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Students and Sports: The Association between Participation in Sports and Academic
Achievement

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Educational Psychology

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By

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Declaration

I certify that the thesis entitled “Students and Sports: The Association between Participation in Sports and Academic Achievement” submitted as part of the degree of Master of Educational Psychology is the result of my own work, except where otherwise acknowledged, and that this research paper (or part of the same) has not been submitted for any other degree to any other university or institution.

Abstract

Previous studies have found that participation in sports is positively associated with academic achievement for students. Due to the lack of studies in the New Zealand context and few studies examining Intermediate School students, the purpose of the current study was to examine the associations between the level of participation in sports and mean grades for Intermediate students. Data were obtained from self-report measures on sports participation and academic achievement. These data were gathered via anonymous questionnaires which were completed by students ($n=86$) from two different Intermediate Schools in Auckland. Results from the Independent Samples T-Tests revealed that male sports participants achieved significantly higher mean grades overall; and higher maths grades, than male non-sports participants. Further, and not surprisingly, sports participants from the high decile school achieved higher grades than students from the lower decile school. Simple Linear Regression revealed that the frequency of sports played per week was positively associated with mean grades. Results were therefore consistent with previous studies confirming the value of sports participation.

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Students and Sports: The Association between Participation in Sports and Academic Achievement

Introduction

One of the main aims for most parents, teachers, or schools is for their children or students to succeed academically. For this reason, it is important for them to know which factors are likely to have an influence on a students' academic achievement. With growing research on the positive relationship between academic achievement and sports participation, there should be increasing numbers of children participating in sporting activities (Bailey, 2006; Cornelißen & Pfeifer, 2007; Fox, Barr-Anderson, Neumark-Sztainer & Wall, 2010; Schlessner, 2004; Stephens & Schaben, 2002; Trudeau & Shephard, 2008). However, participation in sports by the younger generation of New Zealanders is declining; and the number of children falling in the overweight and obese category is increasing (Ministry of Education (MOE), 2007; Carnachan, 2010).

Nationwide research was conducted by Sport New Zealand (NZ) on sports participation and found that 50% of children do not participate in any sports and 70% of those that do play; drop out by ages 13-17 (Sport NZ, 2006). Furthermore, only 10% of those sports participants played sports during summer, and 16% during winter, for 5 hours or more (Sport NZ, 2006). However, national guidelines state that young children should be engaging in at least 60 minutes of moderate to vigorous physical activity through activities such as sport (MOE, 2007).

As parents play an influential role on their child's level of participation in sports, they often worry that playing sports will have a negative impact on their learning (Sport NZ, 2006). However, the majority of studies around the world have found no negative impact on academic achievement with some studies finding a positive impact (Bailey, 2006; Cornelißen & Pfeifer, 2007; Fox et al., 2010; Schlessner, 2004; Stephens & Schaben, 2002; Trudeau &

Shephard, 2008). None of this research had been conducted in New Zealand specifically; and because the school curriculum in countries such as those used in previous studies differs to the New Zealand curriculum, their results may not generalise to students within this country.

Also, very few studies looked at the effects on Intermediate students. Children attending Intermediate Schools fall within the age range of 11-13 therefore they are reaching early adolescence and go through a lot of changes physically, mentally and emotionally. Hence it is important to consider the impact of factors such as sports involvement, on the academic achievement of students within intermediate schools.

This research topic was of particular significance to the researcher with an interest in sport and high regard for academia. Furthermore, the researcher stresses the importance of being physically active and healthy while gaining a good education; especially with the increasing obesity rates in New Zealand. The current study, therefore, aimed to look at the association between sports participation and academic achievement of Intermediate Students within New Zealand; to see if results were consistent with international studies (Chomitz et al., 2009; Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Eitle & Eitle, 2002; Fox et al., 2010; Lindner, 2002; Stephens & Schaben, 2002; Trudeau & Shephard, 2008).

For the purposes of this study; sport, physical activity and physical education (P.E.) are often used interchangeably. Physical activity is defined as any type of structured or unstructured body movement which is included in P.E. and sports. Sport is defined as physical activity, directed by rules and requires skills, in which individuals and teams often compete with one another. Physical education is a program at school which teaches a range of physical activities.

Overview of General Studies

A large number of studies have been carried out around the world to look into the effect of participation in sports and physical activity. An overview of these studies will be discussed with the majority revealing that sports participation does not negatively impact academic achievement (Ahamed et al., 2007; Bailey, 2006; Chomitz et al., 2009; Coe et al., 2006; Hillman et al., 2008; Mahar et al., 2006; Rees & Sabia, 2010; Tomporowski et al., 2008; Trudeau & Shephard, 2008).

Trudeau and Shephard (2008) reviewed studies that examined the effects of increasing physical activity within a school week; by decreasing teaching time from academic subjects. They found that in a 5 year Quebec study, primary school students performed better in mathematics when compared to control groups; even though 33 minutes were removed from their mathematics class to increase P.E time.

Additionally, the results of both a Canadian and South Australian study showed similar results (Trudeau & Shephard, 2008); suggesting that learning efficiency increases with sports involvement. In the Canadian study, Ahamed et al. (2007) increased physical activity by 47 minutes per week for 16 months and compared test scores with a control group. They found that academic achievement was positively impacted; as the average score rose from 1595 to 1672 units.

In the South Australian study, Trudeau and Shephard (2008) explained that academic time was reduced to increase physical activity time by 1.25 hours per day. After measuring reading and arithmetic scores, the authors found that academic achievement in these subjects was not negatively impacted. Moreover, this effect was maintained 2 years later in a follow-up study thus suggesting that increased time spent on P.E. does not have any immediate or long-term detrimental effects on academic achievement.

A range of studies also found that physical fitness was positively associated with academic achievement (California Department of Education (CDE), 2005; Castelli, Hillman, Buck and Erwin, 2007; Chomitz et al., 2009; Coe et al., 2006). CDE (2005), Castelli et al. (2007) and Chomitz et al. (2009) presented that students who were more physically fit were more likely to have higher grades and Coe et al.'s (2006) results indicated that vigorous physical activity most effectively supported higher grades. These authors and others therefore concluded that, schools should not reduce time of sports and P.E. to increase academic time; but instead they should do just the opposite (Ahamed et al., 2007; Chomitz et al., 2009; Coe et al., 2006; Trudeau & Shephard, 2008; Vail, 2006).

Authors have also examined exactly how much physical activity is sufficient to significantly improve academic performance. The results of Coe et al.'s 2006 study indicated that higher grades were associated only with increased time on vigorous physical activity. No significant effects on academic achievement were found with moderate physical activity. Etnier et al. (1997) found that moderate to high intensity activity was also beneficial to cognitive functioning. However, Ahamed et al. (2007) indicated that not only did less than 10% of school time consist of physical activity, but less than half the time of P.E. was spent performing moderate to vigorous activity. Furthermore, Tomporowski et al. (2008) stated that physical activity has significantly reduced over the past 10 years, therefore, academic performance may not be up to potential.

From the above results it seems that the current amount of physical activity in schools is not effective for enhancing grades. Therefore, with increasing pressure on educators and policy makers; it is important to examine how physical and sporting activities are associated with academic achievement (Chomitz et al., 2009). These studies, along with others, will be discussed next, in relation to the variables and methods chosen for the current study; which assessed the association between sports participation and academic achievement.

Theory

The current study aimed to look at whether participating in a sport had a negative or positive impact on intermediate students' grades. The majority of studies that examined similar variables found either no association or a positive association; however Lindner (2002) suggested that care needs to be taken when drawing conclusions from these results, and offers an explanation worth noting.

Lindner (2002) discussed that results indicating a positive relationship between academic achievement and physical activity could be due to two reasons called the selection hypothesis and the situational hypothesis. The selection hypothesis states that certain people naturally tend to be drawn to an active lifestyle and are better in sports and academia (Lindner, 2002). Recent research by Mustelin et al. (in press) supports this idea as their results suggest that genetic factors are a significant contributor towards sporting activity levels for young adults. Therefore biological factors may lead some people towards a sporting lifestyle and others towards a more sedentary lifestyle.

On the other hand, the situational hypothesis suggests that parents of students that do well academically are usually more lenient towards allowing their child to participate in a sport; where as parents of students that do poorer academically, are more inclined to prohibit their child to participate in a sport (Lindner, 2002). Cheung and Chow (2010) and Sport NZ (2006) discuss the fact that parents play an important role in their child's participation or non-participation in sports. Parents have a direct influence on their child's participation in physical activity and how their child perceives physical activity (Cheung & Chow, 2010). Therefore the parents of a 'low-achieving' child may be discouraging towards a sporting lifestyle.

Psychological and Cognitive Benefits

Physical activity and participation in sports are known to have many benefits. Some of these include increased self-esteem, self-confidence, social development, cognitive development and academic achievement (Bailey, 2006). Furthermore, research suggests that physical activity reduces stress, anxiety, depression and improves learning and memory; all factors which lead to higher academic performance (Bailey, 2006; Chomitz et al., 2009; Etnier et al., 1997; Hillman et al., 2008; Trudeau & Shephard, 2008; Vail, 2006).

Hillman, Erickson, and Kramer (2008) discuss research on the positive relationship that was found between physical activity and cognitive measures including; perceptual skills, verbal and maths tests, IQ, and academic readiness. Furthermore, the authors stated that this effect was strongest for two age groups in particular; one of which was 11-13 year olds, the same age group as intermediate students. Such results align with the aims of the current study providing an indication that participation in sports may be positively associated with academic achievement, and that a strong relationship may be present for intermediate students.

Vail (2006) discusses findings that stress the importance of physical activity and physical education on academic achievement. It is stated that the exercise gained from the physical activities helps students concentrate better in class which in turn would contribute towards improved grades (Vail, 2006). However, in a meta-analytic review of 134 studies, Etnier et al. (1997) found that, when comparing between the effects of small bursts of exercise, with long-term exercise programmes; the long-term programmes were much more beneficial to cognitive functioning. These results suggest that participation in sports may need to be long-term for there to be a positive impact on the cognitive and psychological aspects associated with academic achievement.

Neurological Benefits

Researchers have discussed the neurological benefits of physical activity and how it increases the blood flow to the brain thus; increasing ones mental alertness and attention span, enhancing ones self-esteem, and reducing the chance of boredom (Bailey, 2006; Coe et al., 2006; Etnier et al., 1997; Mahar et al., 2006; Shephard, 1996; Taras, 2005). All of these factors are known to have a positive effect on academic achievement (Bailey, 2006; Coe et al., 2006; Mahar et al., 2006). Furthermore, in an overview of research on the effects of exercise; Tomporowski et al. (2008) found that there was a positive association between physical fitness and academic achievement in the majority of studies.

One particular study, by Etnier et al. (1997) found that exercise of moderate to high intensity was advantageous not only for increasing the nutrient supply to the brain; but also for increasing neurotransmitters which is beneficial for memory. Moreover, Vail (2006) explains how certain exercises encourages both hemispheres of the brain to work collaboratively thus promoting the brain to function systematically.

These results therefore provide support towards the common belief that a healthy body leads to a healthy mind. The neurological benefits found in these studies also provide a good basis for the variables of the current study as it supports the idea that a positive association exists between physical activity and the components that contribute towards excelling academically.

Physical Activity and On-task Behaviour

An experimental study conducted by Mahar et al. (2006) assessed the effects of a classroom-based physical activity program used in an American school to promote fitness and improve on-task behaviours of students. In the study, 135 students in the experimental group participated in the programme called Energizers for 12 weeks. After assessing the third and fourth grader's on-task behaviour, the researchers found that not only did their

behaviour improve by 8% since the programme was implemented; but those students that were previously engaging in the most off-task behaviours increased their on-task behaviour by 20%. These results were promising as they indicated that increasing physical activity increases on-task behaviour; which may essentially lead to improvements in academic achievement. However, academic achievement was not assessed in this study; therefore such a conclusion could not be made.

Gender

Lindner (2002) carried out research in Hong Kong schools comprising of 13-17 year olds in which data from academic records and sports participation questionnaires were collected. The study included participants from different academic bands; in which students from higher bands obtained better academic grades than those from lower bands. The results from Lindner's study indicated that a positive relationship did indeed exist between academic performance and physical activity; as students from higher bands were more inclined to spend time engaging in physical activities, compared to those in lower bands. However this finding was only significant for males.

Another study was carried out in Germany by Cornelißen and Pfiefer (2007) in which data from the German Socio-Economic Panel were used to determine how educational attainment was affected by participation in sports. Data on the level of education achieved and level of involvement in sports of 6050 participants were used in the year 2000. Cornelißen and Pfiefer found that the probability of gaining higher school degrees increased when children and adolescents were involved in a sport. Additionally, their results indicated that the probability of attaining the highest level of school degree increased by 6.1% for males and 5.6% for females, that participated in a sport. Similar results were found for attaining a university degree which suggests that beneficial long-term effects also exist for those that participate in a sport in their younger years.

In addition to these two studies, Fox et al. (2010) looked at the relationship of physical activity and sports team participation on the academic achievement of both middle and high school students. The authors used 1998-1999 survey data of 4746 students of which 1501 were middle school students. They focused on; student's participation in sports teams, time spent doing moderate to vigorous activity (MVPA), and mean Grade Point Averages (GPA). Fox et al.'s (2010) results were similar to previous studies and revealed that male middle school students that participated in sports had higher mean GPAs than those that did not, however, there were no significant results for females.

In contrast to these three studies, two studies found that females significantly outperformed male students (Stephens & Schaben, 2002; Schlessner, 2004). Stephens and Schaben (2002) looked at the relationship between interscholastic sports and academic achievement for students in 8th grade. The researchers used 136 student's GPA and maths scores as measures against their self-reported level of participation in sports in the 1998-1999 school years. The findings of the study indicated that, with regard to GPA, female sports-participants (2.967) outperformed male participants (3.400).

In the second study, Schlessner (2004) investigated the relationship between extracurricular activities and GPAs of 111 eighth grade students. Data were collected from school lists of GPAs and the activity groups in which the corresponding students were participants in 2002-2003. Schlessner (2004) found that the mean GPA for female activity participants was higher than any other group. Each of these studies found gender differences therefore this variable was an important factor to examine in the current study.

Ethnicity

Eitle and Eitle (2002) used information from the National Education Longitudinal Survey, in America. The researchers' data dated from 1988 to 1990 from which they focused on differences between 4930 black and white male intermediate students playing sports, and

their academic outcomes. They found that participating in sports, other than football and basketball, correlated with better academic grades for white students but poorer grades for black students. Such findings indicate that differences may exist between different ethnic groups; however this variable was not analysed in the current study.

Socio-Economic Status (SES)

In addition to ethnic differences, Eitle and Eitle (2002) also found that differences existed between students from different socio-economic backgrounds. Their results indicated that both sports participants and non-sports participants that had a lower SES did poorer academically than students with a higher SES. Chomitz et al.'s (2009) findings were also consistent with this as students with lower SES were less likely to pass Maths and English tests than students with higher SES.

The California Department of Education (2005) looked at data from both fitness and academic tests to explore the relationship between fitness and academic achievement while looking at differences between low and high SES students. They found that, consistent with other research, a stronger positive relationship existed for high SES students. It is further explained that the higher grades and fitness levels associated with high SES students could be a result of better health and living conditions (CDE, 2005). CDE (2005) also discuss research indicating that an improvement in SES and the factors that improve health; leads to better wellbeing and improved grades. Therefore the current study also looked at whether differences existed between the academic achievement of sports participants from schools of different decile ratings.

In New Zealand, schools are rated by Deciles which give an indication of the socio-economic background of the students in that school (e.g. Decile 1 – students come from families with a low socio-economic status, Decile 10 – students come from families with high a socio-economic status) (Valentine, 2007). According to Statistics New Zealand (2007),

based on the median income of employees, the highest income areas in Auckland were in the Auckland City (Central Auckland) region with the lowest income areas in the Manukau City (South Auckland) region.

Core Subjects

Chomitz et al. (2009) carried out a cross-sectional correlational study on the relationship between physical fitness and academic achievement. Chomitz et al. (2009) used academic achievement data on 1841 American public school students in fourth, sixth, seventh, and eighth grade. Their data comprised of Maths and English grades and physical fitness test scores. The researchers found that there was a strong relationship between maths grades and fitness test scores with the maths passing rate estimated to increase by 38% as the number of fitness tests passed increased by a unit. Similar results were evident for English grades with an estimated 24% increase; however the relationship between the two variables was much weaker.

Stephens and Schaben (2002) looked at both mean GPA scores and maths scores. The results of the authors study indicated that those that participated in a sport had higher cumulative GPAs than those that did not participate; which was evident for both sexes. Furthermore, similar results were found for maths grades with sports-participants obtaining a higher percentage score (64%) than non-participants (48%).

Schlesser (2004) also found that, consistent with results of previous studies, students involved with extra-curricular activities had higher GPAs than those that did not. Although this effect is a positive one, it should be noted that the activities referred to in this study included six sporting activities and three non-sporting activities. Analyses differentiating sports versus non-sports activities would have been beneficial however this was not present for this study.

Castelli et al. (2007) and CDE (2005) both looked at the relationship between physical fitness and academic achievement in core subjects. Castelli et al. (2007) found that students who were fitter and had a lower Body Mass Index (BMI) performed better in Reading and Mathematics. Furthermore, CDE's (2005) results indicated that physical fitness was strongly associated with higher grades in English, Mathematics, History and Science.

Therefore, not only did the current study aim to examine the association between sports participation and mean grades, but it also looked at the association between sports participation and each core subject (Mathematics, English and Science).

Sport Type and Number of Sports

Eitle and Eitle's (2002) correlational study had an interesting result when assessing the relationship between different sports and academic achievement scores. Their results indicated a negative relationship between football and basketball participation and achievement scores. Both these sports are team sports therefore the current study looked at whether or not the type of sport, i.e. team or individual sport, had a significant effect on a student's mean grade.

In addition to the type of sport, the current study also looked at the number of sports played. Stephens and Schaben's (2002) study looking at interscholastic sports and the academic achievement of intermediate school students found that students involved with more sports had higher grades than students that engaged in a lower number of sports. Furthermore, the two participants that took part in five sports were amongst the highest GPA students in the class (Stephens & Schaben, 2002).

Time Spent

Cornelißen and Pfieler's (2007) findings illustrated that participating in sports competitions did not have the same beneficial effects as regular sporting activities. The probability of achieving higher degrees did not increase with participation in competition, on

the other hand, it did not decrease either. The researchers suggested that this may have been due to the fact that time-consuming sports do not go hand in hand with time-consuming studies that are associated with higher degrees. Although the current study did not examine the effects of sports competitions specifically, it did look at how the amount of time spent on sports per week affects a student's academic achievement. The assessment of such a variable therefore demonstrates whether time is a factor; like Cornelißen and Pfiefer suggest. In contrast, the American study by Fox et al. (2010) looked at how the amount of time spent on moderate to vigorous physical activity (MVPA) affected student's mean GPAs. Their results indicated that increased time spent on MVPA was found to be associated with higher mean GPAs, which was significant for both male and female middle school students.

Purpose of Current Study

The purpose of the present study is to examine the association between participation in sports and academic achievement. As discussed, most of the international literature presented positive results therefore the current study sought to find similar results within New Zealand. Such results would guide the decision making process for students and parents when deciding to participate in sports. According to the literature just reviewed, it is evident that certain variables are worth examining. These include differences between; gender, deciles, core subject grades, amount of time spent on sports, and number of sports played. Therefore the current study aimed to answer the following research questions.

Research Questions

1. Does participation in sports affect the academic achievement of intermediate students?
2. Does the number of sports in which a student participates affect their academic achievement?

3. What is the relationship between the amount of time spent on a sport per week and academic achievement?
4. Is there a difference between the effects of sports participation on academic achievement for males and females?
5. Is there a difference between the effects of sports participation on academic achievement in different core subjects?
6. Is there a difference between the effects of sports participation and academic achievement for high decile and low decile intermediate school students?

Hypotheses

Question One:

H₁: There will not be a negative effect on academic achievement for students who participate in sports compared to students who do not participate in sports as measured by mean grades.

H₂: Students who participate in one or more sports will demonstrate higher academic achievement than students who do not participate in a sport as measured by mean grades.

Question Two:

H₃: Students who participate in a higher number of sports will demonstrate higher academic achievement than students who participate in a lower number of sports as measured by mean grades.

Question Three:

H₄: Students who spend more hours/days per week on sports will demonstrate higher academic achievement than students who spend less hours/days per week on sports as measured by mean grades.

Question Four:

H₅: Male students who participate in sports will demonstrate higher academic achievement than female students who participate in sports as measured by mean grades.

Question Five:

H₆: Students who participate in sports will demonstrate higher achievement in Mathematics than achievement in English and Science as measured by Mathematics grades.

Question Six:

H₇: Students from a high decile school who participate in sports will demonstrate higher academic achievement than students from a low decile school who participate in sports as measured by mean grades.

Method

The current study aimed to look at the association between participation in sports and academic achievement of intermediate students while comparing differences between gender, deciles, core subject grades, amount of time spent on sports, and number of sports played. The methods used in the present study are similar to those of previous studies (Fox et al., 2010; Schlessler, 2004; Stephens & Schaben, 2002); however they have been altered by the researcher to examine the current research hypotheses.

Participants

Participants for this study were 86 intermediate students from two public schools in Auckland. The participants included both Form 1 (year 7) and Form 2 (year 8) students aged 11-13 years old. The mean age of the participants in this sample was 12 years, 1 month. The gender ratio of the total sample was fairly even although the majority of participants were female (54.7% female, 45.3% male).

School 1 had 30 students in Class 1, 29 students in Class 2 and 31 students in Class 3 giving a total of 90 potential participants. Each of the 90 students were given consent forms and those consenting were given questionnaires. However, only 52 out of the 90 students

returned completed consent forms and filled out questionnaires. The participation rate for School 1 was therefore approximately 58%. Of the 52 questionnaires returned, all the questionnaires were fully completed (all questions were answered); therefore complete data collection was obtained on 100% of the students that participated.

School 2, on the other hand, had 26 students in Class 1 and 2 and 29 students in Class 3 giving a total of 81 students. These students were also given consent forms and those that consented were given questionnaires. Of these students, only 34 returned completed consent forms and questionnaires giving a participation rate of approximately 42%. However, from these 34 students, only seven fully completed the questionnaires thus complete data were obtained from only 20% of the participants. Overall, the participation rate was approximately 50%, and 69% of these participants fully completed the questionnaire.

Participants were recruited from two schools of differing decile rating. School 1, which was located in Auckland Central, was a decile 9 school and School 2, located in South Auckland, was a Decile 1 school. The racial breakdown of the total sample was 27.9% New Zealand European, 22.1% Pacific Islander, 17.4% Asian, 14% Maori, 14% Mixed or Other, and 4.7% Indian. The demographics of the participants for each school are presented in Table 1 below.

The two different schools that were used in the sample were chosen because they included students that came from both high and low income families thus representing students from varied socio-economic backgrounds. The use of just one class from each school could have produced biased results if, for example, the class chosen was an 'accelerant' class including high achieving students. Therefore, 3 classes (out of a possible 28 for School 1 and 24 for School 2) were randomly chosen from each school thus ensuring variation within the sample.

Table 1.
Demographic Breakdown of Participants from Each School

Variable		School 1	School 2	Total
N		52	34	86
Decile		10	1	
Gender	<i>Male</i>	56%	56%	45%
	<i>Female</i>	44%	44%	55%
Ethnicity	<i>N.Z. European</i>	46%	-	28%
	<i>Pacific Islander</i>	8%	44%	22%
	<i>Asian</i>	29%	-	17%
	<i>Maori</i>	2%	32%	14%
	<i>Indian</i>	6%	3%	5%
	<i>Mixed/Other</i>	9%	21%	14%
Mean Age		12 yr 5 m	11y 6m	12y 1m

From the 86 students that participated in the study, 77% participated in one or more sports and 23% did not. The gender ratio for sports participants was equal with 33 male and 33 female sports participants. Of the non-sports participants, 70% were female and 30% were male. Out of the 77% of sports participants, 35% were from the low decile school and 65% were from the high decile school. Furthermore, 55% of students from the low decile school and 45% of students from the high decile school made up the 23% of non-sports participants.

The breakdown of the type of sport played and organisation played for, was as follows: Out of the 66 students that played a sport, 36% of students played individual sports such as swimming or cycling of which 42% were male and 58% were female. Students playing a team sport such as cricket or soccer made up 64% of the sports participants of which 45% were female and 55% were male. Additionally, half of the sports participants played for the school of which 40% were male and 60% female. The other half of these students played for an outside club or organisation and 61% of these students were male with

39% being female. The gender differences between each school for these variables are illustrated in Table 2 below.

Table 2.

Percentage of Students Within each Sporting Variable for each School

Sporting Variables		School 1	School 2	Total
Participant	<i>Male</i>	44%	60%	50%
	<i>Female</i>	56%	40%	50%
Non-Participant	<i>Male</i>	11%	45%	30%
	<i>Female</i>	89%	55%	70%
Individual Sport	<i>Male</i>	38%	66%	42%
	<i>Female</i>	62%	34%	58%
Team Sport	<i>Male</i>	50%	60%	55%
	<i>Female</i>	50%	40%	45%
School Team	<i>Male</i>	35%	36%	35%
	<i>Female</i>	65%	64%	65%
Outside Org.	<i>Male</i>	52%	80%	60%
	<i>Female</i>	48%	20%	40%

Materials

The only materials used in the current study included information sheets and consent forms for parents, students, and principals and questionnaires for the students. These questionnaires were made up of three sections which are illustrated in Appendix A. The first section asked for demographic information such as age, sex, and ethnicity. The second section requested information regarding the current level, if any, of involvement in sports, number of sports played, type of sports played, frequency played per week, hours played per week, and how long they had been playing. The third section of the questionnaire required information about the students' academic achievement for that year. It asked the students what grade they received in their mid-year report card for their core subjects, English, Maths, and Science.

The anonymous self-report questionnaires were used to obtain information on both sports participation, and academic achievement, due to limitations with the ethics committee regarding concerns with confidentiality in accessing academic records of students from school databases. However, the self-report questionnaire was a useful tool as it provided a means for asking specific relevant questions for the study from which answers could be recorded and coded systematically (Hersen, 2004). Furthermore, participants were able to give answers openly (open-end questions) rather than be constrained to choosing already given answers (i.e. multi-choice).

The preservation on anonymity of the participants also meant that students would be less inclined to give false answers as it would not be possible to identify the student from the questionnaire. Moreover, the students were instructed to complete the questionnaires in their own time (at home) therefore it did not interfere with school time and it also reduced the likelihood of their answers being influenced by their peers.

The questions used in the questionnaire were formed by the researcher to obtain data consistent with prior studies. For example, Stephens and Schaben (2002) and Fox et al. (2010) examined how the number of sports played might affect a student's academic achievement. Question 2 was therefore included in the questionnaire (Appendix A) to obtain these data. Coe et al. (2006), Rees and Sabia (2010), and Fox et al. examined the amount of time spent on physical activity/sports therefore Question 5 and 6 were designed to obtain data on both frequency and time spent per week on sports.

Chomitz et al. (2009) examined the effects of physical fitness on different subjects therefore Question 8 was designed to collect data on individual grades from each core subject. However, unlike prior studies, the current questionnaire also included Science grades so that comparisons could be made between the three subjects rather than two (Maths

and English). Many studies also looked at gender and SES and have found significant differences; hence the inclusion of these questions in the demographics section.

Procedure

Before proceeding with the current study, the Code of Ethical Conduct for Research was reviewed and an application was made to the Massey University Human Ethics Committee after which approval was obtained to carry out the research project (MUHEC: Northern Application 11/033). Once approval was received (see Appendix B), the principals of five schools were contacted, given information regarding the study, and asked if their school would like to participate. These schools were found from a list provided on the Ministry of Education website detailing information such as the name and type of school (primary, intermediate, high), geographical location (across New Zealand), and decile rating (1-10).

The basis of choosing these five schools was on geographical location and decile rank. A school from each district (North, South, East, West and Central Auckland) with differing decile ratings (1, 3, 5, 7, and 9) were chosen. After finding the school website of each of these schools, contact details of the school principal were obtained and each principal was contacted. Three of the five schools declined to participate. Consequently, meetings at the two schools that agreed to participate were arranged to discuss the study. Information was provided to the Deputy Principals of these two schools.

The Deputy Principals of each school were then asked to choose three classes from their Intermediate School. The teachers of these classes were given information sheets and consent forms by the deputy principal for both the students in their class and their parents. Participation in the study was completely voluntary and it was made clear that the students' grades would not be affected if the student decided to participate or not. Students were given

a week to complete the consent forms and upon returning them, would receive an anonymous questionnaire (Appendix A) to fill out and return within a week.

Once the questionnaires were completed and returned to the students' teachers, the Deputy Principal collected the paperwork and notified the researcher. For the duration of the study, the researcher had contact with only the Deputy Principals of each school thus preserving the anonymity of the students and their classes. Furthermore, it was made clear to each participant that not only would their answers be completely anonymous, they also had the right to refuse to answer any question if they wished.

Once these data were collected, the consent forms were stored away in a secure filing cabinet and the questionnaires were organised into groups of sports participants and non-sports participants, males and females, and low and high deciles. Each questionnaire was then labelled with a number from 1-86 for data entry purposes. Data were then entered into SPSS 18.0 (Statistical Programme for Social Sciences) with different labels for each variable. Note that data from Section Two, Question 7 were not used in data analysis as the students answers were not consistent enough to categorise.

Data Analysis

Once the data were labelled and entered into SPSS 18.0 accordingly, analyses were conducted (see Tables 3a and 3b) with the significance level set at .05. The mean grade or Grade Point Average (GPA) which, like the subject grades, ranged from 1 to 5 (1 – well below average, 2 – below average, 3 – average, 4 – above average, 5 – well above average). It was calculated for each participant by taking the sum of the grades for each subject (English, Maths and Science) and dividing by the number of subjects (i.e. 3). This mean grade was then used during analysis.

Table 3a includes the Independent Samples T-Test, Simple Linear Regression, and Multiple Linear Regression analyses used; with Mean Grade as a Dependent Variable. Table

3b illustrates the variables on which Independent Samples T-Tests were conducted to evaluate the effect of sports participation on core subject grades. These tests were used as they were consistent with those used in previous studies similar to that of the current study.

Table 3a

Analyses used to evaluate the relationship between sports participation (PPT) and mean academic grades.

Independent Samples T-Test	Simple Linear Regression	Multiple Regression
Sports vs Non-Sports Participants (PPT)	Sport Participation (PPT/Non-PPT)	Sport PPT, Number of Sports, Frequency, Time Spent
Male Sports vs Non-Sports PPTS Female Sports vs Non-Sports PPTS	Number of Sports (1-6)	
Male Sports vs Female Sports PPTS Male vs Female Non-Sports PPTS	Sport Type (Individual/Team)	
Low Decile Sports vs Non-Sports PPTS High Decile Sports vs Non-Sports PPTS	Sport Organisation (School/Outside)	
Low Decile vs High Decile Sports PPTS Low Decile vs High Decile Non PPTS	Sport Time Spent (Hours/wk)	
	Sport Frequency (No. played/wk)	

Table 3b

Independent Samples T-Test used on different Independent and Dependent Variables.

D.V.	<i>English Grade</i>	<i>Maths Grade</i>	<i>Science Grade</i>
I.V.	Sports vs Non-Sports	Sports vs Non-Sports	Sports vs Non-Sports
	Male Sports vs Non-Sports	Male Sports vs Non-Sports	Male Sports vs Non-Sports
	Female Sports vs Non-Sports	Female Sports vs Non-Sports	Female Sports vs Non-Sports
	Male Sports vs Female Sports	Male Sports vs Female Sports	Male Sports vs Female Sports
	Male Non vs Female Non-Sports	Male Non vs Female Non-Sports	Male Non vs Female Non-Sports

Results

The main aims of the current study were to find out whether an intermediate student's academic achievement was affected by factors such as participating in a sport, the number of sports participated played, and the amount of time spent playing the sport per week. Furthermore, the study aimed to examine any differences in effects between sexes, subjects, and deciles.

The research hypotheses were that participation in sports would be associated with higher grades, an increased number of sports would increase academic achievement, and an increased amount of time on sports would be associated with higher academic achievement. Additionally, it was hypothesised that there would be a greater positive effect on males, mathematics, and high decile students. A table of the mean grades and standard deviations (SD) achieved for sports participants and non-sports participants is illustrated in Table 4 below and will be further explained in subsequent chapters.

Table 4

Comparison of mean grades with standard deviations (SD) between sports and non-sports participants (PPT) for male, female, high and low decile students

	All		Male		Female		Low Decile		High Decile	
	<i>PPT</i>	<i>Non-PPT</i>	<i>PPT</i>	<i>Non-PPT</i>	<i>PPT</i>	<i>Non-PPT</i>	<i>PPT</i>	<i>Non-PPT</i>	<i>PPT</i>	<i>Non-PPT</i>
Grades										
<i>Mean</i>	3.36	3.03	3.32	2.61	3.39	3.20	3.10	2.62	3.50	3.52
<i>(SD)</i>	(±.70)	(±.84)	(±.66)	(±.87)	(±.75)	(±.79)	(±.78)	(±.73)	(±.63)	(±.71)
<i>English</i>	3.26	2.85	3.06	2.33	3.45	3.07	2.78	2.36	3.51	3.44
<i>(SD)</i>	(±.81)	(±1.09)	(±.86)	(±1.03)	(±.71)	(±1.07)	(±.90)	(±.92)	(±.63)	(±1.01)
<i>Maths</i>	3.58	3.25	3.70	2.83	3.47	3.43	3.50	2.91	3.63	3.67
<i>(SD)</i>	(±.86)	(±1.02)	(±.77)	(±.98)	(±.95)	(±1.02)	(±.86)	(±.94)	(±.87)	(±1.00)
<i>Science</i>	3.34	3.38	3.32	3.33	3.36	3.40	3.29	3.25	3.35	3.44
<i>(SD)</i>	(±.69)	(±.87)	(±.63)	(±.58)	(±.76)	(±.97)	(±.49)	(±.96)	(±.72)	(±.88)

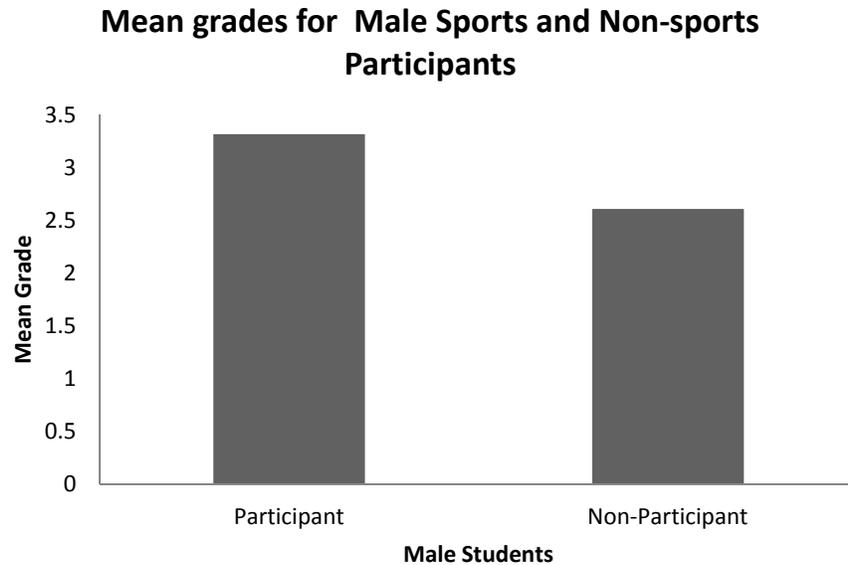
Independent Samples T-Tests

To test the main research hypothesis, an independent samples t-test was carried out using the mean academic grade, derived from the grades of the three core subjects, and reports of participation in sports. The results indicated that although mean grades were higher for sports participants ($M = 3.36, SD = .70$) than non-sports participants ($M = 3.03, SD = .84; t_{(84)} = 1.78, p = .079$), this difference was not statistically significant. Hypothesis 1 was therefore accepted as sports participation does not negatively impact academic achievement.

After testing for gender differences, inspection of the two group means indicated that the mean grade for male sports participants ($M = 3.32, SD = 0.66$) was significantly higher than the mean grade for male students that did not participate in a sport ($M = 2.61, SD = 0.87; t_{(37)} = 2.31, p = .026$). The difference between the two means was 0.71 points on a 5-point GPA scale; and the effect size, $d = 0.71$, was relatively large according to Cohen's (1998) guidelines on studies in behavioural sciences and education. This effect is illustrated in Figure 1 below. The small difference in grades between female sports participants and non-sports participants was not statistically significant ($t_{(45)} = 0.78, p = .435$). These results indicated that Hypothesis 5 could be rejected for females but accepted for males. However, overall the hypothesis was rejected.

Figure 1

The difference in mean grades between male sports participants and male non-sports participants



When comparing mean grades of male sports participants and female sports participants, the Independent Samples T-test revealed that the observed mean difference (0.07) was not statistically significant ($t_{(64)} = .406$, $p = .686$). T-tests were also conducted comparing the effect of sports participation for students in high and low decile schools. The comparison of mean academic grades between sports participants and non-participants in the low decile school did not produce a significant result. Similarly, no significant effect was found for the high decile school. However, upon comparison of the effect of sports involvement between high decile students and low decile students, there was a significant difference in mean grades thus Hypothesis 7 accepted. This is illustrated in Table 5 below.

Table 5

Between-Decile Comparison of Mean Grades between Sports and Non-Sports Participants

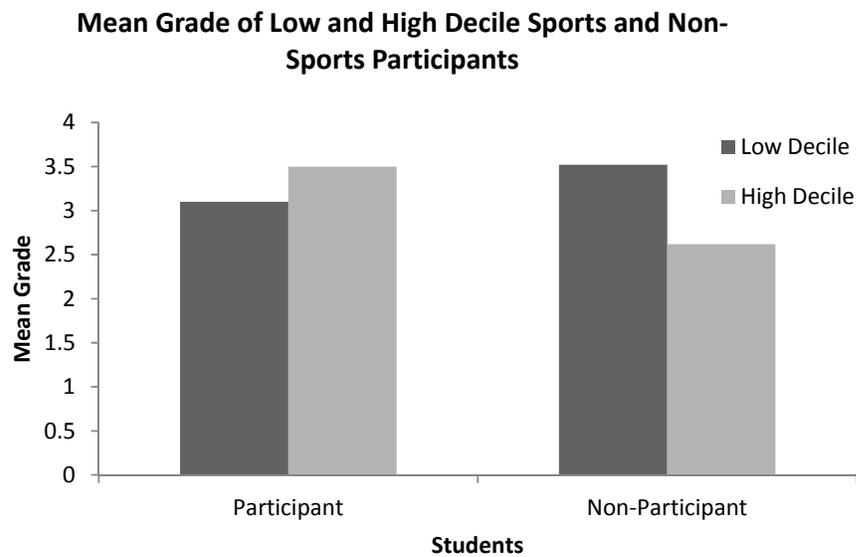
	Sports			Non-Sports			T
	N	M	S.D	N	M	S.D	
Low	23	3.10	0.78	11	2.62	0.73	2.24*
High	43	3.50	0.63	9	3.52	0.71	2.77*

* $p < .05$, two-tailed

Inspection of the two group means indicated that the mean grade for high decile sports participants ($M = 3.50$, $SD = .63$) was significant and higher than the mean grade for low decile sports participants ($M = 3.10$, $SD = .78$; $t_{(64)} = 2.24$, $p = .029$). The difference between the means was 0.40 points and the effect size was $d = 0.70$ which is considered a large effect size relative to studies within this field (Cohen, 1998). The difference between the mean grades for non-sports participants, when comparing between high ($M = 3.52$, $SD = .71$) and low decile ($M = 2.62$, $SD = .73$; $t_{(18)} = 2.77$, $p = .013$) students, was also significant; with a mean difference of 0.90 points. These effects are illustrated in Figure 2 below.

Figure 2

The difference in mean grades between sports and non-sports participants from low and high decile schools.



The effect of sports participation on each individual core subject was also analysed and gender differences were also compared. The results that were statistically significant are demonstrated in Table 6 below. Sports participation had no significant effect on English, Mathematics or Science grades when both sexes were included. However, when comparing between males and females, the two group means indicated that the average English grade for female sports participants ($M = 3.45$, $SD = .71$) was significantly higher than the average

grade for male sports participants ($M = 3.06$, $SD = .86$; $t_{(64)} = 2.02$, $p = .047$) with a mean difference of 0.39 points. The effect size was $d = 0.5$ which is typical according to Cohen's (1998) guidelines for studies within similar fields. Figure 3 below shows this effect. There was no significant difference between the sexes for non-sports participants.

Table 6

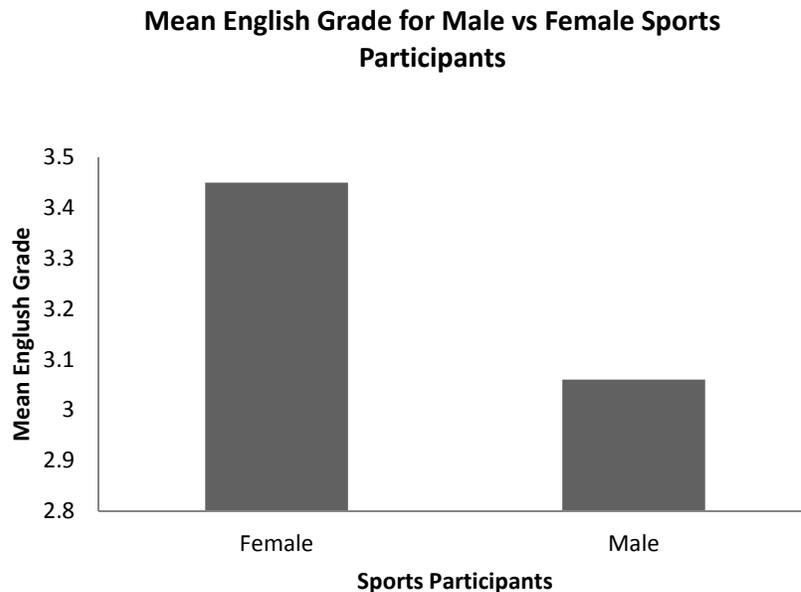
Comparison of Mean Grades and Maths Grades between Male Sports and Non-Sports Participants

	Sports			Non-Sports			t
	N	M	S.D	N	M	S.D	
Mean Grade	33	3.32	0.66	6	2.61	0.87	2.31*
Maths Grade	33	3.70	0.77	6	2.83	0.98	2.43*

* $p < .05$, two-tailed

Figure 3

The difference in mean English grades between female and male sports participants

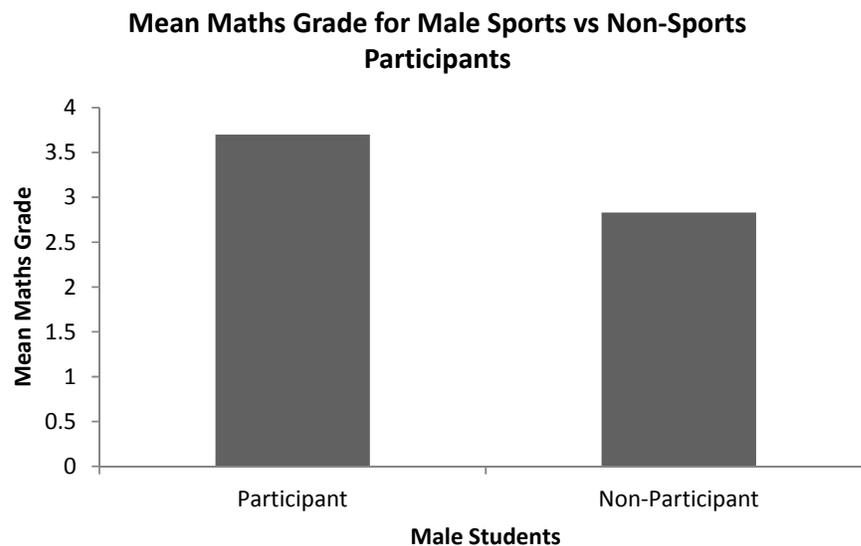


Analysis for Mathematics grades revealed a significant difference in mean grades for male sports-participants when compared to non-participants; however there was no difference between the means of female participants and non-participants. Inspection of the two group

means indicated that the average maths grade for male sports participants ($M = 3.70$, $SD = .77$) was significantly higher than male students that did not participate in a sport ($M = 2.83$, $SD = .98$; $t_{(37)} = 2.43$, $p = .020$). The mean difference was 0.86 points on a 5-point scale and the effect size was 0.8 which is relatively large for studies within this field (Cohen, 1998). This effect is illustrated in Figure 4 below. There were no other significant differences for English or Maths and no significant differences between achievement grades in Science; therefore, overall, Hypothesis 6 was rejected.

Figure 4.

The difference in mean mathematics grades between male sports participants and male non-sports participants



Simple Linear Regression

Correlation and Simple Linear regression analyses were conducted to investigate the relationship between sports participation and mean academic achievement. Table 7 below summarizes the descriptive statistics and analysis results. As seen in the table, the variables that were analysed included sports participation, number of sports, type of sport, organisation played for, time spent in hours, and frequency played per week, all with mean grade.

Simple Linear Regression analysis was used to test if participation in sports significantly predicted students mean grade. The results of the regression revealed that 3.6% of the variation in mean grades could be accounted for by participation in sports. However, there was no significant correlation between participation in sports and mean grade ($R^2 = .036$, $F_{(1,84)} = 3.155$, $p = .079$).

Table 7

Correlations of Variables with Mean Grade from Simple Linear Regression Analyses

Variable	Mean	SD	R ²	R	F
Mean Grade	3.28	±.745	-	-	-
Sport Participation	1.23	±.425	.036	-.190	3.155
No. of Sports	1.50	±1.263	.029	.170	2.496
Sport Type	1.95	±.718	.016	-.126	1.346
Sport Organisation	1.87	±.773	.017	-.129	1.396
Time Spent	4.16	±4.212	.042	.206	3.627
Frequency	2.61	±2.242	.063	.252	5.610*

* = $p < .05$

After analysing whether the number of sports significantly predicted a student's mean grade; it was found that the number of sports predicted about 3% of the variation in mean grades. The correlation between the two variables was also not significant ($R^2 = .029$, $F_{(1,84)} = 3.496$, $p = .118$), therefore Hypotheses 2 and 3 were rejected.

With regard to the type of sport a student played, the regression analysis revealed that the type of sport participated in accounted for 1.6% of the variation in mean grade. The report for this measure, however, also indicated that the type of sport is not a significant predictor for mean grade ($R^2 = .016$, $F_{(1,84)} = 1.346$, $p = .249$).

Simple Linear Regression analysis was also used to test if the organisation that a student played a sport for predicted mean grade and it was found that this variable predicted 1.7% of the variation in mean grade. This measure was not found to be a statistically significant predictor of mean grade ($R^2 = .017$, $F_{(1,82)} = 1.396$, $p = .241$). Further analysis

revealed that the time spent playing a sport, in hours per week, accounted for 4.2% of the variance in mean grade. However, it was not found to be a significant predictor of mean grade ($R^2 = .042$, $F_{(1,82)} = 3.627$, $p = .060$).

The last measure to be analysed was the frequency (i.e., the number of times a student played a sport per week) with mean achievement grades. The results indicated that the frequency played per week accounted for 6.3% of the variation in mean grades. A significant relationship was also found between the frequency of sports played and mean grade ($R^2 = .063$, $F_{(1,83)} = 5.61$, $p = .020$). The correlation between the two variables ($r = .252$) indicated a weak but positive relationship.

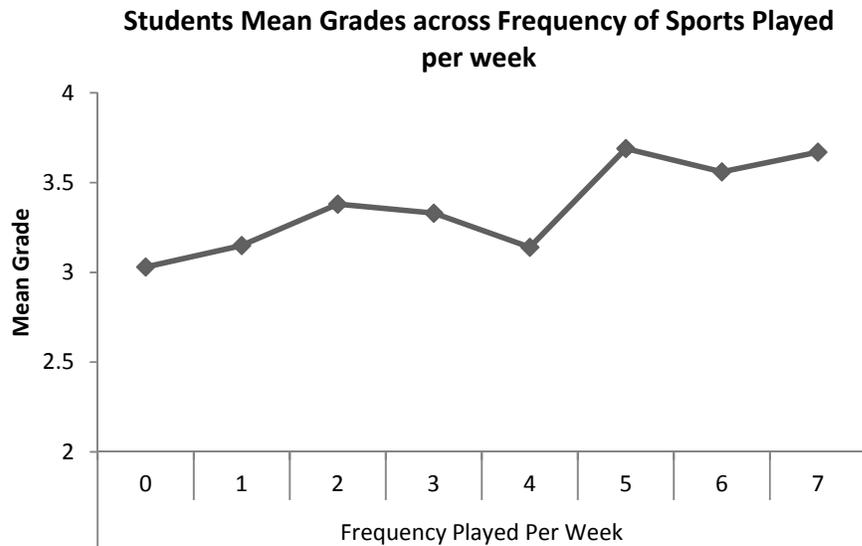
The identified equation to understand this relationship was based on the formula of $y = bx + a$ where y is dependent variable, b is the slope, x is the independent variable, and a , is the intercept. The following equation was therefore formulated based on the data:

$$\text{Mean grade} = 0.084 \times \text{frequency played} + 3.057$$

Therefore, when no sports are played during the week, the average grade of a student is approximately 3.06 out of 5; however, if the frequency of sports played in a week increased to 1 day, a student's mean grade would increase by .084 marks. The difference in mean grades is illustrated below in Figure 5.

Figure 5

The trend of mean grades across the number of times sports are played per week for all students.



Multiple Linear Regression

Simultaneous Multiple Regression was conducted to investigate the best predictors of mean grades. When the combination of variables to predict mean grade included participation in sports, number of sports, frequency played and time spent per week, $F_{(4,79)} = 1.41, p = .239$. The Pearson correlations are presented in Table 8 below. Note that participation in sports, frequency played, and time spent participating in sports per week all significantly correlate with mean grade when all four variables are considered. However, all four variables are highly correlated with each other thus there may be a problem with inter-collinearity. The F statistic, however, is not statistically significant therefore the combination of predictors does not significantly combine together to predict mean grade.

Table 8
Correlations and Significance of Participation in Sports, Number of Sports, Frequency Played and Time Spent with Mean Grade

	Mean Grade	Sports	Number	Frequency	Time Spent
Sports	-.187*	1.00	-.661***	.653	-.758***
Number	.165	-.661***	1.00	.632***	.623***
Frequency	.252*	-.653***	.632***	1.00	.892***
Time Spent	.214*	-.758***	.623***	.892***	1.00

* = $p < .05$

** = $p < .01$

*** = $p < .001$

Summary of Results

After analysing the data via Independent Samples T-Test and Simple and Multiple Regression analyses, only a few results were statistically significant. The main question of whether participation in sports affects academic achievement has been answered. The results indicated that no differences in academic achievement existed between female sports participants and female non-sports participants; however differences existed for males. Independent Samples T-Test revealed that males participating in a sport scored, on average, 0.71 points higher than males that did not participate in a sport, on a 5-point GPA scale.

This was found for Mathematics grades, as male sports participants, on average, scored 0.86 points higher than males that were not sports participants. The only significant effect for females was with English grades. It was also found that the mean English grade for female sports participants was 0.39 points higher than male sports participants.

When comparing results of students from the low decile school to the high decile school, it was found that students from the high decile school that participated in sports had, on average, significantly higher grades than sports participants from the low decile school. However, this effect was also present for non-sports participants as students from the high

decile school obtained, on average, 0.90 points more on their mean grades as compared to the low decile school students.

Finally, the relationship between the frequency of sports played per week and mean grade was also significant. It was found that if a student increased the number of times they played sports in a week by 1 day, their mean grade was predicted to increase by 0.084 points on a 5-point scale.

Discussion

Implication of Results on Hypotheses

It can therefore be concluded that the main hypothesis H_1 was accepted. Participation in sports was not negatively associated with the academic achievement of intermediate students as there was no significant difference found between the grades of sports and non-sports participants. Sports participation was not significantly associated with higher academic grades therefore H_2 was rejected. Although participation in sports was positively associated with academic achievement for male participants; there was no significant difference between the mean grades of male and female sports participants. H_5 was therefore rejected. Male sports participants had significantly higher maths grades than male non-participants; however this association was not significant for females and was not applicable to the other core subjects thus H_6 was also rejected.

The number of sports in which one participated in, did not have a significant relationship with academic achievement, therefore H_3 was rejected. The association between academic achievement and the amount of hours spent playing a sport was not significant, however, the number of days played per week was associated with higher grades. As Figure 5 indicated, students that played a sport 5-7 days a week had a higher mean grade than all other categories. However, as H_4 included both hours and days per week, this hypothesis was also rejected. On the other hand, H_7 was accepted as sports participants from the high decile

school achieved significantly higher mean grades than sports participants from the low decile school.

General Implication of Results

The majority of prior studies studying the effect of participation in sports on a student's academic achievement have found that students grades are either not affected at all or they are significantly higher when participating in a sport. The results of the current study are consistent with those of other studies as no significant differences were found in students grades when comparing the mean grades of sports participants with the mean grade of non-sports participants. Furthermore, it was found that when examining within sex differences, male sports participants actually had higher overall mean grades than males that did not play a sport. Similarly, male sports participants also outperformed male non-participants when looking at average Mathematics grades. However, the same was not true of female sport participants. Such a result implies that participating in sports may affect males and females differently.

Although there was no significant relationship found between the organisation for whom a participant plays, and mean grade, it is interesting to note that the majority of female sports participants (61%) were part of a school sports team rather than an outside organisation or club as compared to males. It is possible that being part of a school sports team results in a different effect on academic school commitments as compared to being part of an outside school organisation; however, such a conclusion cannot be made from these results.

In terms of gender comparisons (i.e. male results versus female results), female sports participants were found to have, on average, higher English grades than male sports participants. It may therefore be possible that participation in sports has a positive effect on English grades for females as compared to males. Compared to female non-participants, the mean English grade was 0.38 points higher for female sports participants; however this result

was not significant. Another explanation may be that females generally are better at English than males, regardless of participation in sports. This may be more likely as comparisons of the group means of male and female non-sports participants reveals that females, on average, score 0.74 points higher than males in English; however this result was also not statistically significant.

Further examination revealed that more students from the high decile school (School 1) participated in sports than students from the low decile school (School 2). Although the response rate was higher from School 1, there were more students in the non-sports participant group from School 2 compared to School 1. This comparison found that sports participants from the high decile school obtained, on average, significantly higher mean grades than sports participants from the low decile school which may have one of two implications. The first implication is that students from high decile schools may generally achieve better grades than students from low decile schools (Eitle & Eitle, 2002; Chomitz et al., 2009). This is highly likely because it was also found that the non-sports participants from School 1 achieved, on average, significantly higher mean grades (i.e., .90 grade points) than non-sports participants from School 2.

The second implication is that students who participate in sports generally do better than students who do not. The support for this statement lies in the number of students who reported playing a sport compared with those who reported no sports involvement. In School 1, of the 52 students who participated in the study, 83% of the students were sports participants compared to School 2's 68% of 34 students. School 1 (high decile) is composed of, overall, more students who participate in sports than School 2 (low decile). Therefore if students who participate in sports do actually do better academically than non-participants; the higher 15% of sports participants in the high decile school compared to the low decile school may explain the significantly higher mean grade of School 1.

The only other significant finding was the association between sport frequency and mean grade. The frequency a student played sports was positively associated with their overall academic achievement thus implying that if students increased the number of days they played a sport in a week (i.e., 5-7 days), their mean grade was likely to improve. This may be because students that play 5-7 times a week need to work extra hard to balance between their academic life and sporting life therefore gaining the benefits of discipline and organisation skills for effective learning. However, although the Linear Regression analysis revealed a positive association between the two variables, the correlation was not very strong.

The current results should, however, be interpreted with caution because the relationship that is found between the variables is not a causal one. For this reason, the results could be interpreted in two ways, one of which was that participation in sports results in higher mean grades for males. However, it may be that male students that do well at school and obtain high mean grades, and high maths grades, are more likely to participate in sports. Similarly, it may be that students who achieve higher mean grades are more likely to engage in sports more times a week than students that get lower grades.

This is supported by Lindner's (2002) results in which the selection hypothesis and situational hypotheses are described. Both these hypotheses are possible explanations for these results as the selection hypothesis suggests male students in the current sample may naturally achieve high grades academically and be drawn to a sporting lifestyle. On the other hand, the situational hypothesis suggests that it may be the parents of the high achieving children allow their children to take part in sports; compared to low achieving children who are less likely to be allowed to participate. Further information is therefore needed to interpret the results more accurately.

Comparisons with Previous Studies

Similar to other studies, the current study's results found that participating in sports did not negatively impact a student's academic achievement. Furthermore, consistent with previous research (Fox et al., 2010; Linder, 2002) significant positive effects were only found for male sports participants. Cornelißen and Pfeifer (2007) also found that the effect of sports participation was greater for males than females. Additionally, two studies (Chomitz et al., 2009; Stephens & Schaben, 2002) found a significant positive effect on maths grades which was consistent with the current studies results for males. Stephens and Schaben (2002) also found that female sports participants outperformed male sports participants, which was also the case for the current study in English grades.

Limitations

There are several limitations which need to be addressed. These limitations include the following: schools were not randomly chosen; the schools were urban public schools, in Auckland, there were unequal sample sizes between the schools; there was a low response rate; self-report measures were used with self-made questionnaires; the research design was non-experimental; and there were a higher number of sports participants in the study.

Firstly, the researcher chose schools on the basis of the schools geographical location and their decile rating therefore the selection of each participating school was not randomly chosen. This is a limitation because the sample was biased towards each extremity (e.g. Decile 1 and Decile 9) and may not give a true estimate of the population. Additionally, the chosen schools were based within Auckland and were urban public schools hence it is possible that students from rural schools or schools in different areas of New Zealand have different effects.

Another major limitation for the study was the number of participants. Only 2 schools participated in the study thus producing a small number of participants in the sample.

The inclusion of more Schools would have increased the number of participants available and produced more reliable results to better represent the population. The low and uneven response rate from both schools added to this limitation. Students from School 2 (Low decile) had an extremely low data completion rate. Not only were some answers left incomplete, but some answers that were given were irrelevant to the question. Therefore, because there were more students in the sample of School 2 (high decile), School 1 may have been under-represented; causing skewed results.

The current study also used self-made questionnaires. Therefore no pilot studies existed to measure the validity or reliability of the questionnaire which may have led to unreliable results. Moreover, the data were based on self-report measures therefore students may have given incorrect or dishonest answers to some of the questions, particularly questions concerning their academic achievement. Such an event may arise due to social desirability bias where the student may want to be perceived as 'smarter' or 'sportier' than they actually are; and would therefore write an answer that is higher than it should be (Grimm, 2010). Even though it was evident and made clear that the questionnaire would be anonymous, such a limitation was still possible and would have produced inaccurate results.

In addition to these limitations, the current study also did not employ an experimental design; thus, no causal relationships can be concluded from the results. For this reason it is possible that effects and associations found between the independent variables and the mean grade may be interpreted in two ways. The results found from the Independent Samples T-Tests may indicate that students who achieve higher grades are more likely to play sports or, conversely, that students obtain higher grades if they play a sport.

Finally, and relatedly, it should be taken into consideration that sports participants are more likely to respond to, or take part in the study, than students that do not play a sport. This is a limitation as the sample included a larger number of sports participants (77%) compared

to non-sports participants (23%) hence non-sports participants were under-represented in this study. This, again, may have produced skewed or unreliable results.

Future Recommendations

Recommendations for future research include an examination of the relationship between sports participation and academic achievement. Firstly, it would be beneficial to obtain more participants in the sample. Future researchers are encouraged to gather data from more schools with different geographical locations, decile ratings, and rural versus urban areas. If the study were to be on a larger scale then it is also ideal to use schools from different cities across the country and not only Auckland schools.

The second recommendation would be to use school records rather than self-report measures. Academic records and records of student's participation in sports teams can be collected from the school database as this would avoid the complications of incomplete questionnaires, dishonest and irrelevant answers. Furthermore, this method would also produce more accurate results. The current study planned to do this, but was limited by the ethics committee's insistence that school records not be accessed to ensure participant anonymity.

Conclusion

An important part of many students' lives is their engagement in sports. It is not surprising then that parents and school personnel alike raise the question of whether participating in a sport has a negative impact of their academic achievement. The results of this study examined this effect and found that sports participation does not negatively impact a student's grades, but in fact for male students is positively associated with higher overall grades and maths grades. Furthermore, the current study found that increasing the number of times a week a student plays sports, is positively related to higher mean grades. Future research is needed in the areas of use of more objective data and demographics, which would

increase generalizability. However, these results suggest that increased sports participation is not detrimental to students' grades.

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Appendix A



Educational Psychology Programme
 School of Education, Massey University
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 Auckland

Students and Sports: The relationship between sports and academic achievement

Questionnaire

Thank you for participating in this study. Your questionnaire will be anonymous so please do not write your name anywhere on this questionnaire, and be as honest as possible. Fill out this questionnaire about your academic achievement and involvement in sports to the best of your knowledge. You may decline to answer any question if you wish. Please complete and return this questionnaire to your teacher within a week.

Section One: Demographics

Date: _____ Age: _____ Male Female

Ethnicity: _____

Section Two: Sports Involvement

Please answer the following questions about your involvement in sports. The word *currently* refers to being part of a sports club/team at this moment. It does not matter whether you are playing the sport during the current season as long as you are part of the club/team this year.

1. Are you *currently* taking part in any sports? _____

If no please proceed to Section Three, If yes please answer the following questions:

2. How many sports do you *currently* play? _____

3. Which sport(s) do you *currently* play? (e.g. cricket, tennis etc.)

4. For each sport you are *currently* playing, please specify the type of team or organization you are associated with. (e.g. swimming - school team, soccer - north shore club)

Sport

Team/Organization

<hr/>	<hr/>

5. How often do you play this sport(s)? (E.g. twice a week during the rugby season, if you play more than one sport please specify for each sport e.g. cricket – once a week, soccer - twice a week)

Sport

Frequency played (per week)

<hr/>	<hr/>

6. In a week, approximately how much time do you think you spend playing this sport(s) (E.g. 5 hrs/wk or if more than one sport please specify for each sport e.g. tennis – 3 hrs/wk, swimming 5 hrs/wk)

Sport

Time spent (per week)

<hr/>	<hr/>

7. How long have you been playing this sport(s) for? (E.g. 3 months or 2 years, if you play more than one sport, please specify for each sport how long you have been playing)

Sport	Played for (weeks/months/years)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Section Three: Academic Achievement

8. In your mid-year report card, what grade did you receive for the following subjects;

English: _____

Mathematics: _____

Science: _____



MASSEY UNIVERSITY
ALBANY

11 August 2011

Vibha Prasad
c/- Associate-Professor S Little
College of Education
Massey University
Albany

Dear Vibha

HUMAN ETHICS APPROVAL APPLICATION – MUHECN 11/033
Students and Sports: The Relationship between Sports and Academic Achievement

Thank you for your application. It has been fully considered, and approved by the Massey University Human Ethics Committee: Northern.

Approval is for three years. If this project has not been completed within three years from the date of this letter, a reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Ralph Bathurst
Chair
Human Ethics Committee: Northern

cc: Associate-Professor S Little
College of Humanities & Social Sciences

Tē Kunenga
ki Pūrehuroa

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