-economic groups as reflected in the following comment by and two female students from School 2:

The Government is doing a lot of good stuff, but out of everything being yourself and your friends giving you input is more encouraging to go out and do it. Like the Government can give you access but it doesn't make you go out and do it. (School 2 female student)

I reckon the Government does [have responsibility] because if there isn't any classes, then you can't do any sport, and if there isn't any equipment, if they don't provide, then you can't do anything, and they are the ones that provide the equipment. (School 2 female student)

Children additionally proposed that their peers, without being directly responsible, could influence their own activity levels through role modelling, encouragement, and making activities more fun. “They kind of encourage you. Like they help you more – make you feel better about doing it, because they are doing it” mentioned a School 2 female student, while a male student from School 1 noted:

Like if there are two friends and one is active and the one is not. Then if the person plays, the other one will be like the active person. That person will feel pressure to be active and more like his friend. (School 1 male student)

Children also suggested that health professionals could take more responsibility for promoting physical activity. Due to their perceived unquestionable authority, children felt that the directives of medical practitioners to increase physical activity levels would be very effective as reflected in the following comment:

I think you do listen to your doctor more. Like they have got all the knowledge and know what is best for you and know what you should be doing 'cause you do listen more to your doctor than like if your friend says, "Oh you should do it." Oh whatever. But if your doctor says you should do it, you have to do it.

(School 2 female student)

Parental attributions

In terms of internal attributions, while parents also alluded to an age gradient where children become progressively more responsible for their own physical activity, they also believed children never assume complete responsibility until they leave the home. Correspondingly, one School 2 parent stated, "I think the older my kids have got, the more physical they've got outside because the longer their leash they've got from me and the further I've let them go. I'll let them bike down to the village now." As caregivers, they held the main responsibility for ensuring their children are physically active. "I can't see how it would work if it was not guided by us" said a School 2 parent.

While parents felt children should have the final word on what they undertake based on their affinity towards a particular activity, they suggested that parents determine whether a child could undertake certain options in the first place due the instrumental

and logistical support, and exposure to and direction of different activities parents provide. This sentiment is reflected in the following quote:

I think saying about responsibility, I also think as a parent you accept responsibility to teach your children all these different things, and I think that this is one of the many many things you teach them and I don't ever put that responsibility on the school because I think the school holds its arms open with all these amazing things and offers them on a plate to children who chose to accept them or not. [It] is up to the child because you are not there to monitor that. (School 2 parent)

Parents commonly expressed frustration with the amount of burden in terms of cost and time placed on them in trying to be a parent who is responsible for their child's physical activity. This frustration was often linked to external attributions of responsibility made particularly to government organisations and schools and noted in the following comment by a parent from School 1:

But you will get some teachers who will turn around and say, it's the parent's responsibility. Why do the parents let the children sit in front of the TV? Why do the parents let their children get so fat and lazy? Why can't the parents get off their butts and take them here, there, and everywhere? If someone said that to you, well just provide me with a car. You help me finance it... You see, you can't generalise it. Some parents aren't responsible. But if you give no excuse to the parents, there is no reason why they can't support their children and get them involved. (School 1 parent)

Local and central government bodies were commonly attributed responsibility for children's physical activity because they were seen as having a significant impact on what opportunities parents could provide their children. This was due to their influence on other entities (such as schools and sporting organisations) via finance, regulation and prioritisation as suggested in the following comment by a School 1 parent.

But as the children get older, even though the parent is still in charge, you have to look at the opportunity that parents actually have to guide them into physical activity, and I think that critical thing is the government ... if you are a mother and you have a big family, there is no way you can financially cater for the specific sporting needs of your children. You know, why can't the Government subsidise so that the soccer club doesn't have to pay huge rates or whatever?... Why haven't we got it right? (School 1 parent)

Schools were in turn viewed by parent participants as the Government's delivery arm in terms of children's physical activity, and thereby as dependent on the higher authority in order to fulfil their responsibilities. "The Board can only advise the Principal of how much of a leaning is taken within the syllabus that is set by the Government" said a School 1 parent.

While there appeared to be good awareness of the Government's physical activity programmes that link into schools and the community, there was some confusion about the Government's role in these programmes and in physical activity and sport generally as reflect in a statement made by a School 2 parent that "it would be quite good to have a government agency whose sole focus was the wellbeing of New Zealand."

Financing of school physical activity programmes by the Government was a particular concern for parents, along with the treatment of programme costs by the schools themselves. Higher socio-economic groups were felt to be more disadvantaged (by both groups of parents) because they do not receive the same level of subsidised activities and reduced course costs/fees that lower Decile schools do for example. These sentiments were reflected in comments made by a School 1 parent (“all we are doing is covering the cost that is passed on to us. And at the school we don’t make a profit but you hear of other schools that do”) and a parent from School 2 (“why should a child whose parents are not financially well-off ... they are doubly killed by living our area”).

Parents also identified the further third party sources to whom they attributed a lesser degree of responsibility for children’s physical activity. The commercial sector was highlighted by parents as an area that could adopt strategies such as sponsoring children’s events to enhance the support of other groups in getting children more active. The media was seen as a key influencer in this regard, particularly with advertising support from commercial and government sectors. The profiling of sports stars was also viewed as a very effective strategy to motivate children to engage in sport and physical activity. As noted by a School 1 parent, “They [the children] get motivated because the media puts sport in the limelight in New Zealand.”

Despite many parents alluding to the role strong role of sport in New Zealand society, only one parent attributed any degree of responsibility to sports organisations and this was in the context of facilitating visits of sports stars to schools.

Teacher's attribution

As with other groups, teachers apportioned an increasing degree of responsibility to children for their physical activity as the children aged. However, teachers viewed their responsibility as a shared one with parents - both of equal importance and separated by the time children were under their care. This was reflected in the comments of a School 1 teacher who said, "When they are at school, we are responsible and we do what we do, and they do what they do at home ... We have to work side by side regardless."

Furthermore, teachers (particularly those from the low Decile group) commonly expressed frustration with parents transferring most of the burden of responsibility to teachers. For example, a School 2 teacher said, "Parents, whatever the main people who are in their lives (caregivers or whatever) - they point at us. There is only so much we can do."

Teachers suggested that educating children about the benefits of physical activity and increasing their awareness of different options was a primary responsibility for them as well as parents. Other designated shared roles were in the provision of funding and motivation for children's physical activity. Where the parents failed to fulfil their responsibility, or lacked sufficient funds, for ensuring their children are physically active, teachers saw themselves as backstops as expressed by the comment of a School 2 teacher who said, "I think we do take responsibility for children whose parents don't spend money on them. I think we have to step in for those kids."

Teachers' attribution of responsibility to themselves and parents for children's physical activity was inextricably linked to government entities that were designated responsibility for enabling opportunities for physical activity. Teachers viewed the

ability of schools and parents (as well as those of sporting organisations) to fulfil their obligations as strongly influenced by the parameters set by local and central Government through funding and regulations as noted in the following comments by School 1 teachers:

The overall umbrella is finance.

Which is the Government.

Which is the Government, but underneath you have got the parents and the users, and underneath the users, someone has to be motivated whether it be the parents, or the club captains, or the person going around to pick the kids up to take them to these places as a lot will not go on their own. (School 1 teachers)

Finally, external attributions were also made by teachers to a lesser degree to health professionals, and to the church by teachers from the low socio-economic school.

Discussion

This study sought clarification on the attribution of responsibility for children's physical activity by key influencers - parents, teachers, and children themselves.

In child and parent groups, the attributions around responsibility for children's physical activity were primarily internal. The attributions made by teachers were also internal but shared equally with external attributions made to parents. This makes sense, with parents being designated responsibility for children's physical activity in out-of-school hours and teachers taking responsibility for the time children were under their care. Providing optimal opportunities for children to engage in physical activity within their respective home and school environments was perceived to be the key role for both

parents and teachers. However, children of this age group proposed that the final decision to engage in physical activity was indeed their responsibility despite adult participants suggesting that they were not completely ready to assume this responsibility.

The groups in this study therefore appeared to understand and accept their respective responsibilities for children's physical activity. Where the system could potentially be breaking down is in the implementation of activities in order to fulfil these responsibilities. This possibility is reinforced by the frustration expressed by both adult groups in terms of the growing burden this presented to them and the increasing blame they felt from other groups for not "doing their job". The Government's role in making the role of parents and schools easier to fulfil was central to these discussions.

An extension of Weiner's theory on attribution (1985) may shed light on why this external attribution made to the Government may impact on the transference of acceptance of responsibility into action to support children's physical activity. Weiner (1985) initially reported that individuals are not held responsible by other individuals for their situation if there is moral justification for the outcome, supported by finding that teachers felt they were backstops for parents who lacked adequate resources. Ziff, Conrad, & Lachman (1995) then proposed that individuals will also not infer responsibilities to themselves for health outcomes if they perceive justification. It may therefore be that parents and teachers feel they are morally justified in not implementing their responsibilities in relation to children's physical activity because the Government is perceived not to be supporting them to the level they believe is appropriate (e.g, by subsidising the costs of physical activities for children).

Thus, it may be useful for governments and other relevant authorities to further educate parents and schools on avenues of support they provide for physical activity, and ideally to prioritise funding for initiatives that directly assist parents and schools in the implementation of their responsibilities. Some examples suggested in the focus groups included: subsidising children to attend sports clubs; providing more sports equipment and coaches for schools; funding visits of sports stars to schools; enabling community facilities to be free of cost for children; involving the corporate sector (perhaps by way of tax breaks) in this area (e.g., they run low cost sports events for children). Of primary importance, however, is that physical activity campaign advertising focuses on low-cost physical activities (such as walking or swimming) so that there is no perceived “out clause” for physical activity.

The findings from this study have implications for both current physical activity initiatives and future research. As a starting point, it would be useful to determine whether there is a relationship between children’s physical activity levels and degree of responsibility in groups attributed internally by the key influencers over children’s physical activity. This would help to establish whether it is indeed worthwhile to target specific groups with responsibility-based physical activity campaigns. With the Government, health professionals, the corporate sector, and the church identified as groups that could be more proactive in terms of their responsibility for children’s physical activity, it would also be useful to examine the respective perspectives of these sectors on their role in children’s physical activity to help identify possible barriers for their increased involvement. The position of NSOs, which given their ability to influence out-of-school activity levels surprisingly featured very little in focus group discussions, should also be investigated.

Future research, particularly with fathers and a wider group of randomly selected children, should also be conducted to account for factors limiting the generalisability of the results of this study – specifically, the presence of only mothers in the parental groups; the non-random selection of the participants; the non-inclusion of a mid socio-economic group; and the small number of participants. However, this study provides a starting point for the application of attributional theory to the area of responsibility for children's physical activity.

CHAPTER 5

Responsibility in Football for Children's Physical Activity

Preface

The content of this chapter comprises a paper was submitted to the *Sport Management Review* in January 2012 and is currently under review for publication. This chapter represents the second study of the two main studies of this thesis exploring responsibility for children's physical activity. The findings of the pedometer study on children's in- and out-of-school physical activity levels detailed in Chapter 2 suggest that children's out-of-school physical activity makes a significantly higher contribution to children's overall physical activity levels. Combined with the highly conspicuous finding in the previous chapter that NSOs are rarely attributed responsibility for children's physical activity despite potentially being able to make a considerable impact in out-of-school time, it is relevant to explore the position of football as the largest junior sport in New Zealand and many other countries in terms of responsibility for children's physical activity.

Additionally, the New Zealand Government has recently undertaken to provide more support to NSOs and their affiliates in their goal to get more children more physically active. It therefore also makes sense to to obtain greater understanding around the barriers and incentives for potentially increased involvement of football and other sports in the physical activity agenda for children to ensure these organisations are ready to capitalise on increased support measures and to contribute to government objectives around getting children more physically active.

Abstract

With its reach, high profile, and accessibility, football is the sport arguably most able to make a positive contribution to the physical activity levels of children worldwide. This study explores the position of National Football Associations (NFAs) in taking responsibility for children's physical activity using framework provided by institutional theory, so that current norms, beliefs, values and barriers for football engaging in the children's physical agenda can be identified and better understood. Semi-structured interviews were carried out with key decision-makers from NFAs of varying size in eight countries where football is a major sport and the physical activity levels of children are a national concern. Transcripts from these interviews were analysed using thematic induction methodology. While there appeared to be a growing awareness in football of the importance of engaging more children in the sport and linking into social outcomes such as increasing physical activity levels, the perception of a legitimate NFA being first and foremost one that is competitive on the world stage with its national teams was identified as a major institutional barrier to progress in this area and to organisational growth. Forms of coercive and mimetic isomorphism that serve to preserve the status quo amongst NFAs were also evident. A recommendation was made to enhance domestic and global activities which promote NFAs who take responsibility for and are successful in children's programmes as legitimate NFAs.

Introduction

Physically active children are more likely to be conferred with a wide range of physical, psychological, and social benefits (Department of Health, 2004), and are more likely to be active adults (National Centre for Chronic Disease Prevention and Health Promotion, 2000). With out-of-school physical activity being found to make a significant contribution to children's overall physical activity levels (Cox, Schofield, Kolt, &

Greasley 2006), it is important that those agents who have access to children during this period take responsibility for ensuring children engage in physically active pursuits.

During out-of-school hours, National Sporting Organisations (NSOs) occupy a unique position to tackle declining physical activity levels and wider global and community level health challenges (Smith & Westerbeek, 2007). By its very nature, sport is an ideal platform to encourage physical activity and health awareness, with good programmes leveraging this relationship whilst minimizing any potential physical risks. In addition, sport appeals to young people with participation-based programmes having the ability to encourage involvement and high profile sports people acting as role models for emulation (Smith & Westerbeek, 2007).

The sport arguably most able to make a positive contribution to the physical activity levels of children with its profile and reach as the largest junior sport is football, or soccer as the sport is also commonly known. This applies to particularly to countries such as England, Australia, USA, Singapore, Switzerland, Germany, Chile and New Zealand where physical inactivity has been identified as a leading risk factor for public health (World Health Organization (WHO), 2002) and football is a major national sport with over 4% of the total population participating in the game (Fédération Internationale de Football Association (FIFA), 2007a).

Played by 265 million people (including 26 million women) in over 207 countries (FIFA, 2007b), football is arguably the world's largest and most popular sport. Combined with the game's low barriers to involvement, and profile and popularity worldwide, football therefore has a tremendous potential to positively influence international as well as domestic physical activity levels of children. Conversely, there

is also potential for National Football Associations (NFAs) to gain considerable benefit by incorporating a physical activity agenda into their strategic planning and activity – through expanded revenue streams from government and non-governmental funding opportunities, organisational image enhancement from being seen as a good corporate citizen in assisting the community, and the widening of a player base that may in the future support the infrastructure of the sport through coaching, refereeing, and volunteering for example.

Football is therefore well placed to assist traditional agencies to reverse current physical activity trends for children. Many NFAs appear anecdotally to have programmes targeting children. However, it is not known whether these initiatives are explicitly linked to the objective of increasing children's physical activity levels. For example, the objectives of New Zealand Football's Small Whites programme targeting 5-12 year old boys and girls were to: 1) reward participation and achievement in football in this age group; 2) provide a fundamental coaching resource for parents; and 3) profile male and female role models to whom Small Whites could aspire (New Zealand Football, 2007). New Zealand Football's strategic plan for the corresponding period (2006-2010) period also did not make any reference to wider objectives around increasing physical activity levels of children at a national level (New Zealand Soccer, 2006).

In light of the significant benefits to be obtained from a widespread uptake of physical activity programmes for children by NFAs, it may be useful to develop tailored strategies to encourage these organisations to take responsibility for contributing to the delivery of public health goals in this area. To develop such strategies, it would first be necessary to understand the reasons underlying the adoption (or lack thereof) of objectives relating to increasing physical activity levels of children through football

programmes by NFAs. Institutional theory provides an appropriate conceptual framework for achievement of this purpose.

Conceptual Framework

In organisational studies, institutional approaches focus attention on relationships among organisations and the fields in which they operate (Lawrence & Suddaby, 2006). Central to the theory are the institutions – societal values, norms, and rules which dominate an organisation’s external environment – which emanate from institutional forces such as the state or other large powerful organisations (Slack & Hinings, 1994). Institutional theorists argue that conformity to these institutionally prescribed values and beliefs is essential for an organisation to receive and maintain legitimacy (Cooney, 2007). Legitimacy is “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system or norms, values, beliefs and definitions” (Suchman, 1995, p.574).

It is the drive for legitimacy, sometimes at the expense of efficiency, that results in the convergence of organisations in a given industry or field to become isomorphic with institutionally prescribed expectations (Cooney, 2007). In other words, conformity to institutional pressures creates homogeneity across organisations, resulting in field-wide values and practices (Danisman, Hinings, & Slack, 2006) In this context, a field is “a community of organisations with a common meaning system and whose participants interact with one another on a more frequent and fateful basis than with those outside the field” (Scott, 1995, p.56).

Coercive, mimetic, and normative processes underpin organisational conformity field to institutionally prescribed expectations within a field (DiMaggio & Powell, 1983).

Coercive isomorphism takes place when pressure is exerted on organisations by other organisations on which they may be dependent, for example, through the regulation of industry or fields by government or courts. Mimetic isomorphism results when organisations faced with uncertainty imitate successful organisations and forms in a given industry or field in an effort to gain legitimacy with their peers. Normative isomorphism occurs when certain modes of practice are spread by professionals in structurally equivalent positions throughout the industry (Cooney, 2007).

Through these processes, institutional theories offer an explanation of how organisations can adopt non-choice behaviors through habit, convention, convenience, or social obligation that essentially serve against their best interests (Oliver, 1991). Institutional perspectives also highlight the causal impact of state, societal, and cultural pressures on organisational behaviour, as well as demonstrating how passive acquiescence (as opposed to strategic adaptation) to the external environment can contribute to the survival and legitimacy of an organisation (Oliver, 1991).

Institutional theory has become a dominant theory in organisational studies and is also commonly used in sport management research (Kikulis, 2000). Sport organisations are embedded in organisational fields and are subject to pressures from a large number of stakeholders such as regulatory agencies, suppliers, consumers, and competitors (O'Brien & Slack, 2003). Sport organisations are heavily influenced by their institutional environment. Institutional theory therefore provides an appropriate framework to examine organisational change in sport - in particular, in analysing why sport organisations exhibit particular organisational arrangements.

The concept of isomorphism has been the focus of many studies within sport management literature (Washington & Patterson, 2011). Slack and Hinings (1994) reported a tendency towards the establishment of more similar NSO structures in their study on the impact of three different types of institutional pressure from Sport Canada on 36 NSOs to change to a more professional bureaucratic structure. Further studies investigating a variety of individual NSOs falling under the umbrella of Sport Canada's jurisdiction (Amis, Slack & Hinings, 2004; Danisman, Hinings & Slack, 2006) and the relationship between US state sport policy and similarity of goals among sports clubs in Norway (Skille, 2009) also denoted trends towards isomorphism between constituent organisations.

Isomorphic tendencies have also been highlighted in studies within individual sports, for example in explaining the relationship between: football clubs in the English Premier League and their website design (Lamertz, Carney, & Bastien, 2008); the distance between women's and men's golf tees and the US State political ideology (Arthur, Van Buren, & Del Campo, 2009); and the low percentage of black coaches in the NCAA (Cunningham, Sagas, & Ashley, 2001). A study by Phelps and Dickson (2009) also found that in drawing on the legitimacy of the New Zealand All Blacks symbolism in naming conventions, the national ice hockey federation was able to increase social support for men's and women's hockey.

In their review of the connection between sport management theory and institutional theory, Washington and Patterson (2011) highlight the lack of focus on the outcomes of pressures on sporting organisations to become more homogenous in the well researched concept of isomorphism. Put another way, we know little about whether the organisations that adopt institutional norms are more successful. Using institutional

theory, this study explores current norms, beliefs and values around NFAs taking responsibility for children's physical activity. This study also seeks to understand how resistance in NFAs to engage in the children's physical agenda could potentially impact on the success of organisations within the football field.

Methods

This study was part of a wider descriptive study on responsibility for children's physical activity approved by the Auckland University of Technology Ethics Committee on 8 July, 2008 (Appendix H).

To collect information pertaining to the position of NFAs perspectives on the role of football in the children's physical activity agenda, a qualitative methodology was employed. Data were collected using semi-structured interviews with eight Presidents, Chief Executive Officers, or their designated delegates at Senior Management level. Given their years of experience, all were considered capable of providing an in-depth view of their NFA as well as insight into other football organisations and issues around the world.

The participants came from NFAs in eight countries, providing representation of five of FIFA's six Confederations. The NFAs were selected on the basis of the following criteria: a) the NFA must be in a country where football is a major sport in the country with over 4% of the population (male and female included) playing; b) the NFA must be in country where physical activity is a recognised public health concern; and c) the senior executive must be able to communicate fluently in English. In addition to these criteria, consideration was also given to ensuring small and large NFAs were included. Annual incomes for the NFAs ranged from approximately US\$0.5 million to in excess

of US\$313 million. Convenience issues were also evident. The ability for researcher to access participants because of cost and timing of travel, as well as the willingness of invited participants to make themselves available were additional factors.

Potential participants were contacted initially by email or in person by the researcher and provided with a participant information sheet (Appendix I). All of those contacted agreed to participate in the study, and after consent forms were provided (Appendix J) face-to-face interviews were conducted over a six-month period in 2008 by a researcher experienced in football governance and management as well as in moderation. Questions were guided by an interview schedule (Appendix K) focusing on four main areas: a) background to the organisation (size in terms of income and capacity, core strategic and operational areas, key stakeholders, organisational benchmarks and main challenges); b) personal perspective on children's physical activity, in particular knowledge of football's involvement in this area and whether they viewed the NFA and football in general as having any responsibility for getting children in their country more active; c) the NFA's provision of children's physical activity programmes; and d) the issues, pressures, and outcomes related to establishing or not establishing these programmes.

The interview schedule, which allowed for open-ended questions, reflected an *a priori* coding scheme to ensure the assignment of units of meaning to descriptive or inferential information gathered during the study (Miles & Huberman, 1994). Although the questions were therefore semi-structured, they were not asked in a rigidly prescribed order, instead focusing on the issues most relevant to the situation of the NFA. For example, if the NFA did not have their own football programmes for children, the discussion centered around why they had not adopted such programmes. In comparison,

when the NFAs did provide children's physical activity initiatives, the focus was on what had encouraged them to do so. Interview duration ranged between 60 – 90 minutes.

To ensure accuracy, all interviews were recorded and then transcribed. Secondary materials such as NFA Strategic Plans, Development Plans and Annual Reports were also gathered and referred to to provide any missing data (e.g., annual income and number of employees) and to cross check information provided (e.g., vision and mission statements and core business areas). Data were then content analysed and categorised according to the *a priori* themes and emergent sub-themes. This took the form of a matrix where text from the various interviews indicative of the specific theme was inserted into cells.

Peer evaluation to check for appropriateness and completeness of the data (Patton, 1990) was carried out on the entire coding sheet. An 85% agreement on the items between the two coders was achieved in the initial evaluation phase, with this level increasing to 95% after discussion on the disagreed items and subsequent movement of agreed upon items into new coding categories.

Results

To ensure the anonymity of participants in the study, NFAs are referred to by a number. Using a combined metric of annual income and number of staff, the NFAs were rank-ordered from smallest (NFA1) to largest (NFA8).

Core business of football

When asked to describe the core business of their own NFA, participants provided many and varied responses. These could be categorised into four key subthemes: a) improving the quality of football; b) development and governance of the game; c) organising national teams and competitions; d) and financial stability.

The overriding and dominant core business of the NFAs was the importance of the NFA's national teams (in particular the senior men's national team). NFA5 was clearly focussed on elite teams when stating the main goal of the organisation was to "qualify for the World Cup and achieve football excellence in [country]; that is really the core." This theme was evident regardless of whether their teams were ranked internationally amongst the highest or lowest football nations, reflected in a comment made by one of the participants from a smaller NFAs:

I think there are several and I do believe that we are looking after high performance as number one and that means that you have got to get your teams onto the world stage...Core business I believe is high performance – getting the [senior national men's team] to play, getting them on the world stage. (NFA2)

Most participants did not refer to mass participation as a critical component of their NFA's business. NFA8, the largest NFA stated, "The [regional associations] just developed their strategy. So their plans are like mini national game plans with same goals, same targets...there's nothing about trying to improve the health of the nation or education." Three participants referred to the importance of building their membership base at youth level. However, NFA interest in youth participation was justified by its contribution to elite football as expressed by NFA3:

Our responsibility is to care about the 250,000 players who have a license in [country] football. The most important are the youth and the kids because the federation is responsible for the national team... So the federation is very interested in the quality of training and coaching with the youth. (NFA3)

The overriding importance of national teams rather than mass participation is also reinforced by the mission statements (i.e., statements outlining the main purpose of the organisation). In the mission statements and descriptions of NFA core businesses, there was only one reference to social goals associated with football or mass participation in the sport. This mission statement referred to the "...unifying educational, cultural, and humanitarian values particularly through youth and development programmes" (NFA1).

The prioritisation of elite football over mass participation and social development was also evident when participants discussed the focus of NFA's globally. NFA4 commented, "I have seen that most of them are interested in their national teams so they are interested in the competition side...For some, their only objective is to go to the World Cup. That's it. If they get that, they're done." NFA7 concurred, "So far, most of them still concentrate on professional football."

Those interviewed attributed less priority to growing mass participation in football to the core functions of NFAs globally. However, many alluded to junior participation becoming increasingly relevant to NFAs. NFA8 stated, "I think increasingly federations are realising that they are responsible for the development of the whole game not just talent."

Responsibility of NFAs for children's physical activity

Participants were also asked to describe their views on what responsibility their NFA and football in general had for ensuring children were physically active. The first question explored who held primary responsibility for children's physical activity within the community. There was consensus amongst participants that responsibility lay predominantly with parents and schools. Parents in particular were perceived as the initiator of a child's physical activity behaviour in their role as the primary educator as NFA6 stated:

I am in favour of it starting with the parents. Your physical activity is really education – it is educating how important it is, just like reading and learning to write and understanding the discipline of the things you have to do in life. I think a lot of things start with parenting. (NFA6)

Schools were seen as having a complimentary role alongside the parents in ensuring children are physically active. Schools have access to children in terms of time and reach as argued by NFA8:

If you went out and did a straw pole and asked people who is responsible for ensuring our children are literate by the time they leave school, you would say it's the schools and the parents. Well I don't see why physical education should be any different. There is no other organisation that has that infrastructure to reach all of the children. So it has got to be the schools I think. (NFA8)

Another justification for the responsibility falling upon schools was the inability of parents to fulfill their responsibilities in providing adequate education for children in the area of physical activity. NFA3 argues:

[Country] is not very well developed in all questions of parent's education. So then all the responsibility will be transferred to school and the school cannot do everything. School has first to teach, and they should educate the children at the same time, ensuring physical education programmes at the same time. It is a very difficult task for our schools. School is the second one of course, to bring children into physical activity but it is very difficult because parents are not doing enough. (NFA 3)

The inability for football organisations to access all children was another reason for football organisations to avoid full responsibility for getting children more physically active. NFA8 lamented, "We have 43 [regional associations] with 400 staff in them but we still couldn't get into all the schools. I think we have 20,000 schools in [country] ... you can't get into them all."

Unanimously, NFAs perceived themselves as having a shared responsibility in the physical activity agenda alongside a mix of stakeholders including schools, parents, local and central government and sporting entities such as NSOs, local and regional federations and clubs. Their viewpoint is reflected in the following statements:

It comes back to that reach thing really...[NFAs] have got a role to play in supporting schools and supporting the development of good clubs in the community. So they play a supporting role, they are a stakeholder in that mix of parents, schools, national and local federations, clubs, local government... So there is a mix of stakeholders and I think we couldn't do it on our own. (NFA8)

I think it is an unfair question - “does our sport have a responsibility?” - because I think all sport does. All of corporate [country] does and all parents do – I think everybody does. It is like global warming, everybody has some share of responsibility. (NFA6)

Participants argued that NFAs do not hold the key responsibility for children’s physical activity. Instead NFAs fulfilled their responsibilities by adopting a support role to institutions such as schools and clubs that deliver sport directly to children. NFAs therefore acknowledged their support role in getting children more physically active but in most cases do not leverage this role directly. NFA8 argued that teacher training, coach education, coach placement, school-club pathways, and competition structures were “the key areas that we as a national governing body should, and we do, link in and support on.” Another argued that the NFA contribution to the school-based activities “should be in the form professional input towards running the school programme and football specific equipment” (NFA1).

Despite the common viewpoint that NFAs have more of a support role in terms of getting children more physically active, all NFAs saw clear benefit in taking more responsibility for children’s programmes. These benefits centred on the ability to grow and develop its player and fan base. NFA8 refers to the player development issue when she states:

I think the biggest challenge is player development. There are massive concerns about the quality of young male players coming through the system, the number of [NFA professional league] players that are not [from the country] anymore. There is a critical struggle going on about whether we invest enough in player

development. If we don't have a successful team long term that will have implications on our TV rights and our sponsorship. NFA8

The fan base argument is exemplified by this statement:

These are really the guys who fill the stadiums and you get them young. Even if the guy or girl is not good enough for the national team, he or she may still continue to play the game at club level. Maybe even not good enough for club, but they can still play the social kick about – he knows what football is all about. He is more likely to send his son or daughter to football training in the future so it's like a circle. (NFA5)

Attracting or protecting funding and resources from both the public and private sector was another key reason given by participants for engaging in children's football programmes. NFA5 spoke of the participation fees when he stated, "In grassroots football you can also derive income. You create certain programmes for kids, parents pay to participate in. So it is a kind of revenue generator." NFA8 described government and corporate support: "Our partnership with [major corporate] and the government has enabled us to employ 66 full time coaches which are working in 12 of our [regional associations] in clusters, running [NFA] skills centres in the community."

Further reasons put forward by NFAs for taking more responsibility in terms of engaging in children's physical activity programmes included: a) follow-on benefits to the individual players and clubs; b) corporate social responsibility in terms of providing a platform for the promotion of socially responsible messages (e.g., acceptable parental

sideline behaviour); d) protection against competitor activity; and e) health and social benefits for the populace.

Adoption of children's physical activity programmes in NFAs

Of the NFAs involved in the study, all except one (NFA4) reported having football programmes for children which were delivered either through schools or affiliated clubs or a combination of both. Only one organisation (NFA8) however, had a programme explicitly linked to children's physical activity objectives. NFA8 explains:

We wanted recently to introduce a skills programme and a lot of the skills programme is all about football but it's not old fashioned football coaching. It's not about this is how you pass a ball, this is how you control it. It's all about using football to support agility, balance, and co-ordination...A few years ago they were saying that 70% of children leaving primary school had poor levels of physical literacy which means they are gone forever, pretty much....we are losing kids that are going to enjoy football for the rest of their life. It's a retention thing. It's as much a grassroots issue as an elite issue because we are going to narrow the talent pool. (NFA8)

For NFAs with programmes not linked to physical activity objectives there was a general perception that football must focus solely on football matters rather than getting involved in non-core children's health objectives. As NFA3 argues, "The health of the population of [country] is not really a focus of the sport federations of [country] ... the first thing is to care about the techniques of their sports."

These organisations felt that children's health and physical activity objectives were being addressed and supported indirectly through the implementation of grassroots programmes in clubs and schools in particular. The following two quote is typical of others:

Our focus is introducing children to soccer. So we think that soccer addresses a lot of the physical activity questions that confront our youth. We are the [NFA]. We are not the [country] Government - that has a different role. That is not to say that those two can't come together and dovetail on a project to expand what we are doing. (NFA6)

NFAs again reported a growing trend towards establishing and augmenting of mass participation programmes for children. A key factor influencing this was identified by NFAs as the spread of ideas following purposeful inter-NFA and/or Confederational level knowledge-sharing programmes and initiatives. NFA1 admitted that they "adopted programmes from [NFA outside Confederation] and [Confederation]". NFA7 describes a Confederation-driven benchmarking system:

By doing some basics you get one star, and then if you have some percentage of the population play football, this is also one star ... And the seventh is if you have one big programme including everything. This is a challenge for the bigger countries. The smaller ones, they are still working on reaching the first star because most of them don't have any basics in grassroots because they don't feel responsible for that. But they should. (NFA7)

Knowledge-sharing mechanisms have also been Confederation driven. NFA5 stated, “I was part of the [Confederation programme] team. That is what we have been promoting. That you need to have a proper pyramid system where emphasis must not be just national teams”. NFA3 referred to the [Confederation] Panel of grassroots football as “the first opportunity to exchange experiences in this working group.” The same participant referred to biennial congresses as opportunities to exchange experiences but that such an exchange was affected by the “differences between the eastern part of [the continent] and the central part of [the continent] for example.”

Differences in the sporting landscape and financial situation between NFAs were seen by participants as critical factors determining whether the leading programmes in the area of children’s football could be replicated in their country. NFA3 reflected:

If I have the same development and economic situation as a country, as a top European country, I would say I would like to be like [NFA8] or like [NFA7]. I think everybody would like that. But we don’t have either the development of the country or the financial situation. So if I have to look for something similar to us in population, in the way the game is developed, in the way we have other neighbours like [leading Confederation NFA] where football is number one so to compete with them is very difficult so and so. I have been checking [NFA outside Confederation]. They have more or less the same situation as us. I will always have an eye on those type of countries. Not to go to the top ones because how can I do something like the [NFA7] if we get here something like US\$5.4 million for the TV rights of the league? In [NFA7] I think they receive something like 400 and something million euros. So you can’t try to be close to

them. You have to try to be close to those countries in which you have similar conditions. (NFA3)

All participants referred to NFA7 and NFA8 (or each other in their case) and leading NFAs in their Confederation as benchmarks in this area. For example, NFA 7 remarked, “Other federations in [the continent] are all behind us – all looking at what the [NFA7] are doing or what the [NFA8] are doing.”

For those NFAs who were identified as benchmarks in the implementation of children’s football programmes, the influence of individual agents was also evident. Within NFA7, a new president was instrumental, whereas in NFA8, a key factor was [NFA Director’s] appointment, which resulted in “putting grassroots and the elite department into one so we could really look at the whole pathway”.

Issues relating to adoption of children’s programmes

While the pressure on NFAs to establish and improve children’s football programmes appears to be increasing, participants in the study report significant barriers to doing so. The main issue is a lack of resources, primarily financial, but also incorporating human resource, stakeholder support and infrastructure. The well-resourced NFA8 commented, “A lot of federations don’t have the resources to go that locally and even some of the national governing bodies ... the most that their resources could do is support a few good quality clubs, so it’s become piecemeal provision.” The less-resourced NFA2 agreed in stating, “Everything we look at now we have to say, “Is it cost neutral? Can we get somebody to sponsor that? Can we cover the cost of this?” If we can’t, it gets culled.”

Infrastructure, and more specifically spaces to play football, was also considered a barrier as well as the absence of a well developed club system. NFA6 highlighted that in well developed football nations “the clubs will reach out and do the development of the player, either with smaller clubs or their own club system. We don’t have that luxury.”

A lack of capable coaches was identified as another major barrier:

You find that even the professional clubs, the youngest ages are critical. Critical years tend to be [coached by] itinerant coaching staff. Full time staff tend to be working at the higher age group. By its nature, your least experienced, poorest, itinerant staff which means that they are working during the day and coaching at night which means you are limited on how much you can develop them. (NFA8)

NFAs also cited their lack of control over the potential target market for participation in the area. NFA3 felt unable to move beyond their licensed players stating, “I can only speak about the football federation and for us children’s football is a very important topic as I said, but it is always limited by the licensed players we have.”

The governance structures within football also create control issues. NFA4 considers it “a matter of the clubs” while NFA7 alluded to problems moving new initiatives and ideas through structural layers:

What we have is a lot of people working around our 180,000 teams which play competition football but this is the only thing they have knowledge about so if we come with new ideas, we have to bring those new ideas to all of the people. And that is hard ... You have to talk with them, you have to make them

participate in the whole thing and this takes some time. But we are working on it. (NFA7)

Non-football sport organisations also influence the ability of football organisations to develop childrens physical activity programmes. NFA4 laments, “Normally here in [country] the other federations think that we are keeping away from them the chance to have other kids playing – that football is concentrating everything.” Similarly, NFA7 stated, “We try to get into schools – let’s say the last 105 years. The whole sport system says, ‘We don’t need football, there is so much football outside schools. We do the other sports inside school.” For NFA4, governments were another complicating factor stating, “It’s not that we don’t want to do it but we must be asked by the Minister. The Minister must provide authorisation ... We don’t have the power to decide on such kinds of things.”

Perserverence of traditional attitudes and resistance to change within the football community also constrain NFA actions. NFA7 states:

The [NFA] is now 108 years old. For 107 years we didn’t have a plan but we had development so a lot of people say, “We don’t need this, football develops by itself”. We now say, “No, there are a lot of changes in society so we should not wait until football changes by itself. The risk is that it will be changed by people from the outside so we better change it from the inside”. For example, with girl’s football which was the biggest change of course... the resistance – there are still old fashioned people, especially in the local areas who say, “Achh, leave me alone.” (NFA7)

Discussion

This study explored the current norms, beliefs and values as well as the impact of underlying sources of resistance within the institutional field of football for engaging in the children's physical agenda.

Despite NFAs enunciating many advantages of taking more responsibility for helping to increase the physical activity levels of children domestically and internationally, only one NFA – the largest – had children's football programmes associated with outcomes related to physical activity behaviours for this target group. That is, while most NFAs have (either directly or indirectly through affiliates) football programmes for children, the institutional norm is based on programmes not linked to the children's physical activity agenda. The reasons for this can be explained within the context of institutional behaviour whereby organisations become isomorphic in seeking to receive and maintain legitimacy within their field (in this case the national governing bodies of football), often at the expense of efficiency or effectiveness.

The most legitimate NFAs are those with national teams that perform well on the world stage. Regardless of the international ranking or size of the NFA, all stated that national teams were their core business. The success of the senior men's national team in particular, was seen as integral to the health of the organisation. National team success is linked to higher expenditure, revenue generation, wider stakeholder support and enhanced public perceptions of the NFA and football. On the other hand, mass participation including football for children, is viewed as secondary to the development and resourcing of the NFA's national teams. The importance of children's football is primarily framed as a source of talent for elite football in the future – as a means to an

end, rather than an end in itself. Using football to enhance children's physical activity levels is therefore not a source of legitimacy.

Participants reported growing NFA awareness of the importance of engaging more children in the game and assisting other institutions to increase the physical activity levels of children. However, the prevailing institutional norm of focusing on elite football, creates significant isomorphic pressures to preserve the status quo. This occurs despite the potential benefit many organisations would obtain from switching their focus to mass participation, especially with children and youth.

In terms of coercive isomorphism, participants associated national team outcomes to the support of key stakeholders (e.g., public and commercial sectors) upon whom they were dependent. There was minimal reference to grassroots programmes having similar dependencies. In addition to the pressure from external stakeholders on NFAs to maintain elite football as the core concern, many participants mentioned the need to compete in international competitions and maintain a presence on the world stage. This is required by NFAs to retain FIFA membership as specified in Article 13 of their Statutes (FIFA, 2008). In addition, Article 14.4 of these Statutes denotes that members who do not compete in at least two FIFA competitions over a period of four years should be suspended from voting at the Congress until they have fulfilled their obligations in this respect.

Conversely, there is no FIFA statute requiring NFAs to provide mass participation programmes for children and youth. In short, there is no coercive pressure from FIFA to grow the game at youth level and thereby potentially link into children's physical activity programmes. With many NFAs highlighting the potential growth in revenue

and widening of their membership base and talent pool as a key benefit of promoting football activities for children, the lack of real focus on this area appears to come at considerable opportunity cost - particularly for smaller NFAs who are unable to get a foothold in high-profile international competitions. A vicious cycle is created - the lack of success attributable to the NFA's national teams impacts on the availability of funding and resource, in turn making it even more difficult to deliver positive outcomes in the elite area and to implement other programmes that could be beneficial to the development of the game and the organisation itself.

As well as membership to FIFA, NFAs are aligned to one of six football Confederations, two of which were reported by participants to be strongly promoting the development of children's football through quality mark programmes and knowledge-sharing initiatives within the Confederation. These actions would appear to constitute mechanisms for coercive and mimetic isomorphism respectively in terms achieving change in the opposite direction - that is, to abandon the status quo and focus more heavily on grassroots football linked to physical activity objectives. However, there appears to be two strong mitigating factors counteracting these pressures: a) the common perception that NFAs do not hold the key responsibility for children's physical activity and are actually already fulfilling their obligations by organising grassroots programmes and supporting the schools through the provision of expertise and resource (such as referees); and b) the relevancy with which NFAs view the programmes of larger, more financially viable organisations to their own specific situation. These two factors contribute to the distancing of NFAs from benchmarking organisations who have children's programmes with physical activity outcomes, with mimetic isomorphism instead operating amongst those organisations that perceived themselves as being in the same situation and of similar size.

However, the quality mark and knowledge-sharing programmes (for example, through regional seminars or visits of individual experts) do however provide good examples of how football organisations are starting to challenge existing norms. Wider and increased exposure of NFAs and their key stakeholders to these benchmark programmes will, in the long term, provide substantial benefit to NFAs and also contribute to an increase in the domestic and international physical activity levels of children.

For those NFAs identified as benchmarks in the area of children's physical activity, the impact of new ideas and priorities of key decision-makers coming into the organisation was viewed as a critical step in the increased focus on children's football. In contrast, whether normative isomorphism also functions within the smaller and medium sized NFAs with regards to preserving the core focus on elite football was unable to be determined by this study but could be a useful topic for further investigation included in a study focusing on isomorphism involving a larger number of NFAs.

In general, the number of NFAs involved is a limiting factor in being able to generalise findings from this study. However, being able to access key decision-makers in football (who would normally have difficulty making available the time period required for interviewing and related correspondence), has enabled the provision of in-depth information which can now also be used as a base to investigate more specific themes applying institutional theory to the sport of football with the purpose of increasing engagement in the physical activity agenda for children. In particular, it would be highly useful to examine the perspectives of the external stakeholders of NFAs (especially those from the public and commercial sector, and governing bodies such as Confederations and FIFA to which the NFAs are aligned) on using football to promote children's physical activity.

Despite the study's limitations however, the application of institutional theory to the exploration of the position of NFAs in taking responsibility for children's physical activity provides a useful framework for understanding the pressures on football organisations to continue with the status quo. That is, to focus on elite football rather than the development of the grassroots sector and potentially beneficial links to children's physical activity programmes, conceivably to the detriment of long term NFA growth. The drive for football organisations to attain or maintain legitimacy in their institutional field primarily through presence on the world stage with successful national teams (in particular the men's national team) helps to explain why these types of programmes which could potentially contribute to significant organisational growth are generally not adopted. This is despite NFA acknowledgement of the importance and utility of programmes associated with health outcomes such as increasing children's physical activity levels. In the wider context of physical activity, health and youth research, institutional theory may therefore provide a useful framework through which barriers to the implementation of health related programmes that are potentially beneficial at both organisational and social levels can be examined in the future.

CHAPTER 6

General Discussion

Summary

To enable the realisation of the potential individual and societal benefit associated with increasing children's physical activity levels, the key influencers over children's physical behaviour must each clearly understand and accept responsibility for their respective roles. Despite the need for responsibility to be taken in meeting important goals around children's physical activity, little is known about the association between responsibility and physical activity, and most notably, confusion appears to exist in the attribution of responsibility for ensuring children are physically active. As a result, there is a risk that no one takes responsibility in this regard, creating a potentially major barrier to increasing the physical activity levels of children. This study therefore sought to explore the perception and attribution of responsibility in children's physical activity in key influencers over children's behaviour in this regard.

The findings of the Study 1 (described in Chapter 2) provided important context to the main study on responsibility in children's physical activity. As well as providing the first pedometer determined measures of physical activity levels in New Zealand primary school-aged children, the study showed the importance of looking beyond the school environment when examining the correlates of, and impact of interventions on, the physical activity levels of children. With children's out-of-school physical activity levels found to make a significantly higher contribution to children's overall physical activity levels, it was suggested that those agents and/or individuals with access to

children during the after-school period play a critical role in ensuring children's physical activity is at the very least of a sufficient level for health.

Taking into account the importance of those individuals and agencies who have influence over children's physical activity during the after-school period, parents were included (along with teachers and children themselves) in a study exploring the meaning of responsibility in the context of children's physical activity. Given the lack of definitions or descriptions of what constitutes responsible behaviour in children's physical activity in the literature, this study was seen as a first and necessary step before any further research in the area was instigated - in particular before measurement tools assessing the relationship between responsibility and children's physical activity levels are created. The findings of the study suggested that a general concept of responsibility - the belief that one possesses the ability to to provoke or prevent a negative outcome - could be applied to children's physical activity through the application of behaviours identified by participants as being indicative of responsible from personal, parental and third party perspectives and which prevented the negative outcome of children being physically inactive. These behaviours could be grouped into common themes which largely related to established correlates of physical activity in children.

The second interpretation of Study 2, investigating the attribution of responsibility from child, teacher and parental perspectives, was provided in Chapter 4. Focus groups conducted with these three different groups aligned to two primary schools in New Zealand revealed that parent, teacher and child groups all readily accepted that they played an important role in children's physical activity. Child and parent groups tended to attribute primary responsibility internally for ensuring children are active, whereas teachers viewed this responsibility as a shared role between themselves and parents. The

Government was also apportioned responsibility for children's levels of physically active activity in being identified as a key determinant as to whether other groups were able to fulfill their responsibilities. Overall however, it was clear that study participants viewed their roles as part of a shared network of responsibility for ensuring children are physically active.

With NSOs surprisingly not featuring in the attributions of responsibility for children's physical activity made in Study 2, the final study of the thesis (described in Chapter 5) explored the position of NFAs in terms of taking responsibility for children's physical activity. Findings from the semi-structured interviews undertaken with key decision makers in eight NFAs worldwide of varying size, highlighted that while NFAs also saw themselves as playing a role in the shared network of responsibility for children's physical activity, there are strong institutional barriers hindering the increased involvement of football organisations in children's physical activity initiatives - the main one being the perception of a legitimate NFA as being first and foremost one that is competitive on the world stage with its men's national team. This perception along with further forms of coercive and mimetic isomorphism were identified as serving to preserve the status quo in football, despite a growing awareness of the importance of engaging more children into the sport and linking into social outcomes such as increasing physical activity levels of children.

Significance of Findings

The scope of this thesis is wide, ranging from a quantitative study investigating in- and out-of school pedometer steps in New Zealand children, through to two separate qualitative studies exploring perceptions of responsibility for children's physical activity utilising focus groups with parent, child and teacher groups in the second study

and semi-structured interviews with key decision makers in NFAs worldwide in the third and final study. As well as transcending disciplinary boundaries by reaching into different domains such as education, sport organisation and the family unit, different methodologies and conceptual frameworks (including attribution theory and institutional theory) were also utilised. While the decision to conduct and include the three constituent studies comprising the thesis was somewhat of an evolutionary process stemming from opportunities arising in the research undertaken and the working environment of the researcher, combined and individually, the three studies offer findings that are of significance for the current body of physical activity literature.

As discussed previously, the study of children's in- and -out of school physical activity levels outlined in Chapter 2 offered the first pedometer based measure of primary school-aged children in New Zealand. This study also set the context for the the main studies of the thesis relating to responsibility in children's physical activity, by highlighting the importance of correlates in the out-of-school period which has since been reinforced by later studies of children's physical activity behaviour and is now a key focus of the New Zealand Government's efforts to get children more involved in sport and physical activity.

Responsibility in physical activity has been a little researched area in general, with the dearth being even more pronounced in the specific case of children. Despite many large scale physical activity campaigns appealing to a sense of responsible behaviour in efforts to increase physical activity levels, there is very little information pertaining to what responsibility in physical activity actually means, either generally or in relation to children. In turn, this has hindered the development of instruments designed to measure the relationship between physical activity and perceptions of responsibility, and

accordingly, the subsequent assessment of whether an individual is sufficiently responsible in their physical activity behaviour or for the physical activity behaviour of others in their care. The establishment of descriptive behaviours and traits that comprise responsible physical activity behaviour from child, parental and third party perspectives therefore provides a new base of information from which these measurement tools can now be developed, as well as concept of what responsible behaviour actually means.

The second interpretation of the study on responsibility in children's physical activity from child, teacher and parental perspectives that looked specifically into attributional aspects of responsibility was also novel in that it is the first study investigating the application of attributional theory to children's physical activity in New Zealand. The findings introduce and highlight a shared network of responsibility in which all sectors of society accept that they play a role in ensuring children are physically active. However the study also helps to clarify whom is pointing to whom in terms of being responsible for ensuring children are physically active, and most importantly has identified potential issues that may be the cause of the support networks for children's physical activity failing despite all parties seemingly being willing to accept their responsibilities. That perceived lack of government support appears to be used as a moral justification for non-implementation of responsibilities by parents and teachers, highlights the continued need for education focusing on low-cost physical activity but more importantly for prioritisation of governmental funding on planned initiatives that assist parents and schools in fulfilling responsibilities for children under their care, such as providing more sporting equipment and infrastructure in schools, and facilitating the lowering the cost of memberships to clubs and community organisations delivering opportunities for sport and physical activity.

That the government is attributed a key role by the participant groups in this study in enabling the children access to opportunities for physical activity is a particularly significant and timely finding, given the New Zealand Government's recent increased emphasis on involving children more in sport as a key way to ensure they are physically active. In examining the perceptions of responsibility for getting children more active in football - a sport that is arguably most able to support this societal objective - in Study 3, a willingness to engage in this area was identified, but also the existence of institutional barriers that may prevent or hinder such organisations practically adopting or implementing activities and initiatives that are designed to increase children's physical activity in such sporting organisations. Such findings will be helpful in the design of strategies for ensuring maximal uptake and benefit of support provided to NSOs by government for increasing children's physical activity levels. From the NSO perspective, insight is also provided (in this case specifically to NFAs) on institutional practises that preserve the status quo and in some cases may not be beneficial for the organisation – a case in point being small NFAs who are a long way from reaching their dream of participating in a men's World Cup yet still allocating the majority of their resource to this area. A better short-to-medium term alternative for example, may be to prioritise initiatives to grow the game in their country, particularly at youth level, in turn affording opportunities to link into social objectives and their associated benefits.

As well as its practical application to a new physical activity policy environment in New Zealand, the study detailed in Chapter 5 offers a new contribution to the body of literature in both sport and physical activity. While there have been many studies using the application of institutional theory to sport, the use of this theory to explain institutional norms and barriers in relation to physical activity and general health behaviours is very new and, based on the clear findings in this study, very appropriate

for use in the future. Additionally, although corporate social responsibility is also a widely investigated topic in football and sport in general, the specific exploration of NFA responsibility for children's physical activity is a new application.

Limitations

While the three studies that make up this thesis are distinctly different in terms of their methodology, there is one common limitation relating to sample size that applies to all of them. With the first study involving 91 children aged 5-11 years from a mid-high Decile primary school in Auckland, New Zealand, one should be cautious in generalising findings to wider populations due to the small sample size and homogeneity of the sample, although we have seen similar patterns in more recent studies such as that of Olds, Meher & Ridley (2011). The wider application of results may also be limited due to the findings being based on three consecutive weekdays of recorded daily step counts as opposed to the recommended four days (including weekend days) of monitoring in order to sufficiently assess habitual physical activity levels of children. However, the pedometer study does provide valuable information in comparing steps between the in- and out-of-school periods on weekdays which are also consistent findings from studies with children outside of New Zealand. Therefore while this overall study may not be generalisable, from what have seen since the research was conducted and published, the findings point to usual patterns of children's physical activity behaviour.

While the second study of this thesis could be potentially criticised for being limited in their ability to transfer to wider populations, the sample sizes used were appropriate for the methodology and the aim of the research which was to explore the concept of responsibility in children's physical activity from parent, teacher and child perspectives.

However, the non-inclusion of a mid socio-economic school, as well as the absence of fathers from the focus groups, and the non-random selection of the child participants may mean the results are biased to certain segments of the population. While further research with larger sample sizes clarifying the perspectives of other population sub-groups (in particular fathers and mid socio-economic groups) would be advisable, the consistency of the results with current correlates of children's physical activity suggest that the study provides a good starting point for understanding how the concept of responsibility applies to children's physical activity and to whom this responsibility is currently attributed.

With key decision makers from eight NFAs forming the participant group for Study 3, the findings may also of course be limited in their transferability. However, the focus of the study was of an exploratory nature and much thought was given to what would be the best method of extracting detailed information from participants. From author's experience working with NFAs in over 60 countries, it was determined that survey methods would not reveal the level of information required due to the limited time of participants (Presidents, General Secretaries or Senior Managers of NFAs) and the lack of enthusiasm for the large number of administrative and survey documents that they are already required to complete. Taking into account that there are 208 NFAs worldwide, the cost and time of personally interviewing a much larger number of participants was prohibitive. However, the resultant participant group did comprise NFAs which ranged widely, especially from financial and cultural perspectives, and from this standpoint provided adequate representation of NFAs in countries where children's physical activity is a major concern.

While it may be argued that football is the dominant sport in most countries and therefore the critical sport to investigate in research relating to sport's potential impact on children's physical activity levels, football is only one sport of many in the NSO landscape. It is therefore difficult to say whether the findings of this study can be appropriately applied to other NSOs and sport in general, particularly in countries like New Zealand where football is a major sport but not the most dominant in terms of popularity, profile or commercial viability. Additionally, the leading sporting codes – due to their high profile and public interest – may be more sensitive to issues relating to responsibility and therefore more aware of, and active in, promoting initiatives that reflect the organisation as being socially responsible. Conversely, smaller NSOs may feel less responsible due to their comparatively reduced reach from both financial and membership perspectives. To determine whether this is the case and the position of NSOs in general on taking responsibility for children's physical activity, it would therefore be a very valuable exercise in the future to undertake a similar study with a wider range of NSOs at both domestic and international levels.

Future Directions

Given that the focus of this thesis was of an exploratory nature in the untapped area of responsibility in children's physical activity, there is also considerable scope for further research stemming from the findings of Studies 2 and 3 in particular. In relation to responsibility for children's physical activity in general, it would now be useful to initiate the development of an instrument specifically measuring the relationship between children's physical activity levels and responsible behaviour – particularly for those groups who attribute responsibility for children's physical activity internally, that is, children themselves, parents, and teachers. The development of such an instrument would also be relevant at a later stage for investigating the association with key third

parties and organisations (such as, health professionals, government sports agencies, and regional/community bodies) impacting on the levels of physical activity in children. Before the latter is done however, it would be necessary to clarify what constitutes responsible behaviour in children's physical activity for these population sub-groups so that the presence or absence of these elements can be appropriately incorporated into measures.

Being able to ascertain the specific relationship between the degree of responsibility held by the various key influencers over children's physical activity and children's actual physical activity levels will also assist in establishing whether it is of value to target specific groups with responsibility-based physical activity campaigns. These campaigns may also benefit from the inclusion and reinforcement of identified behaviours that are associated with responsible behaviour for each target group, rather than a one size fits all approach to promoting physical activity. For example, the results of Study 2 suggest that campaigns targeting parents and teachers to support children under their care in being physically active continue to focus on promoting low cost options for physical activity so that they cannot use financial and logistical barriers as an "out clause" for their responsibilities.

As the Government is often perceived as putting some activities beyond reach of its children, the specific examples of what is seen as responsible behaviour by this sector (such as subsidising sports club fees and enabling community sports facilities to be free of cost for children) need not only to be implemented as planned where possible, but to also be well communicated to parents and teachers in particular. Given the key enabling role the Government was seen to play in helping other sectors to get children more physically active, it would also be highly logical to undertake further research with both

local and central Government – in particular to investigate what this sector views their role as in the shared network of responsibility, and how they see that impacting on the responsibilities of other key influencers over children's physical activity behaviour.

The need for further research to be undertaken with the government sector (particularly in relation to children) is reinforced by the findings of a study by Steele & Caperchione (2005) on six key departments of Rockhampton City Council in Queensland, Australia. The findings of Steele & Caperchione's study, which investigated the role and perceptions of local Government in the promotion of physical activity, suggested that the public sector has very specific views on its responsibility within physical activity promotion. Physical activity was not considered to be a core business of local Government, but there was a clear understanding of the role that local Government plays in supporting a community's ability to be active through the provision of facilities and infrastructure. However, other than facilities and infrastructure, the promotion of physical activity was seen as a community responsibility, with schools especially highlighted as needing to take a more active role in the promotion of physical activity. As well as examining the perceptions of central Government on their perceived responsibility for children's physical activity, it would therefore be of benefit to ascertain the sector's view on the role beyond the provision of infrastructure and facilities that the parents, teachers, children, and NFAs in this study suggested the Government could take (for example, in helping to lower costs of sports club fees, or by encouraging companies to support children's sport through tax breaks).

From the findings of Study 3, it is clear that football organisations are open to working with and supporting governmental as well as community stakeholders in their objectives to get children more physically active in the after-school period deemed critical by the

findings of the pedometer study in Chapter 2. There seems to be a definite willingness from NFAs to do more in this area. Therefore the identification of institutional barriers which are preventing increased involvement in children's physical activity initiatives and in some cases the growth and long-term success of the NFA – most notably the legitimized focus on national team performance and standing – may hopefully spark some internal reflection and re-evaluation within the football institution, particularly in relation to the coercive mechanisms in place that may be preventing more uptake and promotion of programmes for children linked to social outcomes. In this regard, it would be useful as a next step to examine the perspectives of external stakeholders of NFAs (in particular FIFA, the Confederations, the NFA's fan base, in addition to partner organisations in the private and public sector) in order to gauge their receptiveness to the increased use of football as a platform to promote children's physical activity.

Finally, the use of institutional theory to examine perceptions of responsibility for physical activity initiatives in football organisations has proved a very valuable exercise. Institutional theory may therefore be considered in the future as a useful framework in the wider context of physical activity, health, and youth research with which to examine norms around, and barriers to, the implementation of health-related programmes that could provide significant positive impact at individual, organisational and community levels.

Conclusions

The results presented in this thesis represent a substantial contribution to the current body of knowledge in the area of physical activity specifically relating to the little researched area of responsibility for children's physical activity. It is critical that all

agents who have a role in ensuring children are physically active **accept and meet** their respective responsibilities, particularly in the after-school timeframe which was identified in this study as making a higher contribution to the overall physical activity levels of children. This study identified not only the key agents who are attributed responsibility for children's physical activity but also the types of behaviours that are indicative of responsibility in this area for each of the main groups attributed responsibility. Findings also highlighted that while all of the key stakeholders are willing to accept responsibility for the physical activity behaviour of children under their care, the fulfillment of these responsibilities is compromised if a parent, teacher or child perceives they have moral justification for opting out of their duties. The Government in many cases was seen as the scapegoat through the perceived creation of an environment in which children's physical activity is unaffordable or unaccessible, highlighting the importance for proposed changes to provide more direct support to schools and NSOs in New Zealand to be implemented.

This thesis also offered an explanation of why NFAs as sporting organisations that could potentially work with government agencies and community organisations to substantially increase the physical activity levels of children, have not really done so. The existence of a strong institutional norm which promotes NFAs as most legitimate if they have successful national teams, preserves the focus on elite football and prevents wider and increased uptakes of programmes and initiatives that may not only contribute to delivery the organisations long term goals but those of society in terms of increasing the physical activity levels of children.

In closing, the findings of this research point to the importance of responsibility for children's physical activity being promoted and acted upon at multiple levels. While it

is tempting, as many wider health campaigns have in the past, to adopt a right-leaning political stance and subsequent language focusing on personal responsibility in order to change physical activity behaviour, it is clear that New Zealand children have not become lazier over the last 40 years but just have less opportunities to be physically active. As the social ecological model advocates, the environment comprises interconnected elements – individual, inter-personal, organisational, community and social – which also have a large impact on the health-related choices of the individual. All of these elements, which include the families, schools, government bodies and sporting organisations highlighted in this study, therefore have varying degrees of influence on the physical activity levels of children. Based on the findings of this study, it appears that the various sectors are at least aware of their potential impact in ensuring children are sufficiently physically active, but the implementation of activities for which they attributed responsibility needs to be encouraged further through the use appropriately tailored language and interventions that go well beyond promoting children being responsible for their own physical activity behaviour. The uptake of responsibility by all probable, multi-level influences on children's physical activity levels outlined by will then contribute to a more optimal environment for the development and maintenance of healthy physical activity behaviour in children.

References

- Aguilera, R.V., Rupp, D., Williams, C., & Ganapathi, J. (2007). Putting the S back in CSR: A multi-level theory of social change in organizations. *Academy of Management Review*, 32(3), 836-863.
- Amis, J., Slack, T., & Hinings, C.R. (2004). Strategic change and the role of interest, power, and organizational capacity. *Journal of Sport Management*, 18(2), 5-14.
- Andersen, L.B. (1994). Blood pressure, physical fitness, and physical activity in 17-year old Danish adolescents. *Journal of Internal Medicine*, 236(3), 229-234.
- Andersen, L.B., Harro, M., Sardinha, L.B., Froberg, K., Ekelund, U., Brage, S., & et al. (2006). Physical activity and clustered cardiovascular risk in children: A cross-sectional study (The European Youth Heart Study). *Lancet*, 368(9532), 299-304.
- Armstrong, N., McManus A., Welsman, J., & Kirby B. (1996). Physical activity patterns and aerobic fitness among prepubescents. *European Physical Education Review*, 2(1), 19-29.
- Arthur, M.M., Van Buren, H.J.III, & Del Campo, R.G. (2009). The impact of American politics on perceptions of women's golfing abilities. *American Journal of Economics and Sociology*, 68(2), 139-517.
- Australia Bureau of Statistics. (2004). *Children's Participation in Cultural and Leisure Activities, Australia*. Australia: Australian Bureau of Statistics.
- Australian Government Department of Health and Ageing. (2007). In *Evaluation of the National 'Get Moving' Campaign January 2007*. Retrieved 2/1/2009 from <http://healthyactive.gov.au/internet/healthyactive/publishing.nsf/Content/getmoving-eval-jan07>.
- Azjen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behaviour*. Englewood Cliffs, NJ: Prentice-Hall.
- Babiak, K., & Wolfe, R. (2006). More than just a game? Corporate social responsibility and Super Bowl XL. *Sport Marketing Quarterly*, 15(4), 214-222.
- Bailey, R. C., Olsen, J., & Pepper, S. L. (1995). The level and tempo of children's physical activities: An observational study. *Medicine & Science in Sports & Exercise*, 27(7), 1033-1041.
- Baker, T. (2005). In *Children Need 60 Minutes of Daily Physical Activity, Expert Panel Says*. Retrieved 21/06/2005 from <http://pharmalexicon.com/medicalnews/php?newsid>.
- Bar-Eli, M. (1996). External conditions and disposition-behaviour congruity as determinants of perceived personal causation among exercise adherers and non-adherers. *Journal of Sport Sciences*, 14(5), 433-444.
- Baruch, G. K., & Barnett, R. C. (1981). Father's participation in the care of their preschool children. *Sex Roles*, 7(10), 1043-1055.

- Bass, S. (2000). The prepubertal years: A unique opportune stage of growth when the skeleton is most responsive to exercise? *Sports Medicine*, 30(2), 73-78.
- Bauman, A., Bellew, B., Vita, P., Brown, W., & Owen, N. (2002). *Getting Australia Active: Towards Better Practice for the Promotion of Physical Activity*, Melbourne: National Public Health Partnership.
- Bauman, A., McLean, G., Hurdle, D., Walker, S., Boyd, J., van Aalst, I., & et al. (2003). Evaluation of the national 'Push Play' campaign in New Zealand - Creating population awareness of physical activity. *New Zealand Medical Journal*, 116(1179), U534-535.
- Becker, M., Drachman, R., & Kirscht, P. (1974). A new approach to explaining sick role behaviour in low income populations. *American Journal of Public Health*, 64(March), 205-216.
- Beets, M.W., Bornstein, D., Beighle, A., Cardinal, B.J., & Morgan, C.F. (2010). Pedometer-measured physical activity patterns of youth. *American Journal of Preventative Medicine*, 38(2), 208-216.
- Beets, M. W., Patton, M. M., & Edwards, S. (2005). The accuracy of pedometer steps and time during walking in children. *Medicine & Science in Sports & Exercise*, 37(3), 513-520.
- Beighle, A., & Pangrazi, R. (2006). Measuring children's activity levels: The association between step-counts and activity time. *Journal of Physical Activity and Health*, 3(2), 221-229.
- Bell, L.M., Watts, K., Siafarikas, A., Thompson, A., Ratnam, N., Bulsara, M., & et al. (2007). Exercise alone reduces insulin resistance in obese children independently of changes in body composition. *Journal of Clinical Endocrinology and Metabolism*, 92(11), 4230-4235.
- Bertrand J.T. (2007). In *Understanding Risk and Behaviour: A Socio-Ecological Model*. Retrieved 16/26/2010 from <http://www.balancedweightmanagement.com/Understanding%20the%20Social-Ecological%20Modelpdf>.
- Biddle, S.J., Gorely, T., & Stensel, D.J. (2004). Health-enhancing physical activity and sedentary behaviour in children and adolescents. *Journal of Sport Sciences*, 22(8), 670-701.
- Biddle, S.J., Pearson, N., Ross, G.M., & Brathwaite, R. (2010). Tracking of sedentary behaviors of young people: a systematic review. *Preventative Medicine*, 51(5), 345-351.
- Birkett, D. (2004). Reaching low-income families: Focus group results provide direction for behavioural approach to WIC services. *Journal of the American Dietetic Association*, 104(8), 1277-1280.
- Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *Journal of Sports Sciences*, 19(12), 915-929.

- Bowling, A. (1996). Health care rationing: The public's debate. *British Medical Journal*, 312(7032), 670-674.
- Breslow, L. (1998). Musings on sixty years in public health. *Annual Review of Public Health*, 19, 1-15.
- Breslow, L. (1990). In *A Health Promotion Primer for the 1990s*. Retrieved 20/7/ 2005 from <http://www.content.healthaffairs.org.html>.
- Brownell, K. (1991). Personal responsibility and control over our bodies: When expectation exceeds reality. *Health Psychology*, 10(5), 303-310.
- Burry, J. (1999). Obesity and virtue: Is staying lean a matter of ethics? *Medical Journal of Australia*, 171(11), 609-610.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.
- Caspersen, C., Powell, K., & Christensen, G. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100(2), 126-131.
- Chin, N. P., Munroe, A., & Fiscella, K. (2000). Social determinants of (un)healthy behaviours. *Education for Health*, 13(3), 317-328.
- Collard, D.C., Chinapaw, M.J., van Mechelen, W., & Verhagen, E.A. (2009). Design of the iPlay study: Systematic development of a physical activity injury prevention program for primary school children. *Sports Medicine*, 39(11), 889-901.
- Collard, D.C., Verhagen, E.A., Chinapaw, M.J., Knol, D.L., & van Mechelen, W. (2010). Effectiveness of a school-based physical activity injury prevention program: a cluster randomized controlled trial. *Archives of Pediatrics and Adolescent Medicine*, 164(2), 145-150.
- Colley, R., Garriguet, D., Janssen, I., Craig, C.L., Clarke, J., & Tremblay, M. (2011). Physical activity of Canadian children and youth: accelerometer results from the 2007 to 2009 Canadian Health Measures Survey. *Health Reports*, 22(1), 1-9.
- Commonwealth of Australia Department of Health and Ageing. (2004). *Australia's Physical Activity Recommendations for Children and Young People*. Canberra: Department of Health and Ageing.
- Comstock, R., Knox, C., Yard, E., & Gilchrist, J. (2006). Sports-related injuries among high-school athletes – United States, 2005-06 school year. *Centres for Disease Control and Prevention Morbidity and Mortality Weekly Report*, 55, 1037-1040.
- Cooney, K. (2007). Fields, organizations, and agency: Toward a multilevel theory of institutionalization in action. *Administration & Society*, 39(6), 687-718.
- Cooper, A.R., Page, A.S., Foster, L.J., & Qahwaji, D. (2003). Commuting to school: Are children who walk more physically active? *American Journal of Preventative Medicine*, 25(4), 273-276.

- Corder, K., Ekeland, U., Steele, R., Wareham, N.J., & Brage, S. (2008). Assessment of physical activity in youth. *Journal of Applied Physiology*, 105(3), 977-987.
- Cox, M., Schofield, G., & Kolt, G.S. (2010). Responsibility for children's physical activity: Parental, child, and teacher perspectives. *Journal of Science and Medicine in Sport*, 13(1), 46-52.
- Cox, M., Schofield, G., Kolt, G.S., & Greasley, N. (2006). Pedometer steps in primary-school aged children: A comparison between school-based and out-of-school activity. *Journal of Science and Medicine in Sport*, 9(1), 91-97.
- Craig, L., & Swriker, P. (2009). Work and family: How does the (gender) balance change as children grow. *Gender, Work & Organization*, 16(6), 684-709.
- Crouter, S. E., Schneider, P. L., Karabulut, M., & Bassett, D. R. J. (2003). Validity of 10 electronic pedometers for measuring steps, distance, and energy cost. *Medicine and Science in Sports and Exercise*, 35(8), 1455-1460.
- Cuddihy, T. F., Pangrazi, R. P., & Tomson, L. M. (2005). Pedometers: Answers to FAQs from teachers. *Journal of Physical Education, Recreation, and Dance*, 76(2), 36-40.
- Cunningham, G.B., Sagas, M., & Ashley, F.B. (2001). Occupational commitment and intent to leave the coaching profession. *International Review for the Sociology of Sport*, 36(2), 131-148.
- Carrasco, I. (2007). Corporate social responsibility, values, and cooperation. *International Advances in Economic Research*, 13(4), 454-460.
- Danisman, A., Hinings, C.R., & Slack, T. (2006). Integration and differentiation in institutional values: An empirical investigation in the field of Canadian National Sport Organizations. *Canadian Journal of Administrative Sciences*, 23(4), 301-317.
- Davies, R. (2002). Sport, Citizenship and Development: Challenges and Opportunities for Sports Sponsors. *World Sports Forum*, Lausanne, 23 September 2002.
- Department of Health. (2004). *At Least Five a Week: Evidence on the Impact of Physical Activity and its Relationship to Health*. London: Department of Health.
- Denzel, N.K., & Lincoln, Y.S. (1994). *Handbook of Qualitative Research*. London: Sage Publications.
- DiMaggio, P.J., & Powell, W.W. (1983). The iron case revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Duncan, J.S., Schofield, G., & Duncan, E.K. (2006). Step count recommendations for children based on body fat. *Medicine and Science in Sport and Exercise*, 38(8), 1402-1409.
- Duncan, J.S., Schofield, G., & Duncan, E.K. (2007). Step count recommendations for children based on body fat. *Preventative Medicine*, 44(1), 42-44.

- Durnin, J.V.G.A. (1992). *Physical Activity Levels Past and Present*. Cambridge: Cambridge University Press.
- Easton, R., Rowlands, A. V., & Ingledew, D. K. (1998). Validity of heart rate, pedometry, and accelerometry for predicting energy cost for children's activities. *Journal of Applied Physiology*, 84(1), 362-371.
- Ekeland, E., Heian, F., Hagen, K., Abbott, J.M., & Nordheim, L. (2004). Exercise to improve self-esteem in children and young people. *Cochrane Database of Systemic Reviews*, 1: CD003683.
- Ekelund, U., Tomkinson, G., & Armstrong, N. (2011). What proportion of youth are physically active? Measurement issues, levels and recent time trends. *British Journal of Sports Medicine*, 45(11), 859-865.
- Emery, C.A. (2005). Injury prevention and future research. *Medicine and Sport Science*, 48, 179-200.
- Escobedo, L. G., Marcus, S. E., Holtzman, D., & Giovino, G. A. (1993). Sports participation, age at smoking initiation and the risk of smoking among US high school students. *Journal of the American Medical Association*, 269(11), 1391-1395.
- Fairweather, B. (2009). In *Jump Jam*. Retrieved 11/11/2011 from <http://www.kidzaerobix.com/jumpjam.html>.
- Faulkner, G., & Biddle, S. (2002). Mental health nursing and the promotion of physical activity. *Journal of Psychiatric Mental Health Nursing*, 9(6), 659-665.
- FIFA. (2007a). In *Big Count 2006: Statistical Summary Report by Association*. Retrieved 30/3/2008 from <http://www.fifa.com/mm/document/fifafacts/bcoffsurv/statsumrepassoc%5f10342.pdf>.
- FIFA. (2007b). In *FIFA Big Count 2006: 270 Million People Active in Football*. Retrieved 3/30/2008 from <http://www.fifa.com/mm/document/fifafacts/bcoffsurv/bigcount.statspackage%5f7024.pdf>.
- FIFA. (2008). In *FIFA Statutes*. Retrieved 10/3/2011 from http://www.fifa.com/mm/Document/affederation/generic/01/09/75/14/fifa_statutes_072008_en.pdf.
- Glaser, B.G., & Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine Publishing Company.
- Goran, M., Gower, B., Nagy, T., & Johnson, R. (1998). Developmental changes in energy expenditure and physical activity in children: evidence for a decline in physical activity in girls before puberty. *Pediatrics*, 101(5), 887-891.
- Goran, M. I., & Treuth, M. S. (2001). Energy expenditure, physical activity, and obesity in children. *Pediatric Clinics of North America*, 48(4), 931-953.
- Graham, S. (1997). Using Attribution Theory to understand social and academic motivation in African American youth. *Educational Psychologist*, 32(1), 21-34.

- Green, L. W., & Kreuter, M. W. (1990). Health promotion as a public health strategy for the 1990's. *Annual Review of Public Health, 11*, 319-334.
- Guttman, N., & Ressler, W. H. (2001). On being responsible: Ethical issues in appeals to personal responsibility in health campaigns. *Journal of Health Communication, 6*(2), 117-136.
- Hamlin, M., & Ross, J. (2005). Barriers to physical activity in young New Zealanders. *Youth Studies Australia, 24*(1), 31-37.
- Hardus, P. M., van Vuuren, C. L., Crawford, D., & Worsley, A. (2003). Public perceptions of the causes and prevention of obesity among primary school children. *International Journal of Obesity, 27*(12), 1465-1471.
- Hart, K. H., Herriot, A., Bishop, J. A., & Truby, H. (2003). Promoting healthy diet and exercise patterns amongst primary school children: A qualitative investigation of parental perspectives. *Journal of Human Nutrition and Dietetics, 16*(2), 89-96.
- Harwell, M.R. (2011). Research design: Qualitative, quantitative, and mixed methods. In C. Conrad & R.C. Serlin (Eds.), *The Sage Handbook for Research in Education: Pursuing Ideas as the Keystone of Exemplary Inquiry* (2nd ed.). Thousand Oaks, California: Sage.
- Health Canada. (2002). *Canada's Physical Activity Guide for Children*. Publication H39-611/2002-2E, Ottawa: Health Canada.
- Health Education Authority. (1998). *Young and Active*. London: Health Education Authority.
- Hendry, L. B., Shucksmith, J., & Cross, J. (1989). Young people's mental well-being in relation to leisure. In H. P. R. Trust (Ed.), *Fit for Life*. Cambridge: Health Promotion Research Trust.
- Hillman, M., Adams, J., & Whiteleg, J. (1991). *One False Move: A Study of Children's Independent Mobility*. London: Policy Studies Institute.
- Hinkle, A.J. (2010). In *Examining Health Eating and Physical Activity Programmes in Maori and Pasifika Communities in Aoteroa*. Retrieved 14/11/2011 from http://www.fulbright.org.nz/voices/axford/docs/axford2010_hinkle.pdf.
- Hoffman, A.J. (1999). Institutional evolution and change: Environmentalism and the US chemical industry. *Academy of Management Journal, 42*(4), 351-71.
- Huhman, M.E., Potter, L.D., Duke, J.C., Judkins, D.R., Heitzler, C.D., & Wong, F.L. (2007). Evaluation of a National Physical Activity Intervention for Children. *American Journal of Preventative Medicine, 32*(1), 38-43.
- Jahnsen, R., Villien, L., Aamodt, G., Stanghelle, J. K., & Holm, I. (2003). Physiotherapy and physical activity - Experiences of adults with cerebral palsy, with implications for children. *Advances in Physiotherapy, 5*(1), 21-32.

- Janssen, I., & Leblanc, A.G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7(40).
- Johnson, H. C., Cournoyer, D. E., Fisher, G. A., McQuillan, B. E., Moriarty, S., Richert, A. L., et al. (2000). Children's emotional and behavioural disorders: Attributions of parental responsibility by professionals. *American Journal of Orthopsychiatry*, 70(3), 327-339.
- Johnson, R. B., & Turner, L. A. (2003). Data collection strategies in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 297–319). Thousand Oaks, California: Sage.
- Keeley, T., & Fox, K. (2009). The impact of physical activity and fitness on academic achievement and cognitive performance in children. *International Review of Sport and Exercise Psychology*, 2(2), 198-214.
- Kelley, G.A., Kelley, K.S., & Tran, Z.V. (2003). The effects of exercise on resting blood pressure in children and adolescents: A meta-analysis of randomized controlled trials. *Preventative Cardiology*, 6(1), 8-16.
- Kelley, H.H., & Michela, J.L. (1980). Attribution Theory and research. *Annual Review of Psychology*, 31, 457-501.
- Key, J. (2008). *Sport for Young Kiwis – A National Priority*. Retrieved 1/12/2011 from <http://www.johnkey.co.nz/archives/414-SPEECH-Sport-for-young-Kiwis-a-National-priority.html>.
- Kikulis, L. (2000). Continuity and change in governance and decision making in national sport organizations: Institutional explanations. *Journal of Sport Management*, 14(4), 293-320.
- Kilanowski, C. K., Consalvi, A. R., & Epstein, L. H. (1999). Validity of heart rate, pedometry, and accelerometry for predicting the energy cost of children's activities. *Pediatric Exercise Science*, 11(1), 63-69.
- Kirkwood, W. G., & Brown, D. (1995). Public communication about the causes of disease: The rhetoric of responsibility. *Journal of Communication*, 45(1), 55-76.
- Kott, A. (2005). The philanthropic power of sport. *Foundation News and Commentary*, January/February, 20-25.
- Kriemler, S., Meyer, U. Martin, E., van Sluijs, E.M., Andersen, L.B., & Martin, B.W. (2011). Effect of school based interventions on physical activity and fitness in children and adolescents: A review of reviews and systematic update. *British Journal of Sports Medicine*, 45(11), 924-931.
- Kurpad, A. V., Swaminathan, S., & Bhat, S. (2004). IAP National Task Force for Childhood Prevention of Adult Disease: The effect of childhood physical activity on prevention of adult diseases. *Indian Pediatrics*, 41(1), 37-62.

- Lamertz, K., Carney, M., & Bastien, F. (2008). Image on the internet: Inter-organisational isomorphism in image management by professional soccer clubs. *International Journal of Sport Management and Marketing*, 3(3), 242-262.
- Langer, E., & Rodin, J. (1976). The effects of choice and responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology*, 34(2), 191-198.
- Lanyon, L.E. (1996). Using functional loading to influence bone mass and architecture: Objectives, mechanisms and relationship with estrogen of the mechanically adaptive process in bone. *Bone Mineral*, 18(suppl), 37S-43S.
- Larun, L., Nordheim, L.V., Ekeland, E., Hagen, K.B., & Heian, F. (2006). Exercise in prevention and treatment of anxiety and depression among children and young people. *Cochrane Database of Systematic Reviews*, 3: CD004691.
- Lawrence, T.B., & Suddaby, R. (2006). Institutions and institutional work. In S.R. Clegg, C. Hardy, T.B. Lawrence & W.R. Nord (Eds.), *The Sage Book of Organizational Studies* (2nd ed., pp 1-51), Thousand Oaks, USA: Sage Publications.
- Le Masurier, G., & Tudor-Locke, C. (2003). Comparison of pedometer and accelerometer accuracy under controlled conditions. *Medicine and Science in Sport and Exercise*, 35(5), 865-871.
- Loucaides, C., Chedzoy, S., & Bennett, N. (2003). Pedometer-assessed physical (ambulatory) activity in Cypriot children. *European Physical Education Review*, 9(1), 43-55.
- Lox, C.L., Burns, S.P., Treasure, D.C., & Wasley, D.A. (1999). Physical and psychological predictors of exercise dosage in healthy adults. *Medicine and Science in Sports and Exercise*, 31(7), 1060-1064.
- Lynch, J.W., Kaplan, G. A., & Salonen, J. T. (1997). Why do poor people behave poorly? Variation in adult behaviours and psychosocial characteristics by stages of the socioeconomic life course. *Social Science and Medicine*, 44(6), 809-819.
- Malina, R.M. (1996). Tracking of physical activity and physical fitness across the lifespan. *Research Quarterly for Exercise and Sport*, 67(3 Suppl.), S48-57.
- Manios, Y., Kafatos, A., & Codrington, C. (1999). Gender differences in physical activity and physical fitness in young children in Crete. *Journal of Sports Medicine and Physical Fitness*, 39(1), 24-30.
- Mathews, B.L., Bennell, K.L., McKay, H.A., Khan, K.M., Baxter-Jones, A. D. G., Mirwald, R. L., & et al. (2006). Dancing for bone health: A 3-year longitudinal study of bone mineral accrual across puberty in female non-elite dancers and controls. *Osteoporosis International*, 17(7), 1043-1054.
- Matsudo, V.R., Matsudo, S.M., Andrade, D.R., Araújo, T.L., Andrade, E., de Oliveira, L. & et al. (2002). Promotion of physical activity in a developing country: The Agita São Paulo experience. *Public Health Nutrition*, 5(1A), 253-261.

- McAuley E. (1991). Efficacy, attributional, and affective responses to exercise participation. *Journal of Sport and Exercise Psychology*, 13(4), 382-394.
- McBride, B. A., & Mills, G. (1993). A comparison of mother and father involvement with their preschool age children. *Early Childhood Research Quarterly*, 8(4), 457-477.
- McDonald's Corporation. (2005). In *3 Generations of Britain's Sporting Best Inspire Kids to Become Active*. Retrieved 20/7/ 2005 from <http://www.mcdonalds.co.uk/pages/global/sports.html>.
- Michaud Tomson, L., & Davidson, M. (2003). Walk to school - Does it make a difference in children's physical activity levels? *Australian Council for Health, Physical Education and Recreation Healthy Lifestyles Journal*, 50(3-4), 16-24.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative Data Analysis* (2nd ed.). London: Sage.
- Ministry of Education. (2007). In *Physical Activity for Healthy, Confident Kids: Guidelines for Sustainable Physical Activity in School Communities*. Retrieved 14/11/2011 from <http://www.tki.org.nz/e/community/health/PDF/pahck-guidelines.pdf>.
- Ministry of Health. (n.d.). In *Meningococcal B - Be Wise, Immunise*. Retrieved 23/7/2005 from <http://www.immunise.govt.nz/documents/posters.pdf>.
- Ministry of Health. (2003a). In *Tool Kit: Physical Activity: To Increase Physical Activity*. Retrieved 14/11/2004 from <http://www.newhealth.govt.nz/toolkits/physical/groups.htm>.
- Ministry of Health. (2003b). *NZ Food NZ Children: Key Results of the 2002 National Children's Nutrition Survey*. Wellington: Ministry of Health.
- Ministry of Health. (2003c). In *Healthy Eating - Healthy Action. Oranga Kai – Oranga Pumau: A strategic framework 2003*. Retrieved 14/11/2011 from [http://www.moh.govt.nz/moh.nsf/0/6088A42CFAA9AC6FCC256CE0000DAE66/\\$File/heha-strategicframework.pdf](http://www.moh.govt.nz/moh.nsf/0/6088A42CFAA9AC6FCC256CE0000DAE66/$File/heha-strategicframework.pdf).
- Ministry of Health (2007). In *New Zealand Physical Activity Guidelines*. Retrieved 11/11/2011 from <http://www.moh.govt.nz/moh.nsf/indexmh/activity-guidelines>.
- Ministry of Health. (2010). In *National Survey of Children and Young People's Physical and Dietary Behaviors in New Zealand: 2008/09 – Key Findings*. Retrieved 11/11/2011 from <http://www.moh.govt.nz/moh.nsf/indexmh/national-survey-cyp-physical-activity-dietary-behaviours-08-09-sept2010>.
- Mountjoy, M., Anderson, L.B., Armstrong, N., Biddle, S., Boreham, C., Bedenbeck, H.B., & et al. (2011). International Olympic Committee consensus statement on the health and fitness of young people through physical activity and sport. *British Journal of Sports Medicine*, 45(11), 839-848.

- Mummery, W. K., Schofield, G., Hinchliffe, A., Joyner, K., & Brown, W. (2006). Dissemination of a community-based physical activity project: The case of 10,000 steps. *Journal of Science and Medicine in Sport*, 9(5), 424-430.
- Mutrie, N., & Parfitt, G. (1998). Physical activity and its link with mental, social, and moral health in young people. In S. Biddle, J. Sallis, & N. Cavill (Eds.), *Young and active? Young people and health-enhancing physical activity: Evidence and implications* (pp. 49-68). London: Health Education Authority.
- Nader, P.R., Bradley, R.H., Houts, R.M., McRitchie, S.L., & O'Brien, M. (2008). Moderate-to-vigorous physical activity from ages 9-15 years. *Journal of the American Medical Association*, 300(3), 295-305.
- NASPE. (1998). *Physical Activity for Children: A Statement of Guidelines*. Reston, VA: NASPE Publications.
- NASPE. (2004). *Physical Activity for Children: A Statement of Guidelines for Children Ages 5-12 (2nd ed)*. Reston, VA: NASPE Publications.
- National Centre for Chronic Disease Prevention and Health Promotion. (2000). In *Promoting Better Health for Young People Through Physical Activity and Sports: A Report to the President*. Retrieved 5/08/2005 from http://www.cdc.gov/HealthyYouth/physicalactivity/promoting_health/.
- National Centre for Chronic Disease Prevention and Health Promotion. (2003). In *Projects to Increase Physical Activity in Youth: Summary Report*. Retrieved 20/7/2005 from <http://www.cdc.gov/HealthyYouth/physicalactivity/projects.html>.
- National Centre for Chronic Disease Prevention and Health Promotion. (2004). *Physical Activity and Health: A Report of the Surgeon General*. Atlanta: The United States Department on Health and Human Services.
- National Heart Foundation. (2011). In *Jump Rope for Heart for Schools*. Retrieved 11/11/2011 from <http://www.heartfoundation.org.nz/programmes-resources/schools-and-eces/jump-rope-for-heart-taura-peke-mo-te-manawa-ora/>.
- Nelson, N. (2005). *Influences in Childhood on the Development of Cardiovascular Disease and Type 2 Diabetes in Adulthood*. (No. ISBN 0-478-25756-2). Wellington: Ministry of Health.
- Newman, I., & Benz, C.S. (1998). *Qualitative-Quantitative Research Methodology: Exploring the Interactive Continuum*. USA: Southern Illinois University.
- New Zealand Football. (2007). In *Small Whites*. Retrieved 1/4/2008 from <http://smallwhites.co.nz/>.
- New Zealand Government. (2004). In *Physical Activity for Primary School Pupils*. Retrieved 14/11/2004 from <http://www.scoop.co.nz/mason/stories/PA0410/S00061.htm>.
- New Zealand Soccer. (2006). *Our Game, Your Game, the World's Game. New Zealand Soccer Strategic Plan 2006-2010* [Document]. Auckland, New Zealand: Author.

- Nielsen, G.A., & Andersen, L.B. (2003). The association between high blood pressure, physical fitness, and body mass index in adolescents. *Preventative Medicine, 36*(2), 229-234.
- North, T. C., McCullagh, P., & Tran, Z. V. (1990). Effect of exercise on depression. *Exercise and Sport Science Reviews, 19*(1), 379-415.
- Norton, K., Dollman, J., Klanarong, S., & Robertson, I. (2001). Kid's sport. Who is playing what? *Sport Health, 19*(3), 12-14.
- O'Brien, D., & Slack, T. (2003). An analysis of change in an organizational field. The professionalization of English Rugby Union. *Journal of Sport Management, 17*(4), 13-39.
- Olds, T.S., Maher, C.A., & Ridley, K. (2011). The place of physical activity in the time budgets of 10-13 year old Australian children. *Journal of Physical Activity and Health, 8*(4), 548-557.
- Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Journal, 16*(1), 145-179.
- Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization Studies, 13*(4), 563-588.
- Orlitzky, M., Schmidt, F.L., & Rynes, S.L. (2003). Corporate social and financial performance: A meta-analysis." *Organization Studies, 24*(3), 403-441.
- Ory, M.G., Jordan, P.J., & Bazarre, T. (2002). The Behavior Change Consortium: Setting the stage for a new century of health behavior-change research. *Health Education Research, 17*(5), 500-511.
- Pan, Y. & Pratt, C.A. (2008). Metabolic syndrome and its association with diet and physical activity in US adolescents. *Journal of the American Dietetic Association, 108*(2), 276-286.
- Pangrazi, R., Corbin, C., & Welk, G. (1996) Physical activity for children and youth. *Journal of Physical Activity, Recreation and Dance, 67*(4), 38-43.
- Pangrazi, P., Corbin, C., & Welk, G. (1997). Physical activity for children and youth. *California Association of Health, Physical Education, Recreation and Dance Journal, Summer*, 4-7.
- Parnell, W., Scragg, R., Wilson, N., Schaaf, D., & Fitzgerald, E. (2003). *New Zealand Food, New Zealand Children: Key Results of the 2002 National Children's Survey*. Wellington: Ministry of Health.
- Pate, R. (1993). Physical activity assessment in children and adolescents. *Critical Reviews in Food Science and Nutrition, 33*(4-5), 321-326.
- Patton, M.Q. (1990). *Qualitative Evaluation and Research Methods (3rd ed)*. Thousand Oaks, CA: Sage Publications.

- Penfold, S. (1985). Parent's perceived responsibility for children's problems. *Canadian Journal of Psychiatry, 30*(4), 255-258.
- Petruzzello, S. J., Landers, D. M., Hatfield, B. D., Kubitz, K. A., & Salazar, W. (1991). A meta-analysis on the anxiety-reducing effects of acute and chronic exercise: outcomes and mechanisms. *Sports Medicine, 11*(3), 143-182.
- Phelps, S., & Dickson, G. (2009). Symbolism isomorphism and legitimacy: New Zealand's Ice Blacks and Ice Fernz. *International Journal of Sport Management and Marketing, 5*(1-2), 90-100.
- Phillips, P. (2002). The rising cost of health care: Can demand be reduced through more effective health promotion? *Journal of Evaluation in Clinical Practice, 8*(4), 415-419.
- President's Council on Physical Fitness and Sports. (2001). *The President's Challenge Physical Activity and Fitness Awards Programme*. Bloomington: Department of Health and Human Services.
- President's Council on Physical Fitness and Sports. (2004). In *Physical Activity for Children: Current Patterns and Guidelines*. Retrieved 25/11/2005 from http://www.fitness.govt/Reading_Room/Digests/june2004digest.html.
- Prochaska, J. O., & DiClemente, C. C. (1986). Stages of change in the modification of problem behaviours. In M. Herson, R. M. Eisler & P. M. Miller (Eds.), *Progress in Behaviour Modification* (pp. 3-27). Sycamore, IL: Sycamore Press.
- Ramirez-Marrero, F., Smith, B., Sherman, W., & Kirby, T. (2005). Comparison of methods to estimate physical activity and energy expenditure in African American children. *International Journal of Sports Medicine, 26*(5), 363-371.
- Riddoch, C. J., Andersen, L. B., Wedderkopp, N., Harro, M., Klasson-Heggebo, L., Sardinha, L.B., & et al. (2004). Physical activity levels and patterns of 9- and 15-year old European children. *Medicine and Science in Sports and Exercise, 36*(1), 86-92.
- Rizzo, N.S., Ruiz, J.R., Hurtig-Wennlöf, A., Ortega, F.B., & Sjostrom, M. (2007). Relationship of physical activity, physical fitness, and fatness with clustered metabolic risk in children and adolescents: The European Heart Study. *Journal of Pediatrics, 150*(4), 388-394.
- Robertson-Wilson, J., Lévesque, L., & Holden R. (2007). Development of a questionnaire assessing school physical activity environment. *Measurement in Physical Education and Exercise Science, 11*(2). 93-107.
- Rowland, T. W. (1990). *Exercise and Children's Health*. Champaign, IL: Human Kinetics.
- Rowlands, A., Eston, R., & Ingledew, D. (1999). Relationship between activity levels, aerobic fitness, and body fat in 8- to 10-yr-old children. *Journal of Applied Physiology, 86*(4), 1428-1435.

- Rubin, A., Cardenas, J., Warren, K., Pike, C. K., & Wambach, K. (1998). Outdated practitioner views about family culpability and severe mental illness. *Social Work, 43*(5), 412–422.
- Ryall, T. (2011). In *Reduction in State Agencies Confirmed*. Retrieved 1/12/2011 from <http://www.beehive.govt.nz/release/reduction-state-agencies-confirmed>.
- Salkovskis, P. M., Richards, C. H., & Forrester, E. (1995). The relationship between obsessional problems and intrusive thoughts. *Behavioural and Cognitive Psychotherapy, 23*, 281–299.
- Sallis, J.F. (1998). Age-related decline in physical activity: A synthesis of human and animal studies. *Medicine and Science in Sport and Exercise, 32*(9), 1598-1600.
- Sallis, J., Bauman, A., & Pratt, M. (1998). Environmental and policy interventions to promote physical activity. *American Journal of Preventative Medicine, 15*(4), 379-397.
- Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise, 32*(5), 963-975.
- Salmon, J., & Timperio, A. (2007). Prevalence, trends and environmental trends on child and youth physical activity. *Medicine and Sport Science, 50*, 183-199.
- Schneider, D. (1994). Setting priorities for children's health: Viewpoints of family physicians and paediatricians. *Journal of the American Board of Family Practice, 7*(5), 387-394.
- Schoeneman, T.J., & Curry, S. (1990). Attributions for successful and unsuccessful health behavior change. *Basic and Applied Social Psychology, 11*(4), 421-431.
- Scott, W. R. (1991). Unpacking institutional arguments. In W. Powell & P. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis*, (pp 164-182), Chicago: University of Chicago Press.
- Shaw, S. M., & Dawson, D. (2001). Purposive leisure: Examining parental discourses on family activities. *Leisure Sciences, 23*(4), 217-231.
- Sirard, J. R., & Pate, R. R. (2001). Physical activity assessment in children and adolescents. *Sports Medicine, 31*(6), 439-454.
- Skille, E.A. (2009). State sport policy and voluntary sports clubs: The case of the Norwegian sports city program as social policy. *European Sport Management Quarterly, 9*(1), 63-79.
- Skinner, J., Stewart, B., & Edwards, A. (1999). Amaturism to professionalism: Modelling organisational change in sporting organisations. *Sport Management Review, 2*(2), 173-192.
- Slack, T., & Hinings, B. (1994). Institutional pressures and isomorphic change: An empirical test. *Organization Studies, 15*(6), 803-827.

- Sleap, M., & Warburton, P. (1996). Physical activity levels of 5-11 yr old children in England: Cumulative evidence from three direct observational studies. *International Journal of Sports Medicine*, 17(4), 248-253.
- Smith, A., Andrish, J., & Micheli, L. (1993). The prevention of sports injuries of children and adolescents. *Medicine and Science in Sports and Exercise*, 25(Suppl 8), 1-7.
- Smith, A.C.T., & Westerbeek, H.M. (2007). Sport as a vehicle for deploying corporate social responsibility. *Journal of Corporate Citizenship*, 7(25), 43-54.
- Smith, B. J., Ferguson, C., McKenzie, J., Bauman, A., & Vita, P. (2002). Impacts from repeated mass media campaigns to promote sun protection in Australia. *Health Promotion International*, 17(1), 51-60.
- SPARC. (n.d.). *Have You Pushed Play Today?* [Brochure]. Wellington, New Zealand: Sport and Recreation New Zealand.
- SPARC. (2003a). *SPARC Facts: Results of the New Zealand Sport and Physical Activity Surveys (1997-2001)*. Wellington: SPARC Research Policy Team.
- SPARC. (2003b). *SPARC Trends: Trends in Participation in Sport and Active Leisure (1997-2001)*. Wellington: SPARC Policy Research Team.
- SPARC. (2003c). In *Toward an Active New Zealand: Developing a National Policy Framework for Physical Activity and Sport*. Retrieved 14/11/2004 from <http://www.sparc.org.nz/research-and-policy>.
- SPARC. (2005). In *Push Play*. Retrieved 1/11/2005 from <http://www.sparc.org.nz/pushplay/overview>.
- SPARC. (2009). In *Push Play overview*. Retrieved 1/2/2009 from <http://www.sparc.org.nz/en-nz/communities-and-clubs/Push-Play/>.
- SPARC. (2010). In *Active Movement: An Introduction*. Retrieved 14/11/2011 from <http://www.sparc.org.nz/en-nz/Search/?q=Active+Movement>.
- SPARC. (2011a). In *Push Play*. Retrieved 14/11/2011 from <http://www.sparc.org.nz/en-nz/communities-and-clubs/Push-Play/>.
- SPARC. (2011b). In *Activating Communities Through Schools*. Retrieved 11/11/2011 from http://www.sparc.org.nz/Documents/Young%20People/5473-7_SPC_active_schools_com-web.pdf.
- SPARC. (2011c). In *Regional Sports Trusts*. Retrieved 14/11/2011 from <http://www.sparc.org.nz/en-nz/our-partners/Regional-Sports-Trusts/>.
- SPARC. (2011d). In *National Sports Organisations*. Retrieved 14/11/2011 from <http://www.sparc.org.nz/en-nz/our-partners/National-Sports-Organisations/>.
- SPARC. (2011e). In *Young People*. Retrieved 1/12/2011 from <http://www.sparc.org.nz/en-nz/young-people/>.

- SPARC. (2011f). In *Kia Ora and Welcome to SPARC*. Retrieved 1/12/2011 from <http://www.sparc.org.nz/en-nz/>.
- Sport Auckland. (n.d.). In *Active Families Programme*. Retrieved 20/7/2005, from <http://www.sportauckland.co.nz.html>.
- Sport England. (2003). *Young People and Sport in England: Trends in Participation 1994-2002*. London: Sport England.
- Steele, R., & Caperchione, C. (2005). The role of local government in physical activity: Employee perceptions. *Health Promotion Practice, 6*(2), 214-218.
- Steptoe, A., & Butler, N. (1996). Sports participation and emotional well-being in adolescents. *Lancet, 347*(9018), 1789-1792.
- Strong, W.B., Malina, R.M., Bumkie, J.R., Daniels, S.R., Dishman, R.K., Gutin, B., & et al. (2005). Evidence based physical activity for school-aged youth. *Journal of Pediatrics, 146*(6), 732-737.
- Stryker, L., Duncan, S., Chaumeton, N., Duncan, T., & Toobert, D. (2007). Reliability of pedometer data in samples of youth and older women. *International Journal of Behavioral Nutrition and Physical Activity, 4*, 4.
- Suchman, M.C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review, 20*(3), 571-611.
- Swinburn, B.A., Walter, L.G, Arroll, B., Tilyard, M.W., & Russell, D.G. (1998). The green prescription study: A randomized controlled trial of written exercise advice provided by general practitioners. *American Journal of Public Health, 88*(2), 288-291.
- Telama, R., Yang, X., Laakso, L., & Viikari, J. (1997). Physical activity in childhood and adolescence as a predictor of physical activity in young adulthood. *American Journal of Preventative Medicine, 13*(4), 317-323.
- Telama, R., Yang, X., Viikari, J., Väimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventative Medicine, 28*(3), 267-273.
- Thomas, J.R., Nelson, J.K., & Silverman, S.J. (2005). *Research Methods in Physical Activity (5th ed)*. USA: Human Kinetics.
- Thornton, P.H. (2002). The rise of the cooperation in a craft industry: Conflict and conformity in institutional logics. *Academy of Management Journal, 45*(1), 81-101.
- Tobias, M. (2004). Looking upstream: Causes of death cross-classified by risk and condition New Zealand 1997. *Public Health Intelligence Occasional Bulletin Number 20*. Wellington: Ministry of Health.
- Trost, S. G. (2001). Objective measurement of physical activity in youth: Current issues, future directions. *Exercise and Sport Science Reviews, 29*(1), 32-36.

- Trost, S.G., & Pate, R.R. (1999). Physical activity in children and youth. In J.M. Rippe (Ed.), *Physical Activity in Children and Youth*. Massachusetts: Blackwell Science.
- Trost, S., Sallis, J., Pate, R., Freedson, P., Taylor, W., & Dowda, M. (2003). Evaluating a model of parental influence on physical activity. *American Journal of Preventative Medicine*, 25(4), 277-282.
- Tudor-Locke, C., & Bassett Jr, D. (2004). How many steps per day are enough? Preliminary pedometer indices for public health. *Sports Medicine*, 34(1), 1-8.
- Tudor-Locke, C., Hatano, Y., Pangrazi, R.P., & Kang, M. (2008). Revisiting “how many steps are enough?” *Medicine and Science in Sport and Exercise*, 40(7S), S537-S543.
- Tudor-Locke, C., & Myers, A. (2001). Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Research Quarterly for Exercise and Sport*, 72(1), 1-12.
- Tudor-Locke, C., Williams, J., Reis, J., & Pluto, D. (2002). Utility of pedometers for assessing physical activity: Convergent validity. *Sports Medicine*, 32(12), 795-808.
- Turnbull, A., Barry, D., Wickens, K., & Crane, J. (2004). Changes in body mass index in 11-12-year-old children in Hawkes Bay, New Zealand (1989-2000). *Journal of Paediatrics and Child Health*, 40(1-2), 33-37.
- US Department of Health and Human Services. (1990). *Healthy People 2000: National Health Promotion and Disease Objectives* (No. DHHS Publication No. PHS 91-50213). Washington, DC: U.S. Government Printing Office.
- US Department of Health and Human Services. (1996). *Physical Activity and Health: A Report of the Surgeon General*. Atlanta: Department of Health and Human Services.
- Van Sluijs, E., Kreimler, S., & McMinn, A. (2011). The effect of community and family interventions on young people’s physical activity: A review of reviews and updated systematic review. *British Journal of Sports Medicine*, 45(11), 914-922.
- Vincent, S., & Pangrazi, R. (2002). An examination of the activity patterns of elementary school children. *Pediatric Exercise Science*, 14(4), 432-441.
- Vincent, S.D., Pangrazi, R.P., Raustorp, A., Michaud Tomson, L., & Cuddihy, T. F. (2003). Activity levels and body mass index of children in the United States, Sweden, and Australia. *Medicine & Science in Sports & Exercise*, 35(8), 1367-1373.
- Vincente-Rodriguez, G., Jimenez-Ramirez, J., Ara, I., Serrano-Sanchez, J.A., Dorado, C., & Calbet, J.A. (2003). Enhanced bone mass and physical fitness in prepubescent footballers. *Bone*, 33(5), 853-859.
- Wang, Y., & Lobstein, T. (2006). Worldwide trends in childhood overweight and obesity. *International Journal of Pediatric Obesity*, 1(1), 11-25.
- Warden, S.J, Fuchs, R.K., Castillo, A.B., Nelson, I.R., & Turner, C.H. (2007). Exercise when young provides lifelong benefits to bone structure and strength. *Journal of Bone and Mineral Research*, 22(2), 251-259.

- Washington, M., & Patterson, K.D.W. (2011). Hostile takeover or joint venture: connections between institutional theory and sport management research. *Sport Management Review*, 14(1), 1-12.
- Watt, R. G., & Sheiham, A. (1997). Towards an understanding of young people's conceptualization of food and eating. *Health Education*, 56(4), 340-349.
- Weiner B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4): 548-573.
- Weinsier, R.L., Hunter, G.R., Desmond, R.A., Byrne, N.M., Zuckerman, P.A., & Darnell, B.E. (2002). Free-living activity energy expenditure in women successful and unsuccessful at maintaining a normal body weight. *American Journal of Clinical Nutrition*, 75(3), 499-504.
- Weiss, R., Dzuira, J., Burgert, T.S., Tamborlane, W.V., Taksali, S.E., Yeckel, & et al. (2004). Obesity and the metabolic syndrome in children and adolescents. *New England Journal of Medicine*, 350(23), 2362-2374.
- Welk, G. J., Corbin, C. B., & Dale, D. (2000). Measurement issues in the assessment of physical activity in children. *Research Quarterly for Exercise and Sport*, 71(2), 59-80.
- WHO. (1986). In *Ottawa Charter for Health Promotion*. Retrieved 7/26/2008 from <http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html>.
- WHO. (2000). *Health and Health Behaviour Among Young People: WHO Policy Series. Policy for Children and Adolescents*. Geneva: WHO.
- WHO. (2002). In *Ministerial Round Tables: Risks to Health. A Report by the Secretariat*. Retrieved 2/5/2011 from http://apps.who.int/gb/archive/pdf_files/WHA55/ea55d6.pdf.
- WHO. (2005). *The European Health Report 2005: Public Health Action for Healthier Children and Populations*. Copenhagen: WHO for Europe.
- WHO. (2009). *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks*. Geneva: WHO.
- WHO. (2011). *Global Status Report on Noncommunicable Diseases 2010. Description of the Global Burden of NCDs. Their Risk Factors and Determinants*. Geneva: WHO.
- Wold, B., & Hendry, L. (1998). Social and environmental factors associated with physical activity in young people. In S. J. H. Biddle, N. Cavill & J. F. Sallis (Eds.), *Young and Active? Young People and Health-enhancing Physical Activity: Evidence and Implications* (pp. 119-132). London: Health Education Authority.
- Wolraich, M. L. (1997). Addressing behaviour problems among school-aged children: Traditional and controversial approaches. *Paediatrics in Review*, 18(8), 266-270.

- Yancey, A. K., Wold, C. M., McCarthy, W. J., Weber, M. D., Lee, B., Simon, P. A., & et al. (2004). Physical inactivity and overweight among Los Angeles county adults. *American Journal of Preventive Medicine*, 2(1), 146-152.
- Ziff, M. A., Conrad, P., & Lachman, M. E. (1995). The relative effects of personal control and responsibility on health and health-related behaviours in young and middle-aged adults. *Health Education Quarterly*, 22(1), 127-141.
- Zill, N., Nord, C. W., & Loomis, L. S. (1995). *Adolescent time use, risky behaviour and outcomes: An analysis of national data*. Rockville, MD: Westat.

Appendix A: Published Journal Articles

Journal of Science and Medicine in Sport (2006) 9, 91–97



ORIGINAL PAPER

Journal of
Science and
Medicine in
Sport

www.elsevier.com/locate/jams

Pedometer steps in primary school-aged children: A comparison of school-based and out-of-school activity

M. Cox^{a,*}, G. Schofield^a, N. Greasley^b, G.S. Kolt^a

^a Centre for Physical Activity and Nutrition Research, Faculty of Health and Environmental Sciences, Auckland University of Technology, Private Bag 92006, Auckland 1020, New Zealand

^b Division of Sport and Recreation, Auckland University of Technology, New Zealand

Accepted 21 November 2005

Summary While studies of the physical activity habits of New Zealand children have been carried out, the findings have been restricted by the use of proxy and self-report measures and limited to total overall daily activity. Objective measurement of children's in-school and out-of school physical activity using pedometry is likely to provide more accurate data on habitual daily activity. To date, no such data are available for New Zealand children. In the present study, children from school years 1–6 (girls, $n=46$; boys, $n=45$) at a New Zealand primary school wore a Yamax Digwalker SW-200 pedometer to record school-based and out-of-school steps over a 3-day period. Mean daily steps for the overall sample were 14 333 (S.D. = 4110). Boys ($X=15\ 606$; S.D. = 4601) were significantly more active than girls ($X=13\ 031$; S.D. = 3079) ($p=.00$). Mean steps were also significantly higher in older age groups for both boys ($p=.03$) and in particular, girls ($p=.00$). Of note, for the overall sample, steps taken out of school made up 52.4% of total daily steps. Girls (53.6%) and boys (51.3%) took a similar proportion of their overall daily steps outside of the school environment. While a significant difference was found between the most and least active tertiles in steps taken during both during school hours ($p=.00$) and outside of school hours ($p=.00$), the most active third of the sample completed significantly more of their daily steps outside of school (55.1%) than did their least active (46.7%) counterparts ($p=.00$). These results suggest that physical activity outside of the school environment is a key contributor to a child's overall level of physical activity, reinforcing the need for interventions targeting the family and community as well as the school environment.

© 2006 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved.

* Corresponding author. Tel.: +64 9 921 9999x7250; fax: +64 9 921 9960.
E-mail address: michele.cox@aut.ac.nz (M. Cox).

Introduction

Overwhelming research evidence demonstrates that physically active children are more likely to be conferred with a range of physical, psychological, and social health-related benefits.¹ It is therefore important that children engage in regular and frequent physical activity, not only for their own personal benefit, but longer-term, for national economic and social welfare also. Studies on the physical activity of primary-school aged children from England,² Greece,³ and Australia⁴ suggest concern regarding the activity levels of a large subgroup of children within this population. Consistent with international findings, two New Zealand population-based studies^{5,6} have noted lower levels of physical activity for children. In 2001, only 66% of young New Zealanders aged between 5 and 14 years reported being active as opposed to 69% in 1997.⁵ Another study found that no weekend physical activity was undertaken by 12.5% of 5–14-year-old children.⁶ Given that these New Zealand studies employed self-report and proxy report measures,^{5,6} their findings may be of even more concern, as self-report measures have been shown to overestimate children's physical activity levels.⁷ Children's tendency for recall bias and social desirability have deemed self-report methods inappropriate for use with this age group.⁸ Despite this, no other data are available.⁹

Pedometers have gathered increasing international support as a measure for the assessment of physical activity levels of children.^{10–12} Most pedometer studies with children have found that between 11 000 and 16 000 steps per day are usual,^{11,13,14} with recommended standards being 11 000 and 13 000 for boys and girls, respectively.^{15,16} A study comparing physical activity levels and Body Mass Index (BMI) levels of 6–12-year-old children in three countries, however, found mean step counts varied with nationality.¹⁷ Swedish children were significantly more active than both Australian, and American children who were the least active.¹⁷

Physical activity levels of boys as a group are usually higher than those of girls.¹⁰ Differences according to age, however, are equivocal. It is commonly accepted that the amount of physical activity in which children engage decreases prior to adolescence.^{18–20} However, a more recent pedometer study on US children¹⁵ found no decline in the physical activity levels of 6–12-year olds, despite a concurrent increase in stride length with age and subsequent decrease in step counts. Additionally, a somewhat level activity curve, indicating lack of difference between age groups, was

found for preadolescent American, Swedish, and Australian children.¹⁷ It is therefore unclear as to what point, if any, that a decline in physical activity commences during childhood.

In addition to targeting key at-risk groups in terms of age, effective interventions will also need to take account of the environment in which the greatest potential for increase in physical activity will occur. Physical activity interventions have largely focused on schools, where both resources and facilities for promoting physical activity are readily available.⁹ In contrast to earlier findings from a study in England,²¹ more recent studies suggest that there is greater opportunity to increase the overall level of physical activity in children by targeting physical activity in the home environment rather than at school. After dividing children's levels of physical activity into top and bottom quintiles, Vincent and Pangrazi¹⁵ concluded that major differences in activity level in 6–12-year-old American children occur outside of the school environment. This notion was further supported by a study²⁴ which found that the Australian children in Grades 4–7 had higher overall activity levels if they walked or cycled to school, and another investigation that found that the step counts of 11–12-year-old Cypriot children were significantly higher in the after-school period than during school time.¹⁰

The purpose of this study was to examine the physical activity levels of children aged 5–11 years in both the school and out-of-school environment. A further objective was to provide the first pedometer-determined measures of physical activity levels in a sample of New Zealand primary school children, and to compare physical activity according to age and gender for in-school and out-of-school environments.

Method

Participants

One hundred 100 children were randomly selected from a roll of 450 children stratified by year and sex, at a conveniently-located metropolitan primary school in Auckland, New Zealand. Of the initial sample, 12 children declined to participate and each was replaced by another randomly-selected child of appropriate age and sex. The ages of the children ranged from 5 to 11 years, and the school investigated in the study was a Decile (a proxy for socioeconomic status) 7 school, indicating that the children came from a middle-high socioeconomic group.

Measure

Yamax Digiwalker SW-200 pedometers were used to measure steps in this study. Pedometers measure vertical oscillations of body movement from the hip, providing a total count of accumulated ambulatory movements or steps taken.¹⁵ Pedometers are therefore insensitive to non-locomotor type activity, and to water-based sports.¹⁰ Additionally, pedometers are not sensitive to changes in intensity and are less accurate when people move slowly or with an uneven gait and with children who are obese.²² However, studies assessing the validity and reliability of the Yamax SW-200 have suggested that it is an appropriate instrument for the measurement of children's physical activity levels, particularly in light of their relative low cost.^{11,22}

Procedures

The study was approved by the Auckland University of Technology Ethics Committee. Consultation was conducted through the school principal, and permission gained to seek informed consent from each child's parent, and verbal assent from each child.

Prior to distribution, all pedometers were checked for functionality and then sealed to prevent accidental resetting and behaviour modification due to feedback. Pedometers were attached to the waistband of children's clothing (at the right hip, in line with the knee) by a researcher at the beginning of the school day. The units were then briefly removed at the end of the school day to record the number of steps taken during the school hours before being refitted to record out-of-school activity, measured by the researcher who returned to the school each morning at the same time. This process was carried out on three consecutive weekdays in the month of September (commencement of spring) 2004. No replacement of pedometers during the course of the study was required.

Data analysis

The data for nine children were removed from the analysis due to their absence from school at some stage over the measurement period, or to data not being recorded appropriately. This left a final sample of 91 children (boys, $n=46$; girls, $n=45$) from Years 1–6.

In-school, out-of-school, and total mean step counts and standard deviations, as well as percentages of steps taken in- and out-of-school,

were calculated for all participants who completed the three consecutive days of activity. Year levels were collapsed into two age groups (Year 1–3, $n=45$; Year 4–6, $n=46$) because of the small numbers in each year level; 2×2 factorial ANOVAs were used to investigate differences in mean step counts between and among sexes and age group, between and among in school and out-of-school steps (location) and age group, and for sex and location.

Mean step counts were divided into activity level tertiles (top, middle, and bottom third) to determine frequencies relating to age, gender, and in school and out-of-school steps. Differences between these variables were also examined with 3 (activity level) $\times 2$ (location, age group, and sex) factorial ANOVAs, respectively. The null hypothesis was assumed and probability values of $p \leq .05$ were used to determine significance unless otherwise noted.

Results

Total daily mean steps for the group were 14 333 (S.D. = 4110). Daily mean steps by age group and sex are shown in Fig. 1. At 15 606 (S.D. = 4601), mean steps for boys were significantly higher ($t = -3.13$, $p = .002$) than those for girls (13 031; S.D. = 3079). This was the case in both age groups, with boys' and girls' mean steps increasing with age. The differences in total mean steps by age group were found to be significant ($t = -3.94$, $p = .00$). No effect of interaction between age group and sex on daily mean steps was found ($F_{(1,87)} = .04$, $p = .84$).

Significantly more steps were obtained outside of the school environment (52.4%) than during school hours (47.6%) for the total sample ($F_{(1,89)} = 4.10$,

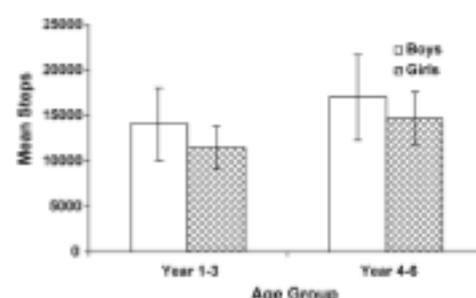


Figure 1 Means and standard deviations for daily steps by sex and age group.

Table 1 In-school and out-of-school mean steps by sex

Sex	Description	In-school	Out-of-school
Female	Mean (S.D.)	6070 (1586)	7021 (2865)
	Percentage	46.4	53.6
	N	45	45
Male	Mean (S.D.)	7594 (2137)	8013 (3274)
	Percentage	48.7	51.3
	N	46	46
Total	Mean (S.D.)	6840 (2025)	7523 (3102)
	Percentage	47.6	52.4
	N	91	91

$p = .05$). Table 1 shows the mean steps by location for each sex. Boys achieved slightly more steps outside of the school environment than in school, with the difference being more pronounced for girls. Neither of these differences were significant ($F_{(1,89)} = .62$, $p = .43$). Significant differences were found between boys and girls for mean steps taken at school ($F_{(1,89)} = 14.87$, $p = .00$) but not for steps taken outside of school ($F_{(1,89)} = 2.36$, $p = .13$).

Table 2 shows the in-school and out-of-school steps for each age group, with younger children completing more steps at school than outside the school environment. This difference was not significant ($t = .48$, $p = .63$), whereas the greater amount of steps taken by older children out-of-school than in-school was significant ($t = -3.13$, $p = .00$). Significantly more steps were also taken by the older age group than the younger children outside of school ($F_{(1,89)} = 17.19$, $p = .00$), but not within the school environment ($F_{(1,89)} = 3.01$, $p = .09$).

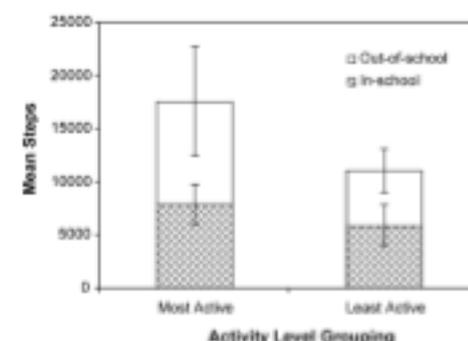
A MANOVA with location as the within-subjects factor, and age group and sex as the between-subjects factors, revealed no interactive effect of age group and sex between ($F_{(1,87)} = 1.14$, $p = .29$) or among ($F_{(1,87)} = .34$, $p = .89$) steps taken at school or outside of school.

Table 2 In-school and out-of-school mean steps by age group

Sex	Description	In-school	Out-of-school
Year 1-3	Mean (S.D.)	6473 (1638)	6268 (2740)
	Percentage	50.8	49.2
	N	45	45
Year 4-6	Mean (S.D.)	7201 (2304)	8570 (2964)
	Percentage	46.7	54.3
	N	46	46
Total	Mean (S.D.)	6840 (2025)	7523 (3102)
	Percentage	47.6	52.4
	N	91	91

Participants were divided into tertiles based on their mean daily step levels. The most active third was composed of those children with step counts ≥ 15763 (mean = 18478; S.D. = 2763), the middle third with step counts ≥ 12090 and < 15763 (mean = 13651; S.D. = 1182), and the least active third with step counts < 12090 (mean = 10225; S.D. = 1425). A significant difference was found between the mean steps of the three groups ($F_{(2,88)} = 151.89$, $p = .00$), with post hoc tests revealing significant differences at the $p = .05$ level between all groups. While 66.7% of the most active group were boys, the least active group comprised mainly girls (67.7%). This difference was not significant ($F_{(1,85)} = 1.64$, $p = .20$). There was also no significant difference between activity level groupings in terms of age ($F_{(1,85)} = .06$, $p = .81$). However, older children comprised 78.8% of the most active group, while younger children made up the majority (74.2%) of the least active group.

Fig. 2 shows a comparison between the most and least active groups for in- and out-of-school steps. In the most active group, 55.1% of total physical activity took place outside of school (mean = 9696 steps; S.D. = 2830), as opposed to 44.9% within the school environment (mean = 7893 steps; S.D. = 1867). The reverse was found for the least active group in which the majority (53.3%) of physical activity took place during school (mean = 5895 steps; S.D. = 1982), rather than outside of school (mean = 5172 steps; S.D. = 2067). The difference between activity level groups on in-school ($F_{(2,88)} = 9.47$, $p = .00$) and out-of-school ($F_{(2,88)} = 26.73$, $p = .00$) steps was significant, with post-hoc testing showing significant differences between the most active group and the least active group at the $p = .05$ level. With out-of-school steps, significant differences at the $p = .05$ level were also

**Figure 2** In-school and out-of-school steps for the most active and least active children.

apparent between the middle active third of children and the other two groups.

Discussion

In addition to providing the first pedometer-determined measures of physical activity levels of New Zealand primary school-aged children, the main purpose of this study was to establish whether or not there are any differences in physical activity levels within the school and non-school environments. In light of the continued focus on school-based interventions for increasing physical activity in this population group, the results of this investigation present some key issues relating to the development of effective interventions both in New Zealand and internationally.

In support of findings from recent studies,^{10,14,15} children were found to accumulate the majority of their steps outside of the school environment. The contribution of out-of-school activity to a child's overall physical activity levels was also reinforced by findings showing that the most active children in the sample achieved a significantly higher proportion of their daily step counts outside of school hours compared with the least active group. These results make sense given that there is a ceiling on the amount of physical activity a child can achieve within structured physical education classes and organised sport, and the limited time available during breaks and lunchtime at school. The greater amount of time and flexibility provided in the hours outside of school, offer a child who is in an environment conducive to engaging in physical activity, much more opportunity to do so. Thus, it is crucial that parents and children understand the positive association between children's overall physical activity levels and their physical activity behaviour outside of the school environment.

Evidence from this study also suggests that future interventions need to target particular subgroups within the primary school-aged population. In support of previous literature,^{10,14,15} girls were found to be significantly less active than boys, with a mean step difference of 2575 steps. Mean step counts of these two groups both fell within the expected 11 000 to 16 000 range,¹¹ and they were well above the recommended guidelines of 11 000 for girls and 13 000 for boys.^{15,16} However, the range of mean scores for each sex across the year levels (boys, 11 596–18 406; girls, 10 368–15 140) show much greater variation than those reported for Swedish, Australian, and American children.¹⁷ Combined with the large range in individual scores for each sex (boys, 7431–26 413;

girls, 7007–19 650), these findings would indicate that the extremely high activity levels of some children in this sample masked a group of sedentary or insufficiently active children. This finding is consistent with population-based studies which have indicated that 32% of New Zealand children are inactive.⁵

It is also apparent that girls need to be considered a priority for interventions designed to increase physical activity levels. Although not significantly different, the least active group of children in this study contained a disproportionate number of girls, and also significantly more younger children. Contrary to findings from previous studies,^{15,18,21} both girls and boys in this study increased step counts as they advanced through school year levels. A possible explanation may be that younger New Zealand children are more limited in unsupervised play outside the home by their parents because of the risks associated with stranger danger and traffic.⁹ However, no interactive effect of age and location on activity level groupings was found. An alternative explanation may arise from the nature of younger children's play tending more towards short, intermittent bouts of activity as opposed to prolonged movements.⁷ In addition, it has also been suggested that pedometers, which have been shown to register fewer than the actual number of walking steps during slow walking, may underestimate the steps of younger children who may move at slower velocities than older children.²³

Age and in- and out-of-school differences found in the study may also be associated with the difficulties associated with the use of pedometers presented earlier in this paper, in particular their insensitivity to non-locomotor forms of movement. If a particular age group or location is characterised by more or less ambulatory type of activity, this may have impacted on the results. Moreover, the small size and homogeneity of the sample should be considered when generalising the findings from this investigation to wider populations. The wider application of results may also be limited by findings based on three consecutive weekdays of recorded daily step counts when four days of monitoring is commonly recommended as a sufficient length of time to determine habitual activity levels in children.¹⁰

Conclusion

The findings of this study highlight the importance of looking beyond the school environment when designing interventions to increase physical activ-

ity levels of children. With their requirement to fulfil the academic needs of children, schools are limited in their ability to provide and promote opportunities for children to become more physically active. While the opportunities schools do have should indeed be maximised, greater increments in overall physical activity levels may be obtained by targeting children through family-based and community-based interventions. The increased amount of time available and the possibility of a wider scope of activity outside of the school environment should offer much greater potential for children to increase the amount of physical activity they undertake. In order for interventions in this area to be successful, however, future research must focus on the clarification of correlates of physical activity outside of the school environment. While family members are thought to play an important role in the development of physical activity behaviours, the mechanisms of parental influence still remain understudied and poorly understood.²⁴

The present study also highlights the importance of continued promotion of physical activity to primary school-aged children in all populations, even seemingly highly active ones. The activity levels of some children in this study, at as low as 7007 steps per day, still give cause for concern. Future research, incorporating both locomotor and non-locomotor forms of physical activity in children, should help clarify the demographic makeup of this group, although a good start point for interventions designed to increase physical activity levels may be with girls, who consistently demonstrate lower physical activity levels than boys. Age groups at which decline in activity levels commence should also be targeted, although the results of this study suggest that this does not occur within the 5–11-year-old childhood range.

Practical implications

- It is important to look beyond just the school environment when designing physical activity interventions for children.
- The amount of time available, and range of potential activities, outside of the school environment offers considerable potential for children to increase the amount of physical activity they undertake.
- Physical activity promotions need to include all primary school-aged children, even the most active ones.
- Children of the age at which physical activity declines should specifically be targeted.

References

1. Department of Health. At least five a week: evidence on the impact of physical activity and its relationship to health. London: Department of Health; 2004.
2. Armstrong N, McManus A, Weltsman J, Kirby B. Physical activity patterns and aerobic fitness among prepubescents. *Eur Phys Educ Rev* 1996;2(1):19–29.
3. Marios Y, Kafatos A, Codrington C. Gender differences in physical activity and physical fitness in young children in Crete. *J Sports Med Phys Fitness* 1999;39(1):24–30.
4. Pangrazi R, Corbin C, Welk G. Physical activity for children and youth. *JOPARD* 1996;67(4):38–43.
5. Sport and Recreation New Zealand. SPARC facts: results of the New Zealand sport and physical activity surveys (1997–2001). Wellington: SPARC Policy Research Team; 2003.
6. Ministry of Health. NZ food NZ children: key results of the 2002 National Children's Nutrition Survey. Wellington: Ministry of Health; 2003.
7. Welk G, Corbin C, Dale D. Measurement issues in the assessment of physical activity in children. *Res Q Exerc Sport* 2000;71(2 Suppl.):559–73.
8. Beets M, Patton M, Edwards S. The accuracy of pedometer steps and time during walking in children. *Med Sci Sport Exerc* 2005;37(3):513–20.
9. Hamlin M, Ross J. Barriers to physical activity in young New Zealanders. *Youth Stud Aus* 2005;24(1):31–7.
10. Loucaides C, Chedzoy S, Bennett N. Pedometer-assessed physical (ambulatory) activity in Cypriot children. *Eur Phys Educ Rev* 2003;9(1):43–55.
11. Rowlands A, Eston R, Ingledew D. Relationship between activity levels, aerobic fitness, and body fat in 8- to 10-year-old children. *J Appl Physiol* 1999;86(4):1428–35.
12. Tudor-Locke C, Williams J, Rejs J, et al. Utility of pedometers for assessing physical activity: convergent validity. *Sports Med* 2002;32:795–808.
13. Tudor-Locke C, Myers A. Methodological considerations for researchers and practitioners using pedometers to measure physical (ambulatory) activity. *Res Q Exerc Sport* 2001;72(1):1–12.
14. Michaud-Tomson L, Davidson M, Cuddihy T. Walk to school—does it make a difference in children's physical activity levels? *ACHPER* 2003;50(3–4):16–24.
15. Vincent S, Pangrazi R. An examination of the activity patterns of elementary school children. *Pediatr Exerc Sci* 2002;14:432–41.
16. President's Council on Physical Fitness and Sports. The President's Challenge physical activity and fitness awards programme. Bloomington: Department of Health and Human Services; 2001.
17. Vincent S, Pangrazi R, Raustorp A, et al. Activity levels and body mass index of children in the United States, Sweden, and Australia. *Med Sci Sport Exerc* 2003;35(8):1367–73.
18. Goran M, Gower B, Nagy T, et al. Developmental changes in energy expenditure and physical activity in children: evidence for a decline in physical activity in girls before puberty. *Pediatr* 1998;101:887–91.
19. Trost S, Page R, Sallis J, et al. Age and gender differences in objectively measured physical activity. *Med Sci Sports Exerc* 2002;34(2):350–5.
20. Rowland T. *Exercise and children's health*. Champaign, IL: Human Kinetics; 1990.

21. Sleep M, Warburton P. Physical activity levels of 5–11 yr old children in England: cumulative evidence from three direct observational studies. *Int J Sports Med* 1996;17(4):248–53.
22. Cuddihy T, Pangrazi R, Tomson L. Pedometers: answers to FAQs from teachers. *JOPARD* 2005;76(2):36–41.
23. Eisenmann J, Wickel E. Moving on land: an explanation of pedometer counts in children. *Eur J Appl Physiol* 2005;93(4):440–6.
24. Trost S, Sallis J, Pate R, Freedson P, Taylor W, Dowda M. Evaluating a model of parental influence on physical activity. *Am J Prev Med* 2003; 25(4):277–82.

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®



Original paper

Responsibility for children's physical activity: Parental, child, and teacher perspectives

Michele Cox^{a,*}, Grant Schofield^a, Gregory S. Kolt^{a,b}^a Centre for Physical Activity and Nutrition Research, Auckland University of Technology, New Zealand^b School of Biomedical and Health Sciences, University of Western Sydney, Australia

Received 16 June 2009; received in revised form 11 January 2010; accepted 19 February 2010

Abstract

Some large-scale child physical activity campaigns have focused on the concept of responsibility, however, there are no measures which establish a link between responsible behavior and physical activity levels. To provide the basis of information required for the development of relevant measurement tools, this study examined the meaning of personal, parental, and third party responsibility for children's physical activity. Eight focus groups, comprising children aged 11–12 yrs, their parents, and teachers from two upper primary schools in Auckland, New Zealand, were conducted. Children (four groups; $n=32$), their parents (two groups; $n=13$), and teachers (two groups; $n=15$) were separated by socio-economic status, and children also by gender. The transcripts from the focus group interviews were then analysed using thematic induction methodology. Across the groups, participants commonly identified a number of behaviors that they felt were indicative of personal, parental, and third party responsibility for children's physical activity. These behaviors formed natural groups with common themes (e.g., self-management, safety), which in most cases were not impacted on by socio-economic status or gender.

Responsibility was therefore found to be a concept that could be related to children's physical activity. It was suggested that these behaviors could be used as a starting point in understanding the relationship between responsibility and physical activity, and to assist with the development of measurement tools assessing the relationship between responsibility and levels of physical activity in the future. In turn, this may lead to the development of more targeted messages for large-scale physical activity campaigns.

© 2009 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved.

Keywords: Physical activity; Child; Parents; School teachers; New Zealand; Responsibility

1. Introduction

As a consequence of the potential benefits of physical activity for children,^{1–3} a number of population-based campaigns have been implemented with the purpose of increasing children's physical activity levels. By the nature of the wording of messages in many of these campaigns,^{4–6} an underlying notion of personal responsibility is implied in changing physical activity behavior. The concept of personal responsibility has also been the predominant message in wider health promotion messages.⁷

Due to children's limited physical and cognitive capabilities, responsibility for children's health behaviors has

historically been assumed by parents, especially mothers.^{8,9} In relation to physical activity, parental responsibility could potentially be displayed through many of the identified correlates of physical activity such as modelling, instrumental/logistical support, direct help, and providing opportunities/equipment.¹⁰ Parents have subsequently been targeted in campaigns to change the physical activity behaviors of their children (e.g., Australia's 'Get Moving',¹¹ New Zealand's 'Push Play',⁵ and USA's 'VERB: It's What You Do'¹² campaigns).

There is also evidence suggesting that schools may be attributed responsibility for children's physical activity behaviors.^{12,13} Responsibility could be assumed in the school environment in a variety of ways (e.g., access to equipment/facilities, number of PE hours, time outdoors, trained/supportive staff) which have also been linked to improved physical activity behavior in children.¹⁴

* Corresponding author.
E-mail addresses: michelecox@ata.ac.nz, michele.cox@aut.ac.nz (M. Cox).

Regardless of who is being targeted to take responsibility for children's physical activity, it is not clear whether perceptions of responsibility are associated with healthier levels of physical activity and better health.¹⁵ Few studies have investigated this relationship. If there is no association, predominant policy initiatives emphasising responsibility in physical activity may be unsuccessful. Given the scale of many physical activity campaigns and the growing cost of physical inactivity to society, it would be prudent to ensure that the most efficacious messages are provided to appropriate target markets. It is therefore crucial to establish whether there is a relationship between responsibility and physical activity, particularly with children for whom early patterns of physical activity may establish a lifetime habit.^{2,3} At present, however, there are no existing measures to examine this relationship. Before such a measure can be developed, the meaning of responsibility in the context of children's physical activity needs to be clarified. A search of the literature identified only one study¹⁶ that provided a definition of responsibility and this was in the context of wider child-care behaviors. This study therefore seeks to understand what responsibility in children's physical activity means to children, their parents, and teachers, as a first step to enable the development of appropriate measures in the future.

2. Methods

This study was approved by the Auckland University of Technology Ethics Committee. A descriptive qualitative approach was adopted. Participants in the semi-structured focus groups were children (boys and girls aged 11–12 yrs), and their parents and teachers, from one high and one low decile intermediate school in Auckland, New Zealand. With decile being a proxy for socio-economic status, School One (Decile 1) represented the low socio-economic group, while School Two (Decile 10) represented the high.

Principals of the schools were contacted via a letter and follow-up phone call to explain the purpose and requirements of the study. Upon Principal's consent and consultation with them regarding potentially low response rates and bias resulting from initially proposed random selection methods, information packs (containing parental information sheets and consent forms, and child assent forms) were distributed to children selected by the Principal on the basis of: (a) a wide range of activity levels; (b) their parents being able to participate in the study; and (c) greater likelihood that they would contribute verbally to the study (that is, they were not shy). 100% children selected returned forms and were included in the study along with their parents, as were the teachers who filled in consent forms after reading information sheets provided to them through the Principal.

Four focus groups for children (separated by gender), two for parents, and two for teachers were conducted over two separate two-day periods in November/December 2005. Eight focus groups containing between 6–9 participants (60

in total) each were therefore carried out. An interview schedule, which was pilot tested with a group of five physical activity experts, was used to guide the topics pertaining to whether one could be responsible for children's physical activity (as a child, parent or teacher), and if so, how this manifested itself.

All focus group discussions were audio taped and then transcribed verbatim. Once they were read several times, a general inductive approach was employed to analyse the transcripts in order to identify common, significant, and dominant themes occurring in the raw data. Coding was undertaken manually and peer evaluation to check its appropriateness and completeness was carried out separately by two expert academics in the field of physical activity and sport. Based on percentage agreement of two randomly selected pages of coding, interrater reliability at 92% and 83% respectively, was deemed acceptable in both cases.

Results from the analysis were organised in such a way to enable the subsequent development of instruments measuring the relationship between various types of responsibility and children's physical activity levels. Participants' responses were consequently grouped in the first instance according to whether they related to individual, parental, or third party responsibility. In each of these three areas, dominant themes relating to the meaning of responsible behavior in physical activity were identified within child, parent, and teacher groups. The main objective was to then identify themes common across all groups that could be potentially used as items in responsibility measures.

3. Results

In relation to **personal responsibility** for children's physical activity, children generally had a lot more to say than did adult participants, suggesting perhaps that children in this age group have a more developed concept of responsibility than adults perceive. This was reinforced by the variety and depth of behaviors and traits suggested by the children to indicate what constitutes responsible behavior in their own physical activity.

In terms of proposed characteristics for personal responsibility in physical activity, across all groups there was little distinction in the views held between males and females, and between those from the different decile schools. However, one theme came through strongly as an indicator of children's personal responsibility for their physical activity—self-directed behavior.

Other themes identified by adults only coincided with those of children when parents and teachers discussed personal responsibility in the context of their own physical activity, highlighting differences in adult's expectations of their own responsible behavior versus children's. Commonalities then included the use of active transport, giving sport and physical activity a go, not over-exercising, and eating well to enable physical activity. Adults also agreed that children

Table 1
Categories of personal responsibility in children's physical activity.

Theme	Indicative types of responsible personal behavior	Example verbatim quote
Self-management	Being active without having to be told by others	You should be mature enough and responsible enough to do it yourself—not count on everyone else. School 2 female student They just do not need to sit at home and do nothing. School 2 female student
	Adopting strategies to ensure one is active	To be responsible [is] to keep your fitness. School 2 female student They know what they should be doing but it's just finding the thing that will keep you going. Some people it's the gym. A lot of people fall by the wayside with the gym because you are the one who has to be responsible to get yourself there – it is the motivation. Whereas for me, I would rather belong to a team and have to turn up so I don't let anyone down. That works for me better than anything else, and having to walk my dogs cause they'll chew each other if I don't walk them. Like having something I have to do. School 2 teacher
	Prioritising time Not procrastinating	You know, it is finding ways to put it into your day. School 1 teacher I'll just have another glass of wine [when being irresponsible for physical activity]. School 2 teacher
Nutrition	Avoiding obesity	You will just sit around and be [a] fat and unfit, and then you'll go out and get hurt and you won't be able to do anymore. School 1 male student
	Optimising nutrition to enable physical activity	You can't eat bad foods and do running and stuff. You have to eat good food and do fitness at the same time. School 2 female student
Consideration	Of other people	On the plane over there, Dad was just sitting like that and it was like, Dad, just get up and walk around the plane. Be careful that you don't get a dead leg. School 2 male student
	Of other things	Yes—they [pets] get arthritis and stuff if they don't get exercise when they are young. School 2 male student
Safety	Preventing injuries to oneself	Do something and they say do not do it. Then you can not try sticking up for yourself cause you might injure yourself or break something. School 2 male student
	Preventing injuries to others	Just being responsible for what you are doing when you are doing PE. So like if you are running with spikes on, you would be careful not to go over somebody's foot. School 2 male student
Attitude	Trying hard/giving things a go/tracking the most of opportunities	And even if you come last—you can say at least tried. And if you continue doing it, you can come first instead of last. School 2 male student You should try and take as many as you possibly can do even though you might not be even able to play but you've never tried it. But you can give it a go. School 2 male student
	Maintaining commitments	I think also if the child shows their parent that they are committed, then the parent thinks it is my responsibility to get you there. So it is a two-way situation. School 2 parent
Environment	Use of active transport	You should walk to the gym instead of taking the car, even if it is far away. I reckon cars were invented because people were lazy and didn't like walking, and it's really bad for the environment as well. If the gym is far away and you need to go to the gym or dairy, you could just bus and save money and help the environment. School 2 female student
	Dealing with the elements	Because it is a hot day and there is lots of sun, you can't play outside for too long, and the sun is making you hot, you will want to come in. School 1 male student

displayed personal responsibility if they showed sustained commitment to sport and physical activity, although this was not a strong theme amongst children.

After examination of all of the themes indicating personal responsibility for children's physical activity, natural groupings of related items were formed. These groupings, comprising *Self-management*, *Nutrition*, *Consid-*

eration, *Safety*, *Attitude*, and *Environment*, are shown in Table 1 along with indicative types of behavior falling into these categories and examples of related quotes arising from the focus groups.

In comparison to personal responsibility, there was more contribution and consensus between the three groups around **parental responsibility** in children's physical activity. Six

Table 2
Categories of parental responsibility in children's physical activity.

Theme	Indicative types of responsible parental behavior	Example verbatim quote
Instrumental support	Positive reinforcement	Like when you are at the end of a game and losing, they shout, "better luck next time". School 1 male student
	Not pushing children	She came second in cross-country and she always came first in most things, and her Mum said, "Helen, you should have come first" and all that stuff. And she started crying and stuff because of that but I don't know if it is a rumour or not, but it could be. Yeah, but her parents just can't say that. School 2 male student
	Remonstrating inactivity	They are always telling me to do it (physical activity), and I don't want to but then I have to do it. School 1 female student
	Encouragement of physical activity	And I think they should also help with your physical activity by encouraging you to do things, even though they haven't done it before. School 2 female student
Logistical support	Provision of transport	... but when they become more interested in things like team sports, then they – obviously you have to provide the getting there and fit it into your life. School 2 parent
	Financing of activities	... the parents are still running around, still buying and working to support their extracurricular activities. School 2 parent
Direction	Role Modelling	And if you're parents aren't doing [anything], and you are not doing anything, you are like thinking "Oh yes, they don't need to do it – since they are not doing it, you don't need to do it. If they tell you to do it, you are like, "well, I don't have to, cause you are not doing it". Like, it is not a very good example. School 2 female student
	Placing into the "right" activities	If we were in the States, I would see no purpose in spending a fortune on swimming lessons, but because we are in New Zealand, I see that as a priority. School 1 parent It is down to finding what is right for the children as well as what they are happy doing, what they are comfortable doing. School 2 parent
	Education about the benefits of physical activity	I think to be motivated you have to have education to learn [that] if you are not going to exercise then you will get like unhealthy, and you will get fat and stuff. So you need to be educated to know that. Who should educate you? Your parents do but school as well. School 2 female student
Nutrition	Provision of good food to enable physical activity	Having the right food so you can be active and play the sports you want to play. School 1 male student So you have got energy School 1 male student So do your parents say to you that you should eat the right food so you can play rugby properly? Facilitator Yes. (multiple) School 1 male students
Active transport	Encouragement of use	... if you said, "let's go for a walk", they'd say "ohhh, we've got a car". I'd say, "I'm paying for petrol – that is why we have to walk. School 1 parent
Child prioritisation	Safety first and foremost	But I think the older my kids have got, the more physical they've got outside, because the longer their leash they have got from me and the farther I have let them go. I'll let them bike down to the village now. I've let them go and have hits at the cricket nets. They are doing a lot more of that stuff – physical activities which for three, or four, or five year olds, no way! School 2 parent
	Financial distribution	... financially, it's a real struggle for me because I have got 4 kids and when they all want to join a club, I pick it. I have to pick and choose between who wants to really do it and age groups and things like that. School 1 parent
	Time management	When you are a woman and then a mother, it is the 363 things that go before you that you take responsibility for, and you are way at the end of that pecking order. School 2 parent

themes (shown in Table 2) were identified including *Logistical Support*, *Instrumental Support*, *Direction*, *Nutrition*, *Active Transport*, and *Child Prioritisation*. Themes relating to *Logistical Support* and *Instrumental Support* were

predominant. In relation to the latter, while children placed great importance on parents encouraging children into physical activity as being part of responsible parental behavior, this theme was only apparent in the discussions of higher

Table 3
Categories of third party responsibility in children's physical activity.

Theme	Indicative types of responsible parental behavior	Example verbatim quote
Access	To facilities and equipment	They always close up the PE shed to early and you cannot get anything out. There is nothing to do so you just sit around. School 2 female student
	To finance	I think that they should give money for PE equipment – like with the shot put, we have only just enough for one class. School 2 male student
	To opportunities	I also think the school should be responsible for setting up activities, like we have lunch time sport and that encourages everyone to play. School 2 female student
Direction	Educator of physical activity benefits	... the teacher and the coaching are as far away as A and Z on the alphabet but they are both heading for the same goal in the middle, which is to get the student to the highest point that you can teach, educate them. School 1 teacher
	Role Modeling	You've always got your friend who can help you out to do a sport or something. Plus your friends – it's fun to play games. School 2 male student Like when we run down to Narrow Neck Beach for Water Wise, Mrs Walker sometimes runs with us. School 2 female student
Instrumental support	Encouragement	They push you. When you are trying to reach your goal and you can't, they won't let you give up and they help you to try and reach that goal. School 1 male student
	Prompting	When we have PE, our teacher should remind us to bring our PE gear because if we don't have it, we can't do it. School 2 female student
Backstop	Fallback if parents fail	I think we do take responsibility for children whose parents don't spend the money on them. If they are a natural athlete, they don't end up in the clubs and it's the zone days that provide them with that opportunity. It's the school rugby team or whatever. School 2 teacher

socio-economic groups of adults. Correspondingly, parents from the low decile schools often referred to a reluctance to encourage their children into sport and physical activities that required support in terms of transportation and finance that they could not provide.

Another differing viewpoint between the two socio-economic groups was whether being an active role model constitutes responsible parental behavior for children's physical activity. While adults from both socio-economic groups thought this was important, children from the lower decile school disagreed and instead placed more emphasis on support mechanisms as key determinants. Furthermore, parents in the low decile groups often referred to the financial sacrifice they had to make to ensure their children could join clubs or uptake physical activity, and in turn the consequence this had on their own options for physical activity.

While there was consensus amongst participant groups regarding *Directive Behavior*, *Nutrition*, and *Child Prioritisation*, teachers and parents placed more focus on parental encouragement of *Active Transport*, than did children. Adults also emphasised that parental responsibility for children's physical activity involved consideration of their safety first and foremost.

Themes relating to parental or personal responsibility were far more common than those connected to **third party responsibility** (e.g., peers, schools, government, health profession, and the individuals within these groups such as teachers). The four themes identified (*Access*, *Direction*, *Instrumental Support*, *Backstop*) are shown in Table 3. Chil-

dren generally had more to say about this area than did parents and teachers.

Themes emerging from children's focus groups centred on the responsibility of third parties to increase their *Access* to physical activity through the provision of equipment and facilities, and also opportunities to engage in a wide range of physical activities. Financial assistance, whether by lowering costs or subsidising of activities, or the straight donation of funds, was also a strong theme falling under this umbrella.

Children, as well as teachers, picked up on parental responsibility themes involving *Direction* and *Instrumental Support* and extended them to third party groups, particularly teachers and sport coaches.

In contrast to the differing views between the two socio-economic groups of children on whether parents should be active role models to display responsibility, they were united that this was the case for third parties, naming teachers and peers specifically. While not a topic arising in children's discussions, adults believed that third parties, especially schools, had a responsibility to act as a *Backstop* where parents failed to act responsibly to ensure their children were physically active.

4. Discussion

While all groups found it difficult to define responsibility in physical activity, participants were able to identify types of behavior that were indicative of personal responsibility in children's physical activity. This was also the case with

parental and third party responsibility. As to be expected, many of these behaviors relate strongly to previously identified correlates of physical activity in children such as healthy diet (*Nutrition*), access to facilities/programs/equipment (*Access*), fewer perceived barriers (*Self-Management*), intention to be active (*Attitudinal*),¹⁰ as well as support from others (*Direction/Consideration*), and parental support/direct help from parents (*Instrumental/Logistical Support*). There is also evidence that those children who utilise active transport are more physically active overall (*Environment/Active Transport*).¹⁷

Research is indeterminate on the effects of parental modelling¹⁰—correspondingly a factor that was also one of the only sources of dispute between the two socio-economic groups of children. The lack of importance placed on parents being active role models by low decile children may be the result of having less resource at their disposal to enable physical activity. With low decile parents frequently referring to sacrifices they made to ensure their children were physically active and their reluctance to encourage children into activities they could not provide financial and logistical support for, it may be that children recognise this dilemma and place more importance instead on parents putting their children's needs for activity first (*Child Prioritisation*).

Prioritising children's needs as a responsible parental behavior, interlinked with safety matters, may also explain why adults placed more emphasis on *Active Transport* than children. It may be that while parents believe that they should be encouraging their children to use various forms of active transport, the primary message children receive from parents is to use forms of transport that adults believe are safer (e.g., cars, buses rather than biking or walking).

While these findings suggest that responsibility is a concept that can be related to children's physical activity from both personal and parental perspectives, a number of factors limit the generalisability of the findings of this study. In particular, the absence of fathers in the parental focus groups, the non-inclusion of a mid socio-economic group, and the non-random selection of child participants may mean that the results are biased to certain subgroups of the population—especially children whose selection based on ability to articulate may be related to higher general perceived competence (including for physical activity) and possibly greater intelligence—both of which could influence the level and nature of a child's sense of responsibility. With results pointing to the presence of current correlates of children's physical activity as an indicator of responsible behavior however, it is reasonable to assume that this study is a good starting point for understanding how the concept of responsibility applies to children's physical activity. Further research which clarifies the viewpoints of other population sub-groups (e.g., fathers, mid-socio-economic and a random sample of children) and segments (such as government, sports organisations, churches, and health professionals) would be necessary before the presence or absence of behaviors identified in this study can be incorporated into a measurement tool to assess

whether a person is sufficiently responsible for physical activity. From this point, it could be determined whether there is indeed a relationship between the degree to which a person is responsible and his/her physical activity levels as current physical activity campaigns suggest.

5. Practical implications

- This study provides a first step in understanding how the concept of responsibility relates to physical activity—a new theme in physical activity research.
- A number of behaviors/traits indicative of being responsible in children's physical activity from personal, parental, and third party perspectives have been identified, many of which are current correlates of children's physical activity. These behaviors/traits should be used as a foundation for exploring further perspectives on responsibility for children's physical activity in wider community groups (e.g., government and health professionals) and more representative samples of the population.
- Future initiatives aimed at increasing children's physical levels should ensure that those behaviors promoted for adoption are in line with those the target market believe they are responsible for (e.g., as children feel a strong responsibility for their pets and parent's physical activity levels, campaigns could be focused around the child taking both for a walk in order to benefit all three groups). Particular attention should be paid to socio-economic differences around attitudes towards activities that require financing and logistical support (e.g., promoting children's gym and club memberships to low socio-economic parents may be futile and cause them distress).

Acknowledgement

No financial support has been received for this project.

References

1. NASPE. *Physical activity for children: a statement of guidelines*. Reston (VA): NASPE Publications; 1998.
2. Department of Health. *At least five a week: evidence on the impact of physical activity and its relationship to health*. London: Department of Health; 2004.
3. Malina RM. Tracking of physical activity and physical fitness across the lifespan. *Res Q Exerc Sport* 1996;67(3 Suppl.):S48–57.
4. National Centre for Chronic Disease Prevention and Health Promotion. *Projects to increase physical activity in youth*. Summary report. Available at: <http://www.cdc.gov/HealthyYouth/physicalactivity/projects.html> [accessed 20 July, 2005].
5. Sport and Recreation New Zealand (SPARC). *Push play overview*. Available at: <http://pushplay.sparc.org.nz/about-push-play/overview> [accessed 2 January, 2009].
6. McDonald's Corporation. *3 generations of Britain's sporting best inspire kids to become active*. Available at: <http://www.mcdonalds.co.uk/pages/global/sports.html> [accessed 20 July, 2005].

7. Kirkwood WG, Brown D. Public communication about the causes of disease: the rhetoric of responsibility. *J Commun* 1995;45(1):55–76.
8. Johnson BC, Courtney DE, Fisher GA, et al. Children's emotional and behavioral disorders: attributions of parental responsibility by professionals. *Am J Orthopsychiat* 2000;70(3):327–39.
9. Penfold PS. Parent's perceived responsibility for children's problems. *Can J Psychiatry* 1985;30(4):255–8.
10. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc* 2000;32(5):963–75.
11. Australian Government Department of Health and Ageing. Evaluation of the national "Get Moving" campaign January 2007. Available at: <http://healthyschools.gov.au/interet/healthyschools/publishing.asp?Content=getmoving-eval-jan07> [accessed 2 January, 2009].
12. Hart KH, Hennis A, Bishop JA, et al. Promoting healthy diet and exercise patterns amongst primary school children: a qualitative investigation of parental perspectives. *J Hum Nutr Diet* 2003;16(2):89–96.
13. Schneider D. Setting priorities for children's health: viewpoints of family physicians and pediatricians. *J Am Board Fam Pract* 1994;7(5):387–94.
14. Robertson-Wilson J, Lévesque L, Holden R. Development of a questionnaire assessing school physical activity environment. *Meas Phys Educ Sci* 2007;11(2):93–107.
15. Ziff MA, Conrad P, Lachman ME. The relative effects of personal control and responsibility on health and health-related behaviors in young and middle-aged adults. *Health Educ Q* 1995;22(1):127–41.
16. McBride BA, Mills G. A comparison of mother and father involvement with their preschool age children. *Early Child Res Q* 1993;8(4):457–77.
17. Cooper AR, Page AS, Foster LJ, et al. Correlating in-school-age children who walk more physically active? *Am J Prev Med* 2003;25(4):273–6.

Appendix B: Ethics Approval (Chapter 3 & 4)



MEMORANDUM

To: Grant Schofield
 From: **Madeline Banda** Executive Secretary, AUTEC
 Date: 3 October 2005
 Subject: Ethics Application Number 05/180 **Responsibility in children's physical activity.**

Dear Grant

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 12 September 2005. Your ethics application is now approved for a period of three years until 3 October 2008.

I advise that as part of the ethics approval process, you are required to submit to AUTEC the following:

- A brief annual progress report indicating compliance with the ethical approval given using form EA2, which is available online through <http://www.aut.ac.nz/research/ethics>, including a request for extension of the approval if the project will not be completed by the above expiry date;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/ethics>. This report is to be submitted either when the approval expires on 3 October 2008 or on completion of the project, whichever comes sooner;

You are reminded that, as applicant, you are responsible for ensuring that any research undertaken under this approval is carried out within the parameters approved for your application. Any change to the research outside the parameters of this approval must be submitted to AUTEC for approval before that change is implemented.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all written and verbal correspondence with us. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at charles.grinter@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of the Committee and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Madeline Banda
 Executive Secretary
 Auckland University of Technology Ethics Committee

Cc: Keri-Michele Cox michele.cox@aut.ac.nz

Appendix C: School Contact Letter (Chapter 3 & 4)

4 October, 2005

Mr Nigel Davis
Wesley Intermediate School
Sandringham Rd Extn
Mt Roskill
Auckland



Dear Mr Davis

Please firstly let me introduce myself - my name is Michele Cox and as well as my role as a writer and the Head of Women's Football in New Zealand, I have returned to university to complete my PhD in the area of responsibility in children's physical activity. Given the growing concern with the number of inactive and insufficiently active children in New Zealand, I believe that this is an extremely important area to study and hopefully improve knowledge and understanding of, so that we may improve the physical activity levels of children nationwide.

In this regard, I am writing to you to see whether you would consider providing consent for a small number of your students, parents and teachers to participate in a study we are conducting in October/November. It will involve conducting five focus groups (boys, girls, mothers, fathers, and teachers) at your school, each with 6-8 participants who will be asked specific questions relating to their thoughts on responsibility in children's physical activity. I have attached the interview schedule so that you can get an idea of the type of questions that will be asked. The information provided by the participants will then be used to design a larger quantitative study examining the link between who is assigned responsibility for children's physical activity and children's actual physical activity levels. Thereafter, all participants and schools involved will receive information summarising the results of this study which they can then potentially use to the benefit of their children.

At your earliest convenience, I would greatly appreciate it if you could let me know whether you would consent to your school being involved in this study. If this is the case, I will call you to arrange a time to meet with you and discuss the methods best suited to recruiting participants from your school and also answer any further questions you may have. I have also attached a draft information sheet that would be given to all potential participants so that you can ascertain further information relating to the study.

My contact details are as follows: michele.cox@aut.ac.nz / ph 09 921 9999 extn 7250 / mob 021 2411 002. I am looking forward to potentially working with you.

Yours sincerely

Michele Cox

Appendix D: School Consent Form (Chapter 3 & 4)



School Consent to Participation in Research

Title of Project: **Responsibility in children's physical activity**

Project Supervisor: **Dr Grant Schofield, Dr Gregory Kolt**

Researcher: **Michele Cox**

-
- I have read and understood the information provided about this research project (Information Sheet dated ADD DATE)
 - I have had an opportunity to ask questions and to have them answered.
 - I understand that the interviews will be audio-taped and transcribed.
 - I understand that the school may withdraw itself or any information provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
 - I understand that the participants may withdraw themselves or any information provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
 - If the school or its participants withdraw, I understand that all relevant tapes and transcripts, or parts thereof, will be destroyed.
 - I agree for my school and its students, parents, and teachers to take part in this research.
 - I wish to receive a copy of the report from the research: tick one: Yes No

School:

Principal signature:

Principal name:

Principal contact details:

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on <click here and type the date ethics approval was granted> **AUTEC Reference number** <click here and type the AUTEC reference number>

Note: The Participant should retain a copy of this form.

Appendix E: Parent and Participant Information and Consent Sheets (Chapter 3 & 4)

Parent & Participant Information Sheet



Date Information Sheet Produced:

dd mmmm yyyy

Project Title

Responsibility in children's physical activity

Invitation to participate

We would like to invite you, as an intermediate school student, or parent or teacher of an intermediate school child, to take part in a 1-hour group meeting to talk about responsibility in children's physical activity. These meetings will take place at the following times at ADD ROOM AND SCHOOL VENUE:

<u>Group</u>	<u>Time</u>	<u>Date</u>
Boys		
Girls		
Mothers		
Fathers		
Teachers		

The purpose of this research

As you will probably be aware, there is serious concern about the physical activity levels of New Zealand children. A team of researchers at AUT are therefore conducting a research project focused on children's physical activity and who is responsible for it. This part of the project is aimed at gathering information regarding the opinions of intermediate school-aged children, parents, and teachers on this topic. The information gathered from this study will assist us in the development of a larger scale study designed to measure the link between who is assigned responsibility for children's physical activity and children's physical activity levels. From there, it is hoped that the information provided will aid the development of interventions aimed at increasing children's physical activity.

How are people chosen to be asked to be part of this research?

All students, parents and teachers from two intermediate schools, of which yours is one, have been invited to take part in the study. In order to be selected, participants must return the consent forms attached, with children also needing to return parental consent forms. After this point, all individuals will be included in the study unless it is oversubscribed, in which case, participants will be randomly selected. In all circumstances, an attempt to include a proportional representation of all ethnicities will be sought.

What happens in this research?

You and 11 others in your group (for example, of boys, mothers, or teachers) will be asked to meet at the time and venue specified above. Once you are all in the room, a researcher will ask the group a number of questions relating to responsibility in children's physical activity. You will then be encouraged to share your views on those topics. It is important to remember that there are no right or wrong answers, and that all contributions will be valued. Also, your participation will be entirely voluntary and you may withdraw from the study at any time.

Appendix E: Parent and Participant Information and Consent Sheets Continued (Chapter 3 & 4)

2

What are the risks?

Due to the nature of this study, it is not envisaged that there will be any risks associated with participation. However, in the unlikely situation that you experience any discomfort, we can make AUT Health and Counselling services available to you for support.

What are the benefits?

All adult participants will receive a \$20 petrol voucher, and refreshments will be provided at the meetings. All individuals and schools participating in the study will receive a fact sheet containing the main findings of the study. It is hoped that this information may help increase your, your school's, and maybe even your country's understanding of how to improve children's levels of physical activity.

In terms of the benefit to the researchers, the information from this study will form part of the PhD research of Michele Cox and the findings may also be used in publications and presentations within an academic context.

How will my privacy be protected?

The information you provide in the meeting will be treated confidentially and as a participant, you will remain anonymous.

What are the costs of participating in this research?

The meetings for each group will take exactly one hour, starting 15 minutes after we ask you to meet.

What opportunity do I have to consider this invitation?

In order to give you enough time to carefully consider whether you wish to be involved, we would ask that you return the consent/assent forms attached before XXX to the SCHOOL OFFICE DETAILS

How do I agree to participate in this research?

If you are a parent or teacher and would like to participate in this research, please fill in the *Consent to Own Participation in Research* form attached and return it to the school office by the date specified above. Students who would like to be involved in the meeting should fill in the *Consent Form for Children* (which requires a parental signature) and return this to the school office by the same date.

Will I receive feedback on the results of this research?

Yes, all schools and individuals participating in the study will receive an information sheet containing a summary of findings from the research.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Assistant Professor Grant Schofield, grant.schofield@aut.ac.nz, 09 921 9999 extn 7307.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEK, Madeline Banda, madeline.banda@aut.ac.nz, 921 9999 ext 8044.

Who do I contact for further information about this research?

Researcher :	Michele Cox	michele.cox@aut.ac.nz	ph 09 921 9999 extn 7250
Supervisors:	Assis. Prof. Grant Schofield	grant.schofield@aut.ac.nz	ph 09 921 9999 extn 7307
	Prof. Gregory Kolt	gregory.kolt@aut.ac.nz	ph 09 921 9999 extn 7774

Approved by the Auckland University of Technology Ethics Committee on 4/10/2005, AUTEK
Reference number 05/180.

Appendix E: Parent and Participant Information and Consent Sheets Continued (Chapter 3 & 4)

Consent to Own Participation in Research (Parents and Teachers)



Title of Project: **Responsibility in children's physical activity**

Project Supervisor: **Dr Grant Schofield, Dr Gregory Kolt**

Researcher: **Michele Cox**

-
- I have read and understood the information provided about this research project (Information Sheet dated ADD DATE)
 - I have had an opportunity to ask questions and to have them answered.
 - I understand that the interview will be audio-taped and transcribed.
 - I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
 - If I withdraw, I understand that all relevant tapes and transcripts, or parts thereof, will be destroyed.
 - I agree to take part in this research.
 - I wish to receive a copy of the report from the research: tick one: Yes No

Participant signature:

Participant name:

Participant contact details:

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 4/10/2005 AUTEK
 Reference number 05/180

Note: The Participant should retain a copy of this form.

Appendix F: Child Assent Form (Chapter 3 & 4)

If you do want to answers some questions and take part in study, please fill in the form below. Will you also ask your parent/caregiver to sign here if they feel that you understand what the project is about and give this form back to your teacher at school tomorrow please.

(child name & signature)

(child room number & teacher)

(parent name & signature)

(parent's email & phone)

(Date)

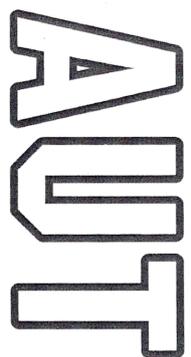
Researcher Name: Michele Cox, PhD Student, Division of Sport and Recreation, AUT, email michele.cox@aut.ac.nz / Ph 09 921 9999 (extn 7250)

WHAT DO I DO IF I HAVE CONCERNS ABOUT THIS RESEARCH?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Assistant Professor Grant Schofield, grant.schofield@aut.ac.nz, phone (09) 921 9999 7307.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Madeline Banda, madeline.banda@aut.ac.nz, 921 9999 ext 8044.

Approved by the Auckland University of Technology Ethics Committee on *type the date* *final ethics approval was granted*, AUTEC Reference number 09/180.



TE WANANGA AROHURI O TAMAKI MAKAU RAU

RESPONSIBILITY IN CHILDREN'S PHYSICAL ACTIVITY

ASSENT FORM FOR CHILDREN

This form will be kept for a period of 6 years.

Hello – my name is Michele Cox.

I would like to spend time at your school to talk to you and other boys and girls in your school about physical activity. I will also speak to teachers and parents about the same thing.

Appendix F: Child Assent Form Continued (Chapter 3 & 4)

What will happen is that once these forms have been collected, I will select a group of boys and a group of girls from all those who would like to take part in the study to meet with me at school so that I can ask them some questions about physical activity. If you are part of one of these groups, you can then come along and tell me what you think. You will also be able to ask me about my work whenever you want to but at any time during the meeting you don't want to say anything, you don't have to. I will also use a tape recorder so that I don't forget what you say. Let me know how you feel about this by ticking one of the boxes:

- Happy
- Fine
- Not sure
- Worried

If you are not sure or worried come and talk to me about it or ask one of your teachers or your parents about this.

You might like to know why I am doing this study. I am finding out about responsibility in children's physical activity because many children in New Zealand are not doing enough physical activity and we would like to help them to do more. It might be something you might like to find out about and help with as well. Responsibility in children's physical activity might be something you feel, it might be something you do or see. I am asking boys and girls some questions so that I can see what you mean in your school by the words responsibility in children's physical activity. We will all work together on this.

Please tick yes if you would like to answer some questions about physical activity with some other boys or girls, no if you do not want to do this, or maybe if you are not sure. If you cannot decide that is fine because you can come along anytime and tell me or one of your teachers or your parents that you want to join in.

- Yes
- No
- Unsure

This is my photo



I hope we can do this together. It will be great to meet you and you will know who I am because of my photograph. I will also wear a badge with my name on, Michele Cox, when I am in your school.

Appendix G: Focus Group Questions (Chapter 3 & 4)

Focus Group Questions

The following questions have been developed to help guide the discussion only and to act as prompts.

Introduction:

- Group leader introduces self
- Makes reference to the availability of refreshments and encourage to help themselves
- Ensure all group members have their nametag on
- Provide broad objective of focus group (for example, discussion about responsibility in physical activity)
- Refer to recording devices and observer taking notes
- Explain rules of the group (that is, there are no right or wrong answers; your thoughts and feelings are all important regardless of whether they are positive or negative; and all comments are confidential and need to stay within the group)

Questions (children):

- **Are responsible for your own physical activity? Why/ why not? (Opening Question)**
- **What do children do when they are being responsible for their own physical activity? (Key Question)**
- What do children do when they are not being responsible for their own physical activity?
- **How would you measure how responsible children are in physical activity? (Key Question)**
- **Do you think children should be responsible for their own physical activity? When should this start? (Key Question)**
- **Do you think children generally take responsibility for their physical activity? Why/why not? (Key Question)**
- **If you wanted to get children to take more responsibility for their physical activity, what would you do? (Key Question)**
- Do you think adults generally take responsibility for their physical activity? Why/why not?
- **Can someone else (a person or an organisation) be responsible for your physical activity? Who? Why? (Key Question)**
- **Who do you think should take more responsibility for your and other children's physical activity? Why? How? (Key Question)**
- In getting you and other children to be more active, what do you think the roles of the following are:
 - a) parents
 - b) wider family
 - c) school
 - d) friends
 - e) government (local and central)
 - f) SPARC
 - g) Regional Sports Trusts
 - h) National Sports Organisations and their affiliates eg clubs, unions etc

Appendix G: Focus Group Questions Continued (Chapter 3 & 4)

- i) health professionals
- j) other
- Who do you think is mainly responsible for the physical activity of the following?
 - a) children who are already active versus children who don't do any exercise
 - b) boys versus girls
 - c) children who are overweight or obese versus those who are in the normal weight range
 - d) children who have rich parents versus those who have poor parents
 - e) children who are a different race from you

Questions (parents):

- **Are you responsible for your own physical activity? Why/ why not? (Key question)**
- **What do people do when they are being responsible for their own physical activity? (Key Question)**
- What do people do when they are not being responsible for their own physical activity?
- **How would you measure how responsible people are in physical activity? (Key Question)**
- **Do you think children should be responsible for their own physical activity? When should this start? (Key Question)**
- **Do you think children generally take responsibility for their physical activity? Why/why not? (Key Question)**
- Do you think adults generally take responsibility for their physical activity? Why/why not?
- **How would you encourage people to take more responsibility for their physical activity? (Key Question)**
- **Can someone else (a person or an organisation) be responsible for children's physical activity? Who? Why? (Key Question)**
- **Who do you think should take more responsibility for children's physical activity? Why? How? (Key Question)**
- In getting children to be more active, what do you think the roles of the following are:
 - a) parents
 - b) wider family
 - c) school
 - d) friends
 - e) government (local and central)
 - f) SPARC
 - g) Regional Sports Trusts
 - h) National Sports Organisations and their affiliates eg clubs, unions etc
 - i) health professionals
 - j) other
- Who do you think is mainly responsible for the physical activity of the following?

Appendix G: Focus Group Questions Continued (Chapter 3 & 4)

- f) children who are already active versus children who don't do any exercise
- g) boys versus girls
- h) children who are overweight or obese versus those who are in the normal weight range
- i) children who have rich parents versus those who have poor parents
- j) children who are from a different cultural background than you

Questions (teachers):

- **What does it mean to be responsible for your own physical activity? (Opening Question)**
- What do people do when they are being responsible for their own activity?
- **How would you measure how responsible people are in physical activity? (Key Question)**
- **Do you think children should be responsible for their own physical activity? When should this start? (Key Question)**
- **Do you think children generally take responsibility for their physical activity? Why/why not? (Key Question)**
- **How would you encourage them to take more responsibility for their physical activity? (Key Question)**
- **Who else do you should take responsibility for children's physical activity? Why? (Key Question)**
- **How would you encourage the above to take more responsibility for children's physical activity? (Key Question)**
- In getting children to be more active, what do you think the roles of the following are:
 - a) parents
 - b) wider family
 - c) school
 - d) friends
 - e) government (local and central)
 - f) SPARC
 - g) Regional Sports Trusts
 - h) National Sports Organisations and their affiliates eg clubs, unions etc
 - i) health professionals
 - j) other
- Who do you think is mainly responsible for the physical activity of the following?
 - k) children who are already active versus children who don't do any exercise
 - l) boys versus girls
 - m) children who are overweight or obese versus those who are in the normal weight range
 - n) children who have rich parents versus those who have poor parents
 - o) children who are from a different cultural backgrounds

Appendix G: Focus Group Questions Continued (Chapter 3 & 4)

Wrap-up

Thanks for coming

Fact sheet with findings will be sent out after study is completed

Appendix H: Ethics Approval (Chapter 5)



MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: Grant Schofield
 From: **Madeline Banda** Executive Secretary, AUTEC
 Date: 8 July 2008
 Subject: Ethics Application Number 08/136 **Responsibility for children's physical activity: the position of national football federations.**

Dear Grant

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 16 June 2008 and that on 3 July 2008, I approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 14 July 2008.

Your ethics application is approved for a period of three years until 3 July 2011.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/about/ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 3 July 2011;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/about/ethics>. This report is to be submitted either when the approval expires on 3 July 2011 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this. Also, if your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply within that jurisdiction.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at charles.grinter@aut.ac.nz or by telephone on 921 9999 at extension 8860.

On behalf of the AUTEC and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Madeline Banda
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Keri-Michele Cox michelecox@xtra.co.nz, Geoff Dickson

Appendix I: Participant Information Sheet (Chapter 5)

Participant Information Sheet



Date Information Sheet Produced:

13 April 2008

Project Title

Responsibility in children's physical activity: The position of National Football Federations.

An invitation for you

As you know from our previous communication, my name is Michele Cox and I am currently completing my doctorate with the Division of Sport and Recreation at the Auckland University of Technology in New Zealand. In order to complete this qualification, I am inviting key decision makers in 8 football federations from all around the world to participate in the third and final study relating to the position of football on taking responsibility for children's physical activity. I would be very grateful if you would also take part, but please be assured that your participation is entirely voluntary and you may withdraw at any time without any adverse consequences.

What is the purpose of this research?

The purpose of this research is to investigate how football can contribute to increasing the activity levels of children both globally and domestically.

How were you chosen for this invitation?

Key decision makers (primarily President's, CEO's or Heads of Development) in football federations where chosen to participate in countries where football is a major sport (particularly for youth) and physical activity has been identified as a public health concern. It was also important to have a variety of federations in terms of their size and function, as well as an ability to conduct the interview in English.

What will happen in this research?

You will be interviewed by the principal researcher (myself) for approximately one hour around questions relating to your organization and to children's physical activity. These questions can be supplied to you in advance should you wish to see them.

The interviews will be recorded to ensure that the content of what you say is captured accurately. I will from there develop transcripts that I am happy to supply to you should you wish to ensure that the transcription accurately reflects your intended comments. These transcripts will only be available to myself and my supervisors, and all of the content will be confidential in any published material.

What are the benefits?

It is hoped the information you and the other participants provide will contribute to a better understanding of the potential for football and sport in general to contribute to positive health outcomes in your country and internationally. You will of course be provided with a summary of the findings to contribute to your own knowledge base in this regard.

How do you agree to participate in this research?

Please complete the attached consent form and return it to via email (michelecox@xtra.co.nz). An appointment will then be made to visit you at your federation or preferred location at a suitable time before July 2008.

Appendix I: Participant Information Sheet Continued

(Chapter 5)

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Professor Grant Schofield* by email (grant.schofield@aut.ac.nz), or phone (+64 9 9219999 extn 7307) .

Concerns regarding the conduct of the research should be notified to the Executive Secretary, ATEC, Madeline Banda, madeline.banda@aut.ac.nz , 921 9999 ext 8044.

Whom do I contact for further information about this research?**Researcher Contact Details:**

Keri-Michele Cox

Email michelecox@xtra.co.nz

Phone +64 21 862077.

Project Supervisor Contact Details:

Professor Grant Schofield

Email grant.schofield@aut.ac.nz

Phone +64 9 9219999 extn 7307

Ethics approval to be granted by the Auckland University of Technology Ethics Committee.

AUTEC Reference number to be provided.

Appendix J: Participant Consent Form (Chapter 5)

Consent Form



Project title: **Responsibility for children's physical activity: The position of National Football Federations.**

Project Supervisor: **Professor Grant Schofield**

Researcher: **Keri-Michele Cox**

- I have read and understood the information provided about this research project in the Information Sheet dated 13 April 2008.
- I have had an opportunity to ask questions and to have them answered.
- I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- I agree to take part in this research.
- I wish to receive a copy of the report from the research (please tick one): Yes No

Participant's signature:

.....

Participant's name :

.....

Participant's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on date to be supplied

AUTEC Reference number to be supplied

Note: The Participant should retain a copy of this form.

Appendix K: Interview Schedule (Chapter 5)

Interview Schedule

Introduction:

- As you know from our previous communication, my name is Michele Cox and I am a FIFA Women's Football Committee Member currently completing my doctorate with the Division of Sport and Recreation at the Auckland University of Technology in Auckland, New Zealand.
- The general topic of my PhD is responsibility in children's physical activity and what I would like to talk to you today about relates to the third and final study of my PhD which is focused on the how of National Football Federations around the world can assist in this regard. As such, we thank your Federation very much for taking part along with other countries such as (name other participants) in which football is a key sport and physical inactivity of children has been identified as a national concern.
- Before I start there are a few things I would like to mention:
 - Please feel free to **discuss your views and opinions** on behalf of the organisation for the next hour. There are **no right or wrong answers** and the **comments made here today are confidential should you wish them to be**. Please let me know if there is something that you would not want to be identified as saying, and I will also make a transcript of the interview available to you afterwards for this purpose.
 - As you can see, as well as taking notes, I also have a **recording device** to ensure that I accurately capture the content of what you say accurately. After the interview, I will develop transcripts and should you wish, I would be happy to send this to you to ensure the transcription accurately reflects your intended comments.
 - I would also like to make it clear that **at any point you do not wish to answer a question or would like to stop the interview, you are of course free to do so**.
 - Does that all sound ok to you?

Upon consent ask the following questions:

Questions:

1. I would firstly like to ask a bit of background about your organisation:
 - a) What is the mission statement of the organisation?
 - b) What do you consider to be your core business or role as a National Football Federation?
 - is this similar to other football federations around the world? .
 - c) How is the organisation structured?
 - d) How many staff do you have in these particular areas?
 - e) What is your annual revenue?
 - f) What are the key sources of income for the organization?
 - g) What is the proportion of expenditure on elite football vs grass roots/development?
 - h) Do you have a community affairs or department that deals with social responsibility issues?

Appendix K: Interview Schedule Continued (Chapter 5)

- i) Who are your main stakeholders?
- j) What are the key challenges for your football federation?
- k) Do you have a strategic plan? **Ask for copy as agreed in study consent**
- l) What are the key programmes in these areas?
- m) Are any of these programmes linked to the objectives of other organisations (such as the government, NOC)?
- n) Which organizations does your federation benchmark itself against?
- o) Who is/are the key decision maker(s) in your federation?
 - what is his/her background?
 - do they have any strong beliefs, in particular moral ones, pertaining to the role of football?

2. Now I would like to ask some questions relating specifically to children's physical activity:

- a) Are physical activity levels of children a concern in your country?
- b) Are you aware of any programmes or initiatives being implemented to help increase physical activity levels of children:
 - i. In your country? (if yes, who by and please describe)
 - ii. In other football federations) (if yes, who by and please describe)
 - iii. What is your degree of contact with these organizations?
- c) Who do you think should be responsible for increasing children's physical activity levels and why?
 - i. Do you think football has a responsibility in this regard and why or why not?
 - ii. Do you think this view would be shared by other football federations and why or why not?

3. Does your federation have any physical activity programmes for children?

- a) If yes:
 - i. Please describe
 - ii. When were they implemented and by whom?
 - iii. Why were they implemented?
 - 1. Were you required or pressured to do this? If so, by whom and why?
 - 2. Did you copy someone else's programme? If so, whose?
 - 3. Did you (or key decision maker) strongly support its introduction? If no, what is this person's view of CSR programmes?
 - 4. Was there a key event that led to its introduction? If yes, please explain?
 - iv. What were the programmes objectives?
 - v. Has it been successful? Why or why not?
 - vi. Has the programme met with any resistance either internally or externally? By whom and why?

Appendix K: Interview Schedule Continued (Chapter 5)

b) If no:

i. Why?

1. Is it not a key priority for your organization?
2. Is the strategic focus in other areas? If so, which ones?
3. Is a key decision maker or stakeholder against it? If so, why?
4. Do you lack expertise or resource (or both) for this purpose?

ii. Are there any plans to introduce such programmes in the future? If so, when and why then?

4. Are there any other comments you would like to make in relation to the involvement of National Football Federations in children's physical activity programmes?

Thank you very much for your time, it is very much appreciated. As I mentioned, I will transcribe the data and send them back to you to ensure that they are accurate. I hope to have the whole study then written up by the end of 2008 and will certainly send you a copy of the outcomes and any published papers if you would like.

Once again thank you for your participation and I look forward to sending you the findings.