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Is Parent or Child Perception of Physical Competence Associated with Fitness Level and Obesity in Children?

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IS PARENT OR CHILD PERCEPTION OF PHYSICAL COMPETENCE ASSOCIATED WITH FITNESS LEVEL AND OBESITY IN CHILDREN?

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CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the thesis of

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ABSTRACT

With child fitness levels on the decline and obesity on the rise, it is important for a parent to correctly perceive his/her child's physical competence, fitness level, and weight status. The purpose of this study was to examine relationships between perceived physical competence, fitness level, and obesity in children, and the ability of a parent to perceive his/her child's perception of physical competence and weight status. In Tompkins County, NY, 28 children (age = 9.61 ± 0.50) and parent (age = 41.74 ± 7.01) pairs served as subjects. The Self-Perception Profile for Children (SPPC) was used to assess the child's perception of physical competence. A parent completed the same survey as he/she believed his/her child would respond. A one-mile run/walk test estimated the child's fitness level, and body mass index (BMI) estimated weight status. Statistical analysis showed that parents accurately assessed child physical competence and weight status. The parent SPPC score was significantly lower for the less fit child and higher for the fit child, which suggests that the parent knew his/her child's physical abilities better than the child. Children, on the other hand, scored themselves differently. The low fit (below Healthy Fitness Zone) children perceived themselves to be as physically competent as the physically fit children (within Healthy Fitness Zone). These results indicate that the perception of physical competence in low fit children does not correspond to actual fitness level and may indicate a lack of understanding in low fit children about the recommended minimum fitness level. In the future, it would be beneficial to track and intervene with children who think they are physically competent, but in reality, do not meet recommended minimum fitness standards.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Obesity is the single most avoidable cause of illness and death (Myers & Vargas, 2000) and the prevalence of obesity in children is alarming. The Centers for Disease Control and Prevention compared data from the National Health and Nutrition Examination Survey (NHANES) in 1976-1980 and 2003-2004 and found that children aged 6-11 years classified as overweight had increased from 4% to 18.8%. Previously, the first National Children and Youth Fitness Study (NCYFS) completed in 1985 showed that children of the same age group, 6-11 years, were fatter than they had been 20 years ago (Corbin, 1986,) and that a full third of the youth were not physically active enough for aerobic benefit (McGinnis, 1987).

As the number of children who are overweight and obese continues to increase, more research is focusing on the causes of obesity. Two major arguments for obesity in children are poor diet (Craeynest et al., 2005; Ebbeling, Pawlak, & Ludwig, 2002) and lack of physical activity (Ball, Marshall, & McCarger, 2005; Gill, MacDougall, & Taylor, 2004; Ebbeling et al., 2002; Olds, Ridley, & Tomkinson, 2007; Stratton et al., 2007).

Researchers report that parents are a major factor that contributes to obesity in children, whether by negatively influencing child eating and physical activity patterns (Ebbeling et al., 2002; Lee, Carter, & Greenockle 1987; McMurray et al., 1993, Schlicker, Borra & Regan, 1994) or by lack of recognition of the child having a weight problem (Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000; Jackson, Strauss, Lee, & Hunter, 1990; Jain et al., 2001; Maynard, Galuska, Blanck, & Serdula, 2003; Myers &

Vargas, 2000). Because overweight children are more likely to become overweight adults (Ball et al., 2005; Gill et al., 2004; Sallis, 1987), all factors that contribute to this epidemic should be studied to better provide methods of prevention and intervention.

Approximately 33% of obese preschool children, 50% of obese school age children, and 80% of obese adolescents become obese adults (Myers & Vargas, 2000). Research by Freedman et al. (2005) and Schlicker, Bora, and Regan (1994) reported similar statistics. According to Rowland and Freedson (1994), physical activity and fitness do not have a distinct health benefit for the pediatric population and the purpose of encouraging activity in childhood is that it may serve as a foundation for a lifetime of physical activity (Rowland & Freedson, 1994; Simons-Morton et al., 1988) that can help to maintain fitness level and prevent weight gain. However, Blair, Clark, Cureton and Powell (1989) suggested three ways children's health may be affected by exercise: 1) high physical activity/fitness may improve health, 2) exercise during childhood could produce changes that will have a beneficial effect on adult health, 3) exercise habits in childhood may persist into adult years resulting in a lifetime of regular activity that could positively affect adult health outcomes. Several researchers agree that physical activity habits are formed during childhood (Ball et al., 2005; Mason et. al 2006) and that these patterns carry over into adulthood (Castelli & Valley, 2007; Rowland & Freedson, 1994). It is likely that active children become active adults (Castelli & Valley, 2007; Gill et al., 2004) and the best strategy for improving the long-term health of children and adolescents through exercise is to create a lifestyle pattern that includes regular physical activity that will carry over to the adult years (Rowland & Freedson, 1994).

According to social cognitive theory, self-efficacy influences behaviors including physical activity, therefore influencing the benefits of such activity (Castelli & Valley, 2007). Children with higher self-efficacy are more likely to participate in physical activity than those with lower self-efficacy. Castelli and Valley (2007) conducted tests to find correlations between physical activity, physical fitness, and motor competence. They found that both physical fitness and perceived motor competence were predictors of physical activity in children and influenced participation accordingly. Woods et al. (2007) also reported that children who have higher perceived competence participate in more physical activity than those with low perceived competence. Kimiecik and Horn (1998) found that children's perceptions of their own physical competence are significantly related to their moderate-to-vigorous physical activity. Lastly, Raudsepp et al. (2002) concluded that physical self-perceptions of sports competence, physical condition, body attractiveness, and strength are moderately associated with moderate-to-vigorous physical activity and fitness.

Southall, Okely, and Steele (2004) compared the actual and perceived physical competence of non-overweight and overweight children and found that overweight children had lower perceived physical competence scores. A study comparing self-perception of physical competence in preadolescent overweight Chinese children found that overweight children had lower perceptions of endurance, coordination, and flexibility, but higher perceptions of strength compared to normal weight children (Sung et al., 2005).

In a study by Kimiecik and Horn (1998), parents' perception of their child's physical competence was measured using the physical competence subscale from Harter's Perceived Competence Scale for Children. The subscale was adapted to include

items oriented specifically to physical fitness. The researchers discovered that parental perceptions of child physical competence were significantly related to the amount of child's level of moderate-to-vigorous physical activity participation. They also found that parental beliefs do influence children's perceptions, motivation, and behavior, meaning that the children with parents who believe they are competent in relation to physical fitness tend to be more active than those with parents who do not perceive their child to be physically competent. Davison, Downs, & Birch (2006) concur that parental support of children's physical activity and perceived athletic competence are often associated with higher levels of physical activity among youth.

Rationale

There is substantial evidence that the fitness level of children is on the decline (Ball et al., 2005; DeVoe & Kennedy, 1997; Kuntzleman & Reiff, 1992; Murphy, 1986; Olds et al., 2007; Schlicker et al., 1994; Simons-Morton, O'Hara, Simons-Morton, & Parcel, 1987; Stratton et al., 2007), while obesity is on the rise (Centers for Disease Control and Prevention, 2007). Just as it is important to correctly perceive one's weight status to modify it accordingly, it is important to correctly perceive one's fitness level to improve upon it and to benefit from the positive health aspects that accompany physical fitness. While several studies have focused on parent and child perceptions of child weight status (Baughcum et al., 2000; Feldman, Feldman, & Goodman, 1998; Jackson et al., 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000; Rolland, Farnhill, & Griffiths, 1996) and physical competence (Davison & Birch, 2001; Raudsepp, Liblik, & Hannus, 2002; Southall, Okely, and Steele, 2004; Sung, Yu, So, Lam, & Hau, 2005; Ulrich, 1987; Woods, Bolton, Graber, & Crull, 2007), it is unclear if parents

understand how their child perceives his/her own physical competence. This is important so that a parent can encourage and motivate his/her child should the child feel less physically competent. If the child feels more confident, then the child is more likely to engage in physical activity. Likewise, it is important that parents are able to objectively assess their child's weight status to be able to support healthy lifestyle adjustments as needed. For a parent to engage in efforts to keep their child fit, the parent must be aware of the child's fitness level status and be aware of the important role of the parent to model physical activity.

Statement of the Problem

The purpose of this study was to examine the associations between a child's perceived physical competence, fitness level and body weight status. A secondary problem was to examine the degree to which a parent, a) understands how his/her child perceives his/her own physical competence, and b) accurately perceives his/her child's body weight status.

Research Questions

The research questions of the study are as follows:

1. Do children categorized as being in the Healthy Fitness Zone differ in mean perceived physical competence than children categorized as Below the Healthy Fitness Zone?

2. Do children categorized as Healthy Weight differ in mean perceived physical competence than children categorized as At-risk/overweight?

3. Do the parents of children classified in the Healthy Fitness Zone assess their children as having higher levels of perceived physical competence than the parents of children classified as Below the Healthy Fitness Zone?

4. Do the parents of children classified as Healthy Weight assess their children as having higher levels of perceived physical competence than the parents of children classified as At-risk/overweight?

5. What are the correlations between parent BMI, child BMI, parent SPPC score and child SPPC score?

6. Are parents able to correctly perceive their child's weight status?

Hypotheses

Hypotheses have been established for only some of the research questions; the others are considered exploratory. Based on previous studies, the following hypotheses have been established:

1) It was hypothesized that low-fit children would have a lower perceived physical competence than healthy-fit children. In other words, children with low physical competence would have a lower fitness level, and children with high physical competence would have a higher fitness level. Belief in one's physical competence appears to influence both participation in physical activity and fitness levels (Burkhalter & Wendt, 2001). Burkhalter and Wendt's (2001) study found that gender and perceived physical competence were significant ($p<.05$) predictors of fitness, and explained 41% of the variance. They also found that children with lower perceptions of physical competence were less fit. This is consistent with the study by Ball et al. (2005) that reported lower aerobic fitness

levels in children at-risk of becoming overweight compared to normal weight children. Castelli and Valley (2007) reported that fitness level and motor competence are significant predictors of physical activity level. Those who were motor competent were more physically active (Castelli & Valley, 2007). Raudsepp, Liblik, and Hannus (2002) found that physical self-perceptions of sport competence, strength competence, physical conditioning, and physical self-worth are moderately associated with moderate to vigorous physical activity and physical fitness. It is likely that children who have lower perceived physical competence are less likely to participate in physical activity which may lead to a lower fitness level.

2) It was hypothesized that there would be a positive correlation between a parent's perceived physical competence of the child and child's perceived physical competence. Kimiecik and Horn (1998) found that children whose parents believe they are competent in relation to physical fitness tend to be more physically active than those whose parents hold lower perceptions of their child's fitness competence. Because child physical activity level and perceived physical competence are positively related, it is also likely that the more competent the parent believes the child to be, the more likely the child is to believe he/she is physically competent.
3) It was hypothesized that there would be an inverse relationship between a child's BMI and child's perceived physical competence. Castelli and Valley (2007) found that BMI was negatively related to the endurance run, curl-ups, push-ups, sit and reach, motor competence, and physical activity level. Sung, Yu, So, Lam,

and Hau (2005) also found an inverse relationship between overweight children and indices from the Physical Self-Descriptive Questionnaire that included appearance, level of physical activity, sports competence, endurance, coordination, flexibility, general physical self-concept, and global self-esteem. Results of Southall et al. (2004) suggest that overweight children have lower perceived and actual competence than non-overweight children. It is probable that the higher a child's BMI, the less likely a child is to feel physically competent.

Significance of Study

Programs to provide guidance for kids to stay fit and active would benefit from support, advocacy, and participation by parents who recognize that their child is unfit. For a parent to engage in efforts to keep his/her child fit, he/she must be aware of the child's fitness status and physical competence. The parent should also be concerned about the negative health consequences that may accompany low fitness. If parent and child perceptions are better understood, more successful intervention strategies can be designed and implemented.

Delimitations

The delimitations of the study are as follows:

1. Only 9 and 10 year old boys and girls served as subjects, therefore generalizations are limited to this age group.
2. Child body size status was determined by body mass index.
3. Child fitness level was determined by performance on the one-mile run/walk test.

Limitations

The limitations of the study are as follows:

1. The sample size was determined based on budgetary constraints.
2. Results were affected by children's motivation to give maximal effort during the one-mile run/walk test.

Assumptions

The assumptions of the study are as follows:

1. It was assumed that the subjects were literate and understood the questions.
2. It was assumed that accurate information was reported.
3. It was assumed that the child gave maximal effort during the one-mile run/walk test.
4. It was assumed that the measurement instruments were valid and reliable.

Definition of Terms

The following terms are defined for the purpose of this study:

Body mass index (BMI): A weight to height ratio calculated as weight in kilograms divided by height in meters squared.

Weight status: status of weight as categorized by BMI standards: underweight, normal weight, at risk of overweight, overweight. Due to small sample size, when analyzing data for this study these four groups were reduced to two: Healthy Weight and At-risk/overweight

Normal weight child: a child whose BMI for age falls into the healthy weight category of at least the 5^{th} percentile but less than the 85^{th} percentile based on the United States 2007 Centers for Disease Control and Prevention growth charts.

At risk of overweight child: a child whose BMI for age is at least in the 85th percentile but less than the 95th percentile.

Overweight child: a child whose BMI for age is equal to or greater than the 95th percentile.

Fitness level: score achieved, based on age and gender, on a particular field exercise related to health such as cardiorespiratory endurance, muscular endurance, muscular strength, body composition, and flexibility.

Physical competence: the perception of characteristics including athletic competence, physical appearance, social acceptance, and global self-worth.

Physical activity: bodily movement that elevates resting energy expenditure.

Chapter 2

REVIEW OF LITERATURE

The health of an individual is often influenced by one's weight, diet, and amount of physical activity. Habits that determine health status, such as exercise and a balanced diet, are formed in childhood and often carry over into adulthood. This review of literature covers three main topics related to the health and wellness of children: 1) weight status, 2) fitness level, and 3) physical competence. In each section the literature will focus on how both the child's and the parent's perceptions of the child may influence the child's inclination to be physically active.

Child Weight Status

The prevalence of overweight and obesity in children is a problem that has only worsened over the years. The Centers for Disease Control and Prevention compared data from the National Health and Nutrition Examination Survey (NHANES) from 1976-1980 and 2003-2004. The CDC found that in pre-school aged children, 2-5 years old, the prevalence of overweight increased from 5% to 13.9%; among children 6-11 years the increase was from 4% to 18.8%; and for adolescents age 12-19 years the increase was 6.1% to 17.4% (CDC, 2007).

Mason et al. (2006) conducted a study on 3 to 5 year-old children living in Chicago and found that one-fourth of the children studied were overweight. Stratton et al. (2007) completed a cross-sectional study of the secular trends in fitness level and body mass index (BMI) of 9 to 11 year olds in Liverpool, UK and reported increases in BMI even among the fittest children. Although BMI does not distinguish between fat mass

and muscle mass, it is likely that the falling fitness level in the majority of the higher BMI groups reflects a body composition that is increasingly more fat than lean mass (Stratton et al., 2007). A review by Kuntzlman and Reiff (1992) supports the idea that America's children are getting fatter. When comparing skinfolds from the National Child and Youth Fitness Study II between the years 1963 and 1987, the median triceps and subscapular skinfold scores increased 2-4 mm (Kuntzlman & Reiff, 1992). Using information gathered by the Chrysler-AAU Physical Fitness Program, increases in child BMI values occurred between 1980 and 1994 (Malina, 2007).

The exact cause of obesity in children is a topic that continues to be studied and debated. One argument is that it is caused by unhealthy eating (Craeynest et al., 2005; Ebbeling et al., 2002) or simply consuming too many calories (Ball et al., 2005; Craeynest et al., 2005). The other main argument is that physical activity is lacking in many children's lifestyles (Ball et al., 2005; Ebbeling et al., 2002; Gill et al., 2004; Lee et al., 1987; Olds et al., 2007; Stratton et al., 2007). Most research has focused on those two factors as the main causes, but there are some other factors worth considering. Genetic mutations (Craeynest et al., 2005; Ebbeling et al., 2002; Schlicker et al., 1994), being bottle fed (Ebbeling et al., 2002), low aerobic fitness level (Ball et al., 2005; Ebbeling et al., 2002; Gutin, Manos, & Strong, 1992; Kuntzlman & Reiff, 1992; Rowland, 1991; Stratton et al., 2007), a diet that includes too much fast-food consumption (Ebbeling et al., 2002; Gill et al., 2004), and familial influence (Ebbeling et al., 2002; Lee et al., 1987; McMurray et al., 1993; Schlicker et al., 1994) can all contribute to obesity. Watching too much television can lead to sedentary behavior (Ebbeling et al., 2002; Gill et al., 2004;

McMurray et al., 1993; Schlicker et al., 1994) and often overconsumption of food (Ebbeling et al., 2002), both of which contribute to obesity.

The way a child perceives his or her weight status can affect a child similar to the way it affects adults. Weight status can affect a child's self-perception, self-esteem and physical competence. The fact that weight can affect self-esteem is demonstrated in a study by Ball et al. (2005) in which the researchers measured child self-perceptions of second, third, and fourth graders. Using the Self-Perception Profile for Children, they found that overweight children had lower levels of social acceptance compared to their normal weight peers. These lower scores suggested that their greater degree of adiposity impacted their perceived acceptance by others (Ball et al., 2005).

It has been recognized that children's self-perceptions become increasingly more evident as they mature (Ball et al., 2005). Feldman et al. (1988) found that by age seven, children acquire adult perceptions of attractiveness. The review by Feldman et al. (1988) included a study of 271 adolescents where the researchers revealed a significant difference between self-perception of obesity and actual weight/height ratio for girls. About half of the girls thought they were too fat, though 83% of those who thought they were too fat were actually normal weight for height. In contrast, boys who thought they were too fat, tended to be overweight. While that survey was conducted on adolescents, Feldman et al. suggested that girls are concerned about obesity before adolescence. They found that normal weight 5 and 6 year old girls may be concerned about body image and have expressed fears of gaining weight (Feldman et al., 1988).

Rolland, Farnill, and Griffiths (1996) completed a study on Australian children's perceptions of their current and ideal body sizes in relation to body mass index. They

used the Collins pictoral scale that consists of outline drawings of seven male and female preadolescent figures ranging from thin to obese. Using this tool, the study found that girls had a significantly greater preference for ideal figures that were thinner than their current body size. In the highest BMI quartile, 76% of the girls and 56% of the boys selected a thinner ideal. Even in the lowest BMI quartile, 10% of the girls still preferred a thinner ideal (Rolland et al., 1996). This leads one to question if children understand what a healthy weight range actually is.

Several studies revealed a mother's inability to accurately estimate her child's weight status, whether underweight, normal weight, or overweight (Baughcum et al, 2000; Jackson, Strauss, Lee, & Hunter, 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000). In a survey by Baughcum et al. (2000), 79% of mothers failed to perceive their overweight child as overweight. Low maternal education was consistently correlated with this inaccurate perception. This study also had the mothers classify their own weight status, and most mothers were accurate in self-perception of their own weight. However, among obese mothers, nonwhites were less likely than whites, and nonsmokers less likely than smokers, to correctly perceive themselves as overweight (Baughcum et al., 2000).

In a survey by Myers & Vargas (2000), 35% of parents did not believe their obese child was overweight. One-third of mothers in a similar study by Maynard et al. (2003) misclassified their child's weight status. While this study did not attempt to find correlations between child weight status and secular trends like the study by Baughcum et al. (2000), it did find that mothers of overweight children had higher BMI values than mothers with children that had a lower weight status (Maynard et al., 2003). This is

somewhat supported by Jackson et al. (1990) who found that mothers' weight did account for a small amount of the variance in accuracy of perception and that the trend was for inaccurate mothers to be heavier than those who were accurate. Maynard et al. (2003) also discussed two possible reasons for why mothers misclassify. First, older children were less likely to be misclassified by their mother than younger children. It is speculated that mothers may believe their younger children will outgrow the excess fat when they get older. The second possibility is based on the results that showed as BMI-for-age z score increased, mothers were less likely to misclassify. Children who are just over the line from normal weight to overweight may be harder to judge by parents. A final interesting finding from this study was that the logistical regression analysis showed that mothers were three times more likely to classify their overweight daughters as at-risk compared to their overweight sons (Maynard et al., 2003).

Jain et al. (2001) tested low-income mothers of preschoolers living in Cincinnati and found that how children measure up on height and weight charts was not as significant to the mothers as was the possibility of the child being teased or not being able to perform physical activities. There was dislike and distrust for the growth charts. These mothers agreed that "being big boned" was culturally acceptable. They also believed that it was nearly impossible to alter a child's weight if there was a familial predisposition to be large. Overall, these mothers considered their child's weight as healthy as long as the child's activity and social functioning were unimpaired (Jain et al., 2001).

When it comes to adults classifying their own weight status, Gill et al. (2004) suggests that adults perceive their weight status differently from their actual weight.

Kuchler and Variyam (2002) found that women more accurately evaluate weight status than men. Of the participants in the survey, 40.6 % who were found to be overweight did not agree that they were overweight. Kuchler and Variyam (2002) state that "mistakes have a systematic component, and are associated with demographics, socioeconomic status, and knowledge and attitudes toward diet and health." Their study also found secular trends. They categorized "doubters" as those that are obese or overweight and think that their weight is about right. Doubters had an inverse relation with education level. The prevalence of doubters decreased as the education level increased. When looking at race/ethnicity, doubters were most predominant among blacks, followed by Hispanics, then whites. This suggests that individuals' ideas about thresholds for obesity and overweight vary along demographic lines. This particular study did not find significant correlations between weight perception and income. The study also mentioned that 39% of the population adhered to the gene theory, which means that they believe they cannot change their weight status based on inherited genetic traits (Kuchler & Variyam, 2002). If adults have difficulty correctly perceiving their own weight status, how can they correctly perceive their child's weight status?

Neff, Sargent, McKeown, Jackson, and Valois (1997) along with Paeratakul, White, Williamson, Ryan, and Bray (2002) support the idea that ethnic differences and sociocultural factors affect obesity. Experiences influence the perceptions, attitudes, and behaviors that may have an impact on health status and body weight (Neff et al., 1997). Because sociocultural factors drive the standards of desirable body weight within cultures, they also drive behaviors such as dieting (Paeratakul et al., 2002). Such sociocultural factors may be the cause of mothers' misperceptions reported Baughcum et al. (2000),

Jackson et al. (1990), Jain et al. (2001), Maynard et al. (2003), and Myers and Vargas (2000).

Child Fitness Level

Fitness level is a term that can be defined in several ways. Gutin et al. (1992) presents several definitions of fitness: "the ability to perform muscular work satisfactorily," "a set of attributes that people have or achieve that relates to the ability to perform physical activity," "the total physiological state of the person, ranging on a continuum from optimal organic function to severe debilitation and death", and more simply, "the ability to carry out physical activities satisfactorily." For purposes of this study, fitness level will be defined by the aspects most important to public health: cardiorespiratory endurance, muscular endurance, muscular strength, body composition, and flexibility (Caspersen, Powell, & Christenson, 1985).

Morrow (2005) commented that we don't know the true current level of youth fitness, while several others show that youth fitness levels are on the decline (Ball et al., 2005; DeVoe & Kennedy, 1997; Kuntzleman & Reiff, 1992; Murphy, 1986; Olds et al., 2007; Schlicker et al., 1994; Simons-Morton et al., 1987; Stratton et al., 2007). DeVoe & Kennedy (1997) report that one-third to upwards of two-thirds of the younger population is unfit. Ball et al. (2005) studied Canadian children and found that children at risk of being overweight had lower levels of aerobic fitness than their normal weight peers. Stratton et al. (2007) completed a serial cross-sectional study of cardiorespiratory endurance and body mass index (BMI) of 9 to 11 year old English children from 1998 to 2004 and found a 23% decrease in scores for the 20m multi-stage shuttle run test (20mMST) of both overweight and normal weight children. Schlicker et al. (1994)

examined the test scores reported by the President's Council on Physical Fitness and Sport. For the 1 mile run, boys aged 6-15 scored lower in 1985 than 1980, with a difference of more than 20 seconds for six of the ten age groups (Schlicker et al., 1994). Girls aged 12-17 also declined when comparing scores from 1979-1981 and 1985. Boys 6-17 years old could also perform fewer pull-ups in 1985 than in the earlier 1979-1981 study (Schlicker et al., 1994). Updyke and Willet (1989) evaluated physical fitness levels of American youth gathered by the Chrysler-AAU Physical Fitness Program from 1980-1989 which was determined by height, weight, cardiovascular, flexibility, and muscle fitness measurements. Their study found a 10% decline in aerobic fitness levels of boys and girls as measured by distance runs- ¼ mile for 6 to 7 year olds, ½ mile for 8 to 9 year olds, ¾ mile for 10 to 11 year olds, and 1 mile for children 12 and older (Updyke & Willet, 1989).

Tomkinson and Olds (2007) conducted a global data analysis of maximal field running tests and revealed secular changes in aerobic performance of 6 to 19 year olds from 27 different countries between the years 1958 and 2003. Over that time period there was a 0.36% decline annually. Patterns were consistent across age, gender, and geographical groups, but not across time. There were some improvements between the 1950's and 1970's, but then an increasing decline each preceding decade (Tomkinson & Olds, 2007). A similar analysis conducted by Olds et al. (2007) supports these findings. Olds et al. (2007) found that aerobic fitness performance plateaued around the 1970s and 1980s then declined by 0.5 % each year for the next 20 years. Malina (2007) completed a data analysis of several physical fitness tests including Fitnessgram and Physical Best, which was surveyed nationally and regionally, and concluded that VO_2max values in

boys measured recently are lower than what they were in the late 1960's and 1970's. This trend is consistent with the decline in aerobic capacity since the 1980s assessed by the 20 meter shuttle run test in 55 studies from 11 countries (Malina, 2007).

Olds et al. (2007) found clear associations between adiposity and cardiorespiratory endurance. Adiposity explained about 20% of the variance in running performance. For countries with the least fit young people (USA and Brazil), each 1% increase in the prevalence of obesity resulted in a decrease of 0.03 standard deviations in performance. While weight is definitely a factor in fitness, Olds et al. (2007) concluded that factors other than adiposity contribute to declines in fitness performance. Other factors that might influence physical fitness include age, maturity, heredity, training, and physical activity (Morrow, 2005).

Pate, Dowda, and Ross (1990) demonstrated that physical activity and physical fitness are significantly associated in 8-9 year old children, where 18-21% of the variance in fitness status was accounted for by physical activity factors. Findings from the National Child and Youth Fitness Study II suggest that children's physical fitness, as measured by the one mile run test, is related to the amount of physical activity that is achieved (Simons-Morton, Parcel, O'Hara, Blair, & Pate, 1988).

In regard to child perceptions of his/her own fitness level, Hall, Fahlman, Kliber, and Boyle (2003) conducted a study of fourth and fifth grade students to determine cross-cultural differences in student's perceptions of their own fitness level compared to actual fitness scores. Students were given a questionnaire and the Fitnessgram fitness test. Only white students were found to have an accurate perception of their own fitness levels

and were the only ethnic group whose self-reported activity levels correlated with their fitness scores (Hall et al., 2003).

Child and parent perceptions of child fitness levels have been mostly overlooked by researchers, with more studies focused on child attitudes towards fitness in general, or fitness testing. If you ask an elementary school aged child what his/her favorite subject is, you are likely to get the response "gym class," P.E.," or "recess." (Corbin, 1986). Early experiences affect future decisions about participation in physical activity (Coelho, 1998; McGinnis, 1987), so it is important for children to have positive experiences to have positive perceptions of fitness. Studies report mixed views of students' perceptions of fitness with some students mentioning "being pushed hard" as a reason for not enjoying physical education (Coelho, 1998). Negative dispositions of adults about physical activity may also be related to a lack of favorable physical activity experiences during childhood (Lee et al., 1987). It is important not only for children to be fit, but to enjoy and want to keep doing activities that establish fitness (Corbin, 1986).

When it comes to fitness testing, standards influence child perceptions. If the standards are too high, the child may become frustrated and may be discouraged from participating in future activities that promote fitness. On the other hand, if the standards are too low, physical fitness may be devalued and result in less physical activity participation (Flohr & Williams, 1997). Flohr and Williams (1997) studied the perceptions of fitness and fitness testing of fourth graders from a rural elementary school in Virginia. They utilized the Children's Physical Fitness Attitude Inventory (CPFAI) that assesses general attitudes about physical fitness. Participants were also tested for physical fitness levels and interviewed. All of the physical fitness test scores, with the

exception of the sit and reach test were related to the CPFAI score (Flohr & Williams, 1997). There were negative attitudes of the shuttle run and positive attitudes related to the pull-up and curl-up. Based on the interviews, the activities and experiences most enjoyed were not perceived by the students as beneficial to their fitness level.

Child Physical Competence

Physical competence is one's ability to perform a certain activity, sport, or exercise. Children's perceptions of competence in areas such as mathematics, reading and sports are differentiated by age five or so (Woods et al., 2007). Similarly, Ulrich (1987) suggests that the accuracy of children's perceptions improves until approximately age eight, then plateaus for several years. Perceived physical competence is derived from two sources: actual physical competence and social support (Southall et al., 2004).

One argument for why children choose not to be physically active is that they lack the actual or perceived physical competence required to participate in many activities which in turn affects their motivation to participate in physical activity (Southall et al., 2004). How students perceive their progress toward the mastery of a particular motor task and support from others that have facilitated this mastery influences whether the child will continue to engage in the task (Castelli & Erwin, 2007). In other words, one's perceptions about his or her performance and social support will likely influence the child's motivation to be physically active (Castelli & Erwin, 2007).

It is sometimes thought that children tend to avoid physical activities in which they do not excel. However, in a study by Ulrich (1987), only 28% of children who did not participate in sports rated not being good enough or not enjoying sports as very important or somewhat important for not participating. Davison & Birch (1998) studied

five year old girls and found that girls with higher weight status reported lower body esteem and lower perceived cognitive ability than girls with a lower weight status. Raustorp, Stahle, Gudasic, Kinnunen, and Mattson (2005) evaluated 678 Swedish children aged 10-14 with the Children and Youth-Physical Self-perception profile (CY-PSPP). A moderate negative correlation was found between BMI and all sub-domains of the CY-PSPP except for physical strength. Boys had a negative correlation of (r = -.19) between physical self-worth and BMI, while girls had a stronger negative correlation of

(r = -.35).

According to social cognitive theory, self-efficacy influences behaviors including physical activity, therefore influencing the benefits of such activity (Castelli & Valley, 2007). Children with higher self-efficacy are more likely to participate in physical activity than those with lower self-efficacy. Castelli and Valley (2007) conducted tests to find correlations between physical activity, physical fitness, and motor competence. They found that both physical fitness and perceived motor competence were predictors of physical activity in children and influenced participation accordingly. Physical fitness was measured using the Fitnessgram protocols. Children who were in the Healthy Fitness Zone according to Fitnessgram standards for cardiorespiratory fitness were likely to be among the most physically active. The researchers concluded that children who had low or medium levels of physical activity were probably inhibited by their lower aerobic fitness level or lack of motor competence.

Woods et al. (2007) also reported that children who have higher perceived competence participate in more physical activity than those with low perceived

competence. Work by Kimiecik and Horn (1998) supports the idea that children's perceptions of their own physical competence are significantly related to their moderate to vigorous physical activity. Raudsepp et al. (2002) also support this idea. Raudsepp et al. (2002) measured perceived competence using Children's Physical Self-Perception Profile (C-PSPP) to assess perceptions of sports competence, physical condition, body attractiveness, and strength. Participants also completed a 7-day physical activity recall and a 20 meter endurance shuttle run test to assess fitness level. Results revealed that physical self-perceptions of sports competence, physical condition, body attractiveness, and strength are moderately associated with moderate to vigorous physical activity and fitness. It was also found that boys in this study had higher physical self-perceptions than girls.

Southall et al. (2004) compared the actual and perceived physical competence of non-overweight and overweight children. In a randomly selected sample of 142 fifth and sixth grade students, BMI was calculated and perceived physical competence was assessed using the Athletic Competence subscale of the Self-Perception Profile for Children. Actual physical competence was assessed using the Test of Gross Motor Development, 2nd edition, which consists of a locomotor subtest and an object control subtest. The locomotor test assessed the run, gallop, hop, leap, horizontal jump, and slide, while the object-control test evaluated skills such as striking, stationary dribbling, catch, kick, overhand throw, and underhand roll. Significantly lower perceived physical competence scores were found in overweight children compared to nonoverweight children. When actual competence was measured, non-overweight children performed better than overweight children in the locomotor subtest, but not in the object-control

subtest. This is due to the fact that an overweight child has more difficulty with locomotor tests such as running and jumping because they have to move a greater mass against gravity. Another interesting finding was that overweight children were significantly younger, heavier, and had a higher BMI than their leaner peers (Southall et al., 2004).

Sung et al. (2005) investigated self-perception of physical competence in preadolescent overweight Chinese children and found that overweight children had lower perceptions of endurance, coordination, and flexibility, but higher perceptions of strength compared to normal weight children. These results were consistent with the actual physical competence scores. Thus, this group of 8 to 12 year olds was able to correctly perceive their abilities.

In a study by Kimiecik and Horn (1998), parents' perception of their child's physical competence was measured using the physical competence subscale from Harter's Perceived Competence Scale for Children. The subscale was adapted to include items oriented specifically to physical fitness. The study also utilized other methods to assess the degree to which parents valued moderate-to-vigorous physical activity, their definitions of success, and their perceived reasons for children's fitness participation. Mothers and fathers did not differ significantly from each other in their perceptions of their child's physical competence, the value they attached to their child's participation in fitness activities, or the degree to which they held a task or ego orientation toward their child's fitness activities. Parental perceptions of child physical competence were also significantly related to the amount of child's moderate-to-vigorous physical activity participation. They also found that parental beliefs do influence children's perceptions,

motivation, and behavior. The results suggest that the children who have parents that believe they are competent in relation to physical fitness tend to be more active than those who have parents with low perceptions.

Davison, Downs, & Birch (2006) concur that parental support of children's physical activity and perceived athletic competence are often associated with higher levels of physical activity among youth. Using a longitudinal sample of girls, Davison et al. (2006) conducted a study to examine processes by which parental support of girls' physical activity and girls' perceived athletic competence across the ages 9 to 11 years predict their physical activity at age 11 years. Two temporal pathways that may predict children's physical activity were presented: 1) higher parental support leads to higher athletic competence, which, in turn, predicts higher physical activity (parent support pathway); and 2) higher perceived competence leads to higher parental support, which predicts higher physical activity (child elicitation pathway). Harter's Self-Perception Profile was used to assess girls' perceived athletic competence. An activity checklist and the Children's Physical Activity scale were used to assess physical activity and inclination toward physical activity. At each age, girls who were more physically active had higher perceived athletic competence and had parents who reported higher levels of support. At age 11, perceived athletic competence and parental support accounted for 27% of the variance in physical activity. While results from this study did not directly provide evidence for the parental support pathway, the researchers did conclude that perceived competence at 9 years of age predicted perceived competence at 11 years of age which then predicted physical activity at 11 years of age.

Summary

As the prevalence of obesity in children continues to increase, factors that contribute to obesity will continue to be studied and debated. While poor diet and physical activity are often the cause, parental influence on these factors plays a major role. The fact that many parents do not recognize when their child is overweight is a problem. Obesity cannot be remedied if it is not recognized. Declining fitness levels in children are also disturbing. This is most likely due to the declining levels of physical activity. Physical competence appears to depend on a child's perception of self. Obese children who feel less competent are less likely to participate in the activities that are needed to regulate their weight. If parent and child perceptions of physical competence are better understood, perhaps better intervention and prevention strategies can be implemented.

Chapter 3

METHODS

The prevalence of obesity in children is increasing and fitness levels are declining with many parents contributing to this epidemic, often by not recognizing when their children are affected by these problems. This study evaluated the accuracy of both child and parent perceptions of the child's fitness level and physical competence including how these factors correlate with BMI. This chapter details the selection of subjects, design of the study, instruments of data collection, data management, and the data analysis.

Subjects

Subjects included parent and child pairs from four elementary schools in Tompkins County, NY. A total of 222 children, all 9 or 10 years of age, completed the SPPC and 213 completed the one-mile run/walk test. The SPPC was returned by 39 parents, however, only 28 were completed correctly. Thus statistical analysis included 28 parent-child pairs comprised of 18 girls and 10 boys.

Design

The study design was a correlational design using a convenience sample of children and parents to determine the relationship between an index of child fitness level and BMI, and child and parent perceptions of child physical competence. Subjects were recruited from four local schools following approval from the school district and respective principals (Appendix A). Fourth graders were tested at each school that granted permission. The recruitment letter, informed consent form, flyer, guidelines for completion/parent demographic questions, and parent SPPC (Appendices B-F) were sent

home with each child. Subjects, comprised of parent-child pairs, were then determined from the number of correctly completed and returned surveys.

An index of child fitness level was determined with a one-mile run/walk test. Perceived physical competence was evaluated using the athletic competence, physical appearance, social acceptance, and global self-worth subscales from Harter's Self-Perception Profile for Children (SPPC; Harter, 1985). As part of the study, parent perception of child physical competence was also examined. Each parent completed the SPPC and was directed to respond to the questions as he/she thought his/her child would respond (Appendix E). A copy of the SPPC is in Appendix F.

Measurement and Procedures

One-Mile Run/Walk Test

To assess the fitness level of the children, a one-mile run/walk test was conducted. The one-mile run/walk test was chosen because it is a test with which most students are familiar and it is a test with good reliability and validity evidence. Rikli, Petray, and Baumgartner (1992) tested 1,050 students and found that the one-mile run/walk test had a test-retest reliability of ($.83 < r < .90$) for boys and girls in third and fourth grades. Buono, Roby, Micale, Sallis, and Shepherd (1991) tested fifth graders and found the one-mile run to be highly correlated with VO_2max ($r = .95$) compared to a step test ($r = .82$) and cycle ergometer test ($r = .77$). The time it took to complete one mile was used to determine if the child fell within the "healthy fitness zone" or "below the healthy fitness zone" according to Fitnessgram® standards (Meredith & Welk, 2007).

The Self-Perception Profile for Children (SPPC)

Harter's SPPC was chosen because of its universal use by researchers, especially that of Ball, Marshall, and McGargar (1995), Raudsepp, Liblik, and Hannus (2002), Southall, Okely, and Steele (2004), and Whitehead (1995). Four subscales of the SPPC were administered to assess each child's perceived physical competence. The subscales included athletic competence, physical appearance, social acceptance, and global self-worth. Harter (1985) found reliability values of these subscales to be .80, .80, .75, and .78 for third and fourth grade subjects. Extensive validity evidence has been collected for the Perceived Competence Scale for Children (older version of the SPPC; Harter, 1982) for use with elementary and junior high children (grades 3 through 6). Content validity evidence was collected using structured interviews, item analysis, reliability analyses, and factor analysis. Construct-related validity evidence was collected using factor analytic methods as well as convergent and discriminant validity techniques.

The SPPC was administered to children during regular school hours. Children answered questions directly on the test paper while the administrator read each question out loud according to the instructions included with the SPPC. Children were instructed not to share answers, and to answer each question as it was read aloud by the administrator.

To assess parent's perceived physical competence of the child, one SPPC was sent home via "backpack mail" to the parent of each child to complete and return in an addressed, stamped envelope. The parents were requested to answer each question based on his/her beliefs about how his/her child responded, without discussing it with the child. The questionnaire also asked the parent to report height, weight, gender, age, race,

marital status, employment status, highest education level, and to categorize the fitness level and body weight status of the child.

Body Mass Index

Height (in) and weight (lb) of a child were measured during regular school hours. Body mass index (BMI) was calculated as weight (lb)/[height (in)]^2 x 703.

Data Management & Analysis

The participant scores on each test (child SPPC, parent SPPC, one-mile run/walk test, and BMI) were entered into a Microsoft Excel worksheet and imported into SPSS for statistical analysis. One-way ANOVA was used to assess the association between the following variables:

1) Child fitness level and child perceived physical competence.
2) Child weight status and child perceived physical competence.
3) Parent perceived physical competence of the child and actual child fitness level.
4) Child weight status and parent perceived physical competence of the child.

A Pearson product-moment correlation coefficient was calculated to determine the correlation between the following variable pairs:

1) Child BMI and parent perceived physical competence of the child.
2) Child BMI and child physical competence.
3) Child BMI and parent BMI.
4) Child physical competence and parent perceived physical competence of the child.
5) Child physical competence and parent BMI.

6) Parent perceived physical competence of the child and parent BMI.

A Chi squared test was used to assess the association between the following variables:

1) Child weight status and parent perception of child weight status.

Chapter 4

RESEARCH MANUSCRIPT

Researchers report that parent influence is a major factor that contributes to obesity in children, whether by negatively influencing child eating and physical activity patterns (Ebbeling et al., 2002; Lee et al., 1987; McMurray et al., 1993, Schlicker et al., 1994) or by failing to recognize a child's weight problem (Baughcum et al., 2000; Jackson et al., 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000). Because overweight children are more likely to become overweight adults (Ball et al., 2005; Gill et al. 2004; Sallis, 1987), all factors that contribute to the obesity epidemic should be studied to better provide methods of prevention and intervention.

According to social cognitive theory, self-efficacy influences behaviors including physical activity. Children with higher self-efficacy are more likely to participate in physical activity than those with lower self-efficacy (Castelli & Valley, 2007). Castelli and Valley (2007) studied the relationships between physical activity, physical fitness, and motor competence. They found that both physical fitness and perceived motor competence were predictors of physical activity in children and influenced participation accordingly. Woods et al. (2007) also reported that children who have higher perceived competence participate in more physical activity than those with low perceived competence. Work by Kimiecik and Horn (1998) supports the idea that children's perceptions of their own physical competence are significantly related to their moderate to vigorous physical activity (MVPA).

Southall et al. (2004) compared the actual and perceived physical competence of non-overweight and overweight children, and significantly lower perceived physical

competence scores were found in the overweight children. A study comparing self-perception of physical competence in preadolescent overweight Chinese children found that overweight children had lower perceptions of endurance, coordination, and flexibility, but higher perceptions of strength compared to normal weight children (Sung et al., 2005).

In Kimiecik and Horn's (1998) study, parents' perception of their child's physical competence was measured using the physical competence subscale from Harter's Perceived Competence Scale for Children (Harter, 1985). The researchers found that parental perceptions of child physical competence were significantly related to the amount of child's MVPA. They also found that parental beliefs do influence children's perceptions, motivation, and behavior. The researchers concluded that the children with parents who believe they are competent in relation to physical fitness tend to be more active than those with parents who do not perceive their child to be physically competent. Davison, Downs, & Birch (2006) concur that parental support of children's physical activity and perceived athletic competence are often associated with higher levels of physical activity among youth.

The purpose of this study was to evaluate a child's perceived physical competence and fitness level, and the accuracy of a parent's perceptions of the child's physical competence and weight status. Just as it is important to correctly perceive one's weight status in order to modify it accordingly, it is important to correctly perceive one's fitness level in order to improve upon it and to benefit from the positive health aspects that accompany physical fitness. While many studies have focused on parent and child perceptions of child weight status (Baughcum et al., 2000; Feldman et al., 1998; Jackson et al., 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000; Rolland et al.,

1996) and physical competence (Davison & Birch, 2001; Raudsepp et al., 2002; Southall et al., 2004; Sung et al., 2005, Ulrich, 1987; Woods et al., 2007), it is unclear if parents understand how their child perceives his/her own physical competence. This is important for parents to recognize so they can encourage and motivate a child who may feel less physically competent. If the child feels more confident, then he/she is more likely to engage in physical activity. Likewise, it is important that parents are able to objectively assess their child's weight status to be able to support healthy lifestyle adjustments as needed. For a parent to engage in efforts to keep his/her child fit, he/she must be aware of the child's fitness level status and the important role of the parent to model physical activity.

METHODS

Design

This study was a convenience sample correlation study to evaluate the relationships between an index of child fitness level and weight status, and child and parent perceptions of child physical competence. An index of child fitness level was determined with a one-mile run/walk test. Perceived physical competence was evaluated using the athletic competence, physical appearance, social acceptance, and global self-worth subscales from Harter's Self-Perception Profile for Children (SPPC; Harter, 1985). This study was approved by the Human Subjects Research Committee at Ithaca College.

Subjects

Subjects included parent and child pairs from four elementary schools in Tompkins County, NY. A total of 222 children, 9 or 10 years of age, completed the SPPC and 213 completed the one-mile run/walk test. The SPPC was returned by 39

parents, however, only 28 were completed correctly. Thus statistical analysis included 28 parent-child pairs comprised of 18 girls and 10 boys. Tables 1 and 2 include physical characteristics of the child and parent subjects included in the analysis, while Table 3 includes parent demographics.

Table 1.

Subject Characteristics. Mean ± (SD)

Child Subjects	N	Age (yr)	Height (in)	Weight (lbs)	BMI (kg/m^2)
Male	10	9.80 (.42)	56.88 (1.85)	81.5 (12.57)	17.71 (2.66)
Female	18	9.50 (.51)	55.88 (2.51)	85.06 (20.80)	18.98 (.51)
Total	28	9.61 (.50)	56.23 (2.31)	83.79 (18.12)	18.53 (3.30)
Parent Subjects	**N**	**Age (yr)**	**Height (in)**	**Weight (lbs)**	**BMI (kg/m^2)**
Male	4	41.50 (7.93)	70.50 (2.69)	178.75 (37.97)	25.26 (5.07)
Female	24	41.78 (7.03)	64.89 (2.69)	148.14 (34.86)	24.85 (5.09)
Total	28	41.74 (7.01)	65.75 (3.51)	153.04 (36.39)	24.92 (4.99)

Table 2.

Subject Weight Status

Child Subjects	N	Healthy Weight**	At risk of/overweight***
	28	17	11

Parent Subjects	N	Healthy Weight****	Overweight*****
	25*	17	8

* Only 25 of the 28 parents reported weight
** Healthy weight child = BMI < 85th percentile
*** At risk of/overweight child = BMI ≥ 85th percentile
**** Healthy weight parent = BMI ≤ 24.9
***** Overweight parent = BMI ≥ 25

Table 3.

Frequency Table of Parent Race, Education, Employment, and Marital Status

Variable		Frequency (N)
Race		28
	White	26
	Alaska Native	1
	Unknown	1

Table 3. (continued)

Variable		Frequency (N)
Education		28
	11th grade	1
	12th grade or GED	1
	Trade school	1
	Some college	9
	Bachelor's degree	3
	Master's degree	10
	Doctoral degree	3
Employment		28
	Full-time	18
	Part-time	5
	Full-time homemaker	3
	Other	2
Marital Status		28
	Single	5
	Married	20
	Separated	1
	Divorced	2

One-Mile Run/Walk Test

To assess the fitness level of subjects, a one-mile run/walk test was conducted. This test was chosen because it is a test with which most students are familiar. Rikli, Petray and Baumgartner (1992) tested 1,050 students and found that the one-mile run/walk test had a test-retest reliability of ($.83 < r < .90$) for boys and girls in third and fourth grades. Buono, Roby, Micale, Sallis, and Shepherd (1991) tested fifth graders and found the one-mile run to be highly correlated with VO_2max ($r = .95$) compared to a step test ($r = .82$) and cycle ergometer test ($r = .77$). The time it took to complete one mile was used to determine if the subject fell within the "healthy fitness zone" (HFZ) or "below healthy fitness zone" (BHFZ) according to Fitnessgram standards (Meredith & Welk, 2007).

The Self-Perception Profile for Children (SPPC)

Harter's SPPC was chosen because of its universal use by researchers, especially that of Ball, Marshall, and McGargar (1995), Raudsepp, Liblik, and Hannus (2002), Southall, Okely, and Steele (2004), and Whitehead (1995). Four subscales of the SPPC were administered to assess each child's perceived physical competence. The subscales included athletic competence, physical appearance, social acceptance, and global self-worth. Harter (1985) found reliability values of these subscales to be .80, .80, .75, and .78 for third and fourth grade subjects. Extensive validity evidence has been collected for the Perceived Competence Scale for Children (older version of the SPPC; Harter, 1982) for use with elementary and junior high children (grades 3 through 6). Content validity evidence was collected using structured interviews, item analysis, reliability analyses, and factor analysis. Construct-related validity evidence was collected

using factor analytic methods as well as convergent and discriminate validity techniques. Each subscale contained six questions with scores that ranged from 6-24. Scores for all four subscales combined could range from 24-96.

Procedures

The one-mile run/walk test was completed at each school. Based on school facilities, students were instructed regarding the appropriate number of laps per mile. As the students ran, the number of laps completed was recorded by the physical education teacher with the exception of one school where students were partnered up with each other and one child ran while the other child counted laps. Mile completion times were recorded by the researcher.

The SPPC was administered to children during regular school hours. Children answered questions directly on the test paper while the researcher read each question out loud according to the instructions included with the SPPC. Children were instructed not to share answers, and to answer each question as it was read aloud. Students were allowed to ask questions at any point throughout the test administration.

To assess parent perception of child physical competence, one SPPC was sent home via "backpack mail" to the parent of each child to complete and return in an addressed, stamped envelope (Appendix F). Instructions directed the parent to answer each question without discussing it with their child, based on his/her beliefs about how his/her child would respond (Appendix E). The questionnaire also asked the parent to report his/her height, weight, gender, age, race, marital status, employment status, highest education level, and to categorize the fitness level (low, moderate, high) and body weight

status (should be 5-10 lbs. heavier, is about the right weight, should be 5-10 lbs. lighter, should be more than 10 lbs. lighter) of the child (Appendix E).

Height and weight of a child were measured during regular school hours to calculate BMI. Measurements were taken in a private area within the classrooms with measurements visible only to the researcher. BMI was used to determine child weight status.

Data Management & Analysis

The subject scores on each test (child SPPC, parent SPPC, one-mile run/walk test, and BMI) were entered into a Microsoft Excel worksheet and imported into SPSS for statistical analysis. One-way ANOVAs were used to assess the association between the following variables:

1) Child fitness level and child perceived physical competence.
2) Child weight status and child perceived physical competence.
3) Parent perceived physical competence of the child and actual child fitness level.
4) Child weight status and parent perceived physical competence of the child.

A Pearson product-moment correlation coefficient was calculated to determine the correlation between the following variable pairs:

1) Child BMI and parent perceived physical competence of the child.
2) Child BMI and child physical competence.
3) Child BMI and parent BMI.
4) Child physical competence and parent perceived physical competence of the child.

5) Child physical competence and parent BMI.

6) Parent perceived physical competence of the child and parent BMI.

A Chi squared test was used to assess the association between the following variables:

1) Child weight status and parent perception of child weight status.

RESULTS

Subjects were categorized for fitness level and weight status. For fitness level, the child was either within or below the healthy fitness zone according to Fitnessgram® standards (Meredith & Welk, 2007). Due to the low number of subjects, those who scored above the healthy fitness zone (n = 8) were pooled with those who scored within the healthy fitness zone (n = 5) to create the healthy fitness zone group (HFZ, n = 13). Those who scored below the healthy fitness zone (n = 13) were placed in the BHFZ group. Weight status was determined by BMI. Only one child was categorized as underweight and was pooled with the healthy weight group. The children at-risk of overweight (n = 7) and overweight children (n = 4) were also pooled due to small sample sizes in each group. Thus, the two groups created were: 1) healthy weight children (HWC, n = 17) and 2) at-risk of/overweight children (AROC, n = 11). Similarly, parent weight status was categorized into healthy weight (PHW, n = 17) and overweight (POW, n = 8). The overweight group consisted of those considered overweight (n = 4) and obese (n = 4), based on BMI. There were no underweight parents.

One-Mile Run/Walk Test

Twenty-six child subjects completed the one-mile run/walk test and had a mean run time of 12.43 ± 3.60 min. Two subjects were either absent the day of testing or were

unable to complete the mile. Based on the children's one-mile times, 13 scored below the healthy fitness zone and 13 scored within the healthy fitness zone. The healthy fitness zone for boys required a run time between 9.0 min. and 11.5 min., while for girls the healthy fitness zone required a time between 9.5 min. and 12.5 min. Run times for all children ranged from 7.25 to 20.53 min.

Self-Perception Profile for Children

Twenty-eight parent-child pairs completed the SPPC and were used in the analyses of SPPC scores and weight status. However, all analyses involving fitness level included only 26 parent-child pairs because two children failed to complete the one-mile run/walk (Table 4). As hypothesized, the HFZ group had a higher mean SPPC score (75.46 ± 12.77) than the BHFZ group (73.00 ± 12.46). However, the mean difference was not statistically significant with $F(1, 24) < 1.00$, $p > .05$, effect size (ES) = .20.

The HWC group had a higher mean SPPC score (75.65 ± 11.50) than the AROC group (73.55 ± 13.87). The difference in scores was not statistically significant $F(1, 24) < 1.00$, $p > .05$, ES = .17, indicating that both healthy weight and at-risk or overweight children share similar perceptions about their own physical competence.

The mean parental SPPC score of children who were classified in the HFZ group (77.85 ± 11.52) was nearly 9.5 points higher than the mean parental SPPC score of children who were classified in the BHFZ group (68.23 ± 8.01). The difference was statistically significant with $F(1, 24) = 6.10$, $p < .05$.

Although the mean parental score of children who were classified as HWC (75.18 ± 11.88) was 6.45 points higher than the mean parental score of children classified as

AROC (68.73 ± 7.73), the difference was not statistically significant with $F(1, 24) = 2.53$, $p > .05$, ES = .66.

Table 4.

Mean and Standard Deviation of Child and Parent SPPC Scores by Child Fitness Level and Weight Status

	Child SPPC score		Parent SPPC score	
	N	Mean (SD)	N	Mean (SD)
Below Healthy Fitness Zone	13	73.00 (12.46)	13	68.23* (8.01)
Healthy Fitness Zone	13	75.46 (12.77)	13	77.85* (11.52)
Healthy Weight Child	17	75.65 (11.50)	17	75.18 (11.88)
At-risk or Overweight Child	11	73.55 (13.87)	11	68.73 (7.73)

*$p < .05$ between fitness categories

Table 5 includes the Pearson product-moment correlations to evaluate the relationships between BMI and perceived physical competence among child and parent subjects. Although, there were no statistically significant correlations ($p > .05$) among the variables, several of the correlations were of interest. As expected, the relationship

(r = -.230) between child BMI and child perceived physical competence was negative (Table 5) and there were positive correlations between child SPPC score and parent SPPC score (r = .283) and between child BMI and parent BMI (r = .236).

Table 5.

Correlation Matrix of Child and Parent BMI and SPPC Scores

	Child BMI	Child Physical Competence	Parent Perception of Child Physical Competence	Parent BMI
Child BMI	--	-.230	-.276	.236
Child Physical Competence		--	.283	-.041
Parent Perception of Child Physical Competence			--	-.272
Parent BMI				--

Figure 1 is a scatterplot of parent SPPC score and child SPPC score. While not statistically significant, it does suggest, as hypothesized, a positive relationship between these variables.

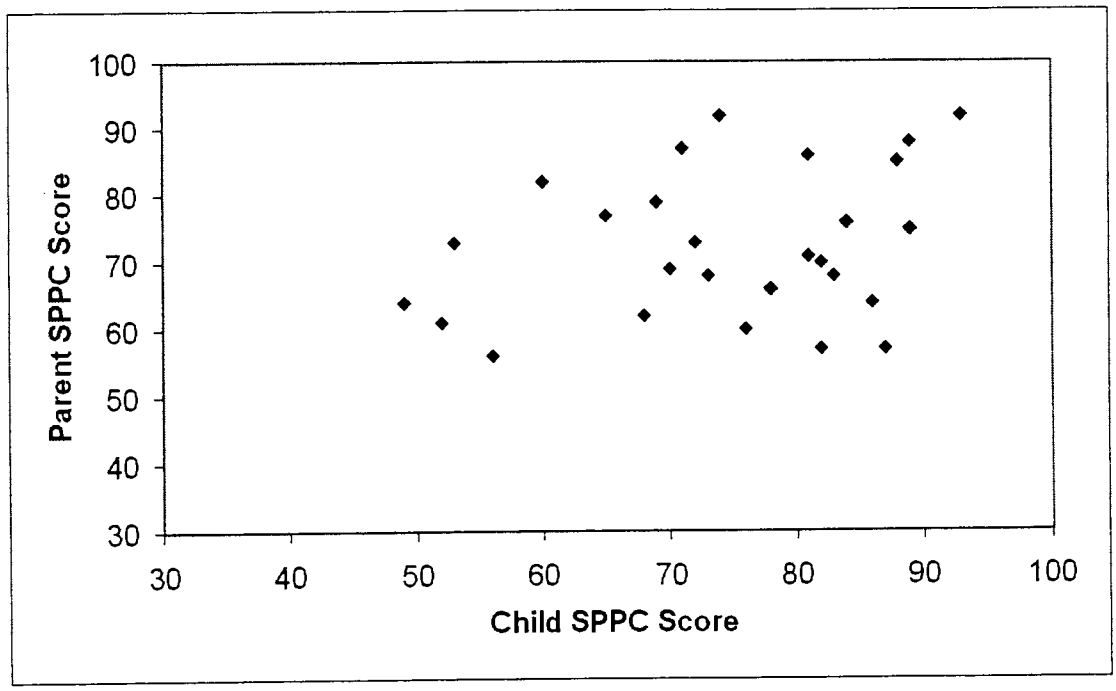

Figure 1. Scatterplot of the relationship between parent SPPC score and child SPPC score

The degree of association between child weight status and parent perception of child weight status was assessed using a Chi squared test (Table 6). The association between child weight status and parent perception of child weight status was statistically significant ($X^2 = 13.38, p < .05$). In other words a parent perceived his/her child to be underweight, healthy weight, or overweight. Based on the analysis, most parents accurately assessed their child's weight status. For example, out of 18 parents who thought that their child was a healthy weight, there were 15 children who were at a healthy weight. Out of the seven parents who thought their child should lose 5-10 lbs., six of the children were overweight.

Table 6.

X^2 Analysis of Child Weight Status Categorized by Parent Perception of Child Weight Status

Parent Perception of Child Weight status	Child Weight Status		
	Healthy	Overweight	Total
	n (%)	n (%)	n (%)
Child should gain 5-10 lbs.	2 (100%)	0 (0%)	2 (100%)
Child is healthy weight	15 (83.3%)	3 (16.7%)	18 (100%)
Child should lose 5-10 lbs.	1 (14.3%)	6 (85.7%)	7 (100%)
Child should lose 10+ lbs.	0 (0%)	1 (100%)	1 (100%)

$X^2 = 13.38, p < .05$

Table 7 shows the percentage of parents by weight status that had healthy weight and at risk or overweight children. Of healthy weight parents, 64.7% had healthy weight children, while 35.3% had at-risk of/overweight children. Of overweight parents, 62.5% had healthy weight children while 37.5% had at risk of/overweight children.

Table 7.

Child Weight Status Categorized by Parent Weight Status

		Parent Weight Status*	
		Healthy Weight	Overweight
		% of Parents (n)	% of Parents (n)
Child Weight Status	Healthy Weight	64.7% (11)	62.5% (5)
	At-risk or overweight	35.3% (6)	37.5% (3)
Total		100%	100%

*Only 25 of 28 parents reported height and weight.

DISCUSSION

The purpose of this study was to examine the relationship between physical competence, fitness level, and body weight status in children. Additionally, this study sought to examine the degree to which parents understand how their children perceive their own physical competence and how accurately the parent perceives the child's weight status.

It was hypothesized that children with low fitness levels would have, on average, lower mean perceived physical competence scores than children with high fitness levels. However, there was no statistical evidence to support this hypothesis. Even taking into account small sample sizes, the 2-point difference in mean SPPC scores between the fit

and unfit children is not a practically significant difference in perceived physical competence. When considering the fitness level of BHFZ children, it is notable that 3 of 10 boys were within 1.0 min. of being categorized as HFZ. For the girls, 3 of 16 were within approximately 1.0 min. of being categorized as HFZ. Because these children were categorized on the borderline of being fit/unfit, they may perceive themselves as physically competent. This could influence the SPPC scores. Due to the small sample size of this study (n = 26), these six subjects could have contributed to the lack of difference in the mean SPPC scores between the HFZ and BHFZ groups.

The finding that children with low fitness levels do not have a lower perceived physical competence is inconsistent with other reports (Burkhalter and Wendt, 2001) in which children with lower perceptions of physical competence were less fit. Several studies found that lower physical activity levels are associated with lower physical competence (Raudsepp et al., 2002; Woods et al., 2007) and lower fitness levels (Castelli & Valley, 2007). While this study did not assess physical activity level, the similarity in physical competence (SPPC) scores of both the HFZ and BHFZ groups suggests that perceived physical competence may be high in low-fit children. It is important to note that the low-fit children did not accurately perceive their abilities. They believed themselves to be as physically competent as the healthy and high-fitness level children when, in fact, they were not.

Physical competence scores also did not differ when subjects were categorized by weight. This may be due to the large coefficient of variation (CV) in SPPC scores of 15% for HWC and 19% for AROC. Additionally, the ES was small at 0.16. In contrast to the lack of difference in SPPC scores between groups, Davison and Birch (2001) did

report lower body esteem and lower perceived cognitive ability in 5 year-old girls who were overweight compared to healthy weight girls. Southall et al. (2004) studied 142 subjects in grades 5 and 6 (who were more similar in age to subjects in the present study) and found that overweight subjects had significantly lower perceived physical competence. Had there been a larger number of subjects in the current study, such as 197 in Davison and Birch (2001), or 142 in Southall et al. (2004), it is possible that the CV for SPPC scores may have been smaller and more clearly delineated group responses. There was only one subject who was on the borderline of being HWC versus AROC, and likely did not influence the differences in mean SPPC scores.

Parents, on the other hand, more accurately perceived their child's physical competence. For example, parents of children in the BHFZ group perceived them to be less physically competent. With an ES of 0.97, it is evident that there was a large difference in the mean SPPC scores between parents of BHFZ and parents of HFZ. Kimiecik and Horn (1998) found that children whose parents believe they are competent in relation to physical fitness tend to be more physically active than those whose parents hold lower perceptions of their children's physical competence. Davison et al. (2006) concurs that parental support of physical activity and perceived athletic competence are often associated with higher levels of physical activity among youth. The current study did not assess physical activity levels, however there is no indication that a less active child is less fit because physical activity level does not correlate well with physical fitness scores in children. For example, Dencker et al. (2008) found moderate-to-vigorous activity to be weakly correlated with aerobic fitness (r = .25) in 8-11 year-old children. Pate, Dowda, and Ross (1990) studied 8 and 9 year-olds and found correlations

ranging from $r = .17$ to .33 between the children's level of physical fitness and level of physical activity. In the present study, there was a significant difference in mean parent SPPC scores between the HFZ and BHFZ groups. However, the children's SPPC scores did not differ significantly between the HFZ and BHFZ groups. Thus, these data do not support the findings of Kimiecik and Horn (1998) because the parent assessment of their child's physical competence did not correspond to that of the child.

In contrast, parent SPPC scores did not significantly differ when children were categorized by weight status. As with the child's perception of physical competence, weight did not affect the parent's perceived physical competence of the child. However, it is interesting to note that the SPPC scores of parents of children in the HWC group were actually 6.5 points higher than parents of the children in the AROC group. While the difference in scores was not statistically significant, it does suggest that parents of children in the AROC group perceived their child to be less physically competent. Presumably, a larger sample size would reduce the large CV in the current study (16% for HWC and 11% for AROC) and reveal the true relationship between child's weight and parent perception of physical competence. Additionally, when taking into account the ES (.64), a medium difference in the means appears. Perhaps with a larger sample size these relationships may have statistically distinguished themselves. Further investigation with a larger sample size would be beneficial to determine if there is a true difference between the groups.

Correlations between parent BMI, child BMI, parent perceived physical competence, and child physical competence were not statistically significant. However, it is noteworthy that a negative relationship ($r = -.276, p > .05$) described the association

between child BMI and parent perceived physical competence of their child. This implies that as BMI increases parent perceived physical competence of the child decreases. Again, further investigation with a larger sample size is necessary to determine the true relationship between these two variables.

As hypothesized, a negative correlation (r = -.230, p > .05) between child BMI and child's perceived physical competence, although not statistically significant, is similar in magnitude and direction reported elsewhere. Castelli and Valley (2007) reported BMI to be negatively related to indices of fitness (endurance run, curl-ups, push-ups, and sit and reach) in a group of 7-12 year-olds with statistically significant (p < .01) correlations of -.28, -.25, -.29, and -.24 respectively. Sung et al. (2005) also found an inverse relationship between overweight children and indices from the Physical Self-Descriptive Questionnaire that included appearance, level of physical activity, sports competence, coordination, flexibility, general self-concept and global self-esteem. Raustorp et al. (2005) evaluated 678 Swedish children aged 10-14 with the Children and Youth-Physical Self-perception profile (CY-PSPP) and reported a similar negative correlation of r = -.19 (p < .05, boys) and r = -.35 (p < .05, girls) between BMI and all sub-domains of the CY-PSPP, except physical strength. Based on the present data and previous studies, it is reasonable to conclude that higher BMI children have lower perceived physical competence.

A positive correlation (r = .236, p > .05) between child BMI and parent BMI suggests that parents may influence the development of obesity in children. Although the correlation in the present study was not statistically significant, previous research supports this relationship (Baughcum et al., 2000). Baughcum et al. (2000) found

mothers of overweight children had higher BMI values compared to mothers of healthy weight children. Overweight children had a 19% chance of having an overweight mother while healthy weight children had a 14% chance of having an overweight mother. Parents may contribute to child obesity by negatively influencing child eating and physical activity patterns (Ebbeling et al., 2002; Lee at al., 1987; McMurray et al., 1993; Schlicker et al., 1994) or by lack of recognition of a child's weight problem (Baughcum et al., 2000; Jackson et al., 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000).

As hypothesized, there was a positive correlation ($r = .283, p > .05$) between the child's physical competence score and parent's perceived physical competence of the child. The correlation is not statistically significant due to the similarity of child SPPC scores in both the HFZ and BHFZ groups. In contrast, parent's responses were more variable and correlated better to the child's fitness level. It is also worth noting that 50% of the parents scored within 10 points of their child's score.

Further examination of the negative correlation ($r = -.041, p > .05$) between parent BMI and child's physical competence score revealed four outlier parent-child pairs shown in a scatterplot (Figure 2). Parent BMI of the outliers was greater than 32 m/kg^2.

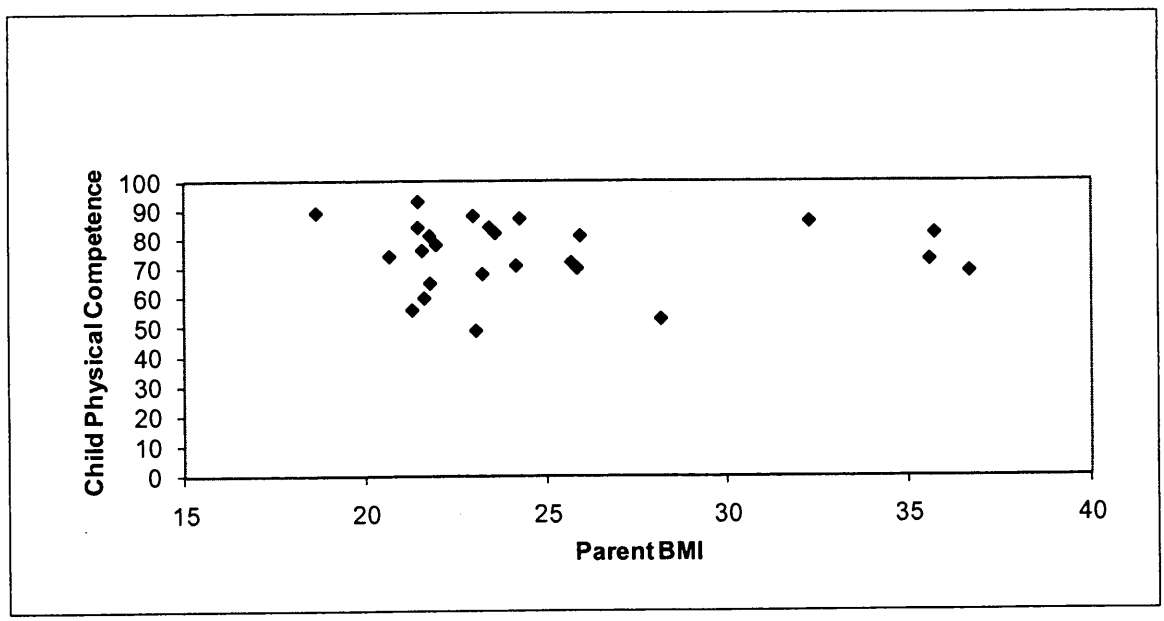

Figure 2. Scatterplot of the relationship between parent BMI (kg/m^2) and child SPPC score

Removal of these outliers increased the correlation to $r = -.28$ ($p > .05$). Secondly, removal of pairs that included a male parent increased the correlation to $r = -.36$ ($p > .05$). Although the correlation remained statistically non-significant, the increase in correlation coefficient might be affected by some relationship between the mother's BMI and the child's perceived physical competence. Correlations were not done using the male parents due to the small sample ($n < 5$).

The negative correlation ($r = -.272$, $p > .05$) between parent BMI and parent's perceived physical competence of the child suggests that there may be a relationship between parent BMI and how the parent thinks his/her child perceives him/herself. It is possible that when parent BMI increases, parent perceived physical competence of the child may decrease. However, no solid assumptions can be made based on the correlation alone, especially since no other known studies have looked at this relationship.

It was also found that parents were able to accurately assess their child's weight status. For example, out of 18 parents who thought that their child was at a healthy weight, there were 15 children who were actually at a healthy weight. This means that only 17% of parents misclassified and said their child was at a healthy weight, when they were actually overweight. Out of the seven parents who thought their child should lose 5-10 lbs., six of the children were actually overweight, while one was actually healthy weight. These nearly accurate perceptions differ from several studies in which the mother did not accurately estimate child weight status in underweight, normal weight, or overweight children (Baughcum et al., 2000; Jackson et al., 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000). Baughcum et al. (2000) reported that 79% of mothers failed to recognize her child as overweight. Low maternal education was consistently correlated with the inaccurate perception. In contrast, 25 of the 28 parents in the present study attended some college, which may have influenced their more accurate assessment of their child's weight status. In a survey by Myers & Vargas (2000), 35% of parents did not believe their obese child was overweight. One-third of mothers in a similar study by Maynard et al. (2003) misclassified their child's weight status.

CONCLUSION

The most notable finding of this research is that low-fit children believe that they are as physically competent as healthy-fit children. This can be a potential problem because if the child continues to view him/herself as fit into teen and adult years, then efforts to improve fitness level may not occur. Of equal importance is the finding that parents were able to correctly perceive their child's physical competence and weight status. This is beneficial, however, only if the parents of the low-fit children work to

improve the child's fitness level and weight status. It is important to note that parents in this study were considered to be highly educated (25 of 28 parents attended some college). Other studies have shown that parents often fail to recognize obesity in their children (Baughcum et al., 2000; Jackson, Strauss, Lee, & Hunter, 1990; Jain et al., 2001; Maynard et al., 2003; Myers & Vargas, 2000) and that low education can be associated with this lack of recognition (Baughcum et al., 2000).

The relationship between child SPPC score and parent SPPC score warrants further investigation. The SPPC score for 50% of parents was within 10 points of their child's score. It would be interesting to see if the same results would be produced from a study with a larger number of subjects with greater variability in SPPC scores and fitness levels.

Several factors limit the generalizability of these results. A low (10%) response rate from parents yielded a small sample size. The second limitation would be a lack of motivation by some children to give their best effort on the one-mile run/walk test. Not all schools had a standard 1/4 mile track. When students had to run a higher number of short laps to complete a mile (e.g., 18 laps/1 mile), motivation decreased significantly. For the future, it is recommended that children be tested on a standard size track if possible.

Because overweight children are more likely to become overweight adults (Ball et al., 2005; Gill et al. 2004; Sallis, 1987), ways to decrease the prevalence of overweight children should continue to be studied. It would also be useful to re-evaluate the less physically competent children from this study in 5-10 years, who believe they are physically competent, yet do not meet recommended minimum fitness standards.

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APPENDIX A

LETTER TO PRINCIPAL

Dear Principal:

I am a graduate student in the Department of Exercise and Sport Sciences at Ithaca College working on my Master's thesis. The purpose of my study is to evaluate the relationship between a child's perceived physical competence and fitness level, and accuracy of the parent's perception of his/her child's fitness level and physical competence. This research will be conducted for three reasons: 1) to determine how a child's perceived physical competence correlates with his/her fitness level; 2) to determine if a parent accurately perceives his/her child's fitness level and physical competence; and 3) to determine how child fitness level and physical competence relates to body mass index of the child.

I was inspired to do this project because of the increasing prevalence of obesity in children. Lack of physical activity is a primary contributor to obesity. Research shows that many mothers are unable to correctly perceive their child's weight status. Likewise, we know that a child who does not perceive him/herself as physically competent is much less likely to engage in physical activity. We also know that the parent is the most important role model for physical activity for their child, and a child who perceives their parent as physically competent is more likely to be physically active. A parent who does not perceive their child as physically competent may negatively pre-ordain the child's physical activity level via lack of modeling. To better understand these relationships, I am proposing to study parent and child pairs using 8 and 9 year olds in the Tompkins County elementary schools.

To conduct my study, I need 35 minutes during the school day to administer the Self-Perception Profile for Children (SPPC) to 9 and 10 year old students whose parents approve participation in the study. The questionnaire can be administered to an entire class simultaneously. Secondly, I would require about 30 minutes during physical education class for students to complete a one mile run/walk test and measure height and weight. Any data from students who are not approved to participate in the study will be discarded. I will need to send an informed consent document and a copy of the SPPC to parents via "backpack mail" with the student to obtain permission to use the child's one mile run/walk, height, weight, and SPPC data in my study, as well as to obtain the parent perception of child physical competence. For your reference, a copy of the SPPC is attached.

I would greatly appreciate permission to recruit subjects for my study, and would be happy to share a summary report of the results in the future. I will contact you soon to see about making arrangements to go over the process of conducting the study in more detail. If you would like to contact me before that time, please call (615) 585-8848, or e-mail me at cchatha1@ithaca.edu. You may also contact my thesis advisor, Dr. Betsy Keller at keller@ithaca.edu or (607) 274-1683. Thank you for your time and consideration.

Sincerely,

Catherine Chatham
Graduate Student
Department of Exercise and Sport Sciences
Ithaca College

APPENDIX B

RECRUITMENT LETTER

Dear Parent,

I am conducting a study to better understand how the way a child feels about his/her physical ability may relate to his/her level of physical fitness. I would also like to know what you think your child feels about his/her level of fitness. To accomplish this, I am asking your permission to include your child in the study and for you to participate in the study as well. This study has been approved by your child's school and Ithaca College, and your child's information will be included only with your permission. Participation for your child includes: 1) completion of a questionnaire during classroom time (takes about 35 minutes), and 2) completion of a one-mile run/walk test (a test students typically due as part of their PE class) and measurement of height and weight, all during PE class, which takes a total of 20-30 minutes. Participation for you includes completion of the same questionnaire that your child will complete (takes about 30 minutes). In addition, I am asking you to measure and report your height and weight and respond to some demographic questions. For your participation, your name will be entered in a drawing to win a gift certificate to Wegman's supermarket.

I would greatly appreciate the participation of you and your child in this study. The attached informed consent document provides more details of the study and requires you and your child's signature if you choose to participate.

If you wish to participate please return the signed informed consent form and completed survey in the enclosed stamped envelope. If you have further questions contact Catherine Chatham at cchatha1@ithaca.edu or call (615) 585-8848. Your participation in this study is greatly appreciated, and please remember that even if you agree to participate in the study you may terminate participation of you and your child in the study at any time and for any reason.

Sincerely,

Catherine Chatham
Graduate Student
Department of Exercise & Sport Sciences
Ithaca College

APPENDIX C

INFORMED CONSENT FORM

Does perception of physical competence influence fitness level and obesity in children?

1. Purpose of the Study. The purpose of this study is to understand if a child's feelings about his/her physical ability influence his/her physical fitness, and to evaluate the parent's perception of their child's physical ability.

2. Benefits of the Study. This study will provide information regarding how we may better structure physical activity programs to increase physical activity in children.

3. What You Will Be Asked to Do. Your child will be asked to complete a one-mile run/walk test. This test will be timed and performed on the school grounds on a nonslippery surface. The test should take no longer than 20 minutes with about 5 minutes of instruction time prior to beginning the test. Your child will be asked to complete the Self-Perception Profile for Children to evaluate how your child feels about his/her physical ability. The SPPC will be administered during regular school hours. Your child will answer questions directly on the test paper while the researcher reads each question out loud. Completion of the SPPC should take approximately 35 minutes. You will complete the same SPPC which will take about 30 minutes. A stamped envelope is provided for you to return the survey and informed consent form. All data will be kept in a locked office at Ithaca College and will be accessible only by the researchers. Files will be destroyed once data analysis is complete.

4. Risks. This study has been approved by your child's school and Ithaca College. Overall, there is minimal risk to participating in this study. There is a slight psychological/emotional risk with the child becoming more aware of his/her height and weight and/or physical fitness level. The one-mile run/walk test is commonly used and has a very low risk of musculoskeletal injury. To further minimize risk, the test will be conducted on a non-slippery surface.

5. Compensation for Injury. This study has minimal risk and it is very unlikely that your child will suffer any discomfort or injury. However, if your child suffers an injury that requires any treatment or hospitalization as a direct result of this study, the cost for such care is your responsibility. If you have insurance, you may bill your insurance company, but you will be responsible to pay all costs not covered by your insurance company. Ithaca College will not pay for any care, lost wages, or provide other financial compensation due to injury in this study.

Initials_____

6. If You Would Like More Information about the Study. Please contact Catherine Chatham via email cchatha1@ithaca.edu or call (615) 585-8848 for more information. You may also contact Betsy Keller via e-mail keller@ithaca.edu or at (607) 274-1683.

7. Withdraw from the Study. You and your child are free to withdraw from the study without penalty. Any information already obtained will be kept but not analyzed. If after the study you decide you do not want your information or your child's information analyzed, you may contact Catherine Chatham. Your information will be maintained but we will not use your data in the study.

8. How the Data will be Maintained in Confidence. Names will only be used to identify parent and child pairs. Subject data obtained will only be seen by the investigator. Subject data will also be numerically coded to maintain confidentiality during statistical analysis.

I have read the above and I understand its contents. I agree to participate and to have my child_____ participate in the study. I acknowledge that I am 18 years of age or older and the parent or legal guardian of the child.

_____
Parent's Name

_____
Parent's Signature Date

_____
Child's Name

_____
Child's Signature Date

Please be sure to initial at the bottom of page 1 and sign this page if you agree to participate.

Would you like to receive a copy of the study results? ( ) yes ( ) no

If so, please include your e-mail or home address below:

_____

APPENDIX D

RECRUITMENT FLYER

Gift Certificates!!!

Return a completed survey and you will be entered into a drawing to win one of three $10 gift certificates to Wegman's Supermarket.

APPENDIX E

GUIDELINES FOR COMPLETION OF THE SURVEY

This survey should be completed by the parent who spends the most time with the study child.

The following survey contains questions about your child's athletic competence, physical appearance, social acceptance, and global self-worth. Please answer the survey based on your beliefs about how your child would respond, without discussing the questions with your child. That is, you should respond to each item as you think your child would respond. Please fill out the survey as accurately as possible. All information will be kept confidential. If you have any questions while trying to complete the survey, please contact Catherine Chatham at cchatha1@ithaca.edu or (615) 585-8848. Before beginning the survey please answer the following demographical questions:

*Parent Name*_____ *Child's Name*_____

Parents: Items 1-8 require information about you.

1) Gender: Male_____ Female_____

2) Age: _____(years)_____(months)

3) Race:
   a. American Indian or Alaska Native
   b. Asian
   c. Black or African-American
   d. White
   e. Native Hawaiian or Other Pacific Islander
   f. Hispanic

4) Last grade completed:
   a. Grade 11 or below
   b. Grade 12 or GED
   c. Post high-school trade school
   d. Some college
   e. Bachelor's degree
   f. Master's degree
   g. Doctorate

5) Employment status:
   a. Employed full-time
   b. Employed part-time
   c. Home-maker, full-time
   d. Not employed
   e. Other, explain_____
6) Marital status:
   a. Single
   b. Married
   c. Separated
   d. Divorced
   e. Widowed

7) Your height (feet/inches)_____(Don't estimate, please measure.)

8) Your weight (pounds)_____(Don't estimate, please measure.)

9) How would you categorize your child's fitness level?
   a. Very low
   b. Below average
   c. Average
   d. Above average
   e. Very high

10) Considering my child's body size, I think he/she:
   a. Should be more than 10 lbs. *heavier*
   b. Should be 5-10 lbs. *heavier*
   c. Is about the right weight
   d. Should be 5-10 lbs. *lighter*
   e. Should be more than 10 lbs. *lighter*

Does your child have a medical condition that limits his/her physical activity level? If yes, please explain._____

APPENDIX F

SELF-PERCEPTION PROFILE FOR CHILDREN

What I Am Like

Name_____ Age_____ Gender: boy girl

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
1.	☐	☐	Some kids find it *hard* to make friends	BUT	Other kids find it's pretty *easy* to make friends.	☐	☐
2.	☐	☐	Some kids do very *well* at all kinds of sports	BUT	Other kids *don't* feel that they are very good when it comes to sports.	☐	☐
3.	☐	☐	Some kids are happy with the way they look	BUT	Other kids are *not* happy with the way they look.	☐	☐
4.	☐	☐	Some kids are often *unhappy* with themselves	BUT	Other kids are pretty *pleased* with themselves.	☐	☐
5.	☐	☐	Some kids have *a lot* of friends	BUT	Other kids *don't* have very many friends.	☐	☐
6.	☐	☐	Some kids wish they could be a lot better at sports	BUT	Other kids feel they are good enough at sports.	☐	☐
7.	☐	☐	Some kids are *happy* with their height and weight	BUT	Other kids wish their height or weight were *different*.	☐	☐

	Really true for me	Sort of true for me				Sort of true for me	Really true for me
8.	☐	☐	Some kids *don't* like the way they are leading their life	BUT	Other kids *do* like the way they are leading their life.	☐	☐
9.	☐	☐	Some kids would like to have a lot more friends	BUT	Other kids have as many friends as they want.	☐	☐
10.	☐	☐	Some kids think they could do well at just about any new sports activity they haven't tried before	BUT	Other kids are afraid they might *not* do well at sports they have never tried before.	☐	☐
11.	☐	☐	Some kids wish their body was *different*	BUT	Other kids *like* their body the way it is.	☐	☐
12.	☐	☐	Some kids are *happy* with themselves as a person	BUT	Other kids are often *not* happy with themselves.	☐	☐
13.	☐	☐	Some kids are always doing things with a lot of kids	BUT	Other kids usually do things by themselves.	☐	☐
14.	☐	☐	Some kids feel that they are *better* than others their age at sports	BUT	Other kids *don't* feel they can play as well.	☐	☐

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
15.	☐	☐	Some kids wish their physical appearance (how they look) was *different*	BUT	Other kids *like* their physical appearance the way it is.	☐	☐
16.	☐	☐	Some kids *like* the kind of *person* they are	BUT	Other kids often wish they were someone else.	☐	☐
17.	☐	☐	Some kids wish that more people their age liked them	BUT	Other kids feel that most people their age *do* like them.	☐	☐
18.	☐	☐	In games and sports some kids usually *watch* instead of play	BUT	Other kids usually *play* rather than just watch.	☐	☐
19.	☐	☐	Some kids wish something about their face or hair looked *different*	BUT	Other kids *like* their face and hair the way they are.	☐	☐
20.	☐	☐	Some kids are very *happy* being the way they are	BUT	Other kids wish they were *different*.	☐	☐
21.	☐	☐	Some kids are *popular* with others their age	BUT	Other kids are *not* very popular.	☐	☐
22.	☐	☐	Some kids *don't* do well at new outdoor games	BUT	Other kids are *good* at new games right away.	☐	☐

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
23.	☐	☐	Some kids think that they are good looking	BUT	Other kids think they are not very good looking.	☐	☐
24.	☐	☐	Some kids *are* not very happy with the way they do a lot of things	BUT	Other kids think the way they do things is *fine*.	☐	☐

APPENDIX G

SURVEY ANSWER KEY

What I Am Like

Name_____ Age_____ Gender: boy girl

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
1.	1	2	Some kids find it *hard* to make friends	BUT	Other kids find it's pretty *easy* to make friends.	3	4
2.	4	3	Some kids do very *well* at all kinds of sports	BUT	Other kids *don't* feel that they are very good when it comes to sports.	2	1
3.	4	3	Some kids are happy with the way they look	BUT	Other kids are *not* happy with the way they look.	2	1
4.	1	2	Some kids are often *unhappy* with themselves	BUT	Other kids are pretty *pleased* with themselves.	3	4
5.	4	3	Some kids have *a lot* of friends	BUT	Other kids *don't* have very many friends.	2	1
6.	1	2	Some kids wish they could be a lot better at sports	BUT	Other kids feel they are good enough at sports.	3	4
7.	4	3	Some kids are *happy* with their height and weight	BUT	Other kids wish their height or weight were *different*.	2	1

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
8.	1	2	Some kids *don't* like the way they are leading their life	BUT	Other kids *do* like the way they are leading their life.	3	4
9.	1	2	Some kids would like to have a lot more friends	BUT	Other kids have as many friends as they want.	3	4
10.	4	3	Some kids think they could do well at just about any new sports activity they haven't tried before	BUT	Other kids are afraid they might *not* do well at sports they have never tried before.	2	1
11.	1	2	Some kids wish their body was *different*	BUT	Other kids *like* their body the way it is.	3	4
12.	4	3	Some kids are *happy* with themselves as a person	BUT	Other kids are often *not* happy with themselves.	2	1
13.	4	3	Some kids are always doing things with a lot of kids	BUT	Other kids usually do things by themselves.	2	1
14.	4	3	Some kids feel that they are *better* than others their age at sports	BUT	Other kids *don't* feel they can play as well.	2	1

	Really True for me	Sort of True for me				Sort of True for me	Really True for me
15.	1	2	Some kids wish their physical appearance (how they look) was *different*	BUT	Other kids *like* their physical appearance the way it is.	3	4
16.	4	3	Some kids *like* the kind of *person* they are	BUT	Other kids often wish they were someone else.	2	1
17.	1	2	Some kids wish that more people their age liked them	BUT	Other kids feel that most people their age *do* like them.	3	4
18.	1	2	In games and sports some kids usually *watch* instead of play	BUT	Other kids usually *play* rather than just watch.	3	4
19.	1	2	Some kids wish something about their face or hair looked *different*	BUT	Other kids *like* their face and hair the way they are.	3	4
20.	4	3	Some kids are very *happy* being the way they are	BUT	Other kids wish they were *different*.	2	1
21.	4	3	Some kids are *popular* with others their age	BUT	Other kids are *not* very popular.	2	1

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	Really True for me	Sort of True for me				Sort of True for me	Really True for me
22.	1	2	Some kids *don't* do well at new outdoor games	BUT	Other kids are *good* at new games right away.	3	4
23.	4	3	Some kids think that they are good looking	BUT	Other kids think they are not very good looking.	2	1
24.	1	2	Some kids *are* not very happy with the way they do a lot of things	BUT	Other kids think the way they do things is *fine*.	3	4

APPENDIX H

ANOVA TABLES

Table H-1.

ANOVA to compare child fitness level by child perceived physical competence (SPPC score)

Source	SS	df	MS	F	p
Between Groups	39.385	1	39.385	.247	.623
Within Groups	3819.231	24	159.135		
Total	3858.615	25			

Table H-2.

ANOVA to compare child weight status by child perceived physical competence (SPPC score)

Source	SS	df	MS	F	p
Between Groups	29.498	1	29.498	.190	.667
Within Groups	4040.610	26	155.408		
Total	4070.107	27			

Table H-3.

ANOVA to compare parent's perceived physical competence of the child (parent SPPC score) by child fitness level

Source	SS	df	MS	F	p
Between Groups	600.962	1	600.962	6.106	.021
Within Groups	2362.000	24	98.417		
Total	2962.962	25			

Table H-4.

ANOVA to compare child weight status by parent's perceived physical competence of the child (parent SPPC score)

Source	SS	df	MS	F	p
Between Groups	277.776	1	277.776	2.530	.124
Within Groups	2854.652	26	109.794		
Total	3132.429	27			