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Parental Influences on a Child's Physical Activity Levels

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PARENTAL INFLUENCES ON A CHILD'S PHYSICAL ACTIVITY LEVELS

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ABSTRACT

Parental Influences on a Child's Physical Activity Levels

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The purpose of this study was to: (a) determine whether influences such as parental Advocacy, Expectations, Involvement, Role Modeling, Beliefs about Competency, and Performance Contingent Responses correlate with physical activity levels of children; (b) determine if role modeling has the greatest correlation to physical activity of children, and (c) determine whether a fathers' influences on children's physical activity are greater than a mothers'. The Physical Activity Questionnaire for Children (PAQ-C) and The Parental Influence Questionnaire were given to sixty-five children ranging in age from 8 to 12 year enrolled in physical education classes from three Miami-Dade County (Florida) schools. A multiple linear regression analysis revealed that in combination some parental influences show significance in predicting physical activity of children. Stepwise regression analysis revealed that the mothers' beliefs about competency was the only variable that strongly predicted children's physical activity levels. Lastly, a multiple regression analysis revealed that the mothers' beliefs about competency, is the most significant in predicting physical activity level of children more so than the fathers'. The other parental influences investigated in this study do not play a role in predicting physical activity levels. In conclusion, the findings of the study serve as a model demonstrating that there are other factors beyond parental influence that affect the children's physical activity levels.

CHAPTER ONE

INTRODUCTION

Childhood obesity is on the minds of many as the rise of health issues in relation to this disorder are becoming more of a concern. Health consequences such as increased cardiovascular risks factors and diabetes are evident in children that are obese (Freedman et al, 1999). These risks can eventually lead to more serious health complications in adulthood such as heart attack. (Freedman et al, 1999). Children should be participating in moderate to vigorous physical activity at least 60 minutes or more. Given the current statistics regarding childhood obesity it is important to learn that our future generations are falling into this trap. Heart disease is also related to obesity among children. In the Bogalusa Heart Study researchers found that elevated blood pressure occurred more frequently in obese children and can lead to clinically diagnosed hypertension in adulthood (Bao et al, 1995).

A significant contributor to childhood obesity is a sedentary lifestyle among children (Andersen, Crespo, & Bartlett, 1998). Twenty-six percent of children in the United States watch four of more hours of television per day and 67% watch at least two hours per day (Andersen, Crespo & Bartlett, 1998). Further, only one-third of elementary and secondary school offer daily physical education classes (DiNubile, 1993). Physical inactivity in general may be due to numerous factors which can include any combination of the following: demographics, lack of time, lack of places for children to play, lack of equipment, transportation, and lack of parental and peer support. (Larsen, McMurray, & Popkin, 2000) In general all of these factors can haven an contributing impact on a child's sedentary lifestyle.

There are many factors that could favorably influence children's physical activity levels these include: regular physical education in the school systems, opportunities to take part in after school programs located at recreation centers, the opportunity to participate in sport programs, or convenience of location to their surrounding playgrounds, pools, or community centers. One of the obvious factors that could influence children's physical activity levels is parental influence. Concerning parental support, it would be interesting to note to what degree parents take responsibility for their child's physical inactivity. Parental influence on children's activity levels can come in several forms: encouragement, involvement, facilitation, and role modeling (Weiss, Ebbeck, & Horn, 1997; Craig, Goldberg, & Dietz, 1996; & Bandura, 1997). Young children rely heavily on adults, especially parents, as sources of encouragement regarding their physical abilities (Weiss, Ebbeck & Horn, 1997). Parental involvement also is contributor also is a contributor in regard to socialization into sport. It can be expressed in simplest terms as the parent's feeling or showing that physical activity is important. Another variable is parental facilitation – the parents overall effort to make it easier for the children to be physically active (Craig, Goldberg, & Dietz, 1996). And, finally, there is role modeling in which the parents give a representation of what is important or valued (Bandura, 1997). Parents acting as role models to their own children could positively impact their children involvement in sports (Godin & Shephard, 1998).

Parents can help their children benefit from being involved in physical activity or sports. When children engage in activity they show excitement, have fun, learn, improve skills, stay in shape, improve appearance, as well as increase strength, endurance, and flexibility (Tappe, Duda, & Menges-Ehrwald, 1990). Parents can make a difference by helping their children develop

healthy lifestyles. Without these positive influences from parents, physical inactivity and the negative health consequences that come with it may continue to be a problem for children.

Statement of Purpose

The purpose of this study was threefold, First, we sought to determine whether the influences of parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance contingent responses correlate with children's physical activity levels. Secondly, the researchers wanted to determine if role modeling had the greatest correlation to physical activity. Lastly, we investigated the fathers' influence on children's physical activity and if it were greater than the mothers'.

Hypotheses

Three hypotheses were tested in this study. First, it was hypothesized that, in combination parental advocacy, expectations, involvement, role modeling, and beliefs about competency and responses will strongly correlate with physical activity level in children. Second, it was hypothesized that role modeling will have the greatest correlation with physical activity levels in children. Third, the father's influence will show the greatest correlation to children's physical activity when compared to the mother's influence.

Null Hypotheses

For each hypothesis tested, there was a corresponding null hypothesis. First, parental influences will not in combination correlate with physical activity levels in children. Second, role modeling will not have the greatest correlation to physical activity levels in children when

evaluated relative to the other variables. Finally, differences in the correlation between gender-specific parental influence and physical activity levels in children will be nonsignificant.

Statement of the Problem

Children are not meeting the recommended physical activity levels (Troiano & Flegal, 1998); evidence suggests parents can have an impact on the development of active lifestyles in their children (Eccles & Harold, 1991). Research has shown that parents play a significant role in the development of the children's beliefs in regards to moderate-vigorous physical activity participation (Kimiecik & Horn, 1998) and the parents' encouragement and enjoyment of physical activity can also impact the child's physical activity participation level (Brustad, 1996). The parents clearly exert a large impact on whether or not their children participate in physical activity. It appears fair to state that the extent of parental influence alone, or in combination, on children's physical activity levels remains unknown and uninvestigated.

Significance of Study

Many children in the United States are becoming, or already are, physically inactive. According to past research, children in the United States are less active and more obese than ever before (Brustad, 1996). Increasingly inactive children at risk of becoming obese and manifesting the health risks and complications associated with sedentarism and obesity. Obese children and adolescents have a significant impairment in physical, psychosocial, emotional, social, and school functioning in comparison to healthy children and adolescents (Schwimmer, Burwinkle, & Varni, 2003). The rise of obesity in children and adolescents is still unclear according to the researcher and much of the blame can be been placed on the parents shoulders. It is the thoughts

of the researcher that parental influence can be the determining factor in prevention of obesity in children and adolescents.

Assumptions

1. The children in this study are representative of the entire population of 8-12 year old boys and girls in Miami-Dade Schools.
2. All of the children were influences in one way or another by their parents.
3. All children in this study participated in some form of physical activity due to their enrollment in physical education classes.
4. All children answered the questions truthfully.

Limitations

1. Only children enrolled in physical education class participated.
2. The children were selected based on age level (8-12 years).
3. Children living with only one biological parent were excluded.

Delimitations

1. Only Miami-Dade Schools from South Miami were selected.
2. Grade level of children was based on their age (8-12 years).
3. Only children living at home with both their biological mother and father were included in the sample.

Definition of Terms

Aerobic Power: Indicator of a person's cardiovascular system and level of fitness. Also termed Maximal Oxygen Consumption

Advocacy: parent's encouragement or discouragement of their child's participation in organized sports.

Beliefs about competency: parent's attitudes and communication related to their perception of their child's general athletic ability.

Childhood Obesity: The Statistical definition from the 2000 Centers of Disease Control and Prevention growth charts for the United States, defines obesity as those children whose BMI is at or above the sex and age specific 95^{th} percentile which is greater or equal to a BMI of 30.

Facilitation: The parents overall effort to make it easier for the children to be physically active.

Hypertension: A chronic condition characterized by a resting blood pressure reading of either 140mmHg for systolic blood pressure or 90mmHg for dialostic blood pressure or higher on at least two separate occasions.

MET: Metabolic Equivalent used to estimate the amount of oxygen used by the body during physical activity (Ainsworth et al, 1993).

Moderate-Vigorous Physical Activity:

Parent: A natural or adoptive parent of a child, a guardian, or a person legally acting in the place of a parent.

Performance Contingent Responses: The affective and behavioral reactions demonstrated by parents following children's display of physical activity abilities.

Physical Activity: Bodily movement that is produced by the contraction of skeletal muscles and the substantially increases energy expenditure.

Pressure: Parent's desire that their children's performances demonstrate high levels of competence.

Role Modeling: The parents give a representation of what is important or valued

Sedentary: The ACSM defines sedentary lifestyle as not participating in a regular exercise program or meeting the minimal physical activity recommendations from the U.S. Surgeons General's report.

CHAPTER TWO

LITERATURE REVIEW

The purpose of this study was to determine the extent to which parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance-contingent response correlate with children's physical activity levels and to determine if parental role modeling has the greatest correlation to children's physical activity levels. An additional purpose is to determine whether a father's influences on children's physical activity levels are greater than mother's.

Childhood Obesity and Quality of Life

Studies have investigated the prevalence of overweight and obese children and the effects these conditions have on their quality of life. Researchers have suggested that it is not only important to realize that obesity among children is occurring in our nation, but that it is important to explain how these factors can affect children's lives (Schwimmer, Burwinkle, & Varni, 2003).

The prevalence of children and adolescents who are overweight or obese has increased within the past years. This rise has been blamed on a variety of factors such as a decrease in physical activity (Troiano & Flegal, 1998), as well as an increase in time spent watching television (Andersen, Crespo & Bartlett, 1998) and playing on the computer (Andersen, Crespo & Bartlett, 1998). The American Obesity Association states that 30.3% of children (6 to 11 years) are overweight and 15.3% are obese (Ogden et al, 2002). The Center for Disease Control in 2000 reported that 15% of children and adolescents are overweight, a 4% increases from 1994 (Ogden et al 2002).

A study examined the health-related quality of life of obese children and adolescents compared with children and adolescents who are healthy or those diagnosed as having cancer (Schwimmer, Burwinkle, & Varni, 2003). It consisted of 106 children between the ages of 5-18 years who had been referred to an academic children's hospital for obesity. The children gave their medical history and underwent a physical examination in the laboratory. Physical and medical conditions such as diabetes mellitus, apnea, tibia vara, fasting hyperinsulinemia, and dyslipidemia were considered as obesity-related conditions.

The children were measured using a pediatric quality of life inventory generic core scale to determine their health-related quality of life. Published pediatric quality of life from the past was used as reference data and comparison (Varni et al, 2002). The results of this study showed that obese children and adolescents have a significant impairment ($p < .001$) in physical, psychosocial, emotional, social, and school functioning in comparison to health children and adolescents (Schwimmer, Burwinkle, & Varni, 2003). These obese children and adolescents have a 5.5. times greater chance of having an impaired quality of life.

The children in this study were also compared to children and adolescents diagnosed with cancer (Jonides, Buschbacher, Barlow, 2002). Comparisons showed that the obese child and adolescents had similar health-related quality of life of the cancer-treated child and/or adolescent. This result was unexpected according to the authors (Schwimmer, Burwinkle, & Varni, 2003).

Parents and Children's Perceptions of Physical Activity

Obesity has been related to the lack of physical activity and physical fitness (Troiano & Flegal, 1998). Physical activity has been one of the leading steps in terms of prevention of

obesity, especially in children. This section discusses literature pertaining to children's physical activity and how children as well as their parents perceive what they do, specifically in terms of moderate-vigorous physical activity.

The study by Kimiecik and Horn (1998) had four purposes. The first objective was to describe the nature of a parental belief system deemed relevant to children's moderate-vigorous physical activity (MVPA) participation. The second purpose was to determine if a parental belief about MVPA was to the parents' sex (male, female) related. Third, Kimiecik and Horn examined the relationship between parental exercise behavior and children's MVPA participation; lastly they determined the extent of the relationship between parental beliefs and children's' self-reported MVPA. The children in this study ranged in age from 11 to 15 years and their parents ranged in age from 30 to 54 years. Questionnaires were first given to the parents. A 16-item Fitness Value Scale was used to find how the parents valued their children's participation in MVPA. The second questionnaire, the Perceived Physical Competence was administered to measure parent's perception of their child's physical competence. The third questionnaire that consisted of task and ego orientation items was administered to determine what the parent felt in terms of the child being successful in a fitness testing scenario. Fourth the parents were asked why their children participate in fitness. These reasons included fun, physical and mental health, increased ability to play sports, development of life skills, enhanced fitness, mastery of skills and weight control. The parents were also asked about their own MVPA. To measure the children's MVPA three different approaches were used. First an interview was conducted on the children, and then a 2-day recall format was used to assess the child's activity level on one week day. Lastly, the children indicated how much time they engaged in exercise during different situations

(before, during, after school, on weekends, and in general throughout the year) and then were asked to compare their level of exercise to all peers.

The first interaction was tested for parent's beliefs concerning their child and the value their parents attached to participation in physical activity. The mother's beliefs on physical health, mental health, weight control and fun scored higher than the father's beliefs, although the mother's and father's values attached to their child's participation in physical activity did not differ. The third test examined the relationship between parental exercise and their children's MVPA and revealed that the parent's own self-reported physical activity level was significantly related to their child's self-reported MVPA (Wilks' alpha = .44; $F(24, 142) = 1.95$; $p < .009$). The last objective was to determine if parental beliefs and the children's self-reported MVPA were related. The results, in general, showed that parents' beliefs related to their children's MVPA participation with the mother showing significance in task goal orientation. Role modeling from the parents, however, had no significant effects on their children's MVPA. The study found that relationships among parental beliefs and the children's adoption of their own beliefs based on the parents' beliefs, influenced the children's MVPA patterns (Kimiecik & Horn, 1998).

In an earlier study, Kimiecik et al., (1996) examined the relationship between children's beliefs and their participation in MVPA to determine whether children's beliefs were related to the perceptions of their parent's beliefs about them. Additionally they, examined the relationship between children's perceptions of their parent's beliefs and the children's MVPA (Kimiecik, Horn, & Shurin, 1996). The participants in this study were 81 children between the ages of 11 and 15 years. The 16-item Fitness Value Scale was used to assess the degree to which children value participation in MVPA. Harters' Perceived Competence Scale for Children (Harter, 1982)

was used to measure perceived competence in cardiovascular endurance, flexibility, muscular strength, muscular endurance, as well as overall perceptions of fitness competence. Another questionnaire was used to find children's perceptions of their parents' beliefs about them, and their parents' goal orientations from the children's point of views. The children were presented with a scenario that described a fitness test they had just taken at school and were then asked to rate it based on what would make their parent(s) happy about their performance on this fitness test. Last, the children were interviewed using a two-day recall format to obtain measures of children's MVPA. The children completed another questionnaire indicating how much exercise they engaged in across five situations (before, during, after school, on weekends, and throughout the year) (Kimiecik, Horn, & Shurin, 1996).

The 16-item Fitness Value Scale and the desire to participate in physical activity indicated a moderate (r=.45) relationship. This indicated validity in the scale used to determine the degree to which the children value participation in MVPA. The Perceived Fitness Competence revealed good reliability between responses given one week earlier (r = .91). This indicates the instrument is good for retesting purposes. In the questionnaire of children's perceptions of parental beliefs a Cronbach's alpha of .76 was found for the task subscale and .69 for ego subscale. In general, children's perceptions of fitness competences and a task orientation for fitness testing are strongly related to their self- report of participation in MVPA. Also, children's beliefs were found to be related to their perceptions of their parent's beliefs, regarding their MVPA involvement. These data support the idea that parents may play a significant role in the development of children's beliefs regarding MVPA.

McMurray et al., (1993) explored the effect of parental attitudes and self-reported exercise habits on the fitness and activity levels of their children. This study involved third and

fourth grade children and their parents (ages 24 to 76 years). Children's height and body mass were measured. Aerobic power was estimated using the "Eurofit" submaximal cycle ergometer test. A 26-item self-reported activity questionnaire was used to assess children's activity levels (McMurray et al., 1992). The items ranged from sedentary activities like reading and video games to more activities like running, swimming, and soccer. A weak, but significant, correlation ($r=.304$, $p < .0001$) was found between the self-reports of activity from the children, and the parents' and teachers' estimates of the child's activity levels.

The parents of the children were given an Exercise and Benefits Barrier Scale-EBBS (Sechrist et al., 1987) to measure parental attitudes toward exercise. They also completed another questionnaire to determine how often the parents participated in physical activity that lasting 20-30 minutes per session over the past 6 months. According to the reported physical activity from the parents, 30% of the fathers exercised regularly while only 19% of the mothers exercised regularly. For the parents in the study fathers reported being more active than mothers. The children's predicted VO_2max was not significantly correlated with the exercise benefits and barriers scales used to measure parental attitudes toward exercise ($r(1,113) = .065$, $p > .279$) nor with exercise habits of the parents ($r(1,113) = .066$, $p > .279$). These findings suggest that the parent's exercise habits are not associated with the child's activity habits.

Anderssen and Wold, (1992) examined perceived leisure-time physical activity of the children's parents and the child's best friend, perceived direct support for physical activity from parents and friends, direct help from parents in exercising vigorously, and perceived value of physical activity of parents and friends of 7^{th} graders. The children were asked: "Outside of school hours, how often do you do sports or exercise until you are out of breath?" This question

was highly correlated with self-reported hours per week engaged in physical activity (r = .66) for both boys and girls respectively.

The second questionnaire measured the children's perceptions of sport or exercise frequency of their mother and father and best friend in order to predict the measured frequency of encouragement to participate in fitness-related exercise and encouragement to exercise vigorously. The third questionnaire assessed how frequently the children's parents helped in organizing exercise sessions or physical activity. Finally, the children were asked about the importance parents and friends placed on being physically fit as well as the importance friends placed on being a good athlete. Significance for the boys was found in receiving direct support from parents in exercising vigorously ($F(1, 863) = 4.7$, $p < .05$), physical activity level of their best friend ($F(1, 864) = 4.6$; $p < .05$) and direct support for fitness-related exercise from their father ($F(1, 865) = 4.4$; $p<.05$). For the girls, direct support for physical activity given by significant others had effect on their own physical activity ($F(1, 350) = 10.5$; $p <.001$). These results indicated that parents and friends are strongly significant sources of support when it comes to promoting physical activity among children. (Anderssen & Wold, 1992).

Socialization into Physical Activity

Parent's socialization influences on children's physical activity levels have also been studied (Brustad, 1996, Goldberg, Dietz, 1996, & Babkes & Weiss, 1999). The first study investigated whether or not parental physical activity was related to children's perceived physical competence and attractions to physical activity (Brustad, 1996). The basis of that study was the Eccles Theory. This theory states parental belief systems are the most instrumental in the process of children's socialization in sport. Furthermore, it states that the amount of support parents

provide for children's involvement in activity is based on the combination of their own expectations of the likelihood that their child will attain success (Eccles & Harold, 1991). This study included 107 children enrolled in 4th, 5th, and 6th grade physical education classes. The Children's Attraction to Physical Activity (CAPA) questionnaire was used to assess the children's interest in physical activity. To examine perceived physical competence they used a modified version of Harter's (1982) Scale. Internal reliability was found for children's liking of exercise (alpha = .74), games and sports (alpha = .70), physical exertion (alpha = .74) physical activity for health (alpha = .44), parental encouragement (alpha = .71), parental enjoyment (alpha = .71), and parental role modeling (alpha = .64) (Brustad, 1996).

A multiple regression was conducted to examine the strength of the relationship between parent and child in regards to physical activity. For the boys whose parents who encouraged them to be physically active and demonstrated enjoyment of physical activity experienced greater enjoyment of games and sports (r = .62), higher levels of perceived competence (r = .44) and more fun during physical exertion (r = .40). For the girls, higher levels of encouragement and enjoyment from the parents resulted in a stronger attraction to physical activity due to peer relations (r = .54), a greater interest in games and sports (r = .33), and enhanced perceptions compared to their peers regardless of parental support (r = .30). This study provides partial support for Eccles' expectancy-value model of motivation. The researchers found that encouragement was strongly related to boys' attraction to physical activity and perceived physical competence. However girls' enjoyment of physical activity provided the stronger contribution in their attraction to participation in physical activity (Brustad, 1996).

Children's perceptions of parental influence and their psychosocial responses to competitive soccer participation was also studied (Babkes & Weiss, 1999). This study included

227 youth athletes with an age range of 9.0-11.6 yr. as well as the mothers and fathers of those children. A questionnaire was used to measure parental attitudes and behaviors toward their child's involvement in sports. The subscales used in this study were: advocacy, beliefs about competency, performance contingent responses, pressure, involvement, and role modeling. The children also completed Harter's (1981) Self-Perception Profile for children to measure perceived soccer competence. Finally, the children gave answers to three questions; ("How fun is soccer participation?" "How much do you like soccer?" and "How much do you enjoy being on a soccer team?") to determine the level of enjoyment of soccer. The results showed a significant correlation (Wilks' alpha = .77; $F(20, 724) = 2.92$; $p < .001$) between mothers' influence and the participation of soccer players as well as for fathers' perceived attitudes and behaviors and the player's psychological variables involved in soccer participation (Wilks' alpha = .76; F (30, 842)2.01, $p < .002$). Babkes and Weiss concluded that parents do play a critical role in how their children expressed positive affects, perceived competence, and intrinsic motivation in the sport domain (Babkes & Weiss, 1999).

The last study investigated whether perceived behavioral control significantly predicted 5^{th} and 8^{th} graders' intentions to participate in vigorous activity (Craig, Goldberg, & Dietz, 1996). This study used the Theory of Planned Behavior to represent the participation in physical activity among children. This theory states that perceived behavioral control has a direct effect on intention and also on behavior (Craig, Goldberg, & Dietz, 1996). Vigorous activity was measured by a list of high intensity physical activities with METS ≥ 6 that the children need to check off, and also how often the student reported his/her heart beating fast and his/her breathing being hard as a result of play, exercise, or sports. For grades 5 and 8 combined, the correlation between intent and attitude was significant ($r = .45$)as was intent and perceived behavioral

control (r = .30) was significant. These results indicated that when vigorous activity was fun and exciting the child was more likely to engage in it.

Validity and Reliability of Questionnaires

This present study used two questionnaires: one for the parents and one for the children. The Parental Influence Questionnaire was used in a previous study (Babkes & Weiss, 1999). The PAQ-C questionnaire was also used in the present study to measure the child's physical activity level using a 7-day recall; it is commonly used and has been validated (Crocker et al, 1997).

The Parental Influence Questionnaire was derived from studies of parental influence on children's attitudes toward physical activity Brustad (1993 & 1996). Additional questions were developed and added by Babkes and Weiss, (1999). The study by Babkes and Weiss (1999) was conducted on mothers and fathers of children participating in youth soccer to determine if strong correlations existed between reported parental behaviors and attitudes and children's perceptions of parental behavior and attitude The Cronbach's alpha coefficient ranged from .56 to .86, with role modeling achieving the highest score and advocacy receiving the lowest. All the other subscales (pressure, involvement, beliefs about competency, and positive contingent responses) attained reliability scores over the .70 criterion. The Parental Influence Questionnaire, therefore, is reliable and valid in terms of perceptions and psychosocial responses pertaining to youth soccer.

The PAQ-C, a self-administered 7-day recall designed to measure general physical activity levels during the school year for children in grades four and higher, was also acceptable in term of validity and reliability (Crocker et al., 1997). The PAQ-C was developed by following

suggestions by Sallis (1993) and Baranowski (1993). Findings from three previous studies using the PAQ-C are as follows. The first study examined the scales and items in the PAQ-C. The study consisted of 215 students from grades four through eight. The scale reliability was examined using Coefficient Alpha. The reliabilities for females (alpha =.83) and males (alpha =.80) showed acceptable item-scale properties (Croker et al., 1997). The second study investigated the test-retest reliability and the internal consistency of the instruments. The participants were 84 students aged 9 to 14 year, from grades four through eight. The students were tested twice, one week apart. The results showed good internal consistency with coefficient alpha scores of .79 and .89, respectively for the assessments. The intraclass correlation was found reliable for a single score for males (r = .75) and females (r = .82). An ANOVA, however, indicated a significant difference in the PAQ-C scores of ($F, (1, 83) = 22.26, p < .01$). The authors stated this difference was due to the difference in weather on the two test days (Croker et al., 1997). The last study examined the reliability of using the three activity scores or two activity scores from different seasons for a group of 200 students ranging in ages from 8 to 16 year. The activity scores were collected in the months of January, April, October, and November. The results showed internal consistency for elementary and secondary school students with coefficient alpha's ranging from .81 to .86 (Crocker et al., 1997). In general these two studies indicated that the PAQ-C is sensitive in determining activity differences in gender and is a valid for use with elementary school - aged children.

Summary

The incidence of obesity in children is on the rise in our nation. Serious health risks are associated with childhood obesity and can lead to further problems later in adulthood. Obese

children and adolescents have impaired physical, psychosocial, emotional, social, and school functioning due to this disease (Schwimmer, Burwinkle, & Varni, 2003). Becoming physically active and physically fit appears to be determined by children's perceptions and those who influence them (Kimiecik & Horn, 1998). Parents play an important role in the child's moderate -to- vigorous activities according to their own beliefs (Kimiecik, Horn & Shurin, 1996). Parents are the child's sources of support and act as role models when it comes to promoting physical activity among children (Anderssen & Wold, 1992). The child's attraction to physical activity can be attributed to the motivational forces of parental encouragement and enjoyment (Brustad, 1996). In general, parents can influence the child to perceive physical activity as fun and exciting; this may increase the likelihood that the child will be physically active and less likely to be overweight or obese.

In conclusion, it is important to note that there are many different ways to measure parental influence on children's physical activity levels (Anderssen & Wold 1992; Babkes & Weiss 1999; Brustad, 1996; Craig, Goldberg, Dietz 1996; Godin & Shephard 1998; Kimiecik & Horn 1998; and McMurray et al., 1993). This study is designed to measure parental influence on children's physical activity to further elucidate the role parents play in preventing and/or redirecting the incidence of obesity in children via promotion of physical activity.

CHAPTER THREE

METHODS

The purpose of this study was to determine the extent to which parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance-contingent response correlate with children's physical activity levels and to determine if parental role modeling has the greatest correlation to children's physical activity levels. An additional purpose is to determine whether a father's influences on children's physical activity levels are greater than mother's.

Participants

The participants in this study were 65 children (boys (n= 26), girls (n= 39)) between the ages of 8 and12 (mean ± 10.32) years and in grade levels 4 through 6. All the children were currently participating in a physical education class in an elementary/secondary school. Initially, the researcher contacted the school principal and physical education teacher to get approval for a pilot study at their school. It was completed on 8 and 9 year old children (N=11) from an elementary school in South Florida. Following approval by the Barry University Institutional Review Board, the researcher contacted several school principals of elementary and secondary schools in Miami-Dade County (Appendix C) regarding student participation and project approval. Once permission was granted by the school principal, the researcher then contacted the physical education teacher from each school to schedule a time to begin the study. During the first visit to the physical education class, the researcher explained why participation is needed in this study. After the study was explained to the children, the researcher gave each child the

parental consent (Appendix A) and child assent forms to take home with him/her. The Signed consent and assent forms (Appendix B) were returned to the physical education teacher; once forms were collected and given to the researcher, participation began.

Instrumentation and Data Collection

For confidentiality, each school was identified by color code and each participant's questionnaire was number coded. Two questionnaires were given to each child. The first questionnaire was the *Physical Activity Questionnaire for Children* (PAQ-C) (Croker et al., 1997) (Appendix D), which asks the child to recall all activities for the previous 7 days. It includes a list of number physical activities and a line for the child to fill in any activity not included in the list. From the PAQ-C a child's activity frequency during physical education class, recess, lunch, right after school, evenings and weekends can be quantified an average score was calculated from nine items, each scored on a 5-point Likert scale ranging from no physical activity (1) to 7 times or more of physical activity (5) for the past 7 days. Item 1 was determined from the mean value for all activities scores. Items 2 through 8 (physical education, recess, lunch, right after school, evenings, weekends, describes you best) were each indicated on a 5-point scale (1 being low activity and 5 being high activity). Item 9 was determined from the mean scores for all days of the week. Item 10 asked whether the child was sick during the past week but was not part of the summary of activity scores. Once values were found for each of the 9 items an overall mean score was calculated for each participant. This score was the final PAQ-C activity summary score to identify physical activity level.

The second questionnaire was a 72-item instrument titled *Parental Influence* (Babkes & Weiss, 1999). (Appendix E) These questions probed into a child's perception of maternal and

paternal influences on physical activity. The influences quantified in this study are Advocacy for mother (6 items) and father (6 items), Beliefs about Competency (12 items), Performance Contingent Responses (12 items), Expectations (12 items), Involvement (12 items), and Role Modeling (12 items). The child answered each item using a 5-point Likert Scale (1 = almost never, 5 = almost always).

The questionnaires were handed out in the selected physical education class at each school. The children were separated into small groups by the researcher with no more than 6 children to a group. The children were then asked to listen to directions and pay attention to the researcher as the questions were read out for each individual question. If the child did not understand a question, the child was asked to raise his/her hand and then at that time, the researcher was available to answer the question one-on-one with the child. Once completion of the questionnaire was finished each child was asked to hand in the questionnaire to the researcher. The researcher then double-checked the questionnaire to make sure every question was completed. The children were asked to sit quietly until all questionnaires were completed. Once all questionnaires were in the hands of the researcher the children were dismissed from the study and able to participate in the time remaining in their physical education class.

Pilot Data

The pilot study consisted of 11 children boys (n = 6), girls (n= 5) between the ages of 8 and 10 (mean ± 8.64 yr) participating in a physical education class. The questionnaires were administered in a classroom setting with all 11 children completing the questionnaires at their own pace. The researcher was available to answer any questions that the children had while

completing the questionnaires. The researcher did not read the questions out loud to the children and did administer them into small groups.

The combination of means from the pilot work of each forced parental influence subscale excluding advocacy father, performance contingent responses mother, and expectations for both mother and father were used to predict the physical activity level of the child. A Stepwise multiple linear regression was calculated to predict the child's physical activity level based on their parental influence. Pearson Correlations were also calculated for the individual variables relationship between the child's physical activity level and the parental influences. A highest correlation ($r(9) = -.503$, $p < .05$) was found between physical activity level and mother's beliefs about competency.

It was hypothesized that the father would show the greatest influence on the child's physical activity level in comparison to the mother. Two separate multiple linear regression was calculated to predict the child's physical activity level based on the mother's influences – advocacy, beliefs about competency, involvement, and role modeling. A non-significant regression was found ($F(4, 7) = .543$, $p > .05$), with an R^2 of .237 and a standard error of estimate of .35477. The other regression was used to calculate the father's influences – beliefs about competency, performance contingent responses, involvement, and role modeling. A significant regression was found ($F(4, 7) = 7.686$, $p < .05$), with an R^2 of .815 and standard error of estimate .17488. According to these results the father's influences identified above showed a significant relationship whereas those of the mother did not. Therefore, the father's influences, not the mother's were better predictor of physical activity level.

Statistical Analyses

SPSS Version II was used for statistical analyses. From the Parental Influence Questionnaire, each answer was separated mother and father into the appropriate category and by the different subscales: Advocacy, Beliefs about Competency, Performance Contingent Responses, Expectations, Involvement, and Role Modeling. Answers were scored from a Likert Scale (1 being "Almost Always and 5 being "Almost Never").

Internal consistency was calculated for each subscale along with item analysis. Means for each subscale were computed by including the items that add to the internal consistency of the subscale. A multiple linear regression was used to determine if parental influence in combination predicts the child's physical activity level. A stepwise multiple regression was used to determine which influence demonstrated the greatest significance in correlating with level of physical activity. A multiple regression was used to determine whether father's influence was significantly greater than the mother's influence. All data were expressed as mean ± standard deviation. Significance was set at $r = .700$ and $p < .05$.

CHAPTER FOUR

RESULTS

Physical Activity Questionnaire

Descriptive statistics for the *Physical Activity Questionnaire for Children* are provided in Table 1. Item 1 (all activities) asked the child to report all activities they participate in during their spare time. Some of the activities listed were skipping, walking for exercise, tag, and football. Item 2 (physical education participation) asked the child how often during physical education class were they active; the scores ranged between (1- I do not do physical education) to (5 - I always do physical education). Item 3 (activity during recess) asked the child to score what they do during recess on a scale from (1- sitting down the majority of time) to (5- ran and played around hard most of the time). Item 4 (activity during lunch) asks the child to score what they normally do during lunch on a scale from (1- sitting down the majority of time) to (5- ran and played around hard most of the time). Item 5 (activity right after school) asks the child to score how many days right after school did they very actively participated in sport, dance or games on a score of none to 5 times last week. Item 6 (activity during evenings) asked the child to recall how many evenings they participate in sports, dance, or games with a scale of (1- none) to (5- 6 or 7 times last week). Item 7 (activity during last weekend) was a recall of how active was the child in sports, dance or games on the past weekend, the scale was (1- none) to (5- 6 or more times). Item 8 (description of amount of time spent being active) asked the child to describe themselves best for the total seven past days with the scale ranging from (1- all or most of my free time was spent doing things that involve little physical effort) to (5- very often (7 times or more)). Item 9 (how often each day) asked the child to circle how often they were

physically active for each individual day ranging from (1- none) to (5- very often). And, Item 10 asked the child if they were sick or if anything preventing them from physical activity from the last week. The overall mean (item 1-9) was used to determine the physical activity level of the children. Item 10 reported no unusual activity or illness for that week. In general, from a 7- day recall children were only active 2 or 3 times within the week, ran or played around a little bit, and sometimes were active in physical education. Internal consistency and reliability was determined for the combination of all the questions. Table 2 shows the Cronbach's alpha for items 1 through 9.

TABLE 1. Mean scores (N = 65) from the Physical Activity Questionnaire for Children.

Items	Mean *	SD
1. All activities	1.9645	.60719
2. Physical education participation	4.2308	.98058
3. Activity during recess	4.3077	.98303
4. Activity during lunch	1.9692	1.3803
5. Activity right after school	3.3231	1.3123
6. Activity during evenings	2.9077	1.2339
7. Activity during last weekend	3.5385	1.2384
8. Description of amount of time spend being active	3.2154	1.1387
9. How often for each day	3.2923	1.1281
10. Overall Score	3.1944	.71463

* Mean of 5-point Likert Scale (1 = lowest physical activity) (5 = highest physical activity)

Table 2. Cronbach alpha's for Parental Influence Questionnaire and PAQ-C

Scale	r	Deleted
PAQ-C	.806	# 4 (Activity During Lunch)
Mother		
Advocacy	.637	Item # 37, 49
Beliefs about Competency	.808	
Performance Contingent Responses	.750	Item # 18, 42
Expectations	.401	Item # 7
Involvement	.814	
Role Modeling	.822	
Father		
Advocacy	.809	Item # 38, 50
Beliefs about Competency	.917	
Performance Contingent Responses	.738	Item # 18, 42
Expectations	.598	Item # 8
Involvement	.873	
Role Modeling	.849	

Significance at r = .700

Parental Influence Questionnaire

Descriptive statistics for the Parental Influence Questionnaire are provided in Table 3. The average scores were consistently higher for the mother's subscales with the exception of Expectations, Involvement, and Role Modeling. The last two subscales were higher, on average, for the father, and there was no difference between parental subscales for Expectations. Internal consistency and reliability was determined for each individual subscale – Table 2.

TABLE 3. Mean Scores (N = 65) for the Parental Influence Questionnaire

Scale	Mean	SD
Mother		
Advocacy	4.0231	.75224
Beliefs about Competency	4.0897	.73307
Performance Contingent Responses	4.6462	.61485
Expectations	2.3200	.65173
Involvement	3.0744	.95107
Role Modeling	3.5897	.84834
Father		
Advocacy	3.8096	1.0833
Beliefs about Competency	3.9744	1.0292
Performance Contingent Responses	3.7885	.86741
Expectations	2.3200	.65173
Involvement	3.4487	1.0631
Role Modeling	3.7359	.97978

* Mean of a 5-point Likert Scale (1 = almost always) (5 = almost never)

Combination of Parental Influences and its Relationship to Physical Activity Level

A Stepwise multiple linear regression was calculated to predict the child's physical activity level based on their parental influence. The combination of means of each parental influence subscale excluding Expectations for both mother and father were used to predict the physical activity level of the child. A significant multiple regression equation was found with the following influences predicting the child's physical activity level; advocacy mother, advocacy father, beliefs about competency mother, beliefs about competency father, performance contingent responses mother, performance contingent responses father, involvement mother, involvement father, role modeling mother, and role modeling father at ($F(10,54) = 2.619$, $p < .001$), with an R^2 of .327 and a standard error of estimate .36843.

Correlations of Parental Influences and Physical Activity Levels

A stepwise regression was calculated to determine if role modeling had the highest correlation with physical activity level excluding expectations for both mother and father. The mother's beliefs about competency was significant ($F(1, 63) = 12.800$, $p < .001$), with an R^2 .169 and a standard error of estimate of .65666. The results indicate that mother's beliefs about competency is the only significant parental influence in determining a child's physical activity level. In addition a Pearson Correlation was calculated for the relationship between the child's physical activity level and the parental influences. The highest correlation ($r(63) = .411$, $p < .01$) was found, an indication of a significant linear relationship between physical activity level and another's beliefs about competency. The results of the correlations can be found in Table 4.

TABLE 4. Correlations of mean physical activity and mean parental influences.

Scale	Pearson Correlation
Mother	
Advocacy	.262*
Beliefs about competency	.411*
Performance contingent responses	.143
Involvement	.150
Role modeling	.150
Father	
Advocacy	.197
Beliefs about competency	.230*
Performance contingent responses	-.009
Involvement	.144
Role modeling	.270*

* Significance ($P \leq .05$)

Father's Influence on Physical Activity Level

It was hypothesized that the father would show a greater influence on the child's physical activity level in comparison to the mother. Two separate multiple linear regressions were calculated to predict the child's physical activity level. The first multiple linear regression was based on the mother's influences: Advocacy, Beliefs about Competency, Performance Contingent Responses, Involvement, and Role Modeling. A significant regression equation was found ($F (5, 59) = 3.172$, $p < .001$), with an R^2 of .212 and standard error of estimate of .66078. Mother's Beliefs about Competency was the only significant predictor. The second multiple linear regression was calculated to predict the child's physical activity level based on the father's influences: Advocacy, Beliefs about Competency, Performance Contingent Responses, Involvement, and Role Modeling. A significant regression equation was found ($F (5, 59) = 3.481$, $p < .001$) with an R^2 of .228 and standard error of estimate of .65405. The subscale Performance Contingent Responses is the only significant predictor. Thus, indicating that the mother not the father's influence is a predictor for the child's physical activity level.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to determine the extent to which parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance-contingent response correlate with children's physical activity levels and to determine if parental role modeling has the greatest correlation to children's physical activity levels. An additional purpose is to determine whether a father's influences on children's physical activity levels are greater than mother's.

Physical Activity Questionnaire

The PAQ-C was used in the present study for the children to recall their physical activity from the past seven days. The results revealed that the children in the study were at a moderate level of physical activity with a total mean of 3.35 (1 = low activity and 5 = high activity) for an average of 7 times per week. Physical education participation was the second highest score (mean = 4.23), physical activity during recess was the highest (mean = 4.31) and in retrospect the physical activity level was the lowest during the child's spare time and during lunch (mean =1.96).

Since the highest scores were obtained during physical education class and recess it might is evident that these children received most of their physical activity during school. This can be indication that parental influence may be a factor if the child's physical activity level is low due to the low scores for activity during the evenings, right after school, and during the last weekend.

Past research using the PAQ-C has shown good reliability and internal consistency (Croker et al., 1997). The only problems that existed with this questionnaire in the past were different, was in weather conditions from the two separate weather conditions. (Croker et al., 1997). This factor was not included in this study, however it could change the results if the weather conditions were different and the children were not able to be physically active due to rain for example or a different time of the year of administration.

Parental Influence Questionnaire

In the present study the Parental Influence Questionnaire was used to determine if different socialization variables such as advocacy, beliefs about competency, performance contingent responses, expectations, involvement, and role modeling from the mother and father have any influence on the child's physical activity level. Numerous researchers have studied socialization variables and if they influence physical activity in children (Kimiecik & Horn, 1998; Anderssen & Wold 1992; Brustad, 1996; and Weiss & Babkes, 1999).

The results of this study demonstrated that socialization variables in combination exert some significance in predicting a child's physical activity level. The main finding of this study, however, was that maternal beliefs about competency was the most influential and limiting factor in predicting their child's physical activity level. These results somewhat support with the findings of Kimiecik and Horn (1998) in which they found relationships among parental beliefs, and the children's adoption of their own beliefs from the parents beliefs all of which influenced the children's MVPA patterns.

The subscale Beliefs about Competency in this study was used to distinguish how the child views what the respective parent believes about them. Based on the results from this study

the following items predicted the child's physical activity level; does the mother think the child is good at sports, does she believe sports comes easily to them, does she believe that they are better at sports than most kids their age, is she proud of their sport skills, and does she believe that they are a good athlete. This result was unexpected by the researcher. Role modeling from the father's aspect was thought to be the predicting factor however, no significant correlations were found to back this assumption.

Brustad (1996) found that when studying differences in gender that the boys are more physically active when their parents encourage them and the parents show high levels of perceived competence. For the girls, they found that parental encouragement and enjoyment resulted in physical activity participation. In this present study gender was not a covariate and could have been a distinguishing factor since boys and girls reported being interested in different types of physical activities and might receive different support from their parents. When the parental influences of Advocacy, Beliefs about Competency, Performance Contingent Responses, Involvement, and Role Modeling were used to study children's participation in soccer (Babkes & Weiss, 1999), it was found that the parent's do play a significant role in participation in soccer.

The researcher believes that these results may be due to the assumption that the children in this study may have spent more time with the mother than the father. The children might have fathers that work for a living and are unable to be there to support their child's physical activity or, on the other hand, the children might have mothers who stay at home instead of working and take care of the family and the family's needs. Therefore, parental influence would be higher from the mother's aspect.

The subscale Beliefs about Competency for the mother was the only significant predictor for physical activity level of children in this study. The researcher assumed that this may be due to the child feeling and/or recognizing that they have acceptance from their mother in regard to participating in physical activity. In regard to physical activity, positive beliefs about competency appear to encourage the children to be physically active and allow the child to acknowledge the support coming from his/her parents, in this case the mother.

Since investigation of children's physical activity and how parents might be involved is so widely studied and examined that there might not be a correct answer or a direct correlation to physical activity level. The researcher notes that parental influences need to come in positive forms in order to achieve a positive outcome, prediction of physical activity. For the purposes of this study the use of the Parental Influence Questionnaire and PAQ-C determined Beliefs about competency from the mother to be the best predictor of a child's physical activity level.

Limitations

To this researcher's knowledge this was the first time the PAQ-C and Parental Influence Questionnaire were used in combination which could represent why the standard error of estimate was high. Limitations to this study also include the schools selected, the age level of the subjects, the inclusion of participating in physical education class, and the small number of children surveyed. It was assumed that the schools selected and age groups represented all the children in Miami-Dade County, Florida.

Recommendations

For further research there are many recommendations. First, it would be interesting to see if a child's sex, age, cultural or racial differences has any influence on the different physical activity levels or parental influences, all of which were not cofactors in this study. Second, including the parents of the child to complete the Parental Influence Questionnaire would investigate differences in perceived influences between parent and child. Third a change in demographics would allow a comparison of South Florida children to Northeastern children; it would be interesting to see if indeed weather plays a factor in the child's physical activity. Fourth, determine social economic status as a cofactor this could have an impact on physical activity. And lastly, include the parent's occupation status many parents might work at night, evenings, multiple jobs or others may be stay-at-home parents and these could influence their child's physical activity levels.

Summary

One purpose of this study was to determine whether the influences of such as parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance- contingent responses predict children's physical activity levels. In general, in combination parental influences show some significance in predicting the child's physical activity level. However, the main contributor remains unknown from the results of the current study and further research is needed. Another purpose was to determine if parental role modeling has the greatest correlation to a child's physical activity level. The results indicated that role modeling was not significant and beliefs about competency was, in fact, the only significance variable ($p = .001$).

The last purpose was to determine whether a father's influences on children's physical activity levels are greater than a mother's. The results showed only the mother to have a significant relationship. Therefore, the father is not the most influential as assumed. Based on these results a child's physical activity level is predicted and correlated with the mother's beliefs about competency.

To conclude, mother's Beliefs about Competency showed to be a prediction of physical activity levels, with the child's physical activity level at a moderate level. This can be an indication either more needs to be done in the aspects of socialization of sport from the parent, or the parent(s) have little to none influence on the physical activity level. Since the mean average of physical activity level was in the "moderate" range it was hard to distinguish between the two circumstances. This in turn leads to the need for more research to be done to find exactly how we can change the current problems existing relating to childhood obesity and the low levels of physical activity. And additional research using the PAQ-C and Parental Influence Questionnaires is needed to determine if these two methods used in combination actually can predict children's physical activity levels based on parental influences.

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APPENDIX A

BARRY UNIVERSITY

PARENTAL INFORMED CONSENT FORM

&

ASSENT FORM INVOLVING MINORS

Your child's participation in a research project is requested. The research is being conducted by Marissa Stanczyk, a Master's degree student in the Sport and Exercise Science department at Barry University, and is seeking information that will be useful in the field of Exercise Science. The aim of the research is to determine whether or not parents influence their child's physical activity levels. The following procedures will be used: two surveys regarding your child's physical activity level and parental influences will be given to your child to complete during his/her physical education class. I anticipate the number of participants to be 100.

If you decide to allow your child to participate in this research, he/she will be asked to: complete two questionnaires during a physical education class. It should take about 30 minutes to complete both. I will be with your child while he/she completes the questionnaire in case he/she needs assistance.

The consent to be a research participant is strictly voluntary and should you decline to allow your child to participate or should your child choose to drop out at any time during the study, there will be no adverse affects on you or your child. There are no risks in participating in this study. The information provided by your child will help us understand ways that we can improve physical activity levels in children.

As a research participant, information that your child provides will be held in confidence to the extent permitted by law. Any published results of the research will refer to group averages only and no names will be used in the study. Data will be kept in a locked file in the researcher's office. Your signed consent form will be kept separate from the data. All data will be destroyed after five years.

If you have any questions or concerns regarding the study or your child's participation in the study, you may contact me, Marissa Stanczyk at (305)919-8320, or my advisor, Dr. Mier at (305)899-3573 or Institutional Review Board point of contact, Ms. Avril Brenner, at (305)899-3020. If you are satisfied with the information provided and are willing to allow your child's participation in this research, please signify your consent by signing this consent form.

Voluntary Consent

I acknowledge that I have been informed of the nature and purposes of this experiment by Marissa Stanczyk and that I along with my parent(s) have read and understand the information presented above, and that I have received a copy of this form for my record. I give my voluntary consent to allow my child to participate in this experiment.

_____ _____

Signature of Participant Date

_____ _____

Signature of Parent Date

_____ _____

Researcher Date

Assent for Children

We are doing a research study that includes children such as you. We have explained the study to you, and we need to know whether you are willing to participate. Please sign your name below so that we can be certain whether you want to be in the study or not. Thank you.

____ I am willing

____ I am not willing

to participate in the research study which has been explained to me by

_____ _____
Signature of Researcher *Date*

_____ _____
Signature of Child *Date*

_____ _____
Signature of Parent *Date*

APPENDIX B

PRINCIPAL LETTER

School Name
Address

Dear:

My Name is Marissa Stanczyk and I am a graduate student at Barry University, Miami Shores, FL majoring in Exercise Science. I am requesting the participation of some of your school's students for my thesis study. The aim of the research is to find the relationship between parental influences and their child's physical activity levels. Each participant will be asked to complete two questionnaires. The first questionnaire is the *Physical Activity Questionnaire for Children* (PAQ-C); which asks students to recall activities for the previous 7 days. The second questionnaire is titled *Parental Influence*. The questionnaire consists of 72 questions that involve mother and father influences into physical activity. The estimated time for completion for both questionnaires is 20 minutes.

After approval from you the researcher will then contact the physical education teacher to schedule a time and date for the children to participate. The questionnaires will be administered in small groups (2-3 children) with the researcher reading and explaining when necessary each question. The expected date of the research study to begin is the beginning of March. The study should only take one day to hand out informed consent and one day to complete the questionnaires.

If you have any further questions regarding this study or your school's participation in the study, you may contact me, Marissa Stanczyk at (XXX)XXX-XXXX , or my advisor, Dr. Mier at (XXX) XXX-XXXX or Institutional Review Board point of contact, Ms. Avril Brenner, at (305) 899-3020. If you agree to have your school and children participate in this study, a written letter typed and signed by you is requested. I as the researcher will be available to pick up the letter if permission is granted. Thank you for your time.

Sincerely,

Marissa Stanczyk
(XXX)XXX-XXXX
email address

APPENDIX C

PARENTAL INFLUENCE QUESTIONNAIRE FOR CHILDREN

Age:_____

Sex: M_____ F_____ Grade:_____

We are trying to find out about your level of physical activity from ***the last 7 days*** (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

---

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Skipping	❍	❍	❍	❍	❍
Rowing/canoeing	❍	❍	❍	❍	❍
In-line skating	❍	❍	❍	❍	❍
Tag	❍	❍	❍	❍	❍
Walking for exercise	❍	❍	❍	❍	❍
Bicycling	❍	❍	❍	❍	❍
Jogging or running	❍	❍	❍	❍	❍
Aerobics	❍	❍	❍	❍	❍
Swimming	❍	❍	❍	❍	❍
Baseball, softball	❍	❍	❍	❍	❍
Dance	❍	❍	❍	❍	❍
Football	❍	❍	❍	❍	❍
Badminton	❍	❍	❍	❍	❍
Skateboarding	❍	❍	❍	❍	❍
Soccer	❍	❍	❍	❍	❍
Street hockey	❍	❍	❍	❍	❍
Volleyball	❍	❍	❍	❍	❍
Floor hockey	❍	❍	❍	❍	❍
Basketball	❍	❍	❍	❍	❍
Ice skating	❍	❍	❍	❍	❍
Cross-country skiing	❍	❍	❍	❍	❍
Ice hockey/ringette	❍	❍	❍	❍	❍
Other:	❍	❍	❍	❍	❍

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

I don't do PE .....…..❍
Hardly ever ..... ❍
Sometimes ..... ❍
Quite often ..... ❍
Always ..... ❍

3. In the last 7 days, what did you do most of the time *at recess*? (Check one only.)

Sat down (talking, reading, doing schoolwork)……❍
Stood around or walked around ..... ❍
Ran or played a little bit ..... ❍
Ran around and played quite a bit ..... ❍
Ran and played hard most of the time ..... ❍

4. In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)

Sat down (talking, reading, doing schoolwork).… ❍
Stood around or walked around ..... ❍
Ran or played a little bit ..... ❍
Ran around and played quite a bit ..... ❍
Ran and played hard most of the time ..... ❍

5. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... ❍
1 time last week ..... ❍
2 or 3 times last week ..... ❍
4 times last week ..... ❍
5 times last week ..... ❍

6. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... ❍
1 time last week ..... ❍
2 or 3 times last week ..... ❍
4 or 5 last week ..... ❍
6 or 7 times last week ..... ❍

7. *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... ❍
1 time ..... ❍
2 — 3 times ..... ❍
4 — 5 times ..... ❍
6 or more times ..... ❍

8. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

A. All or most of my free time was spent doing things that involve little physical effort .....……❍

B. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) .....……❍

C. I often (3 — 4 times last week) did physical things in my free time .....…..❍

D. I quite often (5 — 6 times last week) did physical things in my free time ……❍

E. I very often (7 or more times last week) did physical things in my free time …❍

9. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday	❍	❍	❍	❍	❍
Tuesday	❍	❍	❍	❍	❍
Wednesday	❍	❍	❍	❍	❍
Thursday	❍	❍	❍	❍	❍
Friday	❍	❍	❍	❍	❍
Saturday	❍	❍	❍	❍	❍
Sunday	❍	❍	❍	❍	❍

10. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

Yes .....…….. ❍
No ..... ❍

If Yes, what prevented you? _____

APPENDIX D

PHYSICAL ACTIVITY QUESTIONNAIRE FOR CHILDREN

Coding structure for questionnaire:

Scale	Item #s for mother	Item #s for father
Advocacy	1, 13, 25, 37, 49, 61	2, 14, 26, 38, 50, 62
Beliefs about Competency	3, 15, 27, 39, 51, 63	4, 16, 28, 40, 52, 64
Performance Contingent Responses	5, 17, 29, 41, 53, 65	6, 18, 30, 42, 54, 66
Expectations	7, 19, 31, 43, 55, 67	8, 20, 32, 44, 56, 68
Involvement	9, 21, 33, 45, 57, 69	10, 22, 34, 46, 58, 70
Role Modeling	11, 23, 35, 47, 59, 71	12, 24, 36, 48, 60, 72

(reverse code: #37, #38, #49, #50)

PARENTAL INFLUENCE QUESTIONNAIRE

Please circle the ONE response to each item that best describes your feelings about the question. The questions ask about you and your parent's experience in sports and soccer. Please respond to every item. If you have any questions, please raise your hand.

1) My mother encourages me to join sports.

Almost Always Usually Sometimes Rarely Almost Never

2) My father encourages me to join sports.

Almost Always Usually Sometimes Rarely Almost Never

3) My mother thinks that I am good at physical activity.

Almost Always Usually Sometimes Rarely Almost Never

4) My father thinks that I am good at physical activity.

Almost Always Usually Sometimes Rarely Almost Never

5) My mother gets upset with me when I do not play sports well.

Almost Always Usually Sometimes Rarely Almost Never

6) My father gets upset with me when I do not play sports well.

Almost Always Usually Sometimes Rarely Almost Never

7) My mother expects me to make few mistakes when playing sports.

Almost Always Usually Sometimes Rarely Almost Never

8) My father expects me to make few mistakes when playing sports.

Almost Always Usually Sometimes Rarely Almost Never

9) My mother gives me instruction or advice on how I can play sports better.

Almost Always Usually Sometimes Rarely Almost Never

10) My father gives me instruction or advice on how I can play sports better.

Almost Always Usually Sometimes Rarely Almost Never

11) My mother feels good when playing sports or exercising.

Almost Always Usually Sometimes Rarely Almost Never

12) My father feels good when playing sports or exercising.

Almost Always Usually Sometimes Rarely Almost Never

13) My mother suggests various sports that I might enjoy.

Almost Always Usually Sometimes Rarely Almost Never

14) My father suggests various sports that I might enjoy.

Almost Always Usually Sometimes Rarely Almost Never

15) My mother thinks that sports comes easily to me.

Almost Always Usually Sometimes Rarely Almost Never

16) My father thinks that sports comes easily to me.

Almost Always Usually Sometimes Rarely Almost Never

17) My mother tells me when I play sports poorly.

Almost Always Usually Sometimes Rarely Almost Never

18) My father tells me when I play sports poorly.

Almost Always Usually Sometimes Rarely Almost Never

19) My mother wants me to be better than most of my friends at sports.

Almost Always Usually Sometimes Rarely Almost Never

20) My father wants me to be better than most of my friends at sports.

Almost Always Usually Sometimes Rarely Almost Never

21) My mother attends my sport games.

Almost Always Usually Sometimes Rarely Almost Never

22) My father attends my sport games.

Almost Always Usually Sometimes Rarely Almost Never

23) I like that my mother plays sports or exercises.

Almost Always Usually Sometimes Rarely Almost Never

24) I like that my father plays sports or exercises.

Almost Always Usually Sometimes Rarely Almost Never

25) My mother lets me try any sport I choose.

Almost Always Usually Sometimes Rarely Almost Never

26) My father lets me try any sport I choose.

Almost Always Usually Sometimes Rarely Almost Never

27) My mother thinks I am better at sports than most kids my age.

Almost Always Usually Sometimes Rarely Almost Never

28) My father thinks I am better at sports than most kids my age.

Almost Always Usually Sometimes Rarely Almost Never

29) My mother lets me know she is proud of me when I play sports well.

Almost Always Usually Sometimes Rarely Almost Never

30) My father lets me know he is proud of me when I play sports well.

Almost Always Usually Sometimes Rarely Almost Never

31) It’s important to my mother that I become a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

32) It’s important to my father that I become a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

33) My mother takes me to and from sport practices and games.

Almost Always Usually Sometimes Rarely Almost Never

34) My father takes me to and from sport practices and games.

Almost Always Usually Sometimes Rarely Almost Never

35) I like to do the same sports or physical activities as my mother does.

Almost Always Usually Sometimes Rarely Almost Never

36) I like to do the same sports or physical activities as my father does.

Almost Always Usually Sometimes Rarely Almost Never

37) My mother does not allow me to join some sports that I want to join.

Almost Always Usually Sometimes Rarely Almost Never

38) My father does not allow me to join some sports that I want to join.

Almost Always Usually Sometimes Rarely Almost Never

39) My mother is proud of my sport skills.

Almost Always Usually Sometimes Rarely Almost Never

40) My father is proud of my sport skills.

Almost Always Usually Sometimes Rarely Almost Never

41) My mother ignores me after poor sport performances.

Almost Always Usually Sometimes Rarely Almost Never

42) My father ignores me after poor sport performances.

Almost Always Usually Sometimes Rarely Almost Never

43) My mother thinks that my performance is usually not good enough.

Almost Always Usually Sometimes Rarely Almost Never

44) My father thinks that my performance is usually not good enough.

Almost Always Usually Sometimes Rarely Almost Never

45) My mother practices or plays sports with me.

Almost Always Usually Sometimes Rarely Almost Never

46) My father practices or plays sports with me.

Almost Always Usually Sometimes Rarely Almost Never

47) My mother enjoys participating in sports or exercise.

Almost Always Usually Sometimes Rarely Almost Never

48) My father enjoys participating in sports or exercise.

Almost Always Usually Sometimes Rarely Almost Never

49) My mother discourages my involvement in playing sports.

Almost Always Usually Sometimes Rarely Almost Never

50) My father discourages my involvement in playing sports.

Almost Always Usually Sometimes Rarely Almost Never

51) My mother thinks that I am a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

52) My father thinks that I am a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

53) My mother is pleased when I play soccer well.

Almost Always Usually Sometimes Rarely Almost Never

54) My father is pleased when I play soccer well.

Almost Always Usually Sometimes Rarely Almost Never

55) My mother thinks I should be a lot better in sports than I am.

Almost Always Usually Sometimes Rarely Almost Never

56) My father thinks I should be a lot better in sports than I am.

Almost Always Usually Sometimes Rarely Almost Never

57) My mother plays sports with me.

Almost Always Usually Sometimes Rarely Almost Never

58) My father plays sports with me.

Almost Always Usually Sometimes Rarely Almost Never

59) My mother exercises regularly.

Almost Always Usually Sometimes Rarely Almost Never

60) My father exercises regularly.

Almost Always Usually Sometimes Rarely Almost Never

61) My mother encourages me to play sports.

Almost Always Usually Sometimes Rarely Almost Never

62) My father encourages me to play sports.

Almost Always Usually Sometimes Rarely Almost Never

63) My mother thinks that I am a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

64) My father thinks that I am a good athlete.

Almost Always Usually Sometimes Rarely Almost Never

65) My mother congratulates me after good sport performances.

Almost Always Usually Sometimes Rarely Almost Never

66) My father congratulates me after good sport performances.

Almost Always Usually Sometimes Rarely Almost Never

67) My mother puts pressure on me to play sport well.

Almost Always Usually Sometimes Rarely Almost Never

68) My father puts pressure on me to play sport well.

Almost Always Usually Sometimes Rarely Almost Never

69) My mother practices sport skills with me.

Almost Always Usually Sometimes Rarely Almost Never

70) My father practices sport skills with me.

Almost Always Usually Sometimes Rarely Almost Never

71) My mother likes physical activity and exercise.

Almost Always Usually Sometimes Rarely Almost Never

72) My father likes physical activity and exercise.

Almost Always Usually Sometimes Rarely Almost Never

APPENDIX E

MANUSCRIPT

Stephen Silverman, Editor-in-Chief
Research Quarterly of Exercise and Sport
Box 126, Teachers College
Columbia University, New York, NY 10027-6696

Dear Stephen Silverman, Editor-in-Chief ;

This manuscript represents results of original work that have not been published elsewhere. This manuscript has not and will not be submitted for publication elsewhere until a decision is made regarding its acceptability for publication in *Research Quarterly for Exercise and Sport*. If accepted for publication, it will not be published elsewhere. Furthermore, if there are any perceived financial conflicts of interest related to the research reported in the manuscript I/ Dr. Constance Mier, Dr. Ann Gibson, and Dr. Gualberto Cremades have disclosed it in the Author's Notes. This research is not part of a larger study. The following sections of the manuscript are being asked to be reviewed; abstract, text, references, and tables.

Sincerely,

Marissa Stanczyk
2600 NE 135th St. Apt 4F
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PARENTAL INFLUENCES ON A CHILD'S PHYSICAL ACTIVITY LEVELS

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PARENTAL INFLUENCES ON A CHILD'S PHYSICAL ACTIVITY LEVELS

ABSTRACT

Parental Influences on a Child's Physical Activity Levels

The purpose of this study was to: (a) determine whether influences such as parental Advocacy, Expectations, Involvement, Role Modeling, Beliefs about Competency, and Performance Contingent Responses correlate with physical activity levels of children; (b) determine if role modeling has the greatest correlation to physical activity of children, and (c) determine whether a fathers' influences on children's physical activity are greater than a mothers'. The Physical Activity Questionnaire for Children (PAQ-C) and The Parental Influence Questionnaire were given to sixty-five children ranging in age from 8 to 12 year enrolled in physical education classes from three Miami-Dade County (Florida) schools. A multiple linear regression analysis revealed that in combination some parental influences show significance in predicting physical activity of children. Stepwise regression analysis revealed that the mothers' *beliefs about competency* was the only variable that strongly predicted children's physical activity levels. Lastly, a multiple regression analysis revealed that the mothers' *beliefs about competency,* is the most significant in predicting physical activity level of children more so than the fathers'. The other parental influences investigated in this study do not play a role in predicting physical activity levels. In conclusion, the findings of the study serve as a model demonstrating that there are other factors beyond parental influence affecting the children's physical activity level.

KEY WORDS

Aerobic Power: Indicator of a person's cardiovascular system and level of fitness. Also termed Maximal Oxygen Consumption

Advocacy: parent's encouragement or discouragement of their child's participation in organized sports.

Beliefs about competency: parent's attitudes and communication related to their perception of their child's general athletic ability.

Childhood Obesity: The Statistical definition from the 2000 Centers of Disease Control and Prevention growth charts for the United States, defines obesity as those children whose BMI is at or above the sex and age specific 95^{th} percentile which is greater or equal to a BMI of 30.

Facilitation: The parents overall effort to make it easier for the children to be physically active.

Hypertension: A chronic condition characterized by a resting blood pressure reading of either 140mmHg for systolic blood pressure or 90mmHg for dialostic blood pressure or higher on at least two separate occasions.

MET: Metabolic Equivalent used to estimate the amount of oxygen used by the body during physical activity (Ainsworth et al, 1993).

Parent: A natural or adoptive parent of a child, a guardian, or a person legally acting in the place of a parent.

Performance Contingent Responses: The affective and behavioral reactions demonstrated by parents following children's display of physical activity abilities.

Physical Activity: Bodily movement that is produced by the contraction of skeletal muscles and the substantially increases energy expenditure.

Pressure: Parent's desire that their children's performances demonstrate high levels of competence.

Role Modeling: The parents give a representation of what is important or valued

Sedentary: The ACSM defines sedentary lifestyle as not participating in a regular exercise program or meeting the minimal physical activity recommendations from the U.S. Surgeons General's report.

INTRODUCTION

There are many factors influencing children's physical activity, such as regular physical education in schools, opportunities to take part in after-school programs, opportunities to participate in sport programs, or convenience of location to surrounding playgrounds, pools, or community centers. Obviously, parents can also influence children's physical. Parental influence on children's activity levels can come in several forms: encouragement, involvement, facilitation, and role modeling. Young children rely heavily on adults, especially parents, as sources of encouragement regarding their physical abilities (Weiss, Ebbeck & Horn, 1997). Parental involvement also is a contributor in regards to socialization into sport. It can be expressed in simplest terms as the parent's feeling or showing that physical activity is important. Another variable is parental facilitation – the parent's overall effort to make it easier for the children to be physically active (Craig, Goldberg, & Dietz, 1996). And, finally, there is role modeling in which the parents inform a child of what is important or valued (Bandura, 1997). Parents acting as role models to their own children could positively impact their children's involvement in sports (Godin & Shephard, 1998).

Parents can help their children benefit from being involved in physical activity or sports. When children engage in activity they show excitement, have fun, learn, improve skills, stay in shape, improve appearance, and increase strength, endurance, and flexibility (Tappe, Duda, & Menges-Ehrwald, 1990). Parents can make a difference by helping their children develop healthy lifestyles. Without these positive influences from parents, physical inactivity and the negative health consequences that come with it will continue to be a problem for children.

Purpose Statement

The purpose of this study was to determine whether influences parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance contingent responses correlate with children's physical activity levels; and to determine if role modeling has the greatest correlation to physical activity. An additional purpose is to determine whether father's influences on children's physical activity are greater than mother's.

Hypotheses

Three hypotheses were tested in this study. First, it was hypothesized that in combination, parental advocacy, expectations, involvement, role modeling, and beliefs about competency and responses will correlate with physical activity level in children. Second, it was hypothesized that role modeling will have the greatest correlation with physical activity level in children. Last, the father's influence will show the greatest correlation to children's physical activity compared to mother's influence.

Statement of the Problem

Children are not meeting the recommended physical activity levels, evidence suggests parents can have an impact on the development of active lifestyles in their children (Eccles & Harold, 1991). Research has shown that parents play a significant role in development of the children's beliefs in regards to moderate-vigorous physical activity participation (Kimiecik & Horn, 1998) and the parents encouragement and enjoyment of physical activity can also impact the child's physical activity participation (Brustad, 1996). The parents clearly exert a large effect on whether or not their children participate in physical activity. The problem however still exists with childhood obesity and physical inactivity. It would be fair to state that it is still not

completely known what contributions the mother and father or in combination construct on their child's physical activity levels.

Significance of Study

Many children in the United States are becoming or already are physically inactive. According to past research, children in the United States are less active and more obese than ever before (Brustad, 1996). These children at risk of becoming obese can begin to manifest the health risks and complications associated with this disorder. Obese children and adolescents have significant impairment in physical, psychosocial, emotional, social, and school functioning in comparison to healthy children and adolescents (Schwimmer, Burwinkle, Varni, 2003). The rise of obesity occurring in children and adolescents is still unclear and much of the blame has been placed on the parents shoulders. Parental influence can be the determining factor in prevention of obesity in children and adolescents . This study differs from other studies in correlating physical activity levels with different parental influences in the use of the PAQ-C and Parental Influence Questionnaire. It will determine whether influence differs between mothers and fathers and which socialization variable represents the highest correlation to children's physical activity.

Obesity can be related to the lack of physical activity and physical fitness. In the prevention of obesity it is important to live an active life. Physical activity is one of the leading steps in terms of prevention of obesity, especially in children.

Kimiecik and Horn, 1998 found in their study of relating parents' beliefs to their children's MVPA participation that role modeling from the parents had no effects on their children's MVPA. The study found that relationships among parental beliefs, and the children's adoption of their own beliefs from the parents beliefs, influenced their children's MVPA patterns (Kimiecik & Horn, 1998).

McMurray et al., (1993) explored the effect of parental attitudes and self-reported exercise habits on the fitness and activity levels of their children. Children's predicted VO_2max was not significantly correlated with the exercise benefits and barriers scales used to measure parental attitudes toward exercise ($r(1,113) = .065$, $p>.279$) nor with exercise habits of the parents ($r(1,113) = .066$, $p>.279$). These findings suggest that the parent's exercise habits are not associated with the child's activity habits.

In a study by Anderssen and Wold, 1992 they found that parents and friends are not strongly significant sources of support when it comes to promoting physical activity among children On the other hand, encouragement was strongly related to boys' attraction to physical activity and perceived physical competence, and girl's enjoyment of physical activity made the stronger contribution in their attraction to participation in physical activity in a study by Brustad, 1996. Babkes and Weiss concluded in their study that parents do play a critical role in how their children expressed positive affects, perceived competence, and intrinsic motivation in the sport domain (Babkes & Weiss, 1999).

METHODS

Participants

The participants in this study were 65 children (boys (N= 26), girls (N= 39)) between the ages of 8 and12 (m+/- 10.32 yr) and in grade levels 4 through 6. All the children were currently participating in a physical education class in an elementary/secondary school. Initially, the researcher contacted the school principal and physical education teacher to get approval for a pilot study at their school. It was completed on 8 and 9 year old children (N=11) from an elementary school in South Florida. Following approval by the Barry University Institutional Review Board, the researcher contacted several school principals of elementary and secondary

schools in Miami-Dade County regarding student participation and project approval. Once permission was granted by the school principal, the researcher then contacted the physical education teacher from each school to schedule a time to begin the study. During the first visit to the physical education class, the researcher explained why participation is needed in this study. After the study was explained to the children, the researcher gave each child the parental consent and child assent forms to take home with him/her. The Signed consent and assent forms were returned to the physical education teacher and once forms were collected and given to the researcher, participation began.

Instrumentation and Data Collection

For confidentiality, each school was identified by color code and each participant's questionnaire was number coded. Two questionnaires were given to each child. The first questionnaire was the *Physical Activity Questionnaire for Children* (PAQ-C) (Croker et al., 1997) (Appendix D), which asks the child to recall all activities for the previous 7 days. It includes a list of number physical activities and a line for the child to fill in any activity not included in the list. From the PAQ-C a child's activity frequency during physical education class, recess, lunch, right after school, evenings and weekends can be quantified an average score was calculated from nine items, each scored on a 5-point Likert scale ranging from no physical activity (1) to 7 times or more of physical activity (5) for the past 7 days. Item 1 was determined from the mean value for all activities scores. Items 2 through 8 (physical education, recess, lunch, right after school, evenings, weekends, describes you best) were each indicated on a 5-point scale (1 being low activity and 5 being high activity). Item 9 was determined from the mean scores for all days of the week. Item 10 asked whether the child was sick during the past week but was not part of the summary of activity scores. Once values were found for each of the 9 items an overall mean

score was calculated for each participant. This score was the final PAQ-C activity summary score to identify physical activity level.

The second questionnaire was a 72-item instrument titled *Parental Influence* (Babkes & Weiss, 1999). (Appendix E) These questions probed into a child's perception of maternal and paternal influences on physical activity. The influences quantified in this study are Advocacy for mother (6 items) and father (6 items), Beliefs about Competency (12 items), Performance Contingent Responses (12 items), Expectations (12 items), Involvement (12 items), and Role Modeling (12 items). The child answered each item using a 5-point Likert Scale (1 = almost never, 5 = almost always).

The questionnaires were handed out in the selected physical education class at each school. The children were separated into small groups by the researcher with no more than 6 children to a group. The children were then asked to listen to directions and pay attention to the researcher as the questions were read out for each individual question. If the child did not understand a question, the child was asked to raise his/her hand and then at that time, the researcher was available to answer the question one-on-one with the child. Once completion of the questionnaire was finished each child was asked to hand in the questionnaire to the researcher. The researcher then double-checked the questionnaire to make sure every question was completed. The children were asked to sit quietly until all questionnaires were completed. Once all questionnaires were in the hands of the researcher the children were dismissed from the study and able to participate in the time remaining in their physical education class.

Instrumentation

For confidentiality, each school was identified by color code and each participant's questionnaire was number coded. Two questionnaires were given to each child. The first

questionnaire was the *Physical Activity Questionnaire for Children* (PAQ-C) (Croker et al., 1997), which asks the child to recall all activities for the previous 7 days. It includes a list of number physical activities and a line for the child to fill in any activity not included in the list. From the PAQ-C a child's activity frequency during physical education class, recess, lunch, right after school, evenings and weekends can be quantified. A summary score of physical activity was calculated from nine items, each scored on a 5-point Likert scale ranging from no physical activity (1) to 7 times or more of physical activity (5) for the past 7 days. Item 1 was determined from the mean value for all activities scores. Items 2 through 8 (physical education, recess, lunch, right after school, evenings, weekends, describes you best) were each indicated on a 5-point scale (1 being low activity and 5 being high activity). Item 9 was determined from the mean scores for all days of the week. Item 10 whether the child was sick during the past week was not part of the summary of activity scores but identified children who had unusual activity during the previous week. Once values were found for each of the 9 items an overall mean score was calculated for each participant. This score was the final PAQ-C activity summary score to identify physical activity level.

The second questionnaire was a 72-item instrument titled *Parental Influence* (Babkes & Weiss, 1999). These questions probed into a child's perception of maternal and paternal influences on physical activity. The influences quantified in this study are Advocacy for mother (6 items) and father (6 items), Beliefs about Competency (12 items), Performance Contingent Responses (12 items), Expectations (12 items), Involvement (12 items), and Role Modeling (12 items). The child answers each items using a 5 point Likert Scale (1 = almost never, 5 = almost always).

The questionnaires were handed out in the selected physical education class at each school. The children were separated into small groups by the researcher with no more than 6 children to a group. The children were then asked to listen to directions and pay attention to the researcher as the questions were read out for each individual question. If the child did not understand a question, the child was asked to raise his/her hand and then at that time, the researcher was available to answer the question one on one with the child. Once completion of the questionnaire was finished each child was asked to hand in the questionnaire to the researcher. The researcher then double checked the questionnaire to make sure every question was completed. The children were asked to sit quietly until all questionnaires were completed. Once all questionnaires were in the hands of the researcher the children were dismissed from the study and able to participate in the time remaining in their physical education class.

Statistical Analysis

SPSS Version II was used for statistical analyses. From the Parental Influence Questionnaire, each answer was separated mother and father into the appropriate category and by the different subscales: Advocacy, Beliefs about Competency, Performance Contingent Responses, Expectations, Involvement, and Role Modeling. Answers were scored from a Likert Scale (1 being "Almost Always and 5 being "Almost Never").

Internal consistency was calculated for each subscale along with item analysis. Means for each subscale were computed by including the items that add to the internal consistency of the subscale. A multiple linear regression was used to determine if parental influence in combination predicts the child's physical activity level. A stepwise multiple regression was used to determine which influence demonstrated the greatest significance in correlating with level of physical activity. A multiple regression was used to determine whether father's influence was

significantly greater than the mother's influence. All data were expressed as mean ± standard deviation. Significance was set at $r = .700$ and $p < .05$.

RESULTS

Physical Activity Questionnaire

Descriptive statistics for the *Physical Activity Questionnaire for Children* are provided in Table 1. Item 1 (all activities) asked the child to report all activities they participate in during their spare time. Some of the activities listed were skipping, walking for exercise, tag, and football. Item 2 (physical education participation) asked the child how often during physical education class were they active; the scores ranged between (1- I do not do physical education) to (5 - I always do physical education). Item 3 (activity during recess) asked the child to score what they do during recess on a scale from (1- sitting down the majority of time) to (5- ran and played around hard most of the time). Item 4 (activity during lunch) asks the child to score what they normally do during lunch on a scale from (1- sitting down the majority of time) to (5- ran and played around hard most of the time). Item 5 (activity right after school) asks the child to score how many days right after school did they very actively participated in sport, dance or games on a score of none to 5 times last week. Item 6 (activity during evenings) asked the child to recall how many evenings they participate in sports, dance, or games with a scale of (1- none) to (5- 6 or 7 times last week). Item 7 (activity during last weekend) was a recall of how active was the child in sports, dance or games on the past weekend, the scale was (1- none) to (5- 6 or more times). Item 8 (description of amount of time spent being active) asked the child to describe themselves best for the total seven past days with the scale ranging from (1- all or most of my free time was spent doing things that involve little physical effort) to (5- very often (7

times or more)). Item 9 (how often each day) asked the child to circle how often they were physically active for each individual day ranging from (1- none) to (5- very often). And, Item 10 asked the child if they were sick or if anything preventing them from physical activity from the last week. The overall mean (item 1-9) was used to determine the physical activity level of the children. Item 10 reported no unusual activity or illness for that week. In general, from a 7- day recall children were only active 2 or 3 times within the week, ran or played around a little bit, and sometimes were active in physical education. Internal consistency and reliability was determined for the combination of all the questions. Table 2 shows the Cronbach's alpha for items 1 through 9.

Parental Influence Questionnaire

Descriptive statistics for the Parental Influence Questionnaire are provided in Table 3. The average scores were consistently higher for the mother's subscales with the exception of Expectations, Involvement, and Role Modeling. The last two subscales were higher, on average, for the father, and there was no difference between parental subscales for Expectations. Internal consistency and reliability was determined for each individual subscale – Table 2.

Combination of Parental Influences and its Relationship to Physical Activity Level

A Stepwise multiple linear regression was calculated to predict the child's physical activity level based on their parental influence. The combination of means of each parental influence subscale excluding Expectations for both mother and father were used to predict the physical activity level of the child. A significant multiple regression equation was found with the following influences predicting the child's physical activity level; advocacy mother, advocacy father, beliefs about competency mother, beliefs about competency father, performance

contingent responses mother, performance contingent responses father, involvement mother, involvement father, role modeling mother, and role modeling father at ($F(10,54) = 2.619$, $p < .001$), with an R^2 of .327 and a standard error of estimate .36843.

Correlations of Parental Influences and Physical Activity Levels

A stepwise regression was calculated to determine if role modeling had the highest correlation with physical activity level excluding expectations for both mother and father. The mother's beliefs about competency was significant ($F(1, 63) = 12.800$, $p < .001$), with an R^2 .169 and a standard error of estimate of .65666. The results indicate that mother's beliefs about competency is the only significant parental influence in determining a child's physical activity level. In addition a Pearson Correlation was calculated for the relationship between the child's physical activity level and the parental influences. The highest correlation ($r(63) = .411$, $p < .01$) was found, an indication of a significant linear relationship between physical activity level and another's beliefs about competency. The results of the correlations can be found in Table 4.

Father's Influence on Physical Activity Level

It was hypothesized that the father would show a greater influence on the child's physical activity level in comparison to the mother. Two separate multiple linear regressions were calculated to predict the child's physical activity level. The first multiple linear regression was based on the mother's influences: Advocacy, Beliefs about Competency, Performance Contingent Responses, Involvement, and Role Modeling. A significant regression equation was found ($F(5,59) = 3.172$, $p < .001$), with an R^2 of .212 and standard error of estimate of .66078. Mother's Beliefs about Competency was the only significant predictor. The second multiple linear regression was calculated to predict the child's physical activity level based on the father's influences: Advocacy, Beliefs about Competency, Performance Contingent Responses,

Involvement, and Role Modeling. A significant regression equation was found ($F(5,59) = 3.481$, $p < .001$) with an R^2 of .228 and standard error of estimate of .65405. The subscale Performance Contingent Responses is the only significant predictor. Thus, indicating that the mother not the father's influence is a predictor for the child's physical activity level.

DISCUSSION

The purpose of this study was to determine the extent to which parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance-contingent response correlate with children's physical activity levels and to determine if parental role modeling has the greatest correlation to children's physical activity levels. An additional purpose is to determine whether a father's influences on children's physical activity levels are greater than mother's.

Physical Activity Questionnaire

The PAQ-C was used in the present study for the children to recall their physical activity from the past seven days. The results revealed that the children in the study were at a moderate level of physical activity with a total mean of 3.35 (1 = low activity and 5 = high activity) for an average of 7 times per week. Physical education participation was the second highest score (mean = 4.23), physical activity during recess was the highest (mean = 4.31) and in retrospect the physical activity level was the lowest during the child's spare time and during lunch (mean =1.96).

Since the highest scores were obtained during physical education class and recess it might is evident that these children received most of their physical activity during school. This can be indication that parental influence may be a factor if the child's physical activity level is

low due to the low scores for activity during the evenings, right after school, and during the last weekend.

Past research using the PAQ-C has shown good reliability and internal consistency (Croker et al., 1997). The only problems that existed with this questionnaire in the past were different, was=s in weather conditions from the two separate weather conditions. (Croker et al., 1997). This factor was not included in this study, however it could change the results if the weather conditions were different and the children were not able to be physically active due to rain for example or a different time of the year of administration.

Parental Influence Questionnaire

In the present study the Parental Influence Questionnaire was used to determine if different socialization variables such as advocacy, beliefs about competency, performance contingent responses, expectations, involvement, and role modeling from the mother and father have any influence on the child's physical activity level. Numerous researchers have studied socialization variables and if they influence physical activity in children (Kimiecik & Horn, 1998; Anderssen & Wold 1992; Brustad, 1996; and Weiss & Babkes, 1999).

The results of this study demonstrated that socialization variables in combination exert some significance in predicting a child's physical activity level. The main finding of this study, however, was that maternal beliefs about competency was the most influential and limiting factor in predicting their child's physical activity level. These results somewhat support with the findings of Kimiecik and Horn (1998) in which they found relationships among parental beliefs, and the children's adoption of their own beliefs from the parents beliefs all of which influenced the children's MVPA patterns.

The subscale Beliefs about Competency in this study was used to distinguish how the child views what the respective parent believes about them. Based on the results from this study the following items predicted the child's physical activity level; does the mother think the child is good at sports, does she believe sports comes easily to them, does she believe that they are better at sports than most kids their age, is she proud of their sport skills, and does she believe that they are a good athlete. This result was unexpected by the researcher. Role modeling from the father's aspect was thought to be the predicting factor however, no significant correlations were found to back this assumption.

Brustad (1996) found that when studying differences in gender that the boys are more physically active when their parents encourage them and the parents show high levels of perceived competence. For the girls, they found that parental encouragement and enjoyment resulted in physical activity participation. In this present study gender was not a covariate and could have been a distinguishing factor since boys and girls reported being interested in different types of physical activities and might receive different support from their parents. When the parental influences of Advocacy, Beliefs about Competency, Performance Contingent Responses, Involvement, and Role Modeling were used to study children's participation in soccer (Babkes & Weiss, 1999), it was found that the parent's do play a significant role in participation in soccer.

The researcher believes that these results may be due to the assumption that the children in this study may have spent more time with the mother than the father. The children might have fathers that work for a living and are unable to be there to support their child's physical activity or, on the other hand, the children might have mothers who stay at home instead of working and

take care of the family and the family's needs. Therefore, parental influence would be higher from the mother's aspect.

The subscale Beliefs About Competency for the mother was the only significant predictor for physical activity level of children in this study. The researcher assumed that this may be due to the child feeling and/or recognizing that they have acceptance from their mother in regard to participating in physical activity. In regard to physical activity, positive beliefs about competency appear to encourage the children to be physically active and allow the child to acknowledge the support coming from his/her parents, in this case the mother.

Since investigation of children's physical activity and how parents might be involved is so widely studied and examined that there might not be a correct answer or a direct correlation to physical activity level. The researcher notes that parental influences need to come in positive forms in order to achieve a positive outcome, prediction of physical activity. For the purposes of this study the use of the Parental Influence Questionnaire and PAQ-C determined Beliefs about competency from the mother to be the best predictor of a child's physical activity level.

Limitations

To this researcher's knowledge this was the first time the PAQ-C and Parental Influence Questionnaire were used in combination which could represent why the standard error of estimate was high. Limitations to this study also include the schools selected, the age level of the subjects, the inclusion of participating in physical education class, and the small number of children surveyed. It was assumed that the schools selected and age groups represented all the children in Miami-Dade County, Florida.

Recommendations

For further research there are many recommendations. First, it would be interesting to see if a child's sex, age, cultural or racial differences has any influence on the different physical activity levels or parental influences, all of which were not cofactors in this study. Second, including the parents of the child to complete the Parental Influence Questionnaire would investigate differences in perceived influences between parent and child. Third a change in demographics would allow a comparison of South Florida children to Northeastern children, it would be interesting to see if indeed weather plays a factor in the child's physical activity. Fourth, determine social economic status as a cofactor this could have an impact on physical activity. And lastly, include the parent's occupation status many parents might work at night, evenings, multiple jobs or others may be stay-at-home parents and these could influence their child's physical activity levels.

Summary

One purpose of this study was to determine whether the influences of such as parental advocacy, expectations, involvement, role modeling, beliefs about competency, and performance- contingent responses predict children's physical activity levels. In general, in combination parental influences show some significance in predicting the child's physical activity level. However, the main contributor remains unknown from the results of the current study and further research is needed. Another purpose was to determine if parental role modeling has the greatest correlation to a child's physical activity level. The results indicated that role modeling was not significant and beliefs about competency was, in fact, the only significance variable ($p = .001$).

The last purpose was to determine whether a father's influences on children's physical activity levels are greater than a mother's. The results showed only the mother to have a significant relationship. Therefore, the father is not the most influential as assumed. Based on these results a child's physical activity level is predicted and correlated with the mother's beliefs about competency.

To conclude, mother's Beliefs about Competency showed to be a prediction of physical activity levels, with the child's physical activity level at a moderate level. This can be an indication either more needs to be done in the aspects of socialization of sport from the parent, or the parent(s) have little to none influence on the physical activity level. Since the mean average of physical activity level was in the "moderate" range it was hard to distinguish between the two circumstances. This in turn leads to the need for more research to be done to find exactly how we can change the current problems existing relating to childhood obesity and the low levels of physical activity. And additional research using the PAQ-C and Parental Influence Questionnaires is needed to determine if these two methods used in combination actually can predict children's physical activity levels based on parental influences.

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TABLE 1. Mean scores (N = 65) from the Physical Activity Questionnaire for Children.

Items	Mean *	SD
1. All activities	1.9645	.60719
2. Physical education participation	4.2308	.98058
3. Activity during recess	4.3077	.98303
4. Activity during lunch	1.9692	1.3803
5. Activity right after school	3.3231	1.3123
6. Activity during evenings	2.9077	1.2339
7. Activity during last weekend	3.5385	1.2384
8. Description of amount of time spend being active	3.2154	1.1387
9. How often for each day	3.2923	1.1281
10. Overall Score	3.1944	.71463

* Mean of 5-point Likert Scale (1 = lowest physical activity) (5 = highest physical activity)

Table 2. Cronbach alpha's for Parental Influence Questionnaire and PAQ-C

Scale	r	Deleted
PAQ-C	.806	# 4 (Activity During Lunch)
Mother		
Advocacy	.637	Item # 37, 49
Beliefs about Competency	.808	
Performance Contingent Responses	.750	Item # 18, 42
Expectations	.401	Item # 7
Involvement	.814	
Role Modeling	.822	
Father		
Advocacy	.809	Item # 38, 50
Beliefs about Competency	.917	
Performance Contingent Responses	.738	Item # 18, 42
Expectations	.598	Item # 8
Involvement	.873	
Role Modeling	.849	

Significance at r = .700

TABLE 3. Mean Scores (N = 65) for the Parental Influence Questionnaire

Scale	Mean	SD
Mother		
Advocacy	4.0231	.75224
Beliefs about Competency	4.0897	.73307
Performance Contingent Responses	4.6462	.61485
Expectations	2.3200	.65173
Involvement	3.0744	.95107
Role Modeling	3.5897	.84834
Father		
Advocacy	3.8096	1.0833
Beliefs about Competency	3.9744	1.0292
Performance Contingent Responses	3.7885	.86741
Expectations	2.3200	.65173
Involvement	3.4487	1.0631
Role Modeling	3.7359	.97978

* Mean of a 5-point Likert Scale (1 = almost always) (5 = almost never)

TABLE 4. Correlations of mean physical activity and mean parental influences.

Scale	Pearson Correlation
Mother	
Advocacy	.262*
Beliefs about competency	.411*
Performance contingent responses	.143
Involvement	.150
Role modeling	.150
Father	
Advocacy	.197
Beliefs about competency	.230*
Performance contingent responses	-.009
Involvement	.144
Role modeling	.270*

∗ Significance ($P \leq .05$)