Barriers to Physical Fitness Program Implementation in the Childcare Centers of Northern Manhattan

An Honors Thesis for the Department of Community Health

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CHAPTER 1 INTRODUCTION AND METHODS

Introduction

Asthma Basics for Children (ABC), a program run by Columbia University's Mailman School of Public Health, was launched in 2001 to reduce higher than average rates of childhood asthma in Northern Manhattan in New York City. The strategy of ABC is to empower the neighborhood residents of Northern Manhattan communities to take charge as proactive partners with physicians and community-based centers in the early identification and management of childhood asthma. Sally Findley, PhD, is the Director of the Northern Manhattan Asthma Basics for Children Initiative and Professor of Clinical Population and Family Health at the Mailman School of Public Health.

ABC also has an active childhood obesity department, which is one of the main forces fighting childhood obesity for the ages five and under group in Northern Manhattan and the South Bronx. ABC advocates an organized sequence of athletic activities for preschool children, including games and creative movements. Recent studies have shown that these organized activities lead to better results for Body Mass Index (BMI) scores and for preventing childhood obesity when compared to free (unorganized) play (Findley, 2008). ABC believes that instead of New York City's sixty-minute requirement for active play, all children should have a minimum of sixty minutes of structured (organized) physical activity, and sixty minutes of unstructured activity. ABC also advocates that preschool-aged children should not be inactive for more than an hour at a time (unless sleeping). ABC believes organized exercise, as opposed to free play, has greater health benefits for young children.

After working for ABC the last two summers as the Active Play Program Coordinator, I have developed my own plan for childcare centers to help improve their children's health without spending large amounts of money. As one of the principal workers on the "Lets Play, But Where?" project, which had as its goal the lowering of the high rates of childhood obesity and asthma, I provided childcare centers in Washington Heights and Harlem in New York City with free athletic programming for the children during their playground time. I worked with staff on locating desirable playgrounds in the community and designed an athletic program that assures that the children are constantly moving.

I received enthusiastic responses from children and their teachers in all the classes I worked with during their recess time. The children were happy and grateful to have someone play games with them and help them learn new skills. By sparking their interest in active play and developing their coordination, the program increases the likelihood that the children will pursue physical activities like sports and dance and lead an active, healthy life. The ultimate goal is to change the behaviors of the children, the teachers, and the parents, in order to promote preventative health practices and improve the quality of life in these neighborhoods.

As a community health major, I have learned about the theoretical foundations of the field of public health, such as the benefits of "up stream" intervention. An "up stream" intervention is one that tries to prevent a problem before it starts. In the case of childhood obesity, this means putting interventions in place as early as possible; that is,, before the child becomes at risk for overweight or obesity. In the field of community health, the "Socio-Ecological Model" is used to determine what the risk factors for a

condition such as childhood obesity would be, and where to intervene. The Socio-Ecological Model recognizes the relationship between the individual and his/her environment. At its starting level, the model focuses on the "individual" and his/her knowledge skills and attitudes. Next is the "interpersonal" level, which includes family, friends, and social networks. The "organizational" level follows, and includes organizations and social institutions. There is then the "community" level, which encompasses the relationships among the organizations and institutions. Finally, there is the "public policy" level, which includes national, state, and local laws. Barriers to healthy behaviors affect whole communities. An "up-stream", multi-level intervention has the ability to lower and remove barriers so that behavior change can become more achievable and sustainable (CDC, 2009).

As a child development major, I have learned about the physical and social development of young children and the theories and practices that lead to healthy development. Child development theorist, Urie Bronfenbrenner, created a similar model to that of the Socio-Ecological Model as part of his "Ecological Theory" to explain an individual's psychological development. This theory consists of five environmental systems that range from direct inputs of interactions with social agents to broader cultural influences. The first of these systems is the Microsystem, which includes the settings in which an individual lives and all the direct interactions he/she has, for example, those with parents, peers, and teachers. The second system is the Mesosystem, whish represents the relationships between Microsystems, for example, those between school and the family. The third is the Exosystem, which includes the social settings that indirectly affect the child, for example, a mother's job. The fourth is the Macrosystem,

which includes the attitudes and ideologies of the culture in which the individual lives, for example, the ethnic and SES group. The fifth and final system is the Chronosystem, which represents the changes in people and environments over time, for example, the effect on a child of a parent's job loss or of a father leaving home (Bronfenbrenner, 2010). Bronfenbrenner believed that all of these systems affect the development of the individual.

My internships at the Mailman School enabled me to both use and experience what I have learned in the classroom in a real world situation where I could actually help people. My work with ABC has also prompted the study described in this thesis which addresses three main questions. First, what is the current state of the playgrounds in Northern Manhattan? Second, can a program be created that will help the children of Northern Manhattan become active without increasing the expenses of their childcare centers? Third, what are the barriers to physical fitness program implementation in the childcare centers of Northern Manhattan?

I never had any personal experience with childhood obesity. I was an extremely active child with an overactive metabolism. My mother never let me even look at candy or soda, so I never attained a taste for it. Growing up in a family of athletes, I quickly turned to sports as my pastime of choice and was fortunate enough to have parents who supported my athletic pursuits both emotionally and financially. As a child growing up in Brooklyn, New York, I spent much of my time at the local playground or shooting hoops with friends using an old milk crate, which was strung up on a fence in a parking lot. The majority of my friends' families were of a lower SES than my family. We were all black or Hispanic and all loved playing basketball, but as I look back on those days I

realize that a high percentage of my friends were overweight or obese. The extra weight was a handicap for them athletically and socially, but they made no effort made to lose it. It was part of who they were. I later attended a private elementary and middle school, where I was one of two black males in the class. I would estimate that less than 5% of the children in my school were overweight or obese. What was it about the differences in the lives of the children at the private school, in comparison to my friends from the playground, that created such obvious weight differences and put my poorer friends at such a disadvantage? This is one of the major questions that led me to investigate this topic. I have always been interested in health and fitness, and currently, as a junior in college, I work as a personal trainer and play for an NCAA basketball team. Many of my past experiences have led to my interest in the childhood obesity epidemic and in the exploration of interventions that might stop it.

Methods

To answer the questions I stated in the Introduction to this thesis: What is the current state of the playgrounds in Northern Manhattan?; Can a program be created that will help the children of Northern Manhattan become active without increasing the expenses of their childcare centers?; and What are the barriers to physical fitness program implementation in the childcare centers of Northern Manhattan?, I took the following steps. I conducted a participant observation study during the past two summers (2008 and 2009) in which I was able to observe and work firsthand with the children, ages three to six, of the childcare centers of Northern Manhattan. I spent my first visits to the centers observing the children and teachers during their outdoor play periods. I then

created an active play intervention program, which I based on my experiences over the past four years as a personal trainer and member of Tufts University's Personalized Performance Program for all members of the Tufts community. The program I designed also reflects my passionate advocacy for children's physical development to help them reach their potential in all aspects of their lives. The program consists of an age-appropriate physical activity schedule for children ages 3 to 6 filled with games and creative movements designed to decrease the high levels of childhood obesity found in Northern Manhattan. It was important that the program be inexpensive and easy for teachers to implement. I worked on the design of the program with staff from the participating childcare centers in ABC's "Let's Play, But Where?" project. Upon completion, my active play program required only the use of ten foam balls and ten hula-hoops. Each of the twelve childcare centers I worked with received a packet including the entire list of warm-up activities and games with descriptions of how they are to be conducted and played (Appendix B).

The program activities I designed for ABC are all based on the premise that children like games. Active games are fun and engage children so that they do not even realize they are exercising. When children are involved in free play, they eventually tire and stop moving. When children are involved in a physically active game, they have a goal (chasing the ball or tagging their friend), which they will strive to achieve even after they become fatigued. Pushing through this fatigue and continuing to move is what leads to calorie burning and weight loss. Because the active play program activities are structured, the children stay busy. It is the job of the physical trainer to pace the

exercises for the children so that they keep moving and attain optimal health benefits from their time outside without getting overly fatigued.

I conducted the active play sessions with four childcare centers in forty-five minute to an hour-long segments throughout the summer of 2008. In 2009, the number of centers I worked with rose to twelve. I began my active play sessions, as I would with my adult personal training clients, with a warm-up activity followed by a total body stretch. I would have the children stand in a circle with their teachers, while I stood in the middle and led the stretches and warm-up movements (*e.g.*,"shake and freeze like a statue", "walk like a crab/gorilla"). I would then lead the children in a series of physically active games, relay races, and skill building activities. I worked the latter into the program because I wanted the children to have an early grasp of physical development skills such as throwing, catching, and kicking accurately. By introducing the children to these movements at an early age, they gain the necessary confidence to help them pursue more advanced activities like athletics and dance. While working with the children in childcare centers in Northern Manhattan, I attempted to alter the directors' and teachers' perceptions of recess as a simple break time and convince them of the importance of structured active play for their children's physical development and health.

The preschool directors in Northern Manhattan complained that they did not know where the safest playgrounds in their area were located. So the next step I took was to locate, photograph, and evaluate the playgrounds in the area. I personally examined the 56 playgrounds from 110th street to 207th street in Manhattan, checking for working water fountains and bathroom facilities, adequate shade, and overall safety and cleanliness. I used the data I collected (see Appendix C) to analyze the proximity of the participating

childcare centers to the playgrounds that I found to be of the highest quality. I then created written directions for walking from the centers to the playgrounds, and distributed them to childcare directors and teachers (see Appendix D).

Unfortunately, I was unable to measure the body mass indexes (BMI) of the children I worked with at the beginning and end of the program. The internship was only ten weeks in length (summer, 2009). What I did instead was to interview four of the childcare directors of the programs I worked with, using a questionnaire that was focused on the response of the centers to the recent government recommendation of sixty minutes of physically active play for children in the three to five age group. I created the questionnaire with the help of my supervisor Sally Findley, as a part of ABC's "Let's Play Summer 2009 Initiative". The completed questionnaires provided valuable information about the facilities the children use during active play periods, the amount and kind of parent participation in the programs, and information about the barriers to physical fitness in early childhood centers. The questionnaire and methods were submitted and approved by the Tufts Institutional Review Board (IRB). The twelve directors of the centers where I conducted play sessions during the summer of 2009 were invited to complete the questionnaire. Of these, eight were unable able to do so, citing their busy summer schedules as reasons for non-participation in this part of the study. Directors who participated completed Consent to Participate forms which provided permission for me to quote and use respondents' names in the report.

The limitations of this study include a reliance on self-reporting from the childcare directors only, and the small percentage (33%) of the directors participating. I would have liked to have had the opportunity to interview more of the childcare directors

of the centers where I worked, but many of them were going through their state evaluations during the time I was conducting these interviews. I would also have liked to interview some of the parents about what they believed to be the barriers to their children engaging in physical activity. Due to the time constraints of my internship, I was unable to do so.

The questionnaire I created to use in the interviews is included in Appendix A. I concluded that an interview with center directors would be an effective way to obtain information about the barriers to physical fitness program implementation in the childcare centers of Northern Manhattan because these directors are knowledgeable about each center's programming and its rationale. Many of the interview questions were based on work that ABC and I had previously conducted with the childcare centers.

The program directors who participated in the study included Marilyn Jonson of Quo Vadis Childcare Center, Anita Grossbard of Fort George Childcare Center, Tolu Oluwole of 7th Ave Headstart, and Norma So of Nicholas Cardell Childcare Center. I interviewed the directors in person during the summer of 2009 after the questionnaire was approved by the Tufts University IRB board. The funding for my internship at the Mailman School of Public Health was provided by a Tufts University Career Services grant.

In this study I used information from the Center for Disease Control and Prevention's (CDC) to show the growing problem of childhood obesity in this country, especially in low-income neighborhoods. In addition, I identified crime statistics in Northern Manhattan through an analysis of police reports and neighborhood crime data. This information was relevant because a continual problem for families in Northern

Manhattan communities is that they are unable to take their children to the playground after work due to gang and drug activity on the playgrounds. I also attempted to obtain information on parental working hours in these neighborhoods to show that the childcare center may be the only place where these children have a chance to exercise during the day. I was unsuccessful in finding statistics on parents' work hours, and so I reported only on the response of the childcare directors, who stated that many of the parents work exceptionally long hours.

The next chapter will discuss the literature review I created in order to answer my thesis questions. Chapter 3 will discuss the results of my interviews with the childcare directors, the active play sessions with the children and teachers, and the playground evaluation. In conclusion, Chapter 4 is the discussion section. In this thesis I will argue that the best method of intervention in the face of childhood obesity in Northern Manhattan, is one that motivates the children to become physically active at an early age by having them participate in organized activities, and that takes a multi-level perspective after the Socio-Ecological Model and Bronfenbrenner's Ecological Theory.

CHAPTER TWO REVIEW OF LITERATURE

Importance of Physical Activity and Exercise for Young Children

In the last thirty years there has been a cultural shift in lifestyle that supports children being sedentary. The guidelines of the National Association for Sports and Physical Education (NASPE) state that children between the ages of 5 and 12 need at least one hour of "moderately vigorous" exercise every day (Woolston, 2009). Statistically, only 20 to 40 percent of American children get the recommended amount (Woolston, 2009). The average American child spends more than five hours per day (about 40 percent of his/her waking hours) watching television, on the computer or playing video games (Woolston, 2009).

Participation in physical activity and exercise early in life can be a beneficial form of preventative medicine against these ill health effects. A child who exercises 30 to 60 minutes a day, 3 to 7 days a week, can increase his/her ability to reduce total body fat (Strong & Malina, 2005). If the goal is to target children before they become overweight, it is necessary to conduct more rigorous and longer exercise sessions, up to 80 minutes per day, in order to initiate fat loss in normal weight children who are at risk for being overweight (Strong & Malina, 2005). Currently, the American Academy of Pediatrics, the American College of Sports Medicine, and the U.S. government recommend a sixty-minute per day requirement of active play for children (LetsMove.gov). According to Strong and Malina, a longer amount of time spent in vigorous physical activity may be necessary to have a beneficial effect on adiposity in normal weight youth.

For young children whose parents are working and cannot take them to the

playground, the time they spend at school may be their only opportunity to get exercise. Currently, Illinois and Massachusetts are the only two states that require daily physical education classes for children in kindergarten through 12th grade (Woolston, 2009). Nationally, more and more academic classes are being programmed into the days of elementary school students who, as a result, are getting less and less recess time (Woolston, 2009). Recess gives children a chance to burn energy in a mode of their own choosing, but games of tag or catch can be more physically demanding than many unstructured recess activities (Woolston, 2009). The combination of free play and organized physical activity can promote optimal health outcomes.

Any physical movement that is the result of muscle and skeletal contraction can be considered physical activity (Goran, 2006). Although physical activity can be measured in terms of calories lost, it is not always appropriate to do so. The benefits and health effects of physical activities using a high-energy expenditure (sprinting) versus a low energy expenditure (weight lifting) may not be related to the caloric cost of the physical activity (Goran, 2006). To correctly quantify physical activity, many factors must be taken into account, including: the type and purpose of the activity (recreational or obligatory, aerobic or anaerobic), the intensity level, the duration, the frequency, and the specific caloric cost (Goran, 2006).

Physical activity is an umbrella term that includes "exercise." Exercise is commonly defined as structured activities performed for the purpose of improving physical fitness, but exercise can also be unstructured. When children run on the playground with friends with no specific goal, they are exercising through their play, whether they know it or not. If children run for just a short burst, they are using their

anaerobic system (also known as the Lactic Acid system), which uses glycogen (from carbohydrates consumed) and ATP (the basic stored chemical that produces movement in muscles). The anaerobic system works without the use of oxygen, but only for the first five to fifteen seconds of exercise. After fifteen seconds, as a child continues to run he or she will begin to use his or her aerobic system. The aerobic system also uses glycogen and ATP, but in combination with oxygen. Aerobic exercise not only improves the oxygen intake of the muscles (strengthening the heart), but it also burns away body fat after using up the body's store of glycogen (Goran, 2006). This is why cardiovascular exercise such as running or biking long distances is recommended to improve heart health and to help people lose weight (Goran, 2006).

The kind of active play in which children are participating is important. Involving children in physical activities that are in line with their developmental abilities will help and encourage them to learn fundamental athletic skills that may encourage an interest in sports and athletics later in life. Basic movement patterns developed in the preschool years become the foundation for a wide variety of physical activities later in life (Strong & Malina, 2005). In addition to the health benefits of physical activity for young children, physically active play is pivotal to children's motor development. The ability of a child to use his/her body (motor development) comprises three different domains: gross-motor skills, fine-motor skills, and balance/coordination skills (Brotherson, 2006). Gross-motor skills relate to the development of the large muscles in a child's arms and legs. The development of these large muscle groups is not only important for mastering skills like crawling, walking, lifting, and pushing, but also for achieving an overall sense of physical balance by becoming more physically proportional (Brotherson, 2006).

Balance and proportionality are usually not achieved until age six when children's body proportions are more like those of adults, so it is important for their gross-motor skills that three and four year olds be provided with ample opportunities to exercise and play. By the ages of three to five years, children should be able to walk up and down stairs by themselves, hop on one foot, catch a ball, throw a ball 5 to 15 feet (overhand), run with coordination, and kick a ball (Brotherson, 2006). Conducting a "variety of large-muscle activities with children is important for parents, childcare programs, and schools to give children a chance to develop their large-muscle skills" (Brotherson, 2006). By ages four and five children have mastered many basic movement skills, including running, jumping, hopping, skipping, throwing and catching. They also have plenty of energy to use these skills and refine their movements. As a child grows and gains experience, these basic movements can be coordinated and integrated into more specialized, complex movement skills, which "characterize the free play, sports, games, and other physical activities of school-age youth" (Strong & Malina, 2005). Having young children participate in a wide range of movements is important for coordination, development, and a life-long interest in athletics, dance, or other physical activities. Guided instruction and supervised practice by qualified teachers, coaches, and childcare workers are important to help children learn movement skills (Strong & Malina, 2005).

When looking at the effects of physical activity in young children, there are important correlations between being overweight or having adiposity and cardiovascular health. Cardiovascular (or aerobic) fitness such as running, biking, or hiking can improve cardiovascular health. Even from a very young age, the faster and/or farther children move and the higher their heart rates (within the maximum heart rate established for a

children this age), the stronger their hearts become, enabling them to pump more blood faster, and get oxygen where the body needs it faster and in greater amounts. Successful programs involve "continuous vigorous activity" (*e.g.,* 80% of maximal heart rate) for longer than 30 minutes, for a minimum of three days per week (Strong and Malina, 2005).

Physical activity can also have a positive effect on a child's mental and emotional health. There may be a positive association between physical activity and lower levels of anxiety and depression, depending on the mode of activity (Strong & Malina, 2005). In short, physical activity may alleviate negative emotions and improve self-concept. Self-concept consists of the following domains: social, emotional, academic, and physical. An interaction between these domains could occur when the addition of physical education to a curriculum results in small positive gains in academic performance (Strong & Malina, 2005). If a child's academic performance improves, so might his/her self-concept.

Physical activity also has a positive effect on developing physical self-concept by developing muscular strength and endurance (Strong & Malina, 2005). Children can be competitive with one another and become aware of their athletic abilities and coordination, even as young as 3 to 4 years of age. This awareness affects how the children perceive themselves as well as others (Strong & Malina, 2005).

Childcare centers and preschools are optimal settings for children to achieve their daily physical activity goal, surrounded as they are by their peers. Conversely, home environments, where television, computers, and video games are monopolizing the time of younger and younger children, are no longer optimal settings for active play. The risk of being overweight and participating in sedentary activities is increasingly evident in

children ages 2 to 5 years, and this risk has serious implications for subsequent ages (Strong & Malina, 2005). It is therefore important to encourage physical activity and limit physical inactivity in preschool children. They should be the age group most frequently targeted for obesity intervention because if they can internalize healthy exercise and nutrition habits at such a young age, they will be likely to keep these habits as they grow up (Strong & Malina, 2005).

As children develop their smaller muscles, they gain more control of their fingers and toes and begin to attain fine-motor skills. Grabbing, cutting, writing, and catching are all fine-motor skills acquired by development of smaller muscles (Brotherson, 2006). Fine-motor skills not only develop later than gross-motor skills, but they are also different at different ages. The fine-motor skills of a three-year old, for example, are vastly different from that of a six-year year old. Young children need soft balls and other smaller objects to pick up, throw, and squeeze in order to develop their small-muscle skills (Brotherson, 2006).

Balance and coordination skills are also developed in early childhood in order for the child to be able to perform complex physical activities. Developing balance and coordination skills in early childhood involves "movement of the body in activities such as turning, pulling, twisting, or maintaining stability" (Brotherson, 2006). Balancing and coordination skills developed in early childhood are necessary for throwing, catching, skipping, kicking, and a child's ability to interact in and explore his/her environment. The ability to focus one's eyes on a moving object and kick, catch, or hit it, is essential for many games that children play. Activities such as playing catch, tossing a ball into a goal, or kicking and trapping a ball, are all skills that involve both balance and the

coordination of the eye and the hand (or foot) simultaneously. Side-to-side or lateral movements can help a child develop his or her hand-eye coordination and right-to-left tracking (Brotherson, 2006).

Parents and other caregivers should try to provide their children with useful and age-appropriate equipment, a variety of activities and games, and ample interaction with adults, as well as peers of their own age group, in order to enhance physical growth and development in children (Brotherson, 2006). Adults can help children learn how to move and control their bodies by using the M-O-V-E formula (Brotherson, 2006). M-O-V-E stands for Motivation, Opportunity, Variety, and Equipment (encouragement and enthusiasm too) (Brotherson, 2006).

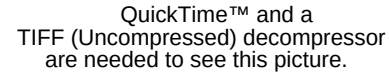
Motivation refers to the fact that children need a reason to be engaged in an activity designed to stimulate physical development (Brotherson, 2006). Children will play until they get bored or tired, so a goal (motivation) is necessary to keep them moving. Organized activities by adults, such as relay races or games like tag or hide and seek that involve peer interaction, are often the best means of motivating children to exert themselves in play (Brotherson, 2006). If an adult is actively engaged with a child and a peer or peers, physical activities become fun (Brotherson, 2006). Opportunity refers to children's need for space to explore and materials and equipment to use (Brotherson, 2006). Variety refers to the need for a plethora of equipment, materials, and activities to satisfy the natural curiosity of children (Brotherson, 2006). A variety of equipment can also improve the quality and entertainment value of active play (Brotherson, 2006). Children need to develop all aspects of their physical abilities, so they must be engaged in a variety of activities that will help them use all of their skills and muscle groups

(Brotherson, 2006). Lastly, the final "E's" of the M-O-V-E formula are definitely the most important because the encouragement and enthusiasm of adults will inspire children to develop their physical abilities regardless of their surroundings and equipment (Brotherson, 2006). If parents and caretakers give children undivided attention and express their excitement in the progress they see in their abilities, even playing soccer with a chewed-up volleyball can be fun and beneficial (Brotherson, 2006).

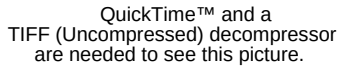
Obesity in Children

Obesity can begin early in life, with weight problems becoming apparent in children as young as two to five years old. Obesity is measured by the Body Mass Index (BMI), which compares a person's weight and height. Children's BMI is calculated as their weight in kilograms divided by their height in meters squared. During the past 20 years there has been a dramatic increase in obesity in the United States. Data from NHANES surveys (1976–1980 and 2003–2006) show that the prevalence of obesity has increased from 5.0% to 12.4% for children ages 2–5 years. In the state of New York, 24.4% of people are obese according to the CDC's 2008 obesity rates, and 14.6% (209,713) of children ages 2 to 4 are obese (CDC, 2009). According to data from the National Health and Nutrition Examination Survey (NHANES), as of 2002, in the U.S. 26% of Mexican American boys and 17% of African American boys ages 6 to 11 were obese, compared with 14% of white boys (Kumanyi & Grier, 2006). Among girls of the same age, 22.8% of African American girls and 17.1% of Mexican American girls were obese, compared with 13% of white girls. In 2008, prevalence of childhood obesity was highest among American Indian/Alaska Native (21.2%) and Hispanic (18.5%) children, and lowest among non-Hispanic white (12.6%), non-Hispanic black (11.8%), and Asian/Pacific Islander (12.3%) children (CDC, 2009).

FIGURE. Change in obesity prevalence during 1998--2003 and 2003--2008 among children aged 2--4 years, by race/ethnicity --- Pediatric Nutrition Surveillance System, United States, 1998—2008 (CDC, 2009)



Obesity is the result of an imbalance between energy intake and expenditure. Childhood obesity occurs when a child consumes more calories than he or she burns, and the two most cited causes are unhealthy eating habits and lack of exercise. For children of the same age and sex, obesity is defined as a BMI at or above the 95th percentile (CDC, 2009). The percentile indicates the relative position of the child's BMI number among children of the same sex and age (CDC, 2009). The chart bellow shows the BMI percentiles for boys in the United States, standard to the year 2000 (CDC, 2000).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There is an overrepresentation of Non-Hispanic blacks and Hispanics in the prevalence of obesity. During the time period from 2006 through 2008, 25.6% of non-Hispanic blacks, non-Hispanic whites, and Hispanics were obese in the U.S. (CDC, 2009). Non-Hispanic blacks (35.7%) had 51% greater prevalence of obesity, and Hispanics (28.7%) had 21% greater prevalence of obesity in comparison to non-Hispanic whites (23.7%) (CDC, 2009). In 2008, national obesity prevalence among Hispanic children was 18.5% (Centers for Disease Control and Prevention, 2009).

Childhood obesity is associated with high blood pressure, high cholesterol levels, and abnormal glucose tolerance, which are all risk factors for cardiovascular disease (CVD). In 2006 through 2008, Seventy percent of obese children had at least one CVD risk factor, and 39% of obese children had two or more CVD risk factors (CDC, 2009). Children who are obese in their preschool years are at much greater risk to contract asthma and sleep apnea early in life. Asthma is a chronic respiratory disease in which the airways become blocked or narrowed causing breathing difficulty. It can be life-threatening and is associated with overweight children with a sedentary lifestyle. Sleep apnea is a sleep-associated breathing disorder in which breathing pauses for a few seconds while the person is asleep, during which time blood oxygen levels can fall dramatically, and results in disruption of sleep with a loud snort, labored breathing, or even choking. Later in life obese children are at greater risk for type two diabetes, hypertension, dyslipidemia, orthopedic problems, and neurological disorders. Diabetes in children and adolescents can result in CVD and kidney failure (CDC, 2009).

Other consequences of childhood obesity are psychological. Young children are molded by genetic factors, their environment, and caregivers. Obese children suffer

emotionally due to Western society's emphasis on physical appearance, which values the thin and muscular and stigmatizes the overweight and obese. Obese children face taunting and discrimination at school, in social situations, and even at home. They experience feelings of shame, rejection, and depression as they reach adolescence. Having low self-esteem can hinder social and academic functioning, affecting children into adulthood (Dietz 1998). Obesity developed in early childhood persists into adulthood 33% of the time, and leads to an increased risk of morbidity and mortality later in life (Dietz 1998). Obesity will persist in approximately 50% of overweight children or adolescents (Dietz 1998).

The National Longitudinal Survey of Youth revealed that obese, adolescent females suffered serious social consequences seven years later including: fewer completed years of education, lower rates of marriage, lower family incomes, and higher rates of poverty (Dietz 1998). The Survey's results persisted when controlled for the family of origin's income and educational levels, as well as for self-esteem, suggesting that obesity in women could have been a determinant of these socioeconomic correlates, rather than a consequence (Dietz 1998).

A strong determinant of the development of obesity in children is a lack of physical play. Their activity level, as measured in number of hours of physical play per week, is inversely related to children's body fat mass (Goran, 2006). Amount of time spent watching television is correlated with the percent of overweight children (Bray, 2006). Children who spend excessive amounts of time watching television, playing video games, or participating in other sedentary activities are less likely to have the amount of energy expenditure they need to stay healthy (Goran, 2006). This is because today's typical

American five-year-old child consumes almost 600,000 calories each year (Woolston, 2009).

Childhood Obesity in Low Income Areas

The prevalence of childhood obesity is disproportionately higher in low-income areas across the United States, in comparison to higher income areas. The causes of these high rates are related to cultural, environmental, and economic factors such as diet, caloric intake, sedentary and physical activity levels, lack of affordable sports and exercise programs, and unsafe public spaces.

Prevalence A 2001 cross-national comparison of childhood obesity assessed the relationship between obesity and socioeconomic status in the U.S., Russia, and China. The study used data from nationwide surveys in the three countries for children ages 6 to 18. The prevalence of obesity and overweight was found to be, respectively, 11.1% and 14.3% in the U.S., 6.0% and 10.0% in Russia, and 3.6% and 3.4% in China (Wang, 2001). The relationship between obesity and SES differed among the three countries. High SES subjects were more likely to be obese in China and Russia, while low-SES groups in the U.S. were at higher risk (Wang, 2001). Obesity prevalence among American adolescents was lowest in the high-income group, in contrast to China, where the obesity prevalence was highest in this SES group (Wang, 2001). Another interesting distinction among the countries is that in both Russia and China, but not in the U.S., the obesity prevalence was higher among children than adolescents, meaning that, among these three countries, only in the U.S. are children becoming increasingly overweight as they grow older (Wang, 2001). The study also found that in the U.S. adolescent group 14.0% of low-income children were obese, compared with 5.5% in the high-income group (Wang, 2001).

According to a July, 2009 CDC report of obesity prevalence among low-income, preschool-aged children in the U.S., childhood obesity continues to be a leading public health concern that disproportionately affects low-income and minority children (CDC, 2009). The results indicated that obesity prevalence among low-income, preschool-aged children increased steadily from 8.5% in 1983 to 12.4% in 1998 to 14.5% in 2003, but subsequently remained basically the same, with a 14.6% prevalence in 2008 (CDC, 2009).

The cause of the stabilization of overall obesity prevalence among these children between 2003 and 2008 is not known. Prevention efforts within state and local Special Supplemental Nutrition Program for Women, Infants and Children (WIC) programs, which target behaviors related to obesity in children, may be a factor in this stabilization (CDC, 2009). WIC is a federal assistance program that provides food to low-income pregnant women, women who are breastfeeding, and infants and children under the age of five. WIC initiatives that have attempted to raise acceptance, awareness, and support of breast-feeding; promote the use of low-fat and fat-free milk (as opposed to whole) by providing vouchers, and advocate reduced television viewing may have all contributed to this stabilization. Obesity prevalence among low-income, preschool-aged children in the U.S., despite having stabilized, is still high and is a leading public health concern (CDC, 2009).

A 2001 study that sought to estimate the prevalence of overweight in low-income young children found that 40% of children enrolled in the New York City Neighborhood WIC Program were overweight or at risk for being overweight (Nelson, *et al*., 2004). This program is the largest WIC provider in New York City, offering food assistance and

nutrition education to more than 50,000 racially and ethnically mixed, low-SES women, infants, and children each year. Results of the study showed that in comparison to other racial/ethnic groups combined, Hispanic children were more than twice as likely to be overweight or at risk for becoming overweight than other racial groups, and 2-year-olds (of all races) were less likely to be overweight than 3- and 4-year-olds (Nelson, *et al*., 2004).

A 2003 study of childhood obesity in New York City public elementary school students found that out of a study sample of 2,681 children, ages 6 to 11, 43% were overweight; more than half of whom (24%) were obese (Thorp, *et al*., 2004). The level of overweight for Hispanic children (31%) was significantly higher than that of black (23%) or white children (16%). Asian children had the lowest level of obesity among all racial/ethnic groups (14.4%) (Thorp, *et al*., 2004). The study concluded that obesity levels among public school students in New York City are an important public health issue, with a rate of one in every four of the children in this population identified as obese. Regardless of ethnicity, low-income children are at excess risk of obesity, although ethnic differences in pediatric obesity do appear at lower-income levels (Kumanyi & Grier, 2006). The study advocated for raising awareness in lower socioeconomic status communities of health risks associated with childhood obesity, and for the importance of developing a sustainable healthy diet and good physical activity patterns early in life (Thorp, *et al*., 2004).

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Causes Diet, physical activity level, and environment are all factors affecting obesity levels in low-income neighborhoods. Why is it that the average low-income child seems

to be at greater risk for obesity than the average higher income child? To answer this question, diet, physical activity level, and environment must all be analyzed using the Socio-Ecological Model on the individual, interpersonal, community, and policy level.

Diet Low-income and minority children watch more television than higher income children and are exposed to more commercials advertising high-calorie, low-nutrient food during an average hour of TV programming (Kumanyi *et al*., 2006). In their neighborhoods there are typically more fast-food restaurants and fewer options for healthful foods than there are in predominantly white neighborhoods (Kumanyi *et al*., 2006). Available food in urban, low SES communities across the country is almost always high in calories from fats and sugars and low in nutritional value (Kipke & Iverson, 2006). Healthy foods are generally expensive or unavailable in poor neighborhoods (Kipke *et al.,* 2006).

Several other factors contribute to the connection between obesity and socioeconomic status. First, low-income consumers tend to be able to afford only higher-energy dense foods, including foods with high dietary fat and sugars. Second, food insecurity, the uncertainty of being able to afford food or have it available, is most prevalent among low-income populations, and is positively associated with obesity rates. Finally, the majority of food stamp recipients live in low-income communities. A positive relationship has been found between women's Food Stamp Program participation and their body weight. In addition, the overall decline in physical activity levels and increase in sedentary activities in this country have contributed to the obesity epidemic (Townsend, 2006).

While in China, richer people have greater access to energy dense foods and typically live a more relaxed and sedentary lifestyle than the poor, who are more active and eat more vegetables, in the U.S., higher income groups usually consume more fruits and vegetables, which are less energy-dense, than low-SES groups (Wang, 2001).

In low-income, inner-city "hot spot" areas like East and South Los Angeles, where nearly 50% of children are overweight or obese, 93 of the 190 food outlets (49%) in East Los Angeles were fast-food restaurants. Sixty-three percent of these fast-food restaurants were within walking distance of a school. Only eighteen percent of the 63 grocery stores sold fresh fruits and/or vegetables of a reasonable quality. Of the stores that did sell the better quality fruits and/or vegetables, only four were within walking distance of a school (Kipke & Iverson, 2006). With respect to fast food restaurants, there is no consensus on the definition of a fast food restaurant that has been applied in health research. However, policy change goals include reducing promotion of unhealthful food from such restaurants, ensuring that the bulk of food available to children in most settings meets nutritional guidelines, and making it easier to identify and afford healthful foods (Sallis & Glanz, 2006).

Exercise These low-income neighborhoods have many obstacles to physical activity, including dilapidated playgrounds and crime filled streets (Kumanyi *et al.,* 2006). Targeted intervention affecting home environment and parental behaviors such as breast feeding and television viewing could be a positive first step to preventing childhood obesity (Kumanyi *et al*., 2006).

Diet alone does not account for the weight disparities between high and low SES communities of different ethnicities. Recently, there have been nationwide decreases in physical activity and increases in sedentary activities among preschool children (California Center for Physical Activity, 2010). Trends that have led to a reduction in childhood physical activity include increased usage of sedentary recreation (TV, computers, video games), increased demand for improved academic achievement (leading to less PE and recess), increased concern for child safety, changes in urban environment and design, personal injury litigation, more two-working parent families, and increased vehicle travel (as opposed to walking or biking) (California Center for Physical Activity, 2010). The average American household drove more than 31,000 miles in 2001, and each American car was driven an average of 13,000 miles (Handy, 2003). The total number of miles driven in the U. S. has grown two-and-a-half times from 1936 to 2001 (National Household Travel Survey, 2001). These trends correspond to reductions in active play for children growing up in the video game era, with programming available for children as young as two years old (California Center for Physical Activity, 2010).

The problem with cross-sectional studies is that they cannot establish a measure of time between the time when someone becomes overweight and potential causal factors that lead to their becoming overweight. Longitudinal studies, on the other hand, can establish such measures because they typically use smaller study populations (O'Loughlin & Gray-Donald, 2000). A 1993-1996 longitudinal study sought to identify 1-and 2-year predictors of excess weight gain among fourth and fifth grade students in 16 elementary schools located in multiethnic, low-income neighborhoods in Montreal,

Quebec, Canada. Levels of sports played after school, as well as video games, were measured for all children. The children who were most overweight at baseline gained the most weight for height at follow-up at one and two years later, and both current and past levels of physical activity were accurate predictors of excess weight gain. Frequency of video game playing was also associated with excess weight gain. These observations from low-income, ethnically diverse neighborhoods suggest that there is an important need for interventions that promote increased physical activity in children and decreased time spent in sedentary activities (O'Loughlin & Gray-Donald, 2000).

Environment A cross-sectional survey of mothers in twenty large U.S. cities collected reports of average daily time of outdoor play and TV viewing for their 3-year-old children and their children's BMI. Although obesity prevalence did not differ (17% vs. 18%) among children from the "least safe" to the "safest" neighborhoods, as assessed by the mothers, or among children who spent more or less minutes in outdoor play and minutes per day of outdoor play, children who lived in the least safe neighborhoods were found to be more likely to watch TV more than two hours per day more often than children in safer neighborhoods (Burdette & Whitaker, 2005). Given that television viewing habits are established early in life, the high level of television viewing (sedentary activity) among the children in less safe neighborhoods could lead to higher levels of obesity in this population later in life (Burdette *et al*., 2005). Increasing the amount of time children spend in outdoor physical play and making neighborhoods safer for children are important interventions for ending the obesity epidemic in this country (Burdette *et al.,* 2005).

There has been limited research about which environmental factors are the major contributors to the current obesity epidemic among the preschool age group. Such research is necessary in order to enact public policies to make environmental improvements. There is a correlation between access to recreational facilities and physical activity in young children (Burdette & Whitaker, 2004). The availability of public playgrounds, parks, and other outdoor play spaces is of critical importance for preschool children, for whom the strongest correlate of physical activity is time spent in outdoor play (Burdette & Whitaker, 2004). Preschoolers living in low-income, inner-city neighborhoods with high crime rates may be at greater risk for obesity simply because there are fewer places to play safely outdoors. Even in areas where there are public playgrounds, their use by preschoolers, and therefore their impact on childhood obesity, could vary depending on neighborhood safety (Burdette *et al*., 2004). With respect to neighborhood crime and safety, Burdette and Whitaker used police crime statistics rather than parental reports of perceived safety in their study. It may be the parent's perception of neighborhood safety that determines whether or not a parent brings his or her child to a playground, and according to the testimonials of the childcare directors, this is the case for the childcare centers as well (Burdette *et al.,* 2004).

In order to combat childhood obesity, the "built environment" must be examined (Sallis & Glanz, 2006). The built environment is "the neighborhoods, roads, buildings, food sources, and recreational facilities in which people live, work, are educated, eat, and play" (Sallis & Glanz, 2006). The built environment can directly affect the decisions people make in their lives, that is, whether or not they take their children to the playground and the amount of fast food they eat and serve every week. There are three

important questions to consider when looking at the built environment's effect on obesity. First, how are major decisions about lifestyle affected by the built environment? Second, would decision-making be affected by changes in the "built" environment? Third, would people's weight and overall health be affected by the changes? (Sallis *et al.*, 2006). During the past forty years, there have been many changes to America's built environment, and these changes have produced sedentary lifestyles and less healthy diets, which may have had a direct impact on the rising childhood obesity rates in this country. Built environments have an effect on children's weight by determining their eating habits and their physical activity level (Sallis *et al*., 2006). However, research into the relationship between children's activity level and their physical environment is limited and less than conclusive.

According to a study by Kipke & Iverson (2006), five parks in East LA are well maintained overall, but they account for only 37.28 acres, or 0.543 acres per 1000 residents. For the children of East LA fast food is easily accessible, but access to both healthy food options and parks where they can engage in physical fitness activities is not (Kipke *et al.*, 2006).

The problem of "self-selection" is a reoccurring limitation in the majority of the studies on the physical environment's effect on activity level. For example, if a study finds that people who live near playgrounds are more physically active than people who do not, one could conclude that the proximity to the playground is the cause of the higher activity level. However, it could just as easily be concluded that people who are more physically active choose to live near playgrounds. Even though the research in this area is not scientifically conclusive, public health officials have stressed the need for changes

in the built environments of low-income urban areas, in order to improve health (Sallis *et al.,* 2006).

Children who have easy access to playgrounds, parks, and recreational programs are more active physically than those who have difficulty getting to, or live further away from, these facilities and programs (Sallis, Prochaska *et al.*, 2000). Preschool children are more active when they have more places nearby where they can participate in vigorous play, and when they can spend more time in those places (Sallis, *et al.*, 1993). It is also important for this age group, ages 2 to 6, to have as much physical activity outside as possible. For them, the strongest correlate of their physical activity level is being outdoors (Sallis *et al.*, 2000).

Conversely, there are studies that have found no correlation between children's weight or activity level and variables such as environmental barriers, access to facilities, and neighborhood safety. In their study in Cincinnati, Ohio, Burdette and Whitaker found no association between overweight children and the accessibility of playgrounds or fast food restaurants or between overweight children and neighborhood crime level (Burdette *et al*., 2004). However, there are certain limitations to their study. Burdette and Whitaker did not account for any variation in the quality of the playgrounds (*e.g*., cleanliness or equipment disrepair).

In order to reduce the level of childhood obesity in this country, effective prevention strategies that focus on safer outdoor environments and policies promoting physical activity and a healthy diet for families, child care centers, and communities will be required (CDC, 2009).

Childhood Obesity in Northern Manhattan

Prevalence Twenty-four percent of the population of Northern Manhattan is considered obese (NYC Department of Health, 2006). The neighborhoods of Harlem and Washington Heights are primarily African American and Hispanic, densely populated, and largely poor. According to the 2000 U.S. Census, approximately 427,247 people live in Northern Manhattan: 52% percent are Hispanic; 33 percent are African American. The median family income in Northern Manhattan is $26,184, and 34 percent of the households have an income below the poverty line (NYC Department of Health, 2006).

According to the 2000 U.S. Census, approximately 218,833 people, predominately African American (56%), live in Harlem, and 26 percent of them are children (NYC Department of Health, 2006). Residents suffer disproportionately high levels of heart disease, stroke, and cancer in comparison to other New York City neighborhoods. Twenty-six percent of the people in Harlem are obese. One in four black men in Central Harlem is unemployed, and 61 percent of children in Central Harlem live in poverty. The median family income in Harlem is $24,295, and 37 percent of households live below the poverty line (NYC Department of Health, 2006).

According to the New York City Department of Health and Mental Hygiene, more than one in four children in Head Start programs and public elementary schools are obese in East and Central Harlem, and more than four in ten are either overweight or obese (NYC Department of Health, 2006). Approximately one in seven public high school students in East and Central Harlem is obese, and nearly one in three is overweight or obese. In East Harlem, 44.2 percent of the population is obese, which is the highest percentage of obesity in any neighborhood of New York City (NYC Department of

Health, 2006). In comparison, 11.1 percent of the population of the Union Square/Lower Manhattan area is obese (NYC Department of Health, 2006). While the prevalence of obesity among preschool children in Head Start and public elementary school children is similar in East Harlem, Central Harlem, and Manhattan overall, the prevalence of obesity among older adults is higher in East Harlem and Central Harlem than in Manhattan as a whole (NYC Department of Health, 2006).

The Northern Manhattan neighborhoods of Washington Heights and Inwood have a population of approximately 270,700. Twenty-two percent of the population is under the age of 15. Seventy-one percent of the population is Hispanic and 14 percent is African American (NYC Department of Health, 2006). Fifty-one percent of the residents of these neighborhoods are foreign born; 31 percent of the residents are living below the poverty line; and the median family income is $28,451 (NYC Department of Health, 2006). The Washington Heights and Inwood communities are among the most disadvantaged communities in New York City and the nation. Similar to Harlem, residents of Washington Heights and Inwood suffer disproportionately high levels of heart disease, stroke, and cancer in comparison to other New York City neighborhoods (NYC Department of Health, 2006). Children in these neighborhoods suffer from high levels of childhood obesity, asthma, and diabetes (NYC Department of Health, 2006).

More than one in five adults are obese in Washington Heights and Inwood; overall, 29 percent of the residents are considered obese, and 40 percent are overweight. According to the Center for Best Practices in Childhood Obesity Prevention at Morgan Stanley Children's Hospital, close to half of all school-aged children in Washington Heights are overweight or obese (Morgan Stanley Children's Hospital, 2009).

Causes The lack of physical activity, a sedentary lifestyle, poor quality diets, and neighborhood safety have influenced the levels of childhood obesity in Northern Manhattan on both the individual and community level. In relation to Bronfenbrenner's theory, factors in the Microsystem, Mesosystem, and Exosystem are all having an effect on childhood obesity rates in this area.

In Northern Manhattan, children in childcare centers spend 58% of their free play time in sedentary activities (Findley, 2008). Childcare centers may be the only place where these children can get exercise (Microsystem). They can do so by participating in vigorous play with their classmates. Parents cannot afford to sign their children up for expensive after-school sports and dance programs, and single parents and parents who work long hours in the low-income communities of Northern Manhattan do not have the time to make regular trips to local playgrounds with their children (Mesosystem). Parents and caregivers also consider inner-city playgrounds to be dangerous places and the settings for criminal or drug activity in the after-school hours (Exosystem). Living in a high crime area is definitely a risk factor for obesity because it is a deterrent to outdoor physical activity.

Physical Activity Changes in physical activity levels, modes, and patterns develop during a child's first three to five years. Children begin to walk, run, and jump. This is also a time when sedentary recreational activities increase, such as hours of watching television (Irigoyen *et al.*, 2008).

In East and Central Harlem, many adolescents and adults do not exercise on a regular basis or eat the recommended amount of fruits and vegetables. More than one in

three high school students report not exercising even 20 minutes a day, 3 days per week, and nearly 6 in 10 report watching TV at least 3 hours per day (NYC Department of Health). "One in 4 adults reports not exercising at all. A similar proportion does not walk or bicycle at least 10 blocks to get to work or school or to run errand. More than 8 in 10 adolescents and more than 9 in 10 adults say they eat fewer than 5 servings of fruits and vegetables per day" (NYC Department of Health).

Forty-eight percent of residents of Inwood and Washington Heights admit to not exercising at all, compared to 32 percent of Manhattan residents, and only one third of the Inwood and Washington Heights residents (36%) report exercising at least 3 days a week (NYC Department of Health).

Diet Because the development of childhood obesity can start very early in life, in Northern Manhattan the first three years of a child's life may represent a critical period in the development of overweight and obesity, one that may be important to target for public health and population-based prevention interventions (Irigoyen *et al.*, 2008). During the first three years, many important developmental changes occur. The child transitions from an entirely milk-based diet to solid foods. This is also the time when eating behaviors and food preferences develop, and children begin to feed themselves (Irigoyen *et al*., 2008).

As in other inner-city communities, Northern Manhattan has areas where the most convenient grocery stores do not carry fresh fruits, vegetables, or even low-fat milk, all of which are recommended to reduce the risk of obesity (Irigoyen *et al.,* 2008). These locale and financial nutritional barriers are compounded by the fact that in this community there is a lack of playgrounds and parks, particularly ones that are both

accessible and considered safe by the community (Irigoyen *et al.,* 2008).

Environment Culture and tradition may partially dictate eating habits, food preferences, activity levels, and types of activities. However, a community's financial status and surroundings also have an effect on the above, and thus affect the culture. The fact that Northern Manhattan is a low-income, minority community may be a major factor contributing to the rapid rise in overweight and obesity. Community safety is an important issue in this area of New York City. In 2009, the number of criminal summons violations in Northern Manhattan was 44,835, which was the third highest among New York City areas (behind the Bronx, and Northern Brooklyn) (New York Post, 2009). There were 43 murders, 157 rapes, and 2,290 robberies in Northern Manhattan in 2009 (NYPD, 2010). In comparison, the rest of Manhattan experienced 16 murders, 84 rapes, and 1,469 robberies (NYPD, 2010).

Families in Northern Manhattan may not have the opportunities or ability to ensure that their children are able to play as actively as is recommended (Irigoyen *et al.,* 2008). The New York Academy of Medicine Study findings suggest that living in inner-city communities such as those in Northern Manhattan increases the risk of early-childhood obesity and that strategies aimed at reducing this risk will need to take into consideration the effect of barriers to healthy living due to poor resources and real and perceived crime in neighborhoods (Irigoyen *et al.*, 2008).

There is increased socialization during a child's preschool years, as he/she leaves the home environment and interacts with other children at the park, playground, or childcare center. In addition to the influence of the home environment, childcare centers may play a major role in influencing dietary and activity patterns early in a child's life

(Irigoyen *et al*., 2008).

Interventions Combating Childhood Obesity

Overall, intervention strategies to combat obesity in children have varied both in method and in results. Some reviews found that interventions focused only on physical activity were more effective than those focused on physical activity and nutrition education combined. Others found that this combination was beneficial; while still others concluded that simple health awareness and monitoring were effective. These variations may be attributed to many factors, such as funding amount, the study population, and the quality of service. One aspect of intervention that no review found evidence against was the importance of involving parents and other caregivers in their children's intervention process.

Using a family-based, health-centered approach, Golan and Crow (2003) compared a program that targeted parents exclusively in their treatment of childhood obesity with a control intervention program where only children were targeted. The home environment has the potential to have a positive effect on children's energy balance and diet composition in many ways. Food-related parenting practices and the physical and emotional environment in which eating and physical activity behaviors are developed are also important variables (Golan & Crow, 2003). The study concluded that over the long term, the treatment of childhood obesity with the parents as the "exclusive agents of change" was more effective than a conventional child-focused approach, but future research is needed on a combination parent-child approach that could possibly be even more effective (Golan & Crow, 2003).

In a review of 147 obesity intervention studies, the overwhelming majority targeted children ages six to eleven. Only nine of the 147 studies included children ages five and

under, which are the crucially important years for intervention (Findley, 2008). Since research has the ability to influence policy, the fact that obesity in preschool age children is not of greater interest in the research community is a concern (Findley, 2008). Family, physicians, and childcare centers should all be strong advocates for interventions that promote physically active lifestyles, and encourage healthy behaviors at home, in the community, and in preschools (Findley, 2008).

One example of a successful in-school strategy to combat childhood obesity is SPARK programming. SPARK is a research-based, national public health organization founded in 1989 that is dedicated to creating, implementing, and evaluating physical activity/nutrition programs that promote lifelong wellness (sparkpe.org, 2010). There are multiple SPARK programs for teachers serving Pre-K through 12th grade students, and each program is designed to promote behavioral and environmental change by providing a highly active curriculum, on-site teacher training, follow-up support, and equipment (sparkpe.org, 2010). Since 1989, when the first SPARK program was created, the developers have expanded their research, which led to the creation of programming for childcare centers (sparkpe.org, 2010). The SPARK trainers work on site with teachers and childcare providers to improve both the quality and quantity of physical activity/education (sparkpe.org, 2010). During the 2006-2007 school year, SPARK collaborated with the New York City Department of Health and Mental Hygiene to test the effectiveness of SPARK programming in three impacted neighborhoods of New York City. Results showed that 91% of preschool teachers trained reported using the SPARK EC (Early Childhood) program, and the amount of the children's physical activity time increased significantly. At centers offering full-day programs, median time increased 22

minutes per week, and in half-day programs, activity time increased 18 minutes per week (sparkpe.org, 2010). The SPARK program is not free. The teacher training, curriculum guide, and equipment cost thousands of dollars, depending on how much equipment a program needs and how many teachers must be trained.

Another review of seven studies published between January 1985 and October 1999 reported mixed results on the effectiveness of obesity prevention programs for children. Two of the long-term (> one year) studies focused on nutrition education and physical activity and resulted in a reduced prevalence of obesity. The third long-term study focused on nutrition education and physical activity and resulted in no effect on obesity prevalence. Three short-term studies focused on reduction of sedentary behaviors through physical activity, two of which resulted in a reduction in obesity prevalence while the third study found no significant reduction. The fourth short-term study, which focused on nutrition education and physical activity, resulted in no effect on obesity, but did find a reduction in fat intake (Campbell, Waters, et al, 2001).

A 2007 study conducted in France, which evaluated two kindergarten-based strategies for reducing overweight in preschool children, provides an example of a long-term intervention strategy that found positive results from obesity education and surveillance. The study found that, at baseline, groups did not differ in overweight prevalence or BMI score, regardless of school area (Jouret, Ahluwalia, *et al.,* 2009). After intervention, prevalence of overweight and BMI scores were significantly lower in intervention groups compared with controls in underprivileged areas (Jouret *et al.,* 2009). The study found that after two years for the first intervention strategy group, there was a significant effect on overweight prevalence in underserved communities only (Jouret *et*

al., 2009). In the more affluent areas, BMI scores were lower in the second intervention strategy group in comparison to the first group and the control group. Results suggested that simple measures, including increasing awareness on overweight and health and periodic monitoring of weight and height with follow-up care when indicated, could be useful to reduce the prevalence of overweight in young children from underserved areas (Jouret *et al.,* 2009).

A 2009 review of studies of interventions designed to prevent childhood obesity through diet, physical activity, and/or lifestyle and social support were retrieved from databases such as MEDLINE and PsycINFO from 1990 to 2005. The interventions were analyzed and assessed for quality and effectiveness. Of the 22 studies analyzed, 10 were long-term studies lasting ≥ 12 months, and 12 were short-term studies lasting 12 weeks to 12 months. Nineteen of the studies were based in schools/preschools, two were family-based interventions focused on non-obese children of obese or overweight parents, and one was a community-based intervention focused on low-income families. Of the long-term studies, six combined nutrition education and physical activity interventions, only one of which resulted in a difference in overweight status between groups, and one resulted in improvements only for the girls receiving the intervention, but not the boys. Two of the studies focused only on physical activity, using a multi-media promotion approach that was effective in preventing obesity. Another two studies focused on nutrition education alone, but neither was effective in preventing obesity. Of the short-term interventions, 4 of the 12 focused on increasing physical activity, two of which resulted in slightly reduced overweight status. The other eight studies, which focused on nutrition and physical activity, had no significant impact on overweight status. The

review concluded that interventions that focused on combining nutrition and physical activity did not improve BMI scores significantly, but that some of the studies that focused on nutrition or physical activity demonstrated small but positive impacts on BMI scores. Almost every study resulted in some degree of improvement in diet or physical activity, although results were mixed. The authors noted that the interventions they analyzed were missing cost-effectiveness data and suggested that the duration, design, and intensity of interventions for the prevention of childhood obesity must be reconsidered in tandem with a comprehensive examination of the interventions' scope and process (Summerbell *et al*., 2009).

CHAPTER 3 RESULTS

The Current State of the Childcare Centers of Northern Manhattan

In New York City there is a requirement for full-day childcare center programs to provide a minimum of sixty minutes of "physical activity" a day. According to the New York City Health Code of the New York City Department of Health and Mental Hygiene, thirty of the sixty minutes must include structured or guided physical activity for children ages three and above. Centers must provide outdoor play except in inclement weather. This may not be a problem for centers that have their own play yards, but for the Northern Manhattan centers, which primarily operate in facilities with little to no access to outdoor space, this requirement presents a problem. In winter, weather is an issue because most of these facilities do not have access to indoor gyms. Childcare staff members must bundle up the children for the cold weather and escort them across busy streets and dirty, badly maintained sidewalks to the closest park playground.

Question 1: What is the current state of the playgrounds in Northern Manhattan?

The poor quality of the settings for play in Northern Manhattan is a barrier to the physical activity of the children who live there. According to the childcare program directors I interviewed, many of the playgrounds are unsanitary and potentially dangerous, lacking in necessities such as shade, water, and bathrooms. For many childcare centers, these playgrounds are the only options available as spaces for children's physical activity because the centers' active play facilities are either inadequate because of size and/or equipment or nonexistent. Furthermore, the teachers and childcare staff are, for the most part, not trained in any sort of physical education.

The exercise program that I created for Asthma Basics for Children received an enthusiastic response from all of the participating childcare centers, and the teachers found it to be easy to recreate.

In an area spanning almost 100 city blocks, from 110th Street to the top of Manhattan, I visited 56 playgrounds, rating them based on the presence and adequacy of equipment, including jungle gyms, swings, and slides; bathrooms; water fountains; amount of shade; and overall cleanliness. I found that there were public playgrounds in close proximity to each of the ABC partner childcare centers, but that many of them did not have bathrooms and/or water fountains. Of the 56 playgrounds I visited, 38 had bathroom facilities, including permanent bathrooms or porta-potties; and 45 had drinking fountains and/or water spraying fountains that children could run and play in, some of which did not work. Only 32 of the 56 playgrounds had both bathroom facilities and at least one water fountain. Teachers who take their preschool classes to playgrounds need assurance that there will be both working bathrooms and water fountains especially during the hot and humid summer months in New York City when it is imperative that children have access to water. The fact that the majority of the playgrounds lacked sufficient shade (see Appendix C) also made them inappropriate for play because some of the metal equipment became so hot that children could have burned themselves on it. Additionally, many of the playgrounds had hypodermic needles amongst the litter on the ground. The childcare center directors noted in our interviews that playgrounds in Harlem and Washington Heights are notorious for gang activity and drug use.

I also learned in my interviews with the childcare directors that the staff's lack of training in any sort of physical education made it difficult for them to provide the

required thirty minutes of structured or guided physical activity. On observation trips to the playground with all of the participating programs, I observed a pattern. The teachers would take the children to the playground, watch them run around for an hour, and bring them back to the center. This exercise routine was unorganized, involving sporadic bouts of active motion, and long periods of standing around.

Question 2: Can a program be created that will help the children of Northern Manhattan become active, without increasing the expenses of their childcare centers?

The program I created for ABC (Appendix B) takes a full body approach: strengthening muscles through explosive and balancing movements (one-legged hops, jumps and crawls), improving flexibility through stretches and bends, and exercising the heart and lungs through cardio work like jogging and skipping to burn fat (for the overweight and obese) and improve lung capacity (for the asthmatic). The sessions involve the whole class so that children who might not normally choose to be active during recess will participate. The concept of play is what makes the program work. Children ages three to five cannot be expected to do pushups and sit-ups, which are beyond their physical development level. If the trainer wants the children to touch their toes, he/she might ask them to "pretend you are a tree and sink your roots into the ground", while demonstrating every movement for them. In the pilot program I taught games such as: "Duck, Duck, Goose", "Follow the leader", "Monster Tag", and "What time is it Mr. Fox?" These games not only have the children using full body motions, but also help them practice their developing motor skills. Relay races and games using a

ball, such as “Hot Potato,” teach concepts of teamwork, turn taking, and ball control, all of which are valuable coordination and social skills and essential for developing children’s future interest and competency in sports. The “asthma games,” which combine physical activity with basic asthma education, are a critically important component of the program because of the high percentage of children with asthma in Harlem and Northern Manhattan.

The ABC Active Play Program relies on little to no equipment, making it particularly appealing to preschools in low-income communities with extremely limited budgets. For these poorly funded preschools, the ABC program provides an affordable (free) alternative to expensive active play programs such as the SPARK program and offers more rigorous outdoor structured activity. The program is also designed as a model for parents and childcare providers so that they can replicate the activities for the children. The structured play program that I created for ABC kept all the children active and involved during the entire time they were outside. During the active play sessions I conducted with the classes of the various childcare centers in Northern Manhattan, the children were very responsive and cooperative during all the games and activities. The children played hard during the majority of our time together. I could see visible signs of fatigue when our sessions were over, and many of the children would be sweating. Although it was hot, and our equipment was minimal, the children would laugh, “high-five” one another, and fiercely compete throughout our sessions. Rarely did a child sit out of an activity, and if one did it was usually because of a fall from which the child would quickly recover.. These active play sessions also engaged teachers as monitors and participants in some of the games, relay races, and activities. This was something

that I had not seen in my prior observations of the outdoor play periods of these classes. The children, teachers, and childcare directors all responded extremely favorably and asked that I return. I was amazed and honored that the children remembered my name and seemed genuinely excited to see me when I would return to their classes from week to week. Many times I received an ambush of hugs and chants of "Mr. Reed" as soon as I walked onto the playground.

One of the first things that I noticed while conducting these active play sessions was that many of the children I worked with had never heard of a majority of the games I taught them. I was surprised by this because I had assumed that games such as "Duck, Duck, Goose", and "Red Light, Green Light" were commonly known and played by all children. I realized that the principal reason these children were so excited to see me was because adults rarely played with them. Their parents work long hours and get home too late to take them to the playground, and from my observations I learned that a majority of their outdoor playtime at school is spent in free play. The ABC Active Play Program experience in Harlem and Northern Manhattan revealed how happy the participating preschool children were to have someone so focused on playing and having fun with them. Having organized activities and an adult to play with and teach them was something that these children had rarely experienced. I believe that another reason why these children were so accepting of me is because I looked like them. I fit into the target population. My supervisor and the childcare directors felt that the fact that I am an African-American male, from Brooklyn, New York, and an NCAA basketball player made me a role model for the children in the communities where I worked. Another advantage I had was that my program worked equally well with class and groups sizes as

small as 10 and as large as 50. The directors particularly liked the way the activities engaged mixed groups of children so that all the children were playing cooperatively with others, even those with whom they normally never interacted.

When asked during their interviews whether they had implemented the recommended games and activities when I was no longer at their center, three of the four participating program directors said that they had implemented my schedule of games and activities. "Yes. Some of the games you played with the children have been used by the teachers. They work very well with ages 3 to 5" (Anita Grossbard). The three centers that did implement the programming all replied that they had received positive results. "They (the children) are breathing very fast and hard with these activities. We conduct them with all the children in our program for 2s, 3s, and 4s and also with a few 5s" (Marilyn Jonson). Two of these three centers conducted the program's games and activities with three to five year olds, and the other center conducted the program with two to five year olds.

When asked what suggestions they had for more outdoor activities, two of the four program directors had no response, one suggested that high school students volunteer to conduct the activities with the children, and one said, "We need more activities for our children on a regularly basis" (Marilyn Jonson). It seems to be a pattern in these centers that because of a lack of staff with physical fitness training, the directors believe they need outside expertise to provide the children with games and activities that will get them up and moving.

All of the program directors said that they try to strike a balance between quiet and active play. When asked what the children do during their active playtime, all the

program directors responded that the children play with balls or play tag, and, if the weather is nice, they go to the playground and use the jungle gym and slides. Two of the centers take their children on walks around the neighborhood, and one of the centers has music and movement activities in the classroom. Unfortunately, three of the childcare centers give their children the major part of their daily physical activity time indoors. The reason is partially due to the lack of safe outdoor space available, and partially due to the lack of training of their teachers and staff in outdoor physical activities and games.

Many of the teachers have received training for activities designed for indoor use such as the I'm Moving, I'm Learning program or the SPARK program. The SPARK program trains teachers and daycare staff in coordinating games and activities involving creative athletic movements with balls, hula-hoop, and a host of other equipment. All four of the program directors said that their programs do use SPARK, that all or nearly all of their teachers are trained in it, and that they have bought the equipment and received positive feedback from both the children and staff. Because only one of the four programs had access to a gym, the rest performed SPARK activities in the classrooms.

All four of the program directors said that their staff members do lead structured active play, which are defined as play that includes games, races, and other adult led organized activities, requiring a whole group of children to be physically active together. Two of the four programs have an hour of structured play every day, and the other two have a half hour of structured play, the directors said. One of the four centers uses SPARK as its only structured play for the day, and the other three use SPARK as well as relays, tag and ball games. When asked if they would like to expand the types of games and activities available to engage the children in structured, active play, all four of the

program directors said “yes”, and one added that she just wants “stuff to keep them moving” (Anita Grossbard).

Question 3: What are the barriers to physical fitness program implementation in the childcare centers of Northern Manhattan?

From the directors’ responses and from observation of the outdoor play times of the twelve Northern Manhattan childcare centers that I worked with during the summer of 2009, it is apparent that when the children are outdoors, the majority of their time is spent in free play as opposed to structured active play. One of the program directors said, “Outdoor play tends to be more unstructured (than indoor activities). Teachers can be shown other possibilities” (Tolu Oluwole).

A big part of the “Let’s Play Summer 2009 Initiative” was to promote more trips to the park or playground with parents, during or after childcare and on weekends. When asked about the difficulties or barriers parents face in taking their children to the park or playground in the neighborhood, all four of the program directors agreed that safety, cleanliness, busy streets, intense summer heat, and no water or bathrooms were concerns and barriers for both the parents and the childcare centers. Two of the four program directors replied that the fact that many parents in these communities work such long hours prevents them from taking their children to play outside. “Parents are working or have other siblings [to care for.] Mostly they go home to take care of the family” (Tolu Oluwole). One director said that there are “strange people sitting on the benches and not enough security” in the parks and playgrounds (Marilyn Jonson). Playground upkeep

was also cited as a danger. One director said, “Paint chips have been noticed on the benches of the local playground” (Anita Grossbard).

Some childcare centers have certain blocks of time for quiet/sit-down activities and other blocks of times for the more active activities. All of the program directors responded that they adhere to the sixty minutes of physical activity rule, but they have done so in different ways. All have some form of organized physical activity session, but it is unclear exactly how long these sessions are. One center has the children playing outside for two hours a day, and another for only 35 to 45 minutes. However, the center that takes children outside for two hours has its own roof top playground, while the closest outdoor play area to the one that takes children outside for only 35 to 45 minutes is eight blocks away. This is a long distance to travel with young children, especially in busy New York City traffic.

Three of the four program directors said that when weather permits, they bring their children to local playgrounds for their “active play times”, while the other center (the Nicholas Cardell Childcare Center) uses its roof for the most part, but occasionally takes the children to a local park during the summer months. When asked if they were satisfied with their options for active play periods, two of the four directors said that they were satisfied but needed more equipment and more activities for their children, and one of them said she wished they had more staff to facilitate activities with the children. The third responded, “Don’t have a choice. Wish we had our own playground” (Anita Grossbard). The fourth did not answer the question.

The childcare center directors are aware of the state of the parks and playgrounds around them and understand the hardships of the parents whose children they serve. The

four childcare center directors who participated in the ABC "Let's Play Summer 2009 Initiative" questionnaire effectively articulated the barriers they face to provide physical fitness programming to the children in their centers, as well as the efforts they are making in the face of these barriers. The directors believe that the "Let's Play Summer 2009 Initiative" was a great idea, and one they hope will continue in future.

CHAPTER 4 DISCUSSION

The obesity epidemic has been increasing over the past 20 years, and a decrease in the level of people's daily physical activity is likely one of the driving forces behind the rise. Lifestyle behaviors determined by a person's environment play a major role in physical activity levels, and an important investment a society can make to combat obesity is in physical exercise. Exercising increases the body's ability to metabolize fat as an energy source, and tends to decrease appetite as well as depression in people who are overweight and obese.

Food is fuel for the body, but many children in low SES, urban communities are getting far too much fuel. Their vast stores of energy need to be expended in physically active play. Children's rapid metabolisms and growing bodies are designed to run and jump and be active. Unfortunately, many children today barely tap into their energy supply because so few calories are burned while sitting in front of a television or computer screen. The national cutbacks of both recess time and physical education classes should be of great concern for parents and caregivers. In physical activity classes, children receive much more than just a workout that burns energy. They also develop coordination and learn skills that will keep them active in sports both in and out of school as they get older, as well as develop the mental conditioning necessary to want to continue to live an active and healthy life.

From the perspective of parents who live in poor neighborhoods, it is understandable that they would prefer to have their children safe at home rather than at poorly maintained and unsafe playgrounds. From the perspective of young children in poor neighborhoods, it is understandable that they would prefer to play video games or

watch television at home rather than go to a playground with broken equipment, no shade, burning hot jungle gyms, no water, and intimidating strangers hanging about. Before seeking to increase the amounts of physical active play in Northern Manhattan, it is imperative to begin by improving the settings for play.

The under-funded childcare centers in Northern Manhattan have few facilities available for physically active play and extremely limited play equipment. I was surprised to find out that the four childcare centers where I conducted my programming all used the SPARK program. Although SPARK is a well designed program operating on the principle that to get children to want exercise, physical activities must be made fun, it is also a very expensive program (SPARK, 2008). It costs thousands of dollars to pay for the staff training and equipment. Many childcare centers in low-income areas are underfunded, so a program like SPARK may be unaffordable, especially taking into consideration staff turnover and the need to train new teachers. I learned that the four childcare center I worked in received grant money to pay for their SPARK programming. Unfortunately, only one of the four has access to an indoor gym. The other three programs have had to perform their SPARK activities in cramped, over-populated classrooms. Regardless of the quality of an active play program, it is difficult to get children to physically exert themselves when there is no room to run and move. It is admirable that these childcare centers are trying to keep their children active in the classroom, but this programming is in no way a substitute for outdoor physical activity.

For most children an hour at the playground is not enough to maintain good health. The pattern of play is often unorganized, involving sporadic bouts of active motion and long periods of standing. All four of the program directors I interviewed claimed that

their staff led structured activities outdoors. This was surprising to me because I saw no structured activities during my observation trips to the playgrounds with any of the centers. Without the motivation that is provided in organized active play and games, these children will not engage in physical activity. Early intervention for obese children is critically important to get them used to exercise early in life, so that they can grow up to be active adolescents and adults.

This is not to say that children should be placed in highly organized sports at an early age. The combination of not understanding complex rules and regulations and not yet having grasped the fundamentals skills of throwing, catching, and kicking can lead to frustration and an unwillingness to want to play sports when they are older.

The next step for the ABC program is to get the parents, especially the fathers, more involved with their children's health and physical activity. Because actively engaged parents help provide children with a strong sense of self and a feeling of security, the development of affordable exercise and athletic programs in low-income areas helps foster positive family relationships. Another important future goal, is to take a greater cultural perspective to the ABC active play program. This could involve creating bilingual versions of the program I created, and/or learning more about the culturally influenced activities and games that the children of Northern Manhattan are brought up playing.

The children in the participating ABC Program are at risk for obesity, asthma, and other health problems. Their families cannot afford expensive after-school and weekend movement and dance classes, gym memberships or nutritious foods; nor can they regularly transport their children to sports practices; their schools do not have the

facilities or the expertise to provide an active play environment; and their communities are dirty and dangerous, with poorly maintained public playgrounds and food options that are overwhelmingly sugary, fatty and fried. They are growing up in a sedentary video-screen culture, resting on couches and feeding on Big Macs. The poverty of the communities in Northern Manhattan, in which poor food quality and a lack of recreational resources determine diet and activity levels, promotes overweight and obesity as young children develop through adolescence and into adulthood. The cycle of inactivity and poor nutrition, passed down by parents for lack of intervention, must be broken.. The idea that children can be affected negatively by obesity and asthma for the rest of their lives, both in regard to self-esteem and academic achievement because they were not able to develop their physical coordination and have proper nutrients at an early age is intolerable. Early intervention with active play programming and physical education will help children maintain a healthy weight, achieve high self-esteem, and decrease the risk of serious illnesses and obesity.

APPENDIX A:

QUESTIONNAIRE:

Asthma Basics for Children: Let's Play Summer 2009 Initiative

Last summer we began to develop a series of asthma games that you can use with children on the playground or at the park. This summer we want to find out more about how you are working to achieve the city's requirement for 60 minutes of active play per day for children in day care. We are also interested in finding out more about how we can increase parent involvement on the playground or at local parks. Throughout the summer we want to work with you to achieve your dreams for the children. But first, we need to know a little more about those dreams. To that end, we have a few questions to ask you to learn about your center's current issues and plans. This questionnaire will take approximately 20 minutes. Do you have time now?

(A) First, let's talk about another ABC project, namely providing our parents' handbook to more parents via the web. As you know, for the past 2 years, ABC has been redesigning the ABC handbook for availability on the web. We want to work with you and your center's families to help them take advantage of this resource.

1. Do you think parents are interested in using the web? How many do you think use it now? Are there 2-3 whom we can contact to help us work with other parents to encourage web use? We are particularly interested in reaching out to the fathers. Are there any fathers who you think would be interested in leading an ABC outreach to fathers program?

2. We would like to offer a program with our parent asthma mentors about using our ABC web resource. Would your center be interested in participating in it by hosting an "info-session" for parents (and teachers/staff)?

3. Do you have a computer with internet access at your center? If yes, can it be used for our demonstration? If not, we will bring our own computer with internet access or invite parents to a center with computer access.

(B) Now, let's talk about the ABC asthma-related games and activities for children.

4. Has your center conducted any of the ABC recommended asthma games or activities for children? If so, which ones? Were they a success? Did you conduct them with the younger children or only with the older children?
5. Did you show the *A is for Asthma* (Sesame Street) film for the children? Did they like it?

6. Did your center participate in the World Asthma Day poster competition in previous years? Did the children enjoy working on it? How about the teachers?

7. Last summer, did your center's children play the outdoor version of Match-Me-Trigger? Did the children enjoy it? How about the teachers?

8. What suggestions do you have for more outdoor play with built-in asthma learning activities? What are difficulties your center faces in taking advantage of this programming?

(C) <u>In order for us to have a better understanding of what kinds of games and activities will work with children at your center, we need to know a little more about your center's facilities and current program.</u>

9. Pre-school children run around almost constantly, and part of the center's role is to help them focus on specific learning-related activities. It is not easy to balance the learning and the "running around" parts of the normal pre-schooler's day. Some centers have blocks of time for quiet/sit-down activities, and blocks of time for the more active activities. Some mix them up, as in the I'm Moving, I'm Learning program used by many Head Start programs. What is your schedule? In each day, how many of half-hour time blocks are devoted to active play versus quiet/sit-down activities, excluding nap or snack times?

10. What do the children do during their "active play" time?

11. Has your staff been trained in leading active play activities, such as SPARKS or I'm Moving, I'm Learning? If yes, when did that training occur? How many of the trained staff are still here? Do you have the equipment for the SPARKS activities, and, if so, do you use it? If yes, what has been the feedback? If not, what has kept you from using it?

12. Where do the children go for their "active play" time? Do they stay in the classroom? If they go outside, where do they go?

13. Are you satisfied with the options you have for active play? What do you like best about the way that you are able to get the children up and moving? What would you like to change? (Probes: More time for active play? More activities? More equipment? Better places to play outside?)

(D) <u>One of the recommendations for improved fitness for children – especially among those aged 3 to 5 when physical activity patterns form - is to encourage them to be literally more active during their play periods. Studies show that structured active play has more positive value for the children's physical development than unstructured or free play. Structured play includes games, races, and other activities</u>

move about.

14. Does your staff lead structured active play times for the children? If so, what games or activities do they conduct? (Probe: How often is there structured play and how long are the sessions? Are the sessions part of a program such as SPARKS or I'm Moving, I'm Learning?)

15. What has been the response of the children and the teachers? Do they these games/structured activities?

16. Would you like to expand the types of games and activities available to engage your children in structured, active play? If so, what types of games or activities would you like to make available to your children on a regular basis?

17. What do you do when you take the children to the park or playground? Do you have enough structured play activities for the children there?

18. When you take children to the park or playground, do you ask for parent volunteers to help? If yes, have you had a good response? Have moms, dads, or both volunteered?

19. In your experience, what methods of engaging parents, both moms and dads, in center activities have worked best? We are particularly interested in involving dads in the active play program (DAPER) as a means of promoting father-child bonding and engagement. What do you think?

(E) We are also thinking about a program, as we discussed last year, to promote more trips to the park or playground with parents, both during or after daycare during the week and on weekends.

20. What are some of the difficulties or barriers parents face in taking their children to the park or playground in this neighborhood? (Probe on issues: safety, cleanliness, street traffic, heat, no working water fountains or bathrooms, faulty equipment)

21. If we developed a program to help bring in more parents, both moms and dads, to get involved with trips with the children to the park/playground, would that be helpful to you?

22. Do you think that involving parents in trips to the park/playground could become an opportunity for them to learn more about healthy living strategies, including the importance of physical activity and healthy snacks and drinks?

(F) We are interested in whether additional programming around physical activity (*e.g.*, trips to the park) may be a way of increasing fathers' involvement in the daycare program and in health promotion for their children.

23. Do you think it is important to involve fathers in your program? Why or why not?

24. Have you tried to involve fathers? How successful have you been? What strategies have worked and which have not worked?

25. How many men do you have on staff in your program? Do you have a staff person who is responsible for father involvement and programs for fathers? Have staff been received training about why father involvement is important and on how to work with fathers?

APPENDIX B:

Exercises and Games for 3 to 6 Year Olds

Reed Morgan

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Warm Up Exercises:

Upper Body

- Bend left, bend right (swaying tree)
- Windmill your arms (big arm circles, little arm circles)
- Flap your arms (like wings)
- Roll your head (side to side, all the way around)

Lower Body

- Squat and jump (frog hop)
- Raise knees high, do kickbacks
- Step over a high fence
- Balance on one leg
- Do high kicks
-Tip toe or creep with your feet
- Skip
- Hop on one foot, hop on two feet

Total Body

- Reach up high, touch your toes
- Twist and shake
- Shake and freeze like a statue

- Walk like a crab/gorilla

- Do jumping jacks

- Spin in place

- Make movements in slow motion

With Equipment

- Pass ball in pairs (by throwing or kicking)

- Follow hula hoop obstacle course: jumping through hoops, hopping from one hoop into another, rolling the hoops

Adult supervised or assisted exercises at playground or park:

- Wheel barrow walk

- Assisted handstand (adult holds the child's legs in the air)

- Hanging/swinging from high playground bar (monkey bars)

- Climbing up the slide

- Swinging (child pumps legs and uses core muscles)

- Tumbling

- Cart wheels (may need parent to hold legs at first)

Games:

1. Duck, Duck, Goose

How the game is played: The children sit down in a circle facing each other. One person is "it" and walks around the circle. As the "it" person walks around, he/she taps people's

heads and says whether they are a “duck" or a "goose". Once someone is named a "goose," he/she gets up and tries to chase the "it" person around the circle. The goal is to tag the “it” person before he/she is able to sit down in the "goose's" spot. If the “goose” person is not able to do this, he/she becomes "it" for the next round and play continues. If the “goose” person does tag the "it" person, the person tagged has to sit in the center of the circle. Then the “goose” person becomes “it” for the next round. The person in the middle can't leave until another person is tagged and he/she is replaced. (gameskidsplay.net)

2. Red Light, Green Light

How the game is played: Choose one player to be Red Light. He/she should stand about 25 yards from the other players, with his/her back turned to them. The other players should be lined up shoulder to shoulder behind Red Light. Their goal is to try to get close enough to tap Red Light on the shoulder, but they can move only when he/she says, "Green Light." To begin play, Red Light closes his/her eyes and yells, "Green Light!" Players then run at top speed toward him/her until he yells, "Red Light!" and turns around as fast as he/she can. The instant the other players hear "Red Light!," they must stop running. Anyone Red Light sees still moving when he/she turns around must return to the starting line. This sequence is repeated until a player gets close enough to tap Red Light on the shoulder when his/her back is turned. This player wins and becomes the next Red Light. (gameskidsplay.net, 2009)

3. Follow the Leader

How the game is played: One child is chosen as the leader, and the other children must copy all of his/her movements. After a little while, another child becomes the leader, and this continues until every child has had a turn at being the leader.

4. Freeze Tag

How the game is played: In this version of tag, one person is still "it", but when he/she touches someone, that person is "frozen" in place. The tagged person cannot move and must stand with his/her feet apart. The only way the tagged person can become unfrozen is if someonc crawls under their legs. Play continues until all the players are frozen. The last person to be frozen is "it" for the next game. (gameskidsplay.net, 2009)

5. Hot Potato

How the game is played: Everybody sits or stands in a circle, and passes a ball around the circle until “STOP” is yelled. The person holding the ball when “STOP” is yelled is out. Pretend the ball is a very, very HOT POTATO, so pass it quickly.

6. Simon Says

How the game is played: The child or adult designated as “Simon” faces the rest of the children, who stand in a group where they can see Simon well. Simon gives commands for the children to follow, such as "Simon says, ‘Clap your hands,’" or "Simon says, 'Kick your feet."' The children are to obey only those commands that begin with the words "Simon says." If the command does not begin with these words (for example, "Jump up and down"), the players should ignore it. Competitive version: Any player who obeys a command not preceded by "Simon says" is out. Speed up the game as the children get good at it. The last player left wins. Noncompetitive version: Enjoy a good laugh with the child who obeys a wrong command, but do not send this child out of the game. Keep on playing until interest wanes. (gameskidsplay.net, 2009)

7. Monster Tag

How the game is played: One child starts out as the monster and has to tag the other children. As the child tags others children, they must all keep holding hands to form a bigger monster.

8. Spiders and Flies

How the game is played: Three children start out in the middle of a space (the spiders), and the rest of the children stand on one side of the space (the flies). When the leader says go, the flies must try to cross the space without being tagged by one of the spiders. If a fly is tagged, he/she turns into a spider. The game ends when all the flies have been tagged.

9. Between the Legs Relay Race

How the game is played: Two groups of children stand in a line facing each other's backs. The child in front passes the ball between his legs to the child behind him. This continues until the ball has been passed to the last person on line. This child must run with the ball to the front of the line and the ball passing between the legs continues. The team that is first to be back in its original line order is the winner.

Other relay races include: the spoon and egg race, the three legged race, and races involving kicking and throwing.

10. What Time Is It, Mister Fox?

How the game is played: The children gather on one side of the space and the adult (Mister Fox) stands on the other side. The adult gives a signal and the kids say, "What time is it, Mister Fox?" Mister Fox says, "It's time to hop!" The children hop toward Mister Fox until he gives the signal to stop. Mr. Fox gives different commands (skipping, crawling, walking backwards), and the children draw nearer. As they get very close to Mister Fox and ask their question, he gives his final answer: "It's midnight!" and

chases them all the way back to the other side of the room. The game can then begin again. Tips for adults: You don't have to be Mister Fox. You could be Sleepy Bear, Grouchy Grandma, Big Baby, or another character that children might like. Also, be creative with the movements. Children love to be silly with their bodies. Say, "It's time to walk with one finger on your nose and one on your belly button!" (gameskidsplay.net, 2009)

11. **Dragon Tail**

How the game is played: Have the children form one long line or train by holding onto the waist of the child in front of him/her. The first child in line will be the dragonhead. The last child in line will be the dragontail. The children in between are the dragon's body. Attach a colorful scarf or streamer to the dragontail. The goal of the game is to have the dragonhead catch the scarf flapping behind the dragontail. The children who are part of the body have to work together to help the dragonhead grab the scarf and to help the dragontail stay out of reach of the dragonhead. This can be very confusing, but lots of fun. The idea is to keep the dragon in one piece, with no child letting go of the child in front (gameskidsplay.net, 2009)

12. **Elves, Giants, and Wizards**

How the game is played: This game can be very confusing so it may take a little time for the children to understand it, but once they do, it will be an outdoor game they want to play over and over again. It requires quite a few children, perhaps a group of 15-20. There are three different characters involved: elves, giants, and wizards. The game is similar to rock, paper, scissors. Each character "beats" the other in small contests. The elves scare the giants, the giants stomp the wizards, and the wizards put a spell on elves. Children are divided into two separate teams. They all huddle and decide who they are going to be: elves, giants, or wizards. Then they line up near the center of the field facing each other. On the count of three, the team call out what character it is and each member makes a gesture to identify their team. The elves wiggle their fingers near their ears, the giants lift their arms over their heads, and the wizards mimic using a wand and pointing it at the other team. This is the tricky part: Teams need to remember quickly who wins because the champion team will run toward the other team and tag as many team members as possible. If it is wizards against giants, for example, the giants will chase the wizards! Anyone who is tagged then joins the other team.

13. Circle Toss

How the game is played: Two teams each stand in a circle and toss a ball from child to child. The team that can catch and toss the ball the most times in a row without dropping it wins.

14. **The Mirror**

How the game is played: Children pair up and stand face to face. One child is designated as "the mirror", and must copy the movements of the other child.

15. Pirate Tag

How the game is played: Some children start with balls, and others start without balls. The ones without balls are the pirates, and their goal is to tag the children with balls. When a child with a ball is tagged, the tagger gets the ball.

16. I Want a Home

How the game is played: Every child sits inside a hula hoop on the ground. The leader removes the hula hoop from one child, and that child becomes the "home shopper." The child calls out, "I want a home!" All the children jump up and leave their hula hoop to find another to sit in. All except one child will be successful. The child who is left standing becomes the next "home shopper."

17. Numbers

How the game is played: Start with two lines of children facing each other. Give each child on both lines a number. A ball is thrown in between the two sides, and a number is called. The two children who have that number run out, try to grab the ball and bring it back to his/her team's side without being tagged by the child from the other team. Example: if number 4 is called out, the two children who were given the number 4 will come out and try to bring the ball back to their team, in order to receive a point. It is also possible to call out two numbers so that the two children on each team will have to work together by passing the ball to get it to their side.

18. Hot Shot Hula Hoop

How the game is played: Two hoops are hung or held is the air. Two teams line up with one ball each, and children take turns trying to make as many shots as they can within a certain time limit.

19. Hula Hoop Race

How the game is played: Every child has a partner, and each pair has a hula hoop. The pairs all start on the same line and must figure out how to get to the finish line as fast as they can while staying within their hula hoop.

Asthma Games:

Note: Some games employ big cards with pictures of different asthma triggers on them.

1. Match Me Trigger

How the game is played: The trigger cards are widely spaced out over a grassy area. Two cards can be flipped over at a time. If they match, they stay flipped, but if they do not match they must be flipped back over. The children must jog, hop, skip, run… to each of the cards. Once all the triggers have been matched, the game is over.

2. Hot/Cold Trigger Hunt

How the game is played: Hide a few trigger disks and ask the kids to find them. If the kids are far away from the disk you say, "You are cold". If the kids are very close to the disk say "You are hot." Also use the terms "warm" and "cool" as hints when necessary.

3. Dust Mites and the Inhaler Tag (variation on freeze tag)

How the game is played: Two children are designated as "the dust mites", and one as "the inhaler". The other children run around trying to avoid the dust mites. It a child is tagged by a dust mite, he/she must freeze or sit until tagged and unfrozen by the inhaler.

4. Guess the Trigger

How the game is played: A child chooses a trigger card, and tries to act it out for the group. The rest of the children try to guess the trigger. Example: if a child gets the card with a dog on it, the child could bark and walk around on hands and knees.

5. Open and Closed Relay

Two groups of children line up in a row. They are on all fours, making a bridge with their bodies. The tunnel they form simulates the passage air travels between the nose and the lungs. The first and last child in line will be standing, and the first will roll a ball (signifying the air) through the tunnel, and the last will catch it and run to the front of the line for their turn to roll. This will continue until every child has gotten a chance to roll. Periodically throughout the game, the adult will yell "close" or "asthma attack", at which point the children will roll up into balls and stop "the flow of air". When the adult yells "open", the game resumes.
An individual child and parent could simulate this game by the parent being the bridge and the child running around under them. Every once in a while the parent could trap the child under them (tickling optional).

Equipment:

- Balls
- Hula Hoops
- Large laminated asthma trigger cards

APPENDIX C:

Reed Morgan

Playground	Location	Bathroom	Water	Notes
1. Ft George Playground (Highbridge Park)	Ft George and Audubon Avenues	No	Yes	small playground, some shade
2. Jacob Javits Playground (Fort Tryon Park)	Cabrini Blvd and Ft Washington Ave	No	Yes	bathroom on corner of Broadway + Arden
3. Wallenberg Playground (Highbridge Park)	W 188 St & Amsterdam Ave	Yes	Yes	some shade
4. Bennett Park	W 185 St and Ft Washington Ave	Yes	Yes	nice grass area with flag pole in middle
5. Quisqueya Playground (Highbridge Park)	W 180 St & Amsterdam Ave	Yes	Yes	lots of shade
6. J Hood Wright Park	W 173 St & Ft Washington Ave	Yes	Yes	big grass area, big boulders to climb on
7. CPF Playground (Highbridge Park)	Amsterdam Ave and W 172 St next to Highbridge Rec Center	Yes	Yes	shade, public pool, large grass area
8. Audubon Playground	W 170 St & Audubon Ave	Yes	No	tree shade
9. Sunken Playground (Highbridge Park)	W 167 St & Edgecombe Ave	No	Yes	tree shade, behind a school
10. Ft Washington	W 165 St, Henry Hudson Pkwy	No	Yes	Hudson Pkwy is too hard to cross
11. Adventure Playground (Highbridge Park)	W 164 St & Edgecombe Ave	No	Yes	good shade, nearby grass area
12. Lily Brown Playground (Fort Washington Park)	W 162 St and Riverside Dr	Yes	Yes	good shade, nearby grass area
13. Holcombe Rucker	W 155 St and Frederick Douglass Blvd	Yes	No	famous basketball court, not much shade
14. Wright Brothers Park	W 155 St & St Nicholas Ave	Yes	No	behind school, not much tree shade
15. Harlem Lane Park Playground	Harlem River Dr between W151 and 154 Streets	Yes	Yes	lots of shade, grass, hard to cross streets to
16.Playground One Fifty Two CLII (Jackie Robinson Park)	W 152 St & Bradhurst Ave	Yes	Yes	lots of shade, lots of grass nearby
17. Carmansville Playground	Amsterdam Ave between W 151 and W 152 Streets	Yes	Yes	tree shade

18. Frederick Johnson Park	7 Ave between W 150 and 151 Streets	Yes	Yes	tree shade, hard to cross streets to
19. Bill Robinson	W 150 St and Adam C Powell Blvd	No	Yes	not much shade, pubic pool
20. Jackie Robinson Park	W 149 St & Bradhurst Ave	Yes	Yes	lots of shade and grass
21. Palisades Playground (Riverside Park)	W 148 St & Riverside Drive	No	No	plenty of shade and nearby grass
22. Col Charles Young Playground	W 144 St & Lenox Ave	Yes	Yes	shade and grass
23. Renaissance Playground	W 143 St btwn Frederick Douglass & Adam C Powell Boulevards	Yes	Yes	well shaded
24. Riverbank Playground (Riverside Park)	W 142 St & Riverside Dr	Yes	Yes	tree shade, near grass
25. Alexander Hamilton Playground	Hamilton Pl between W 140 and W 141 Streets	Yes	Yes	lots of tree shade, and spinkler
26. Frederick E. Samuel Playgrounc	Lenox Ave between W 139 and W 140 Streets	Yes	Yes	plenty of trees
27. Abyssinian Tot Lot	W 139th St between Adam C Powell Blvd and Lenox Ave	No	No	well shaded
28. William McCray	W 138 St between Lenox and 5 Avenues	No	Yes	not much shade
29. Jacob Schiff Playground (PS192	Amsterdam Ave and W 136 St	Yes	Yes	lots of trees, great grassy area
30. Abe Lincoln	5th Ave and E 135 St	Yes	Yes	well shaded, public pool
31. P.S.197 (Howard Bennett plgrd)	W 135 St between Lenox and 5 Avenues	Yes	Yes	good shade, behind school, big playground
32. Annunciation Park	W 135 St & Amsterdam Ave	Yes	No	little shade, large grassy area
33. Moore Playground	Madison Ave between E 130 and E 131 Streets	No	Yes	not much shade
34. St Nicholas Park	W 129 St & St Nicholas Terr	Yes	Yes	good shade, near grass
35. Courtney Callender Playground	5 Ave between W 130 and W 131 Streets	No	Yes	some shade

36. Harlem River Park	Lexington Ave between E 129 and E 130 Streets	Yes	Yes	no shade, mostly just basketball courts
37. Sheltering Arms Park	W 129 St and Amsterdam Ave	Yes	Yes	lots of trees, public pool
38. Alice Kornegay	Lexington Ave between E 128 & E 129 Streets	Yes	Yes	good shade
39. Crack Is Wack (Harlem River Park)	2 Ave and E 128 St	No	Yes	lots of traffic, no shade, all bball courts
40. Claremont (Riverside Park)	Between Riverside Dr W and Riverside Dr E below Tiemann Pl	Yes	Yes	behind Grant's Tomb
41. Othmar Ammann Playground	E 124 St between 1st and 2nd Avenues	Yes	Yes	not much shade, pubic pool
42. Marcus Garvey Memorial Park	W 124 St between 5 Ave And Mt Morris Park West	Yes	Yes	great shade, lots of grass nearby
43. Morningside Park	W 123 St & Morningside Ave	Yes	Yes	waterfall, pond, fountain,grass, shade
44. Mt. Morris East (Marcus Garvey Memorial Park)	E 122 St & Madison Ave	Yes	Yes	bball courts mostly, but near shade + grass
45. Sakura Park	Riverside Dr and W 122 St	No	Yes	Across from Grant's Tomb, lots of shade
46. Wagner Playground	E 120 St and 2 Ave	No	No	all courts, no playground, no shade
47. P.S. 155 Playground	E 118 between 1 and 2 Avenues	Yes	No	some shade
48. Morningside Playground (Morningside Park)	W 117 St & Morningside Ave	Yes	Yes	waterfall, pond, fountain,grass, shade
49. Tot Lot #5 (Riverside Park)	W 116 St andRiverside Dr	No	No	small playground, little shade
50. P.S. 57 (J. W. Johnson Plgrd)	Lexington Ave between E 115 and E 114 St	No	No	good shade
51. M L King Houses	Lenox Ave between W 113 and W 114 Streets	Yes	Yes	some shade
52. Thomas Jefferson Park	E 114 St & Pleasant Ave	Yes	Yes	lots of shade, near grass
53. Tot Lot # 4 (Riverside Park)	W 112 St andRiverside Dr	No	No	small playground, little shade
54. 110th St & Lenox Ave Plgrd (Central Park)	110 St & Lenox Ave	Yes	Yes	lots of shade, near grass

55. 110th St Playground (Central Park)	110 St & Cathedral Pkwy	No	Yes	lots of shade, near grass
56. Emerson playground (Inwood Hill Park)	W 207 St & Seaman Ave	Yes	Yes	lots of shade, near grass

APPENDIX D:

Walking Paths

1. Columbia Early Head Start at 154 Haven.
Best playground option: J Hood Wright Park on W 173 St and Ft Washington Ave.
Directions: Walk north to W 173 St.

2. Ft George Community Enrichment Center at 1525 St. Nicholas Avenue.
Best playground option: Wallenberg Playground in Highbridge Park on W 188 St and Amsterdam Ave.
Directions: Walk east to Amsterdam Ave, turn left and walk north to W 188 St.

3. Nicholas Cardell at 84 Vermilyea Ave.
Best playground option: Emerson playground in Inwood Hill Park on W 207 St and Seaman Ave.
Directions: Walk east on Vemilyea Ave to W 204 St, turn left and go north passed Dykman House to Seaman Ave. Then turn right going east to W 207 St.

4. NMIC – Happy Faces at 76 Wadsworth Ave.
Best playground option: J Hood Wright Park on W 173 St and Ft Washington Ave.
Directions: Walk south to W 174 St, turn right and walk west to Ft Washington Ave.

5. QUO VADIS at 4111 Broadway.
Best playground option: J Hood Wright Park on W 173 St and Ft Washington Ave.
Directions: Walk north to W 174 St, turn left and walk west to Ft Washington Ave.

6. Washington Heights Child Care Center at 610 W 175 St.
Best playground option: J Hood Wright Park on W 173 St and Ft Washington Ave.
Directions: Walk west to Ft Washington Ave, turn left and walk south to W 174 St.

7. Alianza Dominica at 715 W 179 St.
Best playground option: Quisqueya Playground in Highbridge Park on W 180 St and Amsterdam Ave.
Directions: Walk north to W 180 St, turn right and walk east to Amsterdam Ave.

8. United Federation of Black Community Organization at 474 W 159 St.
Best playground option: Wright Brothers Playground W 155 and St. Nicholas
Directions: Walk south down St. Nicholas to W 155 St.

9. West Harlem Early Head Start at 110 Hamilton.
Best playground option: Riverbank Playground on W 142 St and Riverside Dr.
Directions: Walk east on W 142 St to Riverside Dr.
Best playground option 2: Alexander Hamilton Playground on Hamilton Pl between W 141 St and W 140 St.
Directions: Walk south down Hamilton Pl to W 141 St.

10. Story – North Presbyterian HS at W 145 St and St. Nicholas.
Best playground option: St. Nicholas Playground at W 140 St and St. Nicholas.
Directions: Walk south down St. Nicholas to W 140 St.

APPENDIX E:

Consent Form

I, _____ consent to being interviewed by Reed Morgan about the amount of and kind of exercise and active play programming that the children at my childcare center experience. I also agree to the use of my name and that of my center in Reed Morgan's thesis. With regard to my interview responses, I give my permission to be quoted in Reed Morgan's thesis.

Signature _____ Date _____

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