Abstract

THE RELATIONSHIP BETWEEN BODY IMAGE AND FREE TIME PHYSICAL ACTIVITY IN CHILDREN 5-8 YEARS OLD

by

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Childhood obesity has become a huge issue in the United States. This study examines the relationship between body image and free time physical activity in children ages 5-8 years old. The Collins Figure Drawings were used to assess how participants viewed their ideal body image and perceived body image and behavior observed most often was recorded. Overall, results indicated that 34.5% of participants were overweight. Fifty-eight percent of boys and fifty-four percent of girls were dissatisfied with their bodies. The behavior most observed during free time for both girls and boys was sitting. Although the majority of participants were dissatisfied with their bodies, it did not impact the amount of physical activity children achieved. Participants were engaged in moderate physical activity for 13 minutes during free time (free time was for 30 minutes). Results from this study indicated that there is no relationship between body image and physical activity.

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Chapter 1: Introduction

Introduction

Nearly 50% of American youth are physically inactive (Bulwer, 2004). Together with unhealthy eating habits, physical inactivity is the second leading preventable cause of death in North Carolina (Terrell, 2002). Sedentary lifestyles are ranked among the top ten causes of death worldwide. In the United States, 23% of chronic disease is linked to sedentary lifestyles (Bulwer, 2004).

When children are physically inactive, childhood obesity increases. Childhood obesity is defined as a body mass index (BMI) at or above the 95th percentile for children of the same sex and age (Centers for Disease Control, 2009). Within the past 20 years, childhood obesity rates have doubled, and currently, one in three children is now classified as overweight or obese (American Heart Association, 2006). Among children aged 6-11, 15.8% are overweight and another 31.2% are at risk for being overweight (Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006).

More specifically, children in North Carolina are more likely to be overweight compared to their national peers (Centers for Disease Control, 2006). North Carolina ranks fifth in the United States for childhood obesity. Nineteen percent of children in North Carolina ages 10-17 years old are obese (Trust for America's Health, 2009). Between 1995 and 2004, the prevalence of overweight children and adolescents in North Carolina increased 19.8% among 12-18 year olds, 62.2% in 5-11 year olds, and 65.3% in 2-4 year olds. Childhood obesity may be attributed in part to low levels of physical activity.

Statement of the Problem

Childhood obesity is an epidemic in the United States and in North Carolina (Fairclough & Stratton, 2006). North Carolina children are more likely to be overweight compared to their national peers (Centers for Disease Control and Prevention, 2006). Research has shown that obese children grow up to become obese adults. As stated by the Committee on Nutrition (2003), the probability of childhood obesity continuing into adulthood is estimated to increase from 20% at 4 years of age to 80% by adolescence. Thus, it is important to stress physical activity at a young age.

There are many benefits to being physically active. Physical activity reduces the risk of obesity, cancer, cardiovascular disease, and diabetes (Stein, Fisher, Berkey, & Colditz, 2007). Not only does physical activity have positive physical outcomes, it also contributes to emotional health. Physical activity decreases symptoms of anxiety and depression. It increases self-confidence and improves sense of well-being (Stein, Fisher, Berkey, & Colditz, 2007). If a child is physically active, he or she is more likely to have a high self-esteem and will have a positive body image. An inactive child may become dissatisfied with his or her body (Buss, 2001).

If a child becomes overweight or obese, he or she may begin to view their body image negatively. Body image is defined as a person's perception of his or her own physical appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Body dissatisfaction is defined as subjective feelings of dissatisfaction with one's physical appearance (Skemp-Arlt, Rees, Mikat, & Seebach, 2006). According to Buss (2001),

children as young as 7 and 8 years old have reported dissatisfaction with their bodies. By the ages of 8-10, most girls were dissatisfied with their bodies.

The purpose of the study was to understand the relationship between perceived body image and levels of physical activity of children ages 5-8 years old. The study explored how perceived body type of children relates to the duration and intensity of physical activity in which they participated. Data was collected during late spring 2009 during free time at an after-school program. Free play is a period during which children control what activities they participated, and how long they engage in the activity. Activities were freely chosen during free time thus, mimic a leisure experience (Mannell & Kleiber, 1997). Body image, physical activity intensity, and physical activity duration will be examined with the following research questions:

1. What is the relationship between children's body image and the *duration* of physical activity undertaken during free play physical activity among 5-8 year olds?
2. What is the relationship between body image and *intensity* of physical activity during free play among 5-8 year olds?

Results from the study provided important information on how to develop a healthy body image for children through physical activity and health promotion programs. Findings from the study were reported herein and in a separate report to the YMCA of Western North Carolina to make physical activity and positive body image a priority.

Limitations

Findings from the study were limited if children feel uncomfortable talking about their appearance and are reluctant to answer questions. The children may not like to talk about their bodies, especially if they are overweight. In order to minimize embarrassment or discomfort, children were taken into a private room where assessments were conducted. Also, it is important to realize that the children's behavior may change during free play if they know that they are being monitored.

Delimitations

The findings from the study are limited to children ages 5-8. This age is appropriate for the study because research has shown most children become dissatisfied with their bodies by the age of seven. The study focuses on physical activity of participants during free play during late spring of 2009. The study sites were chosen by the cooperating agency.

Variables Defined

Body Image: A person's perception of his or her own physical appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

Body Image Dissatisfaction:

1. Subjective feelings of dissatisfaction with one's physical appearance (Skemp-Arlt, Rees, Mikat, & Seebach, 2006).
2. Body Image Disturbance: refers to the complex construct of body image that includes cognitive component (unrealistic expectation for a certain appearance feature), behavioral component (avoidance of certain situation that elicit body

image scrutiny), and perceptual component (overestimation of one's body size)" (Thompson, Heinburg, Altabe, & Tantleff-Dunn, 1999, p. 9).

Body Mass Index (BMI): "A mathematical ratio between body weight and height" (Ward, Saunders, & Pate, 2007 p. 160). BMI is calculated with the following equation: weight (in kg)/height (m^2)

Childhood Obesity: Is defined as a body mass index (BMI) at or above the 95th percentile for children of the same age and sex (Centers for Disease Control and Prevention, 2009).

Duration: How long a person does a physical activity in any one session (U.S. Department of Health and Human Services, 2008)

Intensity: Measured by the metabolic equivalent (MET) as light, moderate, or vigorous. MET is the energy used by the body as we sit still. Any activity that burns 3-6 METs is considered moderate-intensity physical activity and any activity that burns more than 6 METs is considered vigorous-intensity physical activity (Centers for Disease Control and Prevention, 2008).

MET: Energy used by the body as a person sits still (Centers for Disease Control and Prevention, 2009).

Physical activity: "Bodily movement produced by skeletal muscles that expends energy beyond resting levels" (Ward, Saunders & Pate, 2007, p. 4).

Chapter II: Review of Literature

Background

Childhood obesity is an epidemic (Fairclough & Stratton, 2006). As stated by the Committee on Nutrition (2003), the probability of childhood obesity continuing into adulthood is estimated to increase from 20% at 4 years of age to 80% by adolescence. Associated with obesity are short-term health problems such as hyperlipidemia, hypertension, insulin resistance, respiratory problems, and orthopedic complications (Trost, Sirard, Dowda, Pfeiffer, & Pate, 2003). Other health problems include coronary heart disease, osteoporosis and some types of cancer (Brown, Pfeiffer, McIver, Dowda, Addy, & Pate, 2009). Physical activity has been widely recognized as a factor that can reduce obesity (American Heart Association, 2006). Researchers have linked physical activity and body image in children and adolescents.

Body dissatisfaction is defined as subjective feelings of dissatisfaction with one's physical appearance (Skemp-Arlt, Rees, Mikat, & Seebach, 2006). Davison, Markey & Birch (2000) found that twenty-one percent of 5 year old girls had concerns about their weight. According to Buss (2001), children as young as 7-8 years old have reported to be dissatisfied with their body. At adolescence, 80% of girls and 40% of boys were dissatisfied with their bodies. In an effort to improve children's sense of self, it may be important to increase children's physical activity achievement. The current study sought to investigate the relationship between physical activity and body image.

Physical Activity

Physical activity is defined as "bodily movement produced by skeletal a muscle that expends energy beyond resting levels" (Ward, Saunders & Pate, 2007, p. 4). There are many benefits to being physically active. According to the U.S. Department of Health and Human Services (2008) physical activity reduces the risk of many adverse health outcomes including improved cardiorespiratory and muscular fitness. The 2008 Physical Activity Guidelines for Americans states that children should be physically active for at least 60 minutes per day (U.S. Department of Health and Human Services, 2008). These guidelines stat that most of the activity should be either moderate or vigorous aerobic activity. Regular physical activity promotes a healthy body weight and body composition (U.S. Department of Health and Human Services, 2006).

Physical activity may be achieved during leisure time, school physical education classes, and during other school breaks such as recess/free time. However, recent research indicates that during free time youth are most often engaged in sedentary activities. For example, there has been an increase in physically passive media use such as watching television and playing video games since 1999 (Ziviani, MacDonald, Jenkins, Rodger, Batch & Cerin, 2006). According to the Maternal and Child Health Bureau, one-fifth of high school students reported using a computer for things other than school work three or more hours on an average school day. Another source reports that thirty-eight percent of students reported watching television for three or more hours on an average school day (U.S. Health and Human Services, 2006). Overall, children are

participating in sedentary activities and not achieving the recommended amount of physical activity.

Another avenue for physical activity is physical education. However, the percentage of students engaging in physical education (PE) classes dropped significantly from 41.6% to 25.4% between 1991-1995 (Pate et al, 2006). Another study found that only 6% of middle schools provided physical education for the entire school year, 15% offered daily PE classes for at least half the year, and 34% offered it three days per week for at least half the school year (Pate et al, 2006). Changes in requirements and availability of physical education classes within schools have decreased children's routine physical activity with the exception of children enrolled in athletic programs (Committee on Nutrition, 2003).

Children do not receive daily physical education or sufficient physical activity during physical education classes (American Heart Association, 2006). Thus, if children depend on physical education for physical activity (as many youth do) levels of physical activity will decline as children reach adolescence (Fairclough & Stratton 2006). A third avenue for physical activity promotion is recess/free play. Outside of physical education, free play is another form of physical activity. Free play is important part of a child's day. It allows a child to learn how to work in groups, share, negotiate, resolve conflict, and stand up for themselves. It also allows children to engage in activities such as running, hopping, skipping, and jumping that helps develop movement patterns and skills (Pryke, 2006). Often children engage in active play during free play. Active play is the most common form of physical activity for children (Pryke, 2006).

With obesity rates increasing, free play offers opportunities for youth to participate in physical activity. Further, youth have freedom to decide what they want to do during free play. Physical activity allows a child to build a positive self-perception. (Pryke, 2006). With high rates of obesity and lower than recommended physical activity levels, children are at risk for a negative body image.

Children's Body Image

Body image is defined as a person's perception of his or her own physical appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). By the age of seven, children become increasingly aware of physical differences between themselves and friends (Pryke, 2006). According to Smolak and Levine (2002), children's body image dissatisfaction tends to focus on body type. There are several factors that affect the development of body image in children including parents, peers, and media. First, parents select and comment on a child's clothing and appearance. Further, parents control what a child wears and the types of food a child eats. If a parent feels that their child has a weight problem, the child may be placed on a calorie-restrictive dieting or exercise for weight loss. As a result, children may focus on and be unhappy with their body shape (Smolak, 2002).

Second, peer influences can contribute to the negative stereotype associated with body fat. Social comparisons and teasing appear as factors in elementary schools and some research has indicated that peer influences are more strongly related to body dissatisfaction than parental control (Smolak, 2002). As stated by Rukavina and Li (2007), obesity bias can be psychologically or emotionally damaging for overweight

children and adolescents. The authors explain, “Obesity bias is the tendency to negatively judge an overweight or obese individual based on assumed and/or false character traits” (p. 67). There are two types of obesity bias: implicit and explicit. Individuals who consciously acknowledge or choose to express their attitudes against overweight people hold explicit bias. Implicit bias exists beyond conscious awareness and occurs when environmental cues are present. Examples of implicit bias are when an obese person acts lazy or someone tells a fat joke. Teasing and name-calling are examples of explicit bias (Rukavina and Li, 2007). During physical activity, overweight children’s bodies are not only on display, but so are their movement skills and abilities.

Kostanski and Gullone (2007) studied the impacts of teasing and physical activity on body image of children. The study consisted of 431 children in grades two, three, and four. Fifteen percent of the students involved in the study reported being teased in a form of derogatory labeling (“spaghetti legs” or “fatty boomba”) about weight related issues. Children outside normal weight experienced a greater frequency of teasing. Not only were overweight children being mocked, but so too were underweight children. The participants mentioned names such as “spaghetti sticks” and “skinny bones” in reference to underweight children. The study found that children who reported being teased had greater body dissatisfaction than those who did not report being teased. Body dissatisfaction appeared to be highest in overweight girls.

Lastly, the media has an important role in influencing today’s youth. Many television shows and movies portray thinness as being attractive. Children view this and begin to question if they are attractive. “Children learn from their families, teachers,

friends, and the media that fat is 'bad' and thin is 'good', and they learn this lesson well before adolescence" (Flannery-Schroeder & Chrisler, 1996, pp. 243-244 as cited in McCabe & Ricciardelli, 2003). Media surveys have observed that fashion magazines are read by the majority of women and girls. Fashion and media models are the most potent source of pressure to be thin (Tiggemann, 2002).

As a result of parent, peer, and media pressures, many girls want to be thinner than their current figures. Several studies have examined body image concerns among children and adolescents. Feldman, Feldman, and Goodman (1988) reported results from a survey of 271 girls and boys. Almost half the girls thought they were too fat when 83% were actually normal weight for their height. Boys, on the other hand, were the opposite. Boys wanted to be heavier and more muscular than their current body type (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

Wood, Becker, and Thompson (1996) designed a study to explore children's body image dissatisfaction. The ages of the participants ranged from 8-10 years old. Results from the study stated that girls were considerably more dissatisfied with their bodies and had a lower self esteem than boys. Girls also wanted to be thinner than their current figure. The findings demonstrate that body dissatisfaction occurs before adolescence.

McCabe and Ricciardelli (2003) measured behaviors and attitudes toward body weight among 8-11 years olds in grades 3-5. Participants were grouped by age as (8-9 and 10-11). Results indicated that children with low self-esteem were more dissatisfied with their bodies children with higher self-esteem. Data showed that about half of boys and girls in both age groups had experienced fears about being overweight, wanted to be

thinner, had changed their eating habits, and exercised to lose weight. Both girls and boys (as young as 8 years old) were concerned about their muscles. Two-fifths of 8-9 year old boys and one-fifth of 10-11 year old girls were concerned about the size of their muscles. Boys seemed focused on both losing weight and gaining muscle mass while girls focused on losing weight.

Closely tied to the concept of body image is the concept of self-perception. Self perception is an awareness of the characteristics that constitute one's self (Dictionary, 2009). Initial research has linked adolescents' physical self-perception to their physical activity participation. For example, Kirkcaldy, Shephard, and Siefen (2002) examined the association between physical activity and self-image among 14-18 year olds in Germany. Eleven percent of the participants reported that they never engaged in endurance sporting activities, thirty-nine percent reported infrequent participation, thirty percent often participated, and twenty percent frequently engaged in endurance or aerobic type exercises. The results showed that students who participated in endurance sports had a better self-image as well as better physical and psychological health those who did not participate in endurance sports. Participants who exercised enhanced their fitness and decreased body mass which improved their self-image.

Haines, Neumark-Sztainer, and Thiel (2007) conducted a study to evaluate the relationship between physical activity and different facets of self-perception. The study examined children ages 9-14 years old. The study concluded that self-perception scores among both boys and girls increased over 30% in children who increased their physical activity compared to those who had little or no activity change.

Dwyer, Allison, Goldenberg, Fein, Yoshida, and Boutilier (2006) examined adolescent girls during a focus group that discussed topics such as reasons for participating in moderate to vigorous physical activity, suggestions to help adolescents become physically active, and things that made physical activity difficult. The study found that many girls commented that they felt self-conscious about their appearance in front of adolescent boys. Adolescent boys also intimidated girls verbally during co-ed activities.

Lastly, Boyd and Hrycaiko (1997) conducted a study that measured the relationship between self-perception and physical activity intervention. The study included pre, early, and middle adolescent girls ranging from 9-16 years old. Results showed that pre-adolescent girls with low self-esteem and low physical self-concept benefited the most from the intervention. The intervention consisted of skill-related activities that enhanced physical self-concept. The younger girls focused on coordination, speed, and agility and the older girls focused on endurance activities. As the girls' ages increased, the approval rating of the intervention went down.

Findings indicated that the relationship between self-perception and physical activity is established among adolescents. However, whether this relationship or a relationship between body image and physical activity exists among younger children is unknown.

Leisure Constraint Theory

There are several theories that describe why people participate in physical activity. Due to the scope of this study, the theoretical foundation will focus on why

people *do not* participate in physical activity. Leisure constraint theory is a theory that describes why individuals may not participate in leisure activities. Leisure constraints lead people to define leisure activities, services and locales as inappropriate, uninteresting, or unavailable (Mannell & Kleiber, 1997).

Three types of constraints were identified by leisure researchers (Mannell & Kleiber, 1997). The first constraint is intrapersonal. Intrapersonal constraints are "psychological conditions that arise internal to the individual such as personality factors, attitudes, or more temporary psychological states such as moods" (Mannell & Kleiber, 1997, p. 332). Intrapersonal constraints exist when results of abilities, personality needs, prior socialization and perceived reference group fail to develop leisure preferences (Jackson & Scott, 1999). The second constraint is interpersonal. Interpersonal constraints are psychological conditions that arise out of interaction with others such as family, friends, co-workers, and neighbors (Mannell & Kleiber, 1997). The last constraint is structural. Structural constraints result from external conditions in the environment (Mannell & Kleiber, 1997). Factors that intervene between leisure preference and participation influence structural constraints (Jackson & Scott, 1999). Factors such as a lack of opportunities or the cost of activities are structural constraints (Mannell & Kleiber, 1997).

Body image has been identified as a relevant constraint to leisure. According to Fredrick and Shaw (1995), body image "…can constrain leisure in some situations, although it is not a constraint in the traditional sense of preventing participation" (p. 57). In the study that examined 190 female undergraduate students enrolled in a large

university in Ontario, Canada, the authors found that body image did not have a significant effect on participation levels of female students, but did constrain the enjoyment of aerobics as a leisure activity. It also showed that body image concerns were an important factor motivating participation. Societal pressure for women to be slim was the root of the motivation to participate (Frederick & Shaw, 1995). The notion that body image can and does act as a constraint to leisure time physical activity was supported through the results.

Additionally, Liechty, Freeman and Zabriskie (2006) conducted a study that examined the relationship between body image and leisure constraints for college-age women and their mothers. The study consisted of 116 female students at a private college and 76 mothers. Eighty-eight percent of the women in the study had a negative body image. Results found that participants felt their ideal body image was smaller than their actual size. Related to this negative body image were constraints to participation, constraints to enjoyment, constraints to physically active leisure, and constraints to activities that would promote weight loss. The study found that more than ninety-two percent of the participants experienced at least one of the four constraints (Liechty, Freeman & Zabriskie, 2006).

Body image is often conceived of as both an intrapersonal (psychological) constraint and an interpersonal (social) constraint. Research on intrapersonal constraints did not affect the target population in this study. According to Ziviani, MacDonald, Jenkins, Rodger, Batch, & Cerin (2006), children see themselves through a “looking glass”. The “looking glass” tells a child they are physically competent and are likely to

engage in and enjoy physical activity. If a child's reflection tells them differently, then they may withdraw from physical activity. Intrapersonal constraints affect the child's personality and may cause the child not to be physically active. Similarly, if peers appear to be critical of their physical activities (interpersonal constraint), children will withdraw from situations where they may be vulnerable to criticism (Ziviani et al, 2006). Instead of a child risking embarrassment or teasing by peers, the child may not participate in physical activity.

If a child has had a previous experience in which he or she was mocked due to his or her body image, he or she may avoid that activity again. "Concerns about body image, body weight, or appearance may constrain participation in some leisure activities or may affect enjoyment of particular leisure situations" (Frederick & Shaw, 1995, p. 58). Weight-related teasing could worsen a negative cycle of inactivity and cause a child to avoid physical activity and settle for more sedentary activities (Rukavina & Li, 2007). This attitude can lead to a sedentary lifestyle.

This study examined children during free play because they have the freedom to choose any activity instead of being required to participate in a set physical activity curriculum. Children should be able to fully enjoy free play activities without being concerned with their appearance. If a sound base for physical activity is established as a child, it will develop and be continued throughout adulthood. As stated by Dwyer, Allison, Goldenberg, Fein, Yoshida, & Boutilier (2006), "establishing patterns of physical activity during childhood and adolescence is important for immediate gains in

health and well-being and to develop positive behaviors that can be deployed throughout the life course" (p. 76).

Chapter III: Methods

Purpose of the Study

The purpose of the study was to investigate the relationship between perceived body image and levels of physical activity of children ages 5-8 years old. Data was collected during spring 2009 during free play at an after-school program sponsored by Buncombe County Schools and the YMCA of Western North Carolina. Free play is a period during which children control what and how long they engage in the activity. Activities were freely chosen during free play and thus, mimic a leisure experience (Mannell & Kleiber, 1997). Results from the study may provide important information on how to develop a healthy body image for children through physical activity and health promotion programs. Findings from the study were given to the YMCA of Western North Carolina to make physical activity and positive self-image a priority.

Study Site

Children ages 5-8 years old were invited to participate in the study. Participants currently enrolled in the YMCA of Western North Carolina's after-school program in Buncombe County, North Carolina were eligible for this study. Although the participants were enrolled in a structured after-school program, there was designated time allotted for free time play. Free time play, which is similar to school-based recess, was an opportunity for leisure because children are allowed to freely choose activities in which they would like to participate.

According to the 2008 U.S. Census Bureau, the mean household income for Buncombe County was $59,349. The median household income was $43,208. The data

include the 2007 inflation adjusted dollars. Eight percent of families and thirteen percent of individuals were below the poverty line in Buncombe County. The total population of Buncombe County was 222,881. There were 12,216 children between the ages of 5-9 years old, which is 5.5% of the population in Buncombe County. Eighty-six percent of the population had a high school diploma or higher while thirty-one percent of the population had a bachelor's degree or higher (U.S. Census, 2009).

The YMCA of Western North Carolina has provided a safe and caring environment for youth for more than 150 years. The agency has four branches, three satellite childcare sites, and over 200 programs throughout the community. Programs include aquatics, childcare, youth sports, fitness, and summer day camps. YMCA of Western North Carolina and Buncombe County Schools have partnered to offer after-school programs for the youth of the area. Seventeen schools participate in the after-school program (YMCA of Western Carolina, 2009).

Sample Selection

Participants were recruited from two after-school programs from two different sites. Program sites with adequate numbers of youth were selected for inclusion by the funding agency and partner agency (YMCA and Be Active Appalachian).

Participants had similar characteristics at both sites and were sampled from both sites until a minimum of sixty youth were enrolled in the study. All appropriately aged children at each site were invited to enroll. Based on parental consent and youth assent forms returned 55% were from one site and 45% from the other site.The target sample size was 60 children. Consent forms were sent home to potential subjects requesting

permission for their child to participate in the study. The consent forms were sent home two weeks before data collection began. The parents or guardians were asked to return the consent form within a week. Children were asked their assent verbally prior to the study. Data collectors read the assent forms to each child in a private room. If a child refused to participate, he or she was not included in the study. Once all forms were received, the study began. Data was collected by after-school leaders who were overseen by faculty at Appalachian State University and East Carolina University. The lead researcher managed the data entry and analysis as data was collected. Exceptional children (IQs below 70) were excluded from the study because of their developmental delays. Data collection took place during the late spring when the weather was favorable for outdoor activities. The after-school sites had the basic playground equipment that included a slide, swing set, and an open space for free play, which gave youth a range of options for physical activity recreation during after-school program.

Maintaining Subject Confidentiality

In order to maintain subject confidentiality, children were assigned a number. The data collector listed the name and assigned number for each child who participated in this study. The list was kept confidential in a locked filing cabinet in a locked faculty office at East Carolina University. During the data collection, the children were referred to by name. After data collection, the researcher had the name and number of each child. After the data analysis began, unique identities were marked only as numbers, not names.

Descriptive Statistics

The study described the duration and intensity of physical activity that children

participated in during free play. Five variables were of interest in this study. Results were analyzed according to the child's age, gender, duration of physical activity, physical activity intensity, and perceived body image. The age groups were divided into 5-6 and 7-8 years old. Dividing the participants into those age groups helped the researcher to better understand when children began to notice their own body image. Gender was extremely important in this research because it has been noted in the literature that girls are physically less active than boys.

Measurement & Instrumentation

Body Image

As stated by Skempt-Arlt (2006), body image dissatisfaction is defined as subjective feelings of dissatisfaction with one's physical appearance. Body image was measured using the Collins Child Figure Drawings (1990). Children were given a series of figure drawings with child figures. Seven pictures progressed from very thin to obese. Females selected from female pictures and males selected from male pictures. Two sets of Collins Figure Drawings were used during the study. The Collins Figure Drawings was adapted by an artist to reflect ethnicity. One set included a series of African-American children and the other set had a series of Caucasian children. Thus dependent on race, a series of pictures was chosen. Children were asked the following questions:

- Which picture looks the most like you?
- Which picture shows the way you want to look?
- Which picture shows the way you think is best for girls to look?
- Which picture shows the way you think is best for boys to look?

- Which picture shows the way you think is best for grown-up women to look?
- Which picture shows the way you think is best for grown-up men to look?

The Collins Child Figure Drawing was given to participants during the first two weeks of the study. Trained testers helped administer the drawings to each child. Because of the age of the children, questions were asked and recorded. Each child was taken into a private room and asked the questions. For the Child Figure Drawings, a number was assigned to each figure ranging from 1-7 (one being the thinnest to 7 being the obese). Based on what the child chose for each question, a number was recorded. In order to obtain a score for each child, the difference between their perceived body image (Which picture looks the most like you?) and their ideal body image (Which picture shows the way you think is best for girls/boys to look?) was calculated using simple subtraction. The difference resulted in the score for each child.

Body Mass Index

Body mass index (BMI) was taken on each child. This measurement helped gauge if the child had a realistic view of his or her body. Because of growth and development issues, BMI is measured differently with children than adults. BMI for children is known as BMI-by-age and helps determine if children are underweight, at risk of overweight, or overweight (Ward, Saunders, & Pate, 2007). The Centers for Disease Control uses growth charts to determine a child's percentile based on age and weight categories (Centers for Disease Control, 2006). Children below the fifth percentile are considered underweight, children between the 85^{th}-95^{th} percentile are at risk of being overweight,

and children above the 95th percentile are obese (Ward, Saunders, & Pate, 2007). Height and weight measurements were taken to calculate the BMI of each child.

Physical Activity

According to Ward, Saunders, and Pate (2007), physical activity is defined as "bodily movement produced by skeletal muscles that expends energy beyond resting levels" (p. 4). The researcher used Actigraph GTM1 accelerometers to measure physical activity intensity and physical activity duration. Children wore this small 1x1 inch unit on an elastic belt. The unit, which is similar to a pedometer, was worn above the child's right hip. The Actigraph GTM1 is a motion sensor that uses an internal piezoelectric cantilever beam that creates a charge proportional to the magnitude of the movement. Measurements were taken during unstructured free play. Based on previous literature, a 15-second epoch was used. Epoch is the interval at which data was recorded. As stated by Reilly, Penpraze, Hislop, Davies, Grant and Paton (2008) shorter epochs are more appropriate for children because the perception of children's patterns of physical activity are highly intermittent. Raw Actigraph data was converted into physical activity intensity using the Freedson equation $METs=20757 + (0.0015 \cdot counts \cdot min^{-1}) - (0.08951. age\ [yr]) - (0.000038 \cdot counts \cdot min^{-1} \cdot age[yr])$ (Trost, Pate, Sallis, Freedson, Taylor, Dowda & Sirard, 2001).

Data Collection Plan

The lead researcher was in Eastern North Carolina and the data collection took place in Western North Carolina. Data collectors were undergraduate and graduate students from Appalachian State University. The faculty at Appalachian State University

oversaw the research collection and paid the undergraduate and graduate students for their work. Data collectors were trained prior to data collection. The training lasted for one hour. During the training, the tools for data collection were explained and demonstrated so that data collectors felt comfortable and confident with the tools used, and measurements that were taken. The lead researcher set up a meeting with after-school leaders to explain the study and its goals. At this time, the researcher acquired a schedule from the leaders. This was provided to individuals who had been hired to collect data on site. The schedule listed the times that free play was scheduled and when data was collected. A designated storage area for Actigraphs was established at each YMCA site.

The first day of data collection was spent explaining the study and making the children feel comfortable with the researchers. Data collectors showed students how to properly wear the Actigraphs. After the initial meeting, data was collected for three weeks. During the first two weeks of data collection, assessments were taken. Assessments included height, weight, and administration of the Collins Child Figure Drawings. Children were taken into a private room with the data collectors to gather height, weight, and their responses to the Collins Child Figure Drawing. Once all children's assessments were taken, the physical activity observations began.

Observations took place during scheduled free play sessions at the two after-school program sites. Each Actigraph were assigned a number. Each child was assigned an Actigraph and kept the same Actigraph throughout the study. Before scheduled free play, each student put on the Actigraph. Each child wore it over their clothes and above their right hip bone and played as normal. During free play, data collectors recorded the

behavior observed most often during free play. When free play was over, the students returned the Actigraphs to the designated storage area. Collection of data took place for one week to ensure a minimum of three free play periods for each enrolled child. The researcher periodically checked on data collectors and students for any problems. After a week of wearing the Actigraphs, data collectors collected the devices and returned these to the lead researcher. After receiving the devices, the lead researcher analyzed the results.

Data Analysis

Descriptive statistics were used to describe gender, age, ethnicity, and the types of physical activities. Pearson's R correlation was used during analysis was used to identify the relationship between the score on the body image test score and the duration of physical activity during free play. Correlation was chosen to determine the strength of relationship without casualty. The independent variable was the score from the body image scale. The dependent variable was the duration of physical activity during free play in each physical activity intensity. The duration of physical activity was calculated by the raw minutes of activity (from the Actigraph) and the percentage of the class the child was active. The researcher ran three tests with three different dependent variables. Each test compared the independent variable (body image score) to 1) minutes of vigorous physical activity, 2) minutes of moderate physical activity, and 3) minutes of moderate to vigorous physical activity. Four independent t-tests were used to measure the differences by genders in participants' intensity of physical activity. The independent variable was gender and the dependent variables were the four intensities (sedentary, light, moderate,

and vigorous) of physical activity. For all statistical tests, an alpha level of 0.05 was used to determine significance.

Chapter IV: Results

The purpose of the study was to investigate the relationship between body image and free time physical activity in children ages 5-8 years old. The two research questions were (a) What is the relationship between children's body image and the *duration* of physical activity undertaken during free play and (b) What is the relationship between body image and *intensity* of physical activity during free play?

The sample for this study included 86 children ages 5-8 years old who participated in the after-school programs held at the YMCA of Western North Carolina. Two participants were eliminated because they were nine years old. Eighty-four children were observed for three days during free time, which equated to 252 periods. Fifty-one percent of the participants were female and forty-nine percent were male. Most of the students were Caucasian (71.4%). The mean age of the participants was 6.6 years old (SD=1.0).

Table 1

Demographics

Gender		Ethnicity	
Males	49%	Caucasian	71.4%
Females	51%	African-American	14.3%
		Hispanic/non-white	4.8%
		Asian	2.4%
		Native American	1.2%
		Mixed/multiple	4.8%
		Other	1.2%

Body Image

The majority (47.5%) of the participants in the study were of normal weight according to the Centers for Disease Control and Prevention BMI by age percentiles. Just over a third of children were overweight (34.5%) and 16.7% of children were obese. Boys were more often overweight than girls. Table 2 describes the body mass index (BMI) of the children. Both boys and girls had a negative body image of themselves. More boys appear to have a negative body image (58.6%) than girls (53.5%). Girls saw themselves in a more positive way (32.6%) than boys (24.4%). Fourteen percent of females and seventeen percent of boys felt that their current body image is the way boys/girls should look. Table 3 describes the body image responses of the children. A correlation test was run to determine if there was a relationship between BMI and

students' body image responses. The test concluded that BMI and body image responses were not significantly related in this sample (p=0.35). With the majority of the children having a negative perception of their body image, it was important to see how it affected their physical activity level.

Table 2

Body Mass Index

Classification	Percentage
Underweight	1.2
Normal weight	47.6
Overweight	34.5
Obese	16.7

Table 3

Body Image Responses

Gender	Body Image Responses		
	Negative	Positive	Neutral
Boys	24 (58.3%)	10 (24.4%)	7 (17.1%)
Girls	23 (53.5%)	14 (32.6%)	6 (14.0%)

Table note: Body image scores were determined by subtracting ideal boy/girl from perceived self.

Physical Activity

To determine the primary activity of children during free play, after-school program leaders recorded each child's behavior observed most often. Table 4 lists the

types of physical activities in which each child participated during free time. There was one missing activity and this is noted in Table 4. Both boys and girls were observed sitting most frequently. Girls' second most frequent free play activity was soccer and boys' second most frequent activity was basketball.

Table 4

Activities undertaken during free play

Activity	Frequency and Percentage of Activity	
	Boys	Girls
Sitting	18 14.6%	15 11.6%
Playground	12 1.2%	17 9.8%
Swings	10 8.1%	10 7.8%
Tag/running game	12 9.8%	11 8.5%
Standing	9 7.3%	8 6.2%
Soccer	10 8.1%	14 10.9%
Basketball	15 12.2%	11 8.5%
Blacktop games	10 8.1%	10 7.8%
Slides	8 6.5%	9 7.0%
Jump rope	8 6.5%	13 10.1%
Other	9 7.3%	10 7.8%
Missing data	1 1.0%	

Note: All three free time periods were combined.

Next, Actigraph accelerometers were used to determine the duration and intensity of physical activity during free play. Youth participated at four intensity levels: sedentary, light, moderate, and vigorous. As a group, children in the sample participated in sedentary activities for 1,467 minutes (≈24 hours), light physical activity for 885 minutes (≈15 hours), moderate physical activity for 3,159 minutes (≈53 hours) and vigorous physical activity 1,063 minutes (≈18 hours) during free time. Table 5 shows the mean minutes of physical activity per child at each intensity, during all three free play periods.

Table 5

Mean Duration of Physical Activity during Each Intensity

Intensity	Minutes (Mean)	SD
Sedentary	5.82	4.75
Light	3.51	2.89
Moderate	12.53	5.11
Vigorous	4.22	3.05

Note: Minutes and standard deviation were divided by 3 to represent minutes per free play period.

As described in Chapter 2, previous research has indicated that girls are typically less active than boys. Four independent t-tests were used to test for the differences by gender in participants' intensity of physical activity. In the analysis, gender served as the independent variable and each physical intensity was entered as the dependent variable (sedentary, light, moderate, vigorous). There were few significant difference by gender for any intensity of physical activity (Boys: sedentary p-value=0.81, SD= 14.24, mean= 17.96, light-p=0.05, SD=6.96, mean=9.22, moderate-p=0.45, SD=14.73, mean=37.48, vigorous-p=0.88, SD=9.04, mean=13.29; Girls: sedentary p-value=0.81, SD=14.38,

mean=16.98, light p-value=0.05, SD=9.96, mean=11.79, moderate p-value=0.45, SD=16.05, mean=37.74, vigorous p-value=0.88, SD=9.32, mean=12.05). As indicated, boys and girls had similar amounts at each intensity of physical activity, except light intensity activities.

Testing Research Questions

Research Question 1: What is the relationship between children's body image and the duration of physical activity undertaken during free play physical activity?

A bivariate Pearson's correlation was used to analyze body image and duration of physical activity. As described in Chapter 3, the body image score was calculated by subtracting ideal body image from perceived body image (each picture was assigned a number). A positive score indicates a positive body image whereas a negative score reflects a negative body image. Duration of physical activity was entered as the proportion of recess spent in each of the four physical activity intensities. There was no significant relationship between body image and duration of physical activity for either boys or girls (as shown in Table 6). The *p-value* for boys was 0.22 and the *p-value* for girls was 0.53.

Table 6

The Correlation between Body Image and Intensity

Body Image and Physical Activity	
Boys	
Pearson Correlation	0.22
p-value	0.17
Girls	
Pearson Correlation	0.10
p-value	0.53

Additional analysis included an independent t-test to examine if there was a differential relationship between perceived body image and duration of activity for this sample. Study participants were broken into two age groups, 5-6 and 7-8, and by gender (see Table 7). There were similar significant relationships between body image and duration of activity for males and females (sedentary p-value=0.81, light p-value=0.05, moderate p-value=0.44, vigorous p-value=0.87). As indicated, boys and girls had similar amounts at each intensity of physical activity, except light intensity activities.

Table 7

Age Groups and Mean Minutes of Physical Activity

Level of Intensity	Minutes (Mean)	*p-value*
5-6		
Sedentary	6.17	0.73
Light	3.17	0.08
Moderate	12.70	0.15
Vigorous	4.13	0.39
Total	26.17	
7-8		
Sedentary	5.53	0.73
Light	3.80	0.08
Moderate	12.40	0.15
Vigorous	4.30	0.39
Total	26.03	

Note: Minutes are divided by 3 to represent minutes per free time period.

Research Question 2: What is the relationship between body image and intensity of physical activity during free play?

As indicated in Table 6, the correlation between each physical activity intensity and body image was not significant. Each recess period was broken down into total minutes active and then into four intensities, sedentary, light, moderate, and vigorous. For each intensity, a percentage of recess spent in that intensity was calculated. The percentage of free play in each physical activity intensity was compared to the body image score of both boys and girls. There was no significant relationship (sedentary-p=0.44, light-p=0.36, moderate-p=0.30, vigorous-p=0.81) between body image and intensity of physical activity. An independent t-test was used to analyze the difference in age groups (5-6 and 7-8) and intensity of physical activity. Again, there was no

significant difference between age groups and intensity of physical activity (sedentary-*p*= 0.73, light-*p*=0.08, moderate-*p*=0.15, vigorous-*p*=0.39; mean values for 5-6 year olds in sedentary= 0.60, light=0.30, moderate=1.52, vigorous=12.37; mean values for 7-8 year olds in sedentary=0.55, light=0.38, moderate=0.66, vigorous=12.89).

Chapter V: Summary and Implications

Summary

The purpose of the study was to understand the relationship between perceived body image and levels of physical activity of children ages 5-8 years old. The study explored how children's perceived body type relates to the duration and intensity of physical activity in which they participate. This chapter provides a discussion of key findings and presents implications for future research and professional practice.

Summary of Findings

The sample had a balanced number of boys and girls. About one third of the participants in the study were overweight, which is similar to the national statistics for children (American Heart Association, 2006). With a third of the participants in the sample being overweight, it was important to see if the child's body image affected the way he or she viewed himself or herself and the physical activity in which he or she was engaged during recess. In contrast to previous findings that described girls having a more negative body image than boys (Buss, 2001), boys in this sample appeared to have a more negative body image than girls. Boys were more overweight than girls in the sample. Body mass index and body image responses were not significantly related. This may indicate that children had a realistic perception of themselves and were not critical of different body shapes. Children in the study may have an inclusive view of what other boys/girls should look like. For instance, girls in this sample may think other girls should not look extremely skinny or boys in this sample may think other boys should not look

extremely muscular. Due to this non-critical view, participants in this sample may not feel there is a big difference in their ideal boy/girl and themselves.

In contrast, one third of the children were overweight and body mass index and self-perception were not related, these findings may indicate that children were unable to accurately judge their self-perception. They may not know what a "good way" or "bad way" is to look. The participants in this study may also be too young to fully understand the concept of body image. Most of the research that focused on body image and physical activity examined participants between the ages of 9-14 (Haines, Neumark-Sztainer, & Thiel, 2007; Boyd & Hrycaiko, 1997; Dwyer, Allison, Goldenberg, Fein, Yoshida, & Boutilier, 2006). This is the age when individuals may experience puberty and identity crisis. Participants in this study were much younger and were not going through puberty; thus may not dealt with the same pressures of being thin or muscular as adolescents.

Also, there may not be any pressure to look a certain way (very slim or very muscular) by peers or the media for this age group. Media surveys have observed that fashion magazines are read by the majority of women and girls. Fashion and media models are the most potent source of pressure to be thin (Tiggemann, 2002). Yet in this study, girls similar body image to boys. Children at this age may not read fashion magazines and see the portrayal of thinness as being beautiful. Thus, media may not play a huge factor for this age group. With less pressure, children may be able to participate in physical activities without concern of being teased or influenced by the media.

The primary behavior observed for both girls and boys during free play was sitting. Girls' second most frequent activity was soccer and boys' second most frequent

physical activity was basketball. The prevalence of sitting was also recorded with the Actigraphs although this objective physical activity data suggests that children were most often engaged in moderate physical activity. Children spent the majority of free play in moderate physical activity (3,159 minutes versus 1,467 minutes in sedentary) and spent 1,063 of free play in vigorous physical activity. One possible explanation for this discrepancy between the objective measure and the reported measure is that during bouts of moderate to vigorous physical activity, children may have needed rests breaks to catch their breaths. Data collectors may have recorded them sitting, but it may have been a rest break.

Results from this study have shown an overall participation in physical activity by a sample of 5-8 year olds, but it is important to examine gender differences in physical activity participation. Previous studies state that girls were less active than boys. This study concluded that there was no difference between gender and the intensity of physical activity. Previous studies examined physical activity participation in subjects between the ages of 8-17 years old. Girls in those studies stated that they did not want to participate in physical activity because they were self-conscious in front of boys. The girls also stated that they were intimidated by the boys during co-ed activities (Dwyer, Allison, Goldenberg, Fein, Yoshida, & Boutilier, 2006). This study focused on children between the ages of 5-8 years old. Girls in this study may not have reached an age where they were self-conscious about participating in physical activity in front of boys. The participants were so young that they may not understand the meaning of self-consciousness.

The type of setting may also play a part in the results. Other studies used physical education classes as the setting for research. During this type of setting, children are forced to participate in a particular activity. If a certain activity is challenging for a girl to do, boys may tease or intimidate girls (Dwyer, Allison, Goldenberg, Fein, Yoshida, & Boutilier, 2006). Teasing and intimidation may lead to girls feeling self-conscious about participating. Since this study was during free time in an after-school setting, subjects were allowed to freely choose their own activities. By choosing their own activities, the children may have chosen activities that allowed them to excel. As a result, findings indicated girls and boys participated in similar amounts of physical activity.

Results of Hypothesis Testing

The study further investigated the relationship between body image and duration and body image and intensity of the current sample. Analysis was undertaken to answer the research question, "What is the relationship between children's body image and the *duration* of physical activity undertaken during free play physical activity?" The same analysis was used to determine the relationship between the intensity of physical activity undertaken during free play and children's body image.

As shown in Table 7, findings indicated that children spent the majority of free play participating in moderate physical activity. Children ages 5-6 years old had a mean of 12.70 minutes of moderate activity and 7-8 year olds had a mean of 12.40 minutes of moderate activity per free play period. Five to six year olds spent similar amounts of time (mean=6.17 minutes) in sedentary activities than 7-8 year olds (mean=5.53 minutes) per free play period. Younger children (5-6 year olds in this study) tended to have more bouts

of physical activity instead of sustain periods of physical activity (Pryke, 2006). During these bouts, children were more active, resulting in a higher level of intensity of physical activity. Due to these high intensity bouts of physical activity, the 5-6 year olds may need more breaks, which the data collectors may have interpreted as sedentary activity. The children's activity choices at different ages may also have impacted the intensity of physical activity. Younger children (5-6 year olds) may have been more involved in activities such as running and tag games than the older group (7-8 year olds).

Although the participants in the sample had negative body images overall, there was no relationship between body image and their duration of physical activity. Thus, we can conclude that the participants did not fit the profile of what they thought other boys or girls should look like, but it did not deter them from being active. Children in this study may have felt comfortable with their weight and participated in free time play. Since about one third of the participants were overweight, children may have felt more comfortable because children in the sample had similar body types. Because more children in the study appeared to have similar body types, children who were overweight appear not to have felt left out due to their size. Children appeared to feel confident in their abilities during free play and did not let their body image affect their participation.

Although body image was not related to physical activity duration or intensity for this sample, the data was explored by gender independently. Participants in the study were divided by gender and a bivariate Pearson's correlation was used to understand if a relationship existed between body image and intensity in physical activity for either boys or girls. There was no significant difference between body image and intensity of

physical activity. Although previous research indicated that girls were less active than boys (Fairclough & Stratton 2006), gender did not predict the level of physical activity in this study. Girls and boys participated in similar levels of physical activity during free play. Girls in this study may not have been self-conscious about participating in physical activity with boys. Self-consciousness was one of the reasons that older girls did not participate in physical activity in front of boys (Dwyer, Allison, Goldenberg, Fein, Yoshida, & Boutilier, 2006).

As previously mentioned, children see themselves through a "looking glass". The "looking glass" tells a child they are physically competent and are likely to engage in and enjoy physical activity (Ziviani, MacDonald, Jenkins, Rodger, Batch, & Cerin, 2006). Girls in the study may have felt confident in the activities in which they participated, therefore, engaged in similar levels of physical activity as boys during free play.

Limitations

The study focused on the relationship between physical activity and body image for children. However, participants' parents were not asked about their socioeconomic status. According to the U.S. Census (2008) the mean household income in Buncombe County is $59,349 and the median household income is $43,208. Socioeconomic status may allow for participants in the study to be more involved in physical activities outside of school (such as travel sports teams, dance, arts and crafts, etc). According to Brockman, Jago, Fox, Thompson, Cartwright, and Page (2009), as family affluence increased, self-reported vigorous physical activity increased for 11-15 year olds. A longitudinal study in the United Kingdom showed that physical activity was reduced and

sedentary behaviors increased in children 11-16 years old and levels of sedentary behavior was greater in participants from lower socioeconomic households. High family income was associated with an increased likelihood of adolescents being active in club sports and being more involved in organized physical activity programs than lower income groups (Brockman, et al, 2009). Subjects in the study may have been from high family income, which may have had contributed to their levels of physical activity during free time play. With more expendable money, the subjects are able to be involved in more activities such as travel leagues and sports clubs.

Conclusion, Implications and Recommendations

Although the children in this sample had a negative body image overall and were overweight, it did not stop them from being active during free play. Children did not seem to allow body image to affect their participation in physical activity. Girls were just as active as boys during free time. Age or gender did not play a part in the duration or intensity of physical activity.

Because their view did not deter children from participating, it is important to continue to provide programs where children are active. Professionals should develop techniques to make physical activity fun and enjoyable. Providing equipment that promotes physical activity may encourage children to be physically active. Equipment such as jump ropes, playground equipment, basketball courts, open fields, and sports balls gives children a variety of things to choose from to stay active during recess or free play. Equipment can be used in various ways that stimulate the imagination while keeping children active. For example, a jump rope can be used to jump rope or used as a

river in “Jump the Brook”. The need for equipment is based on the favorite activity observed during the study. These programs will give children an opportunity to achieve recommended daily physical activity amounts and help reduce obesity rates. The findings show that children are not letting their image of themselves affect their participation.

It is important to stress the benefits of free play/recess during school to school officials. Recess allows a child to freely choose an activity that he or she enjoy and promotes children to be physically active. Children can play and use their imagination during recess. At a young age, play is important because it teaches children how to work in groups, share, negotiate, and resolve conflicts. It also helps in the development of movement patterns and skills (Pryke, 2006). Not only are children developing socially and mentally through play activities, but they are also engaging in physical activity. Through physical activity, risks of obesity, cancer, cardiovascular disease, and diabetes are reduced (Stein, Fisher, Berkey, & Colditz, 2007). Not only does physical activity have positive effects physically, but also emotionally. Physical activity decreases symptoms of anxiety and depression. It increases self-confidence and improves sense of well-being (Stein, Fisher, Berkey, & Colditz, 2007).

Professionals and school administrators should work hard to create environments where children feel competent in their abilities. Recess can offer an opportunity for a child to engage in an activity that fits his or her comfort level and that they enjoy. If children feel competent, they are more likely to participate in physical activity (Ziviani, MacDonald, Jenkins, Rodger, Batch, & Cerin, 2006).

With the reduction in obese children, the number of obese adults may be reduced. Children can take these healthy behaviors into adulthood and teach their children healthy eating habits. If this cycle continues, there could be a drop in the number of obese individuals in the United States.

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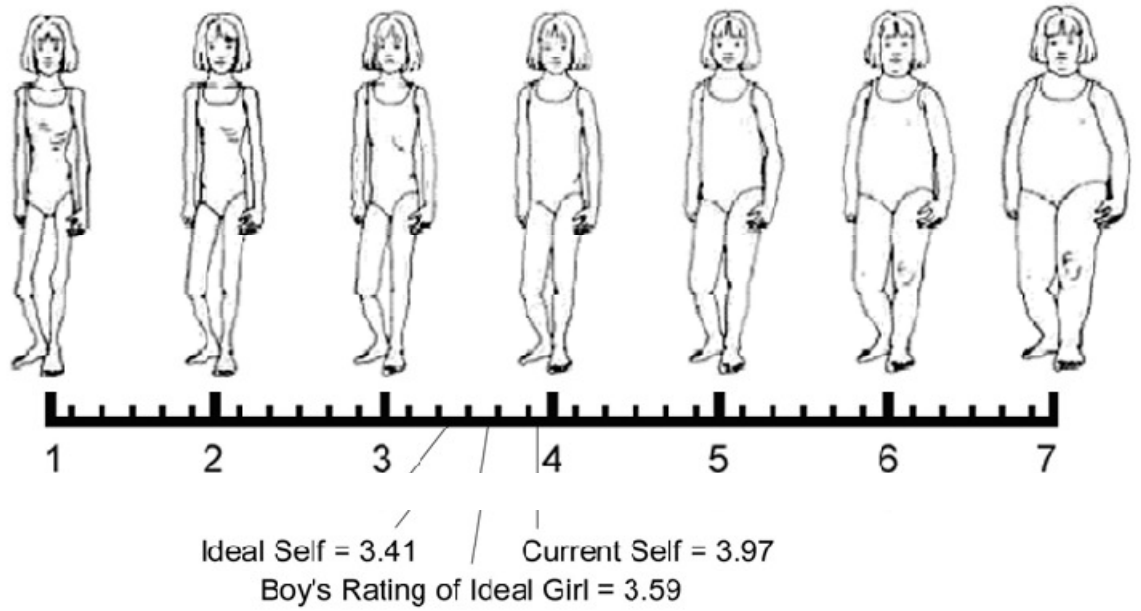
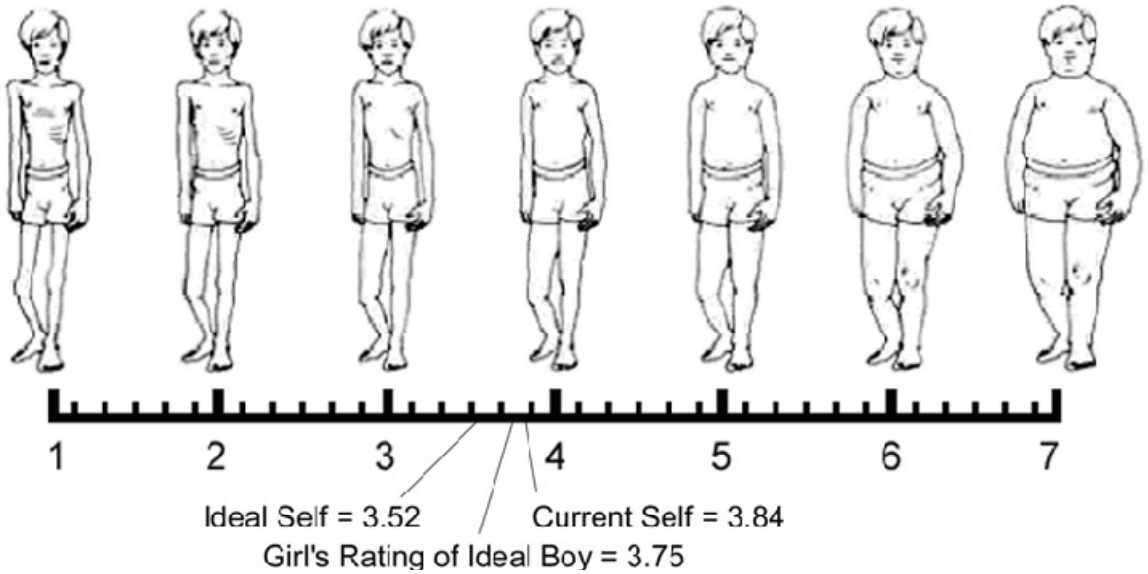
Appendix A: Body Image Instrument





- Which picture looks the most like you?
- Which picture shows the way you want to look?
- Which picture shows the way you think is best for girls to look?
- Which picture shows the way you think is best for boys to look?
- Which picture shows the way you think is best for grown-up women to look?
- Which picture shows the way you think is best for grown-up men to look?

Appendix B: Consent Document

Title of Research Study: The relationship between physical activity and body image in children 5-8 years old
Principal Investigator: Deirtra E. Crandol
Institution: East Carolina University
Address: 2112 Hyde Drive, Greenville, NC 27858
Telephone #: 919-360-8299

PURPOSE AND PROCEDURES

The purpose of this research study is to investigate the physical activity behavior of children ages 5-8 years old. Specifically, research will investigate if there is a relationship between children's physical activity levels and their body image.

Participants will have their height and weight measured at the beginning of the study. The participants will be asked six questions relating to body image. Images of individuals ranging from very thin to very obese will be shown. Your child will choose a picture that best fits their answer.

After each participant has answered the questions, they will be shown how to put on an Actigraph. An Actigraph is a device that measures their amount of physical activity. Before free play at the afterschool program, your child will be asked to put on the Actigraph. This is an elastic belt with a one inch electronic measurement device attached. Children will play as normal. After free play, the child will remove the Actigraph and place it in the designated storage area.

POTENTIAL RISKS AND DISCOMFORTS

In this study, children may feel uncomfortable getting their weight taken and discussing their body image.

POTENTIAL BENEFITS

Participation in the study may lead to increased physical activity programs and self-esteem classes during the after-school program. It will help the program understand the need for physical activity during the school day outside of physical education.

SUBJECT PRIVACY AND CONFIDENTIALITY OF RECORDS

The identity of each participate will be kept confidential. This means that only the researcher will be able to link your child's identity to their body measurements or physical activity level. This information will be mixed with others when reporting and will be reported as part of a group.

VOLUNTARY PARTICIPATION

Participating in this study is voluntary. If you decide to withdraw your child's participation you may do so at any time without losing benefits that you should normally receive. You may stop at any time you choose without penalty to you or your child.

PERSONS TO CONTACT WITH QUESTIONS

The investigators will be available to answer any questions concerning this research, now or in the future. You may contact the investigator, Deirtra E. Crandol at 919-360-8299 or by email at dec0407@ecu.edu. If you have questions about your rights as a research subject, you may call the Chair of the University and Medical Center Institutional Review Board at phone number 252-744-2914 (days). If you would like to report objections to this research study, you may call the ECU Director of Research Compliance at phone number 252-328-9473.

CONFLICTS OF INTEREST

Neither the research site, nor the researcher will receive any financial benefit based on the results of this study.

CONSENT TO PARTICIPATE

Title of research study: The relationship between physical activity and body image in children 5-8 years old.

I have read all of the above information, asked questions and have received satisfactory answers in areas I did not understand. (A copy of this signed and dated consent form will be given to the person signing this form as the participant or as the participant's authorized representative.)

_____ _____ _____

Participant's Name **(PRINT)** **Signature** **Date** **Time**

_____ _____

Guardian's Name **(PRINT)** **Signature** **Date** **Time**

PERSON ADMINISTERING CONSENT: I have conducted the consent process and orally reviewed the contents of the consent document. I believe the participant understands the research.

Person Obtaining consent **(PRINT)** **Signature** **Date**

Principal Investigator's **(PRINT)** **Signature** **Date**

Appendix C: IRB

UNIVERSITY AND MEDICAL CENTER INSTITUTIONAL REVIEW BOARD

HUMAN BEHAVIORAL AND SOCIAL SCIENCE INTERNAL PROCESSING FORM

SUBMISSION FOR UMCIRB REVIEW
FULL AND EXPEDITED RESEARCH

DEMOGRAPHIC INFORMATION

Type of application: ☒ **New** ☐ **Modification Date: UMCIRB #:**

Title of proposed research (this title must match protocol, funding application and consent form): The relationship between body image and physical activity in children 5-8 years old.

Principal Investigator, credentials, department, section and school: Deirtra E. Crandol, BS, Graduate Student, RCLS, College of Health and Human Performance

Check the institutions for which the principal investigator is associated: ☒ECU ☐ PCMH ☐Other

Subinvestigators, credentials, department, section and schools: Dr. Kindal Shores, PhD., RCLS, Assistant Professor, RCLS, College of Health and Human Performance

*** **Investigators not associated with ECU or PCMH require submission of an Unaffiliated Investigator Agreement.**

List of all items related to this research study submitted for UMCIRB review and approval:

SOURCE OF FUNDING

☐ **Government Agency, Name**:
☐ **Private Agency, Name**:
☐ **Institution or Department Sponsor, Name:**
☒ **No funding**
☐ **Grant: include 3 copies of the final grant application for full committee reviews or 1 copy for expedited reviews**

Fund number for IRB fee collection (applies to all for-profit, private industry or pharmaceutical company sponsored projects):

Fund	Organization	Account	Program	Activity (optional)
		73059		

NOTE: The UMCIRB Conflict of Interest Disclosure Form needs to be submitted for expedited and full review.

CHECK ALL INSTITUTIONS OR SITES WHERE THIS RESEARCH STUDY WILL BE CONDUCTED:

☒ **East Carolina University**
☒ **Other** YMCA of Western North Carolina, Appalachian State University

CHECK ALL OF THE FOLLOWING INVOLVED IN THIS STUDY

Population Specifically Targeted

☐ **Normal volunteers**
☐ **Adults (> 18 yrs old)**
☒ **Minors (< 18 yrs old)**
☐ **Institutionalized Participants**
☐ **Students**
☐ **Participants at other Institutions**
☐ **Mentally Impaired Participants**
☐ **Prisoners**
☐ **Wards of the State**
☐ **Minorities**
☐ **Participant pools**
☐ **Staff Participants**
☐ **Non-English speaking**
☐ **Public School System**
☐ **Day care facilities**

Methods/Procedures

☒ **Surveys / Questionnaires**
☐ **Interviews**
☐ **Standardized Tests**
☐ **Non-standardized Tests**
☐ **Focus Groups**
☐ **Deception**
☐ **Databank Information**
☐ **Videotaping / Voice Recording / Photography**
☒ **Public observation**

RESEACH RISK AND LEVEL OF REVIEW REQUIRED

Research participants will be placed at as defined below:
☒ **No more than minimal risk**
☐ **More than minimal risk**

Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests. 45 CFR 46.102(i) The definition for prisoners differs and is located at 45 CFR 46

What level of review does your proposal require?
☒ **Expedited**
☐ **Full**

Those research studies utilizing Pitt County Memorial Hospital resources, Brody School of Medicine resources or involving ionizing radiation should complete the Institutional Approval for Research Form.

Research Questions

1. Subject Selection

- **Describe how participants will be selected or recruited for the research, including enrollment procedure.**
  Children ages 5-8 years old will be invited to participate in the study. Participants must be currently enrolled in the YMCA of Western North Carolina's after-school program in Buncombe County, North Carolina. Consent forms will be sent home from the participating after-school sites to potential subjects' parents requesting permission for their child to participate in the study. Those children who return a consent form will be eligible to participate in the study.

- **Identify the projected number of participants to be enrolled.** There will be 60 children participating in the study. All youth at two YMCA after-school programs will be invited to participate. If more than sixty youth would like to participate they will be accommodated.
- **Outline the inclusion and exclusion criteria for this research study.** Children must be enrolled in an after-school program provided by the YMCA of Western North Carolina and Buncombe County Schools. Exceptional children will be excluded from the study because of their developmental delays.
- **Provide a justification for the sample size selected.** The researchers elected to enroll 60 youth because this number is small enough to allow each child the opportunity to participate but provides requisite statistical power to make significant conclusions. According the U.S. Census, there are 222,881 residents that live in Buncombe County, NC. Of these residents, 12,216 are children ages 5-9 years old. According to the After-school Alliance, 15.3 million youth (40%) are or want to be involved in structured after-school programs. Thus, Buncombe County has an approximate after school enrollment of 4,886 youth. With this fixed population size, we can draw conclusions with a +/- 3% confidence interval with a sample size of 60 participants. Further, since youth will serve as their own behavioral control in the study, we have additional confidence in our statistical power to make conclusions.
- **Describe the safeguards in place to protect the rights and welfare of any vulnerable participants enrolled in this research study.** Because of their young age children are asked to verbally assent and parents are asked to review and sign a consent form for permission for their child to participate in the study. Those participants who return the forms will be involved with the study. Participants who decline to complete the forms will not be considered for the study. If at anytime during the study a participant becomes uncomfortable, they will be allowed to withdraw from the study. Participants will be assigned a number but will be referred to by their name during the study. After data collection is completed, the lead researcher will store the names and assigned numbers in a locked box. The lead researcher will only refer to the participants as numbers after data collection is complete.

Are there any advertisements (public display in written, radio, or TV form) for participant recruitment?

☐ Yes ☒ No If yes, attach the advertisements to the processing form.

Does the research include any monetary inducements, compensation or reimbursement for participation in this research study?

☐ **Yes** ☒ **No** **If yes, attach the payment schedule to the processing form or provide specific protocol reference.**

Will the sponsor reimburse for any items or procedures or supply any items at no cost involved in this research study?

☐ **Yes** ☒ **No If yes, attach written documentation of the items that will be reimbursed or supplied by the sponsor unless this information is specifically noted in the research protocol.**

Are there any associated costs that participants will incur in as a result of participating in this research study?

☐ **Yes** ☒ **No If yes, describe these costs.**

2. Researcher Qualifications
   - **Name and list the duties of the research team members and describe the qualifications of each member to perform their duties.** The research team members must be an undergraduate or graduate student of Appalachian State University or an employee of the after-school staff. The research team will collect height and weights of each participant. Also, the team will conduct the Collins Child Figure Drawings for each participant. Primary activities during free play will be recorded and Actigraphs (similar to accelerometers) will be properly demonstrated and stored by the research team.
   - **Include the completion date of the human protections modules located on the UMCIRB web site.** Crandol 2/2008; Shores updated 8/2008

3. Risk Determination
   - **Describe the research setting, listing any safeguards in place for participant safety.** The research setting will be at two school sites that hold an after-school program through the YMCA of Western Carolina and Buncombe County Schools. The two sites have basic playground equipment.

4. **Risk Determination**
   - **Describe all foreseeable physical, psychological, economic, social, legal and dignitary risks to the participants, with steps outlined to minimize those risks. Risks should be described in terms of probability or likelihood, magnitude and duration when possible.** This will be a minimal risk study. There will be no harm to the person physically. There may be possible embarrassment or discomfort when discussing body composition and taken weight measurements. To minimize embarrassment, body measurements will be taken individually in a private room.
   - **Outline the mechanism for reporting adverse events or unanticipated risks to participants or others for this study.** Adverse events or unanticipated risks will be reported to East Carolina University and Appalachian State University. Dr. Kindal Shores will assume responsibility for reporting adverse events to IRB personnel at IRB.

5. Data/Safety Monitoring: Data monitoring includes activities such as interim analysis or other opportunities for both individual and aggregate study data to be reviewed to ensure the safety of participants. A plan for this type of data monitoring may be required to meet the criteria for IRB approval in order to ensure the protection of participants involved in the research, to review the risk-benefit analysis, and to ensure there are no new findings for which current or future participants should be apprised.
   - **If applicable, describe how data will be reviewed to determine if the study procedures should be changed during the course of the study.** N/A

6. Anticipated Benefits

Describe the benefits of the research study to participants or others. Participation in the study may lead to increased physical activity programs and self-esteem classes during the after school program. It will help the program understand the need for physical activity during the school day outside of physical education.

7. **Data Confidentiality and Subject Privacy**
   - **Describe how confidentiality will be maintained by providing details about the storage facility, duration of storage, data destruction method, and persons with access to the data.**
     Children will be assigned a number. The data collector will list the name and assigned number for each child participating in the study. The list will be kept confidential. During the data collection, the children will be referred to by name. Once the data has been collected, the researcher will have the name and number of each child. Once the data analysis begins, unique identities will only by marked as numbers, not names. At the conclusion of the study, date will be retained in a locked room for seven years after which data will be shredded or burned.

   - **How will subject privacy be maintained during recruitment, data collection and data analysis**? Children will be assigned a number. The data collector will list the name and assigned number for each child participating in the study. The list will be kept confidential. During the data collection, the children will be referred to by name. Once the data has been collected, the researcher will have the name and number of each child. Once the data analysis begins, unique identities will only by marked as numbers, not names.
   - **If the participants data or samples will be used for future research, describe how their privacy will be protected**? N/A
   - **Describe any additional safeguards in place to manage illegal, significantly intimate or potentially embarrassing information gathered in this research study.** N/A
   - **Include steps to handle information that requires mandatory reporting to officials, for example physical abuse, emotional abuse or health problems.** N/A
   - **If the research study involves HIV testing, describe the plans for pre/post-test counseling and other related considerations**. N/A

8. **Obtaining Consent or Parental Permission**
   - **Describe the consent process, including members of the research team that will be obtaining informed consent from study participants.** Children enrolled in the after-school program will have a letter that briefly describes the study and a consent form sent home in their folder. The consent form will request permission from parents to allow their child to participate in the study.
   - **Describe the setting in which the consent will be obtained**. A letter will be sent home to children enrolled in an after-school program. Parents will have the freedom to choose if their child will participate in the study.
   - **Describe the process to minimize undue influence and coercion during the consent process**. There is no incentive for agreeing to participate in the study.
   - **Outline procedures for obtaining informed consent from participants with limited or low literacy**. The research team will send a consent form home in the folders of possible participants. The form will be in English and Spanish.
   - **Describe the process for determining cognitive impairment or other conditions that may make a participant more vulnerable.** After-school staff and teachers will be asked for a list of individuals who are diagnosed (by a professional or by the participant's

school) with a development or physical disability. The participants will be excluded from the study but be allowed to participate in study procedures alongside their peers.

- **Describe the process for identifying the legally authorized representative and the process to debrief and subsequently obtain consent from the study participant, when feasible**. N/A

9. Minor Assent Related Issues

- **Describe the assent processes given the range of ages intended for this research study.** Due to the age of the participants, the research team will verbally read the assent forms. Permission will be verbally obtained from possible participants. If a child refuses to participate, he or she will not be included in the study.
- **If a separate assent is not being used, how will assent be documented?** N/A
- **How will custody changes during participation in the study be determined?** N/A
- **Describe the processes as required for enrolling wards of the state if they are a target population for this study. Note: If a child becomes a ward of the state, the IRB must be notified immediately to seek advice on further protections that may be required.** N/A

10. Background

Describe the current state of knowledge surrounding the research questions to be addressed in this study.

Childhood obesity is an epidemic in the United States and here in North Carolina (Fairclough & Stratton, 2006). North Carolina children are more likely to be overweight compared to their national peers (Centers for Disease Control and Prevention, 2006). These findings are cause for concern. With high rates of obesity and lower than recommended physical activity levels, children are at risk for body dissatisfaction.

Body dissatisfaction is defined as subjective feelings of dissatisfaction with one's physical appearance (Skemp-Arlt, Rees, Mikat, & Seebach, 2006). According to Buss (2001), children as young as 7 and 8 years old have reported dissatisfaction with their body. By the ages of 8-10, most girls were dissatisfied with their bodies. With obesity rates increasing each year, it is important for researchers to pinpoint reasons why children are not achieving the recommended amount of physical activity and have such a negative self-perception. It is still unknown the reasons why children, especially girls, are so dissatisfied with their bodies, although obesity and sedentary lifestyles may contribute. This study will address this problem.

a. Describe the uncertainty to be addressed by this research study (research question).

What is the relationship between children's body image and the *duration* of physical activity undertaken during free play physical activity?

What is the relationship between body image and *intensity* of physical activity during free play?

b. Describe the rationale for the type of research design chosen for this study. The research design was chosen because it examines if body image has an impact on the amount and intensity of physical activity. Free play was chosen because it allows the participants to freely choose physical activities which reflect their personal, intrinsic motivation.

PROTOCOL SUMMARY

Provide a brief, one page description of the research study. All more than minimal risk research studies or research requiring full UMCIRB review must have a separate protocol.

The purpose of the study is to understand the relationship between perceived body image and levels of physical activity of children ages 5-8 years old. Data will be collected during spring 2009 during free play at an after-school program sponsored by Buncombe County Schools and the YMCA of Western North Carolina. Children ages 5-8 years old will be invited to participate in the study. Participants are currently enrolled in the YMCA of Western North Carolina's after-school program in Buncombe County, North Carolina. Although the participants are in a structured after-school program, there will designated time allotted for free play.

Participants will be recruited from two after-school programs from two different sites. Consent forms will be sent home to potential subjects requesting permission for their child to participate in the study. The consent forms will be sent home two weeks before data collection will begin. Youth must also sign an assent form to indicate their willingness to participate. Once all forms are received, the study will begin. Data will be collected by after-school leaders who are overseen by faculty at Appalachian State University. The lead researcher will take over the data once it is collected. Data collection will take place during the spring when the weather is favorable for outdoor activities.

The study will describe the duration and intensity of physical activity that children participate in during free play. The age groups will be 5-6 and 7-8 years old. Body image will be measured using the Collins Child Figure Drawing. Children will be given a series of figure drawings with child figures. Seven pictures will progress from very thin to obese. Each picture is numbered (1 being very thin and 7 being very obese). To ensure that children can relate to the pictures, two sets of pictures are available. One set is a series of African-Americans children and one set is a series of Caucasian children. Dependent on the child's ethnicity, a set will be chosen. Children will be asked several questions which ask the child to reflect on their own body type and their ideal body. Children will choose the picture that best answers the question. The number for the picture will be recorded. Once all children's assessments have been taken, the physical activity observations will begin.
The researchers will use Actigraph GTM1 to measure physical activity intensity and physical activity duration.

Measurements will be taken during unstructured free play. After information is collected from each instrument, data collectors will collect the devices and the lead researcher will analyze and report the results to after-school leaders and faculty at Appalachian State University.

REQUIRED RESEARCH APPROVALS

Does the study involve enrolling participants at another site, institution or department outside of the principal investigator's department?

☒ **Yes** ☐ **No** **If yes, attach the IRB approval letter (if any) or approval letter for institutional or departmental participation to the processing form.**

CHIEF OF SERVICE OR DEPARTMENT CHAIR APPROVALS STATEMENT

I have reviewed this project. I believe that the research is sound, the goals are scientifically achievable, and does not involve any significant human rights issues. There are appropriate departmental resources (financial and otherwise) available to conduct the research. The investigator is qualified to conduct all aspects of this research project based on education, training or experience, and has the necessary authorizations or privileges to conduct all outlined procedures. I endorse the investigator and outlined research project as indicated by my signature below.

I have reviewed the UMCIRB Conflict of Interest Disclosure Form and evaluated the principal investigator of this project for risk related to conflict of interest according to the UMCIRB Standard Operating Procedure Manual. I endorse the investigator and the attached plan (if required) for managing conflict of interest related to this research study as indicated by my signature below.

NOTE: (1) A department chair may not sign this statement if listed as an investigator, and should seek the signature of the division chair/dean. (2) If you don't have a department chair (such as a private practice investigator) then attach a current CV.

Signature of Chief of Service/Department Chair Print

Date

CONTACT INFORMATION

Mailing address for all correspondence:
Telephone Number: **Fax Number:** **e-mail:**
Research assistant: **Telephone number:**

RESPONSIBLE FACULTY MEMBER: For any Principal Investigator that has an undergraduate, graduate, post-graduate student status including residents and fellows, or visiting status to serve as a responsible individual in the oversight of the research study.

Responsible Faculty: Dr. Kindal Shores
Mailing address:
Telephone Number: **Fax Number:** **e-mail:**
shoresk@ecu.edu

I have reviewed the study proposal and all documents and materials to be used in the study.

Signature responsible faculty as above Print Date

INVESTIGATOR RESPONSIBILITIES

The principal and subinvestigators agree to:

1. To obtain UMCIRB approval prior to undertaking any aspect of this research study.
2. To obtain UMCIRB approval prior to instituting any change in the research study, unless it is necessary to protect the safety and welfare of human participants. An action instituted to protect the safety and well-being requires immediate reporting to the UMCIRB.
3. To engage in a continuing exchange of information or advice with the UMCIRB ensuring a continuous review process for the protection of human participants, including submission of a closure form upon completion of the study.
4. To engage in a continuing exchange of information with the appropriate departments within the institutional study site, the institutional officials, the department chairs when appropriate, and the research study sponsor.
5. To ensure the research study is conducted only within the periods of UMCIRB approval.
6. To inform the UMCIRB, research site institution, sponsor or appropriate federal regulatory agency in writing of any serious adverse events and unanticipated problems involving risks to study participants or others as soon as possible.
7. To maintain all study records for 3 years after completion of the study at all sites or longer if required by a professional organization, sponsor, regulatory body or others.
8. To regard participant informed consent as an ongoing process.
9. To enroll participants only after obtaining ethically and legally effective informed consent, using only the most currently approved UMCIRB consent document, when required.
10. To obtain minor assent from children prior to enrollment as outlined.
11. To notify the UMCIRB if any relationships develop that may be considered a conflict of interest.
12. To abide by the UMCIRB Standard Operating Procedures, all applicable federal regulations, Good Clinical Practice, state laws, respective institutional policies to conduct this research study. Ethical standards include the Belmont Report and other professional standards for an individual research area.
13. To comply with regulatory reviews, data audits, and 3rd party observation for the consenting process by appropriate institutional regulatory officials.
14. To notify the UMCIRB prior to relocating employment to provide for the orderly study closure or to transfer the study to another investigator.

Signature Principal Investigator	Print	Date
Signature Sub Investigator	Print	Date
Signature Sub Investigator	Print	Date

Signature Sub Investigator	Print	Date

Signature Sub Investigator	Print	Date