

THE RELATIONSHIP BETWEEN EDUCATION, SELF-EFFICACY AND AGGREGATE
PHYSICAL FITNESS IN CHILDREN

by

Richard (Rich) Bomgardner

Liberty University

A Dissertation Proposal Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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APPROVED BY:

Grania Holman, EdD, Committee Chair

Vance Pickard, EdD, Committee Member

Jeremy Patterson, PhD, Committee Member

Scott Watson, PhD, Associate Dean, Advanced Programs

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ABSTRACT

The purpose of this correlational study was to test the hypothesis that educational environment and level of physical activity self-efficacy relates to aggregate physical fitness levels in fifth-grade children in a Midwestern metropolitan community. Religious and public school children ($N = 184$) completed physical activity self-efficacy measures to examine their exercise and barrier status. These scores were compared to a FitnessGram® battery of physical fitness tests involving body composition, flexibility, muscular strength and endurance, and aerobic capacity to measure their total fitness levels. FitnessGram® scores were converted into a composite score measuring their healthy fitness zone status. Multiple Linear Regressions (R) examined the direction and strength of the linear relationships while the Pearson Product-Moment Correlation Coefficient (r) was used to test the correlation among the variables. Results of the study showed a significant relationship between educational environment and barrier self-efficacy ($r = .158, p = .032$) and aggregate physical fitness ($R = .264, p = .004$). However, school environment and barrier self-efficacy ($r = .205; p = .005$), had a stronger relationship to higher levels of aggregate physical fitness ($R = .282, p = .002$) in fifth-grade children.

Keywords: educational environment, physical activity self-efficacy, aggregate physical fitness, barrier self-efficacy, exercise self-efficacy, FitnessGram®.

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DEDICATION

This dissertation is dedicated to my family, a group of teachers in constant pursuit of improving the education of lifelong learners. Also, to my children, Kyle and Kirk, thank you for allowing me the opportunity to pursue my goal of a doctoral degree. I hope you continue chasing your dreams because you are never too old to achieve personal goals.

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CHAPTER ONE: INTRODUCTION

The lack of physical activity in children has become a growing trend throughout the United States. Limitations in physical fitness predispose children to diseases like obesity, hypercholesterolemia, hypertension, asthma, cardiovascular disease, type 2 diabetes, low self-esteem, and mental disorders such as anxiety and depression (Strong et al., 2005; Taras & Potts-Datema, 2005). The Centers for Disease Control and Prevention (CDC) reports approximately 17% of all children and adolescents in the United States are obese. The most alarming fact regarding these statistics is that this percentage has tripled over the past 30 years for ages two through 19 (Centers for Disease Control and Prevention, [CDC], 2011). Physical activity is defined as “any bodily movement produced by contraction of skeletal muscles that result in a substantial increase of resting energy expenditure” (American College of Sports Medicine [ACSM], 2010, p. 2).

The physical activity environment supplies a variety of reasons for why children are not participating in regular physical activities. These include reduced physical activity times, dietary factors (i.e., increased portion sizes, sugar drinks, etc.), unsafe neighborhood facilities, and increased time watching television or computer games (CDC, 2011). Watching television and entertainment media (i.e. computer games, video games, or cell phones) account for as much as seven hours per day for ages eight through 18 (CDC, 2011). Vader, Walters, Harris, and Hoelscher (2009) reported that fourth and eighth grade students who ate two or more snacks after school were 77% and 44%, respectively, more likely to watch three or more hours of television. As the culmination of bad nutrition and sedentary lifestyles in children continues to grow, the importance of physical activity becomes more imperative (Strong et al., 2005).

With children susceptible to future poor health conditions, the general problem is that children lack common physical activities that enhance the components of fitness: muscular

strength, muscular endurance, flexibility, body composition, and aerobic capacity. The American Academy of Pediatrics (AAP), the CDC, and the United States Department of Health and Human Services (USDHHS) recommend that children participate in at least 60 minutes or more of physical activity each day of the week. The CDC reported that in 2010, 18 % of high school students participated in 60 minutes of physical activity most days per week and 33% participated in physical education. However, 23% of high school students did not participate in any physical activity (CDC, 2010). Therefore, the need for children to understand various levels of physical fitness may be an important tool that can be utilized to develop a healthy lifestyle.

Background

Studies have supported the educational environment as having a strong association with physical activity in children (Boyle-Holmes et al., 2010; Brink et al., 2010; Kriemler et al., 2011; Rigers, Fairclough, & Stratton, 2010; Trost, Rosenkranz, & Dzewaltowski, 2008). These associations are directed toward playground areas, morning and lunchtime recess, after-school programs, and physical activity intervention programs. The main effects were centered on free play and structured activities to show increases in physical activity in children, not physical fitness levels. Additionally, recent studies have shown positive correlations of physical fitness measurements with state achievement scores (Castelli, Hillman, Buck, & Erwin, 2007; Chomitz et al., 2009; Wittberg, Northrup, & Cottrel, 2009). This comparison of a multitude of variables allows one to hypothesize that they are interrelated, and if a student could perform more exercise repetitions or increase the distance run, then a higher state achievement score would be reported.

Self-efficacy, or the measure of one's own ability to complete tasks and reach goals, has been studied to predict the levels of physical activity in children (Bartholomew, Loukas, Jowers, & Allua, 2006; Foley et al., 2008; Kahan, 2004; Martin, McCaughtry, & Shen, 2008; Spence et

al., 2010; Valois, Umstattd, Zullig, & Paxton, 2008). While the results of these studies have demonstrated the predictors of physical activity in children, no publications were identified that compared self-efficacy variables to physical fitness levels. Therefore, the above-mentioned studies are unable to support the theory that strong physical activity self-efficacy relates to high levels of physical fitness.

Problem Statement

The specific problem in this paper focuses on children who express participation in recommended levels of physical activity, when in reality their physical fitness levels are below accepted standards. Standards for physical fitness are established by the FitnessGram® assessment tool developed by The Cooper Institute, Dallas, Texas. The FitnessGram® is a health-related assessment designed to measure physical fitness components in body composition, flexibility, muscular strength and endurance, and aerobic capacity. Participant scores or measurements for each component are compared to health-fitness standards for age and gender. However, the health-related standards do not delineate the participant's level of physical fitness. All children who achieve above the minimal scores are grouped into one category and are considered healthy.

The general population of the proposed study is fifth-grade children (approximately 11-12 years of age) attending various elementary schools in the Midwestern United States. The primary emphasis is to assess whether the educational environment and higher levels of physical activity self-efficacy are related to aggregate physical fitness levels. The research study will incorporate a quantitative correlational design to examine whether educational environment is linked to a higher level of physical activity self-efficacy. In addition, this study will investigate

the level of physical activity self-efficacy and compare the results to an aggregated physical fitness composite score to determine any relationship.

Purpose Statement

The purpose of this correlational study was to test the hypothesis that educational environment and level of physical activity self-efficacy relates to aggregate physical fitness levels in fifth-grade children in a Midwestern metropolitan community. The independent variables of interest are educational environment and physical activity self-efficacy level. Educational environment is operationally defined as the conditions, forces, or factors within or exogenous to an educational setting capable of influencing the setting or those within it (e.g., home, religious, or public school) and physical activity self-efficacy is operationally defined as the participants' belief in their abilities to successfully engage in sessions of physical activity (McAuley & Mihalko, 1998, p. 373). The dependent variable is the aggregate physical fitness level, operationally defined as the summation of the successful completion of physical fitness assessments as recognized by the FitnessGram® (Welk & Meredith, 2008).

Aggregate physical fitness levels in children have not been studied as a correlation to physical activity self-efficacy and educational environment. Kelly, Philips Revels, and Ujamaa (2010) compared the FitnessGram® protocol to the school environment relative to physical education requirements, class time, facilities, opportunities, and teacher certification. Their results indicated that school environment was an effective predictor of physical fitness; however, as with studies in academic achievement, outcomes did not provide any significant composite to physical fitness. In addition, only one school variable, the physical education requirement, demonstrated any correlation to physical fitness and showed better levels of cardiovascular endurance and muscular strength.

Barrier and proxy self-efficacy have been compared to FitnessGram® assessments in the Progressive Aerobic Cardiovascular Endurance Run (PACER) and push-up test (Martin, McCaughtry, Flory, Murphy, & Wisdom, 2011). Conclusions were drawn to assess gender differences and physical fitness. While barrier self-efficacy was a predictor of physical activity, there were no significant results indicating higher levels of physical fitness to lower barrier self-efficacy scores. This would be an important construct to the assessment of physical fitness.

Significance of the Study

Research has shown that elementary school children are spending too much time leading sedentary lifestyles through viewing electronic media (CDC, 2011; Vader et al., 2009). During the next few years as the child becomes a teenager, their participation in physical education decreases (CDC, 2010). The National Association of State Boards of Education (NASBE) recommends an average of 30 minutes per day of physical education or 150 minutes per week (National Association of State Boards of Education [NASBE], 2008). However, since the initiation of the No Child Left Behind Act (NCLB) of 2001, which does not address standards for physical education, this has led to increasing instruction time for English and math (Center on Education Policy, 2007).

Other factors that could contribute to limit physical activity in children include parents with a sedentary lifestyle, living in neighborhoods without playgrounds, or not playing on sports teams (Saar & Jürimäe, 2007; Stalsberg & Pedersen, 2011). Therefore, children having limited opportunity to participate in regular physical activity would have a vague understanding of their physical fitness.

The significance of this study lies with children who attend home, religious, or public schools and score higher on the physical activity self-efficacy assessment and possess greater

aggregate physical fitness levels. Discovering any relationship between educational environment, physical activity self-efficacy, and physical fitness levels would be a valuable asset for school leaders in developing more opportunities for physical activity. Furthermore, parents could learn to recognize areas at home or in the neighborhood to become more active. The benefit of the study for children would offer them a better understanding of their physical activity self-efficacy and how it relates to physical fitness. This could aid in creating a sense of accountability for an active lifestyle.

Research Questions and Null Hypotheses

The following research questions and null hypothesis were used in this study:

Research Question 1: Does the educational environment relate to physical activity self-efficacy levels in elementary school children?

Null Hypothesis (H₀₁): There will be no statistically significant relationship between educational environment and physical activity self-efficacy levels in elementary school children as indicated by the type of school setting and physical activity self-efficacy score.

Research Question 2: Does the educational environment relate to aggregate physical fitness levels in elementary school children?

Null Hypothesis (H₀₂): There will be no statistically significant relationship between educational environment and aggregate physical fitness levels in elementary school children as indicated by the school setting and aggregated FitnessGram® score.

Research Question 3: Does the educational environment and level of physical activity self-efficacy relate to aggregate physical fitness levels in elementary school children?

Null Hypothesis (H₀₃): There will be no statistically significant relationship between educational environment, physical activity self-efficacy levels and aggregate physical fitness levels in elementary school children as indicated by the school setting, physical activity self-efficacy score, and aggregated FitnessGram® score.

Identification of Variables

The key variables in the research study are educational environment, self-efficacy and aggregate physical fitness levels. The educational environment is operationally defined as the conditions, forces, or factors within or exogenous to an educational setting capable of influencing the setting or those within it (<http://www.education.com/definition/educational-environment>). Physical activity self-efficacy is operationally defined as the participants' belief in their abilities to successfully engage in sessions of physical activity (McAuley & Mihalko, 1998, p. 373). Exercise modes evaluate the frequency, duration and intensity levels of the participants and barrier modes examine the challenges to their physical activity. These modes make this study unique in those participants who perceive that engaging in physical activity for long periods of time at higher intensity levels could also possess greater aggregated physical fitness levels. Aggregated physical fitness levels are operationally defined as the summation of the successful completion of physical fitness assessments as defined by the FitnessGram® protocol (Welk & Meredith, 2008). The independent variables are educational environment, and physical activity self-efficacy, and the dependent variable is the aggregate physical fitness level.

Definitions

The following terms are defined by the author unless a citation is given.

Aerobic capacity – maximum rate which an athlete can produce energy through oxidation of energy resources (Harman & Garhammer, 2008, p. 251).

Aggregate physical fitness level – summation of the successful completion of physical fitness assessments as defined by the FitnessGram® (Welk & Meredith, 2008).

Barrier efficacy – measures the ability to conquer personal, social, or environmental challenges (McAuley & Mihalko, 1998, p. 373).

Body composition – physical makeup of the body, including weight, lean weight, and percent fat (Morrow, Jackson, Disch, & Mood, 2005, p. 373).

Body mass index – weight-relative to height and is calculated by dividing body weight in kilograms divided by height in meters squared. (ACSM, 2010, p. 63).

Education environment – conditions, forces, or factors within or exogenous to an educational setting capable of influencing the setting or those within it.

(<http://www.education.com/definition/educational-environment>)

Exercise efficacy – outcomes that assess participants' abilities to complete various sessions of physical activity (McAuley & Mihalko, 1998, p. 373).

Flexibility – range of motion of a joint or group of joints. (Morrow et al., 2005)

Healthy fitness zone – level of fitness to provide some protection from potential health risks imposed by a lack of fitness is measured. (Welk & Meredith, 2008, p. 179).

Human agency – ability to exercise control over one's health behavior and quality of life, and consisting of direct personal agency and proxy agency. (Bandura, 2001).

Motor competency – mastery of physical skills and movement patterns that enable enjoyable participation in physical activities (Castelli & Valley, 2007, p. 359).

Muscular strength – ability of muscle to exert force (ACSM, 2010, p. 86).

Muscular endurance – muscle's ability to continue to perform for successive exertions

and many repetitions (ACSM, 2010, p. 86)

Perceived behavioral control – measures constructs relating to the ability to control the situation for physical activity (McAuley & Mihalko, 1998, p. 374).

Physical activity – any bodily movement produced by contraction of skeletal muscles that result in a substantial increase of resting energy expenditure (ACSM, 2010, p. 2).

Physical activity self-efficacy – participants' belief in their abilities to successfully engage in sessions of physical activity (McAuley & Mihalko, 1998, p. 373).

Physical fitness – a set of attributes or characteristics that people have or achieved that relates to the ability to perform physical activity. (ACSM, 2010, p. 2)

Physical literacy – a construct which captures the essence of what a quality physical education or a quality community sport/activity program aims to achieve (Lloyd, Colley, & Tremblay, 2010, p. 179).

Progressive aerobic cardiovascular endurance run (PACER test) – progressive, multistage maximal exercise test that closely simulates a graded, speed-incremented treadmill test used in the laboratory to directly measure VO₂ max (aerobic capacity) (Welk & Meredith, 2008, p. 104).

Self-efficacy – belief in one's capacities to organize and execute a course of action to produce achievements (Bandura, 1997 p. 3).

Social cognitive theory – general theory of human behavior stipulating that people are active agents in their own lives as they generate thoughts, feelings, and behaviors (Martin & Kilunna, 2005 p. 266).

Socioeconomic status – individual's or group's position in the hierarchical social structure. Socioeconomic status depends on a combination of variables, including occupation, income, wealth, and place of residence.

<http://dictionary.reference.com/browse/socioeconomic+status>)

Sedentary lifestyle – not participating in at least 30 minutes of moderate intensity physical activity on at least three days of the week for at least three months.

(ACSM, 2010, p. 28t).

Theory of planned behavior – perceived behavioral control, together with behavioral intention, can be used directly to predict behavioral achievement

(Ajzen, 1991, p. 184).

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This literature review contains analyses of primary factors surrounding the educational environment, self-efficacy, and physical fitness. In addition, literature concentrating on social cognitive theory and the theory of planned behavior has been reviewed to aid in reflecting the theoretical structure of the study. Since the educational environment focuses on home, religious, and public school settings, the literature relative to school facilities, programs, and recess areas was explored to locate opportunities for physical fitness. A review of the self-efficacy literature identified prior research for activity levels and reasons why children are sedentary. Physical fitness studies in children provide a review of different methods and procedures for testing fitness constructs. A review of the related literature evaluates the key concepts of education, environment, self-efficacy, and physical fitness in children. In addition, this review unites components of physical education, athletic participation, activity recommendations, and parental influence on children regarding physical fitness. The researcher utilized EBSCOhost, Sage Publications, and SPORTDiscus as the primary journal and electronic data bases to locate research literature. Using the keywords of physical fitness, FitnessGram®, self-efficacy, and school physical fitness, the researcher was able to generate the potential literature for review.

Theoretical Framework

The theoretical applications of this study focus on behavioral attitudes toward physical activity or fitness components. Cox (2007) describes different concepts that relate to this theoretical framework in terms of social factors, motivation, self-confidence, and parental involvement. While these types of factors can lead to positive benefits relative to sport participation or physical fitness, there is potential for negative behaviors or thoughts to occur.

When children do not have the support network to be physically active, motivation and self-confidence can become a barrier to exercise. This research study will concentrate on two theories that regulate behavior in exercise: social cognitive theory and theory of planned behavior. Social cognitive theory will focus on self-efficacy or the confidence area, and the theory of planned behavior will center on the intention toward exercise.

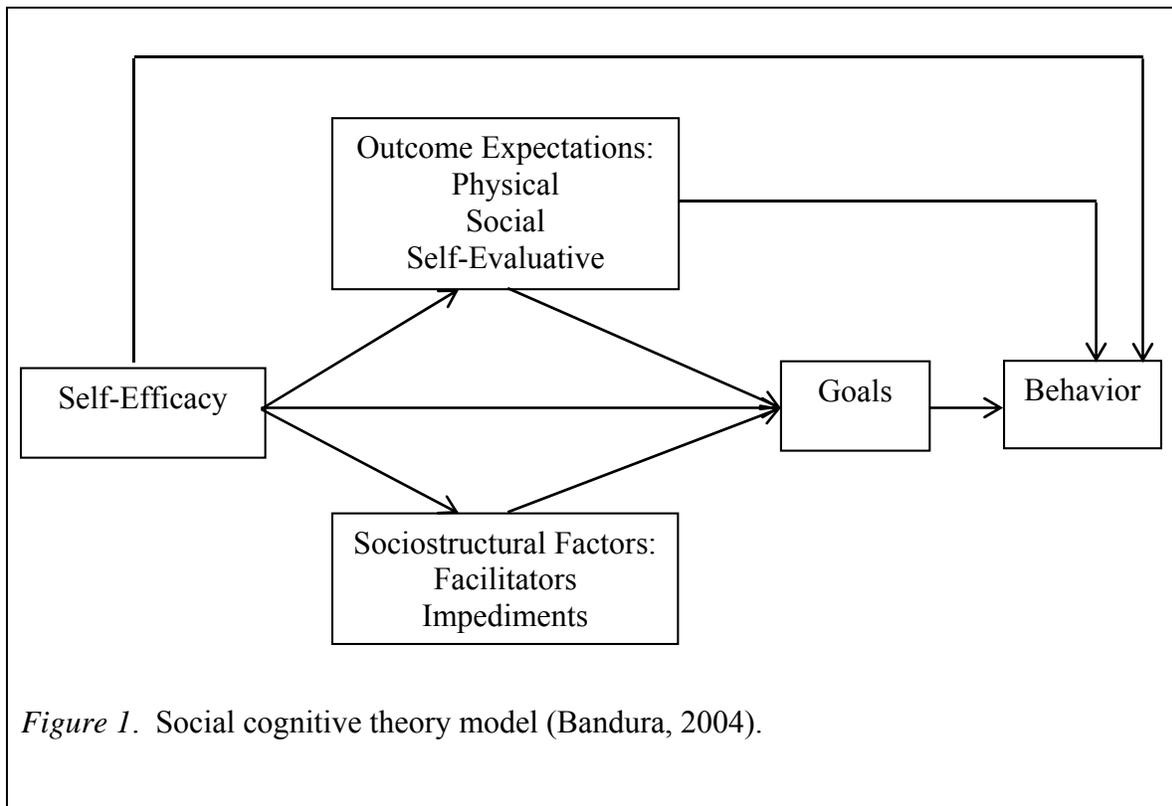
Social Cognitive Theory

Social cognitive theory explores different influences of cognition and environmental factors that affect people. These relate to the thought process of an individual towards a specific task. Bandura (2012) originally introduced this theory in 1997 as an exercise behavioral model. Extensions of this model have also examined areas of behavioral, environmental and personal factors that manipulate the functioning of individuals. Martin and Kulinna (2005) define social cognitive theory as “a general theory of human behavior stipulating that people are active agents in their own lives as they generate thoughts, feelings, and behaviors” (p. 266). It is the individual beliefs that direct a person’s capacity to have control over their behavior. Bandura (1997) states that “perceived self-efficacy refers to beliefs in one’s capacities to organize and execute the course of action required to produce given attainment” (p. 3). Efficacy beliefs foster personal thinking patterns, motivation, expectations, views on barriers, and emotional states of individuals (Bandura, 2006a). This process can involve areas of social and self-influences (Martin and Kulinna, 2005). The basic premise of the social cognitive theory incorporates a procedure called “Human Agency” (Bandura, 2001; Bandura, 2006a; Bandura, 2012). Human agency is the ability to exercise control over health behavior and quality of life and contains personal and proxy agency. (Bandura, 2001; Dzewaltowski, Geller, Rosenkranz, & Karteroliotis, 2010). To further clarify personal and proxy agency, Dzewaltowski et al (2010)

describe personal agency as a child's confidence in their skills and abilities to be physically active and to reach a desired outcome. Furthermore, proxy agency is described as the child's belief in their skills and abilities to perform behaviors that influence others. Martin and Kulinna (2005) discuss social cognitive theory as providing a framework for the theory of planned behavior and self-efficacy. The theory of planned behavior relates to the fact that individuals with strong intentions are more likely to do more than others with lesser intention.

Social cognitive theory can be related to different environments within the context of health and physical activity. Bandura (2004) examined different avenues of health promotion in children through social cognitive channels. The child's behavior, thought processes, emotional status, and beliefs are generated through a variety of dimensions. Family routines, social relationships, and school practices shape the development of children. Exercise, smoking, substance abuse, and self-management skills have been associated with these environments. Children who are exposed to environments that regularly display healthy habits will often continue these into later stages of life. Furthermore, these processes of self-management involve the motivation and regulation of healthy behavior (Bandura, 2005). If children understand the importance of healthy behavior as learned through parents, friends, and school, hopefully this will provide a lasting impression towards behavioral control.

Social cognitive theory pathways. The constructs for social cognitive theory can be evaluated by different pathways that guide behavior. Bandura (2004) developed a perceptual model of sociocognitive facets in which perceived self-efficacy directly influences health behaviors. The model is represented in Figure 1.



Structural components of the social cognitive theory model evaluate how perceived self-efficacy is affected by physical, social and self-evaluative outcomes, and if there are any facilitators or impediments that would modify the intended goals and behaviors. Highly motivated people who possess a great deal of self-efficacy need very minimal assistance in accomplishing their goals and can expect behavioral changes (i.e., self-efficacy-goal-behavior route). On another level, individuals who have some reservations in their abilities to accomplish goals need a little guidance for behavioral change (i.e., outcome expectation route). Lastly, other individuals who feel they do not have the ability to accomplish any goal need a great deal more support and guidance to overcome any challenges (Bandura, 2004).

The differences in how people accomplish physical activity goals and change their behavior appear to be dependent on their perceived self-efficacy. The constructs of outcome

expectations and sociocultural factors have emerged as correlates to physical activity behavior in children (Ramirez, Hodges-Kulinna, & Cothran, 2012). Challenges with lack of facilities to participate in physical activity and having friends and family who did not perform physical activity were common barriers to social support. Barriers and social support were consistent findings for high school students as well; however, taking the initiative to perform physical activity was a stronger barrier than social situations (Petrosa, Hertz, Cardina, & Suminski, 2005). There seems to be a common link between children and high school students achieving their goal of being physically active. Martin et al. (2011) noted that underserved middle school children also reported limitations to physical activity because of personal barriers and social support from classmates. The frequent theme of these studies could indicate that if children in the early years of school develop limitations in social support and influences to engage in physical activity, then this trend could evolve further as they continue to age.

Theory of Planned Behavior

The theory of planned behavior was first introduced by Icek Ajzen in 1985 as an extension of the theory of reasoned action, which simply implies that people usually behave sensibly and their actions are derived from their intentions (Ajzen, 1985). The intentions of the individuals influence the behavior and engagement in the activity or performance. With regard to physical activity or fitness in children, it is assumed that children who believe an activity is enjoyable or has personal benefits, are involved with other children or family members who have the same beliefs. It is also assumed that children who view physical activity or fitness as comfortable and not demanding, would have a more active lifestyle. Dimmock and Banting (2009) examined notions of the theory of planned behavior to formulate the intentions of individuals in physical activity. An important observation within their study lies in the quality or

strength of the intentions: the stronger the intentions toward physical activity, the more likely those intentions were stimulated and acted on. Also, personality of the individual plays a vital role in intentions. These themes are consistent with self-regulation where a driving desire ensures a stronger intention to participate in physical activity. Bellows-Riecken, Rhodes and Hoffert (2008) compared products of the theory of planned behavior to exercise and lifestyle physical activity. They hypothesized that this theory is better suited for construct patterns of structured behavior rather than spontaneous lifestyle physical activity. In addition, the construct of perceived behavioral control relates more to exercise than lifestyle. Their results yielded consistent support of the hypotheses. It would make sense that exercise is often preplanned, structured, and specific to factors of intensity, frequency, and duration, whereas lifestyle physical activity consists of more recreational, leisure, or homeowner activities (e.g., mowing, household chores, etc.). Another interesting point is that exercise intensity had a higher mean score, and lifestyle physical activity had a lower mean score. This would indicate that participants reported exercising at moderate and strenuous intensity levels and had mild levels of lifestyle physical activity. Therefore, the quality and strength of participants' intentions toward exercise clearly outweigh their intentions toward lifestyle physical activity. While attitude, subjective norm and perceived behavioral control predict commitment in regular exercise, it is intentions that display a stronger predictor of reported exercise (Hamilton & White, 2008).

Theory of planned behavior pathways. The theory of planned behavior proposes that intentions are taken into account by personal attitudes, social norms, and perceived abilities. Ajzen (1991) defined each of these three elements independently as the bases of intention. Attitudes or attitude toward the behavior is reflective of the degree in which a positive or negative assessment of the behavior is facilitated. The assessment or evaluation of the behavior

that is positive would seem to provide a favorable outcome in contrast to a negative assessment. Social norms or subjective norms relate to the perceived stress that is felt by the individual to perform the behavior. Stress could be from society, peer-pressure, family, or any other form of anxiety. Perceived abilities or perceived behavioral control refer to the different challenges within the performance of the behavior. This is influenced by past experience, positive outcomes, or various obstacles. The attitude toward behavior, subjective norms, and perceived behavioral control are all used to predict the intentions of the behavior. A schematic of this model is shown in Figure 2.

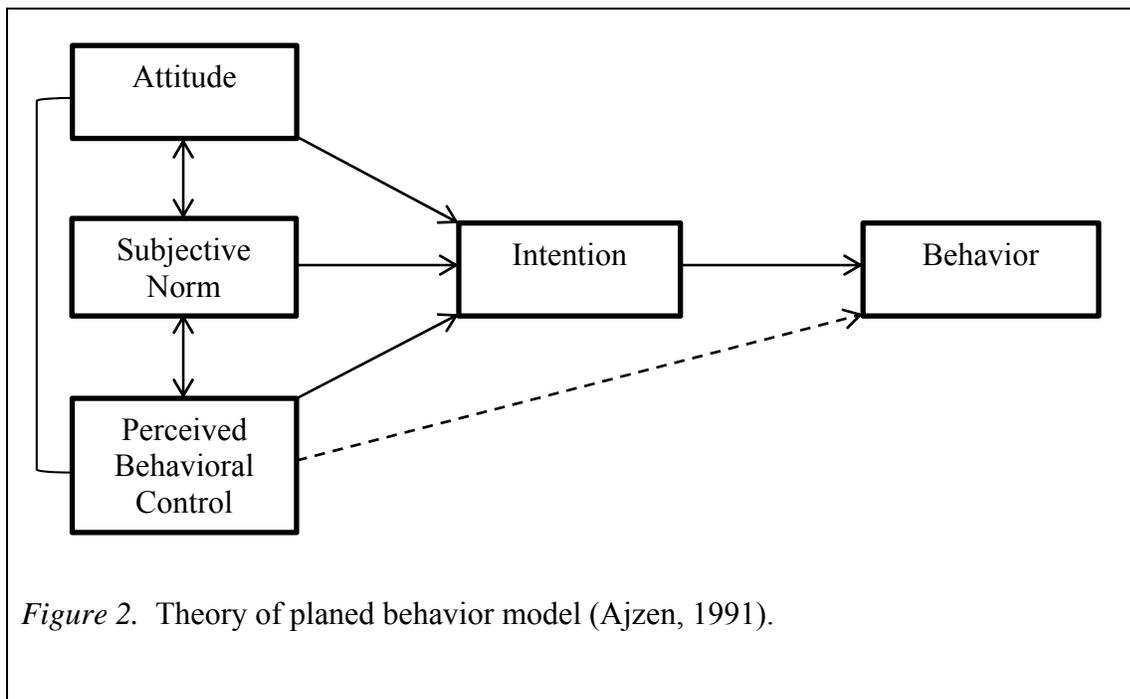


Figure 2. Theory of planned behavior model (Ajzen, 1991).

Ethnicity demographics. If attitudes, social norms, and perceived control all influence the intention to engage in physical activity, then it is assumed that ethnic demographics would be different. The theory of planned behavior has been studied within different ethnic populations (Blanchard et al., 2008; Hagger et al., 2007; Martin, Oliver, & McCaughy, 2007; Nigg, Lippke, & Maddock, 2009). Blanchard et al. (2008) demonstrated that Caucasians have stronger

associations with physical activity being beneficial, useful, and good, as compared to African-Americans. In addition, perceived behavioral control or perceived abilities was higher in African-Americans. Hagger et al. (2007) studied five cultural groups in Asia and Europe to determine their physical activity behaviors. Participants from Great Britain, Estonia, Greece, Hungary, and Singapore were selected from participating secondary schools. Results indicated no dominant specific correlations between the theory of planned behavior and any cultural group. In fact, only Greece showed any consistent outcome with attitude, perceived behavioral control and physical activity intention. Nigg et al. (2009) evaluated constructs of the theory of planned behavior on Asian/Pacific Islanders from Hawaii. The ethnic groups represented included Caucasian, Japanese, Hawaiian/part-Hawaiian, and Filipino. Results were inconclusive for each ethnic group showing no statistical difference. The only significant difference was Filipinos who had lower relationships to attitude and intention to engage in physical activity. However, all other measures of subjective norm, perceived behavioral control and physical activity were relatively consistent within the groups. Martin et al. (2007) studied how the theory of planned behavior affected the prediction of physical activity in Mexican-American children. Using the variables of behavioral intention, attitude, perceived behavioral control, subjective norm and self-reported moderate-to-vigorous physical activity, the authors concluded that intention was the major predictor of current moderate-to-vigorous physical activity. In addition, attitude and subjective norm appeared to heighten the effect of intention. Therefore, this study demonstrates the fact that children who possess a strong attitude toward physical activity tend to participate in moderate-to-vigorous physical activity more regularly.

Ethnic populations tend to possess different correlations to the theory of planned behavior. Caucasians demonstrate stronger attitudes; African-Americans have higher perceived

behavioral control; Greeks show attitude, perceived behavioral control, and physical activity intentions; and Mexican-Americans display intentions to moderate-to-vigorous activity. While each variable in the theory of planned behavioral model is independent, they often overlap and are influenced by personal attitudes, social influences, and personal perceptions. Variances within the model and ethnic populations can be very minimal; however, variances within an ethnic population from different locations could provide stronger associations.

The social cognitive theory and theory of planned behavior variables have been explored using a variety of models (Ajzen, 1985; Ajzen, 1991; Bandura, 1997; Bandura, 2001; Bandura, 2004; Bandura, 2005; Bandura, 2006a; Bandura, 2012; Bellows-Riecken et al., 2008; Foley et al., 2008; Dimmock & Branting, 2009; Dzewaltowski et al., 2010; Hamilton & White, 2008; Martin & Kulinna, 2005; Martin et al., 2008b; Martin et al., 2011; Petrosa et al., 2005; Ramirez et al., 2012). The social cognitive theory explores the actions of personal and proxy agencies that help evaluate the child's confidence and beliefs in their skills. Concepts that aid in determining social cognitive behaviors include self-efficacy, parental support, social support, barriers to exercise, and environment. Likewise, the theory of planned behavior constructs of subjective norm, attitude, and perceived behavioral control are effective in predicting the behavior and intention of physical activity. When all variables were considered simultaneously, there appears to be a variety of factors that can overlap on the surface. However, because children attend different school settings and live in different home settings, it would be difficult to pinpoint common indicators for the lack of physical fitness.

Review of the Literature

The core of this research study centers on assessing the educational environment and the perceptions of children toward their physical activity comprehension, and aggregated physical

fitness levels. Therefore, the study should be able to conclude that children in a specific educational environment possess the highest level of physical fitness and know their physical fitness ability.

Educational Environment

The delivery of education in the elementary and secondary school setting is a diverse and expanding arena. With the development of charter, private, religious, or home schools, parents can choose alternatives to public education. Choices in education offer different curriculums for the child to develop academic skills, knowledge, and experiences. Physical education in these learning environments can also possess different curriculums, structures, or requirements. Currently, no studies have examined the relationships between educational environment, physical activity self-efficacy, and physical fitness.

Home Schools

Welk, Schaben, and Shelley (2004) compared home school children to public school children on their physical fitness levels, school type, psychosocial correlates of attraction, perceived competence, and parental influence on physical activity. Although most comparisons yielded no significant results, the authors determined that parental influence on home school children was higher due to daily interactions between the parent-teacher and child. This could be an important construct if the parent is actively involved in physical fitness as part of their lifestyle. However, Long, Gaetke, Perry, Abel, and Clasey (2010) performed a study to assess the physical activity in children attending home and public schools. Children wore an activity monitor for seven days and recorded the amount of steps taken throughout the day. The authors concluded that children attending public school took a significantly greater number of steps during the day. In addition, public schooled children spent more time performing moderate-to-

vigorous activity than home school children. Lower levels of physical activity or moderate- to-vigorous activity reported for home school children could be related to differences in curriculum design, lack of physical education resources, or lack of playground equipment. Overall, home school children were 24% less active during school days. This could be an important factor for children attending school in the home.

Home school variables. Home schooled children have various options for engaging in physical activity through different venues. Parents can take their children to a local park, Young Men's Christian Association (YMCA), or fitness facility. However, it remains clear that the physical activity environment has greater influence on the child's interest level in participating in physical activity (Chen & Zhu, 2005). In neighborhoods with parks and playgrounds, the lack of facilities or equipment is often reported by parents as being a barrier to physical activity (Davison, 2009). By understanding these potential influences, playground equipment and playgrounds in general, should be designed to promote children's physical activity. In addition, parent's participation in physical activity is also a contributing factor to the child's physical activity level (Lee et al, 2010). Lastly, the physical education component of home school children could be limited by the knowledge and experience of the teacher and or parent.

Religious Schools

Religious based schools offer different curriculums that not only focus on standard education courses, but provide religious education. Lynch (2004) attempted to connect Catholic education and health and physical education principles to establish a means of correlation. However, the most solid evidence linking physical education to religion was the sense of community of being a part of the church. Bopp, Fallon, and Marquez (2011) demonstrated the same results via a faith-based physical activity program for Latinos. By providing a physical

activity program at the church, participation was higher than in comparable facilities. While these studies did not generate any specific approach to religious schools promoting physical fitness, parishioners possessing a sense of community appear to have more involvement in the program. Kahan (2005) studied physical activity support networks in Jewish school children. Results from this study determined that children living with parents who practice the Jewish faith provide physical activity to a lesser degree than parents who hold greater traditions. In addition, children residing in households with greater faith practicing parents regard the environment as supportive of physical activity. These results provide evidence that links Jewish children and their practicing parents to sedentary behaviors (Kahan, 2004). Arab-American school children with parental support displayed some of the same results; however, these children also reported having personal barriers to physical activity (Martin et al., 2008b).

Religious school variables. Religious schools provide many of the same facilities as public schools relative to physical activity. The availability of gymnasiums, playgrounds, and physical education equipment in religious schools appears to be compatible to that of public schools. Previous studies have supported a link between exercise and faith-based practices (Bopp et al., 2011; McLane, Lox, Butki, & Stern, 2003). However, Benjamin and Whitman (2010) and Kahan (2004) discovered differences in physical activity through the evaluation of Orthodox and non-Orthodox Jewish children. Physical activity levels appear to be influenced by observant Orthodox children, especially girls (Benjamin & Whitman, 2010). Therefore, one area of limitation for physical activity could be in the religious beliefs or practices of the family and parents.

Public Schools

A minimal level of physical activity and fitness among children and adolescents in public schools provides awareness of health concerns (Strong, et al., 2005). Adolescents in public

schools are not engaging in physical activity or fitness on regular bases as recommended (Valois et al., 2008). In a sample study of public high schools in the eastern United States, 85.7% of African-American and 78.2% of Caucasian females reported not meeting requirements of moderate physical activity. In addition, 76.3% of African-American and 74.9% of Caucasian males reported not meeting requirements for moderate physical activity as well. This is a huge national concern when more than 75% of high school students report minimal associations with physical activity (Valois et al., 2008). However, this could also be accounted for by the fact that high school physical education is not always required. For example, in the state of Kansas, students need only one credit or two semesters of physical education classes to graduate. Therefore, opportunities for physical activity or fitness center on team sports or self-regulation.

Public school variables. Public school facilities offer a different perspective on how children understand their environment of physical activity. School playgrounds, activity intervention programs, and designated play areas can contribute to the promotion of physical activity in children. These opportunities are also available in many religious school settings. Several studies have evaluated the contributing factors to positive influences of a playground environment in the public school (Brink et al, 2010; Davison, 2009; Farley, Meriwether, Baker, Rice, & Webber, 2008; Nichol, Pickett, & Janssen, 2009). Brink et al. (2010) evaluated the effect of school playground renovations on children physical activity levels and determined that playgrounds with newer and updated equipment or expanded playground areas yielded significant increases in physical activity. This would make sense because children probably generate more excitement when playing on newer equipment and larger play areas than playing on older equipment. Although new equipment would appear to be a vital contribution to physical activity in children, not all schools are fortunate to have new playground facilities.

Farley et al. (2008) demonstrated that children tend to cluster in playground areas that possess equipment, rather than in open courts or fields. Children within areas of a playground that have equipment were 15% more likely to be walking or to be very active, compared children in other areas of the playground. These observations were similar for both genders. Boys performed activities such as four-square, basketball, running, walking, football, and playing on structures. Girls were noted playing basketball, jumping rope, playing four-square, and play structures. These results would seem to be a major consideration in playground design and how architectural design promotes physical activity in children.

Public school intervention programs. Public school intervention programs that encourage physical activity display higher levels of participation in children than traditional physical education classes. These programs offer specific physical activity components and course designs that enforce and stimulate physical activity (Kelly et al., 2010). In addition, school-based interventions provide a greater significant effect in physical activity than outside school programs (Kriemler et al., 2011). Ahamed et al. (2007) even demonstrated that incorporating additional curricular time for physical activity during the school day did not compromise the academic performance of children. Boyle-Holmes et al. (2010) provided additional insight by reporting that children participating in a developmental physical education curriculum in a public school district demonstrated stronger motor skills and physical activity levels than those in a non-developmental school. There has been no research to support if public schools offer more intervention programs than religious schools or to identify if religious schools lack intervention programs.

Public school intervention programs typically do not involve physical education teachers or individuals skilled in the delivery of proper physical activity or fitness lessons. Martin,

Martin and Rosengard (2010) completed a study using a program called PE2GO which was developed by the NIKE Corporation and California Sports, Play, and Active Recreation for Kids (SPARK) organization. SPARK is a nationally recognized research-based organization that promotes physical activity in children. The PE2GO program is utilized by non-physical education teachers to incorporate physical activity into the classrooms where physical education classes have been reduced or eliminated. Teachers are trained, evaluated, and provided equipment in the school to conduct the intervention. The primary aim of the study was to supplement the minutes of physical activity already provided by the physical education teacher or to serve as the physical education specialist. Results indicated that teachers were pleased with the PE2GO program and able to increase physical activity time by more than 50 additional minutes during the week. This intervention could prove to be a vital asset to school districts with budgetary limitations.

Recess and after-school programs. School and lunchtime recesses provide opportunities for children to enhance their physical activity time during the school day. School recess can result in as much as a 60% increase in physical activity participation compared to 20% of activity performed away from school time (Beighle, Morgan, Masurier, & Pangrazi, 2006). To support this theory, Ridgers et al. (2010) studied morning and lunchtime recesses for twelve months and found that children participated in moderate-to-vigorous activities during these times more often than other groups of children. Furthermore, after-school programs also deliver additional time for physical activity. These programs allow children to participate in free play and organized activity which can be structured to accommodate the environment (i.e., indoors or outdoors). Trost et al. (2008) noted that during after-school programs, children averaged 20 minutes of moderate-to-vigorous activity, with significantly higher levels exhibited during free

play sessions. However, not all after-school programs promote consistent moderate to vigorous physical activity for children. In fact, the majority of states lack structured policies or standards promoting after-school physical activity (Beets, Wallner, & Beighle, 2010). Policies and standards for promoting physical activity in after-school programs are so limited that only 14 states have established criteria, five states have outlined a specific time that participants need to be physically active, and three states have embedded core competencies that address after-school providers to promote physical activity (Beets et al., 2010). Not only are there limitations in policies and standards for generating after-school programs, but children also reported being more sedentary most of the time during after-school programs (Orlowski, Hallam, & Wonders, 2010). This is a very alarming situation that only provides children with even more leisure or sedentary time. The more children are grouped with peers that do not participate in physical activity, the more likely these children will develop a sedentary lifestyle. Taber et al. (2011) supported this assumption when they analyzed the responses of more than 4,800 girls from sixth and eighth grades to evaluate their association between school and non-school based programs. The overall results showed that girls who participated in more programs were also more physically active.

School recess, lunchtime recess, and after-school programs are critical in order for children to have free play and structured physical activities so they are not entirely sedentary throughout the day. When sedentary behaviors occur, a variety of health conditions can begin to develop and continually develop as the child ages (Strong et al., 2005). These health conditions relate to increased weight, type 2 diabetes, hypercholesterol, hypertension, asthma, and self-esteem, as well as mental health issues of anxiety, and depression (Strong et al., 2005). To help

or possibly help prevent these health conditions from becoming long-term issues, children should follow established guidelines for physical activity.

Education Standards

In 2004, the National Association of Sport and Physical Education (NASPE) released the second edition of national standards for physical education. These standards are designed to “represent examples of student behavior demonstrating progress toward achieving the standards at each grade-level range” (National Association of Sport and Physical Education [NASPE], 2004, p. 2). Through the years, NASPE has identified some major concerns related to education climate. The No Child Left Behind Act (NCLB) of 2001 has isolated disadvantaged children and does not specifically evaluate physical education. Public health concerns over child obesity rates which have steadily increased over the years, have contributed to the NASPE revised standards. The delivery of physical education in a manner that is consistent across a broad spectrum provides an alignment for practitioners. Lastly, the NASPE wants every child to have the opportunity to become physically active, understand the benefits of their choices of physical activity, and pursue a physically active lifestyle (NASPE, 2004).

No Child Left Behind Act. The NCLB Act is an expansion of the Elementary and Secondary Education Act of 1965 that was signed into law by President Lyndon B. Johnson. The NCLB Act provides an outline for federal funding, academic enhancements, teacher quality programs, promotion of school reform, and enhancement of parental participation in their children’s education (U.S. Department of Education, 2004). The NCLB Act was passed to improve the education of disadvantaged children through greater accountability of schools, yearly testing in reading and math, and offering children an option of transferring out of lower performing schools (Tunnicliffe, Chatterton, & Arcari, 2006). Filburn and Flether (2008)

reported that the NCLB Act requires schools to make adequate yearly progress, increase all student academic proficiency to grade level by 2014, and possess highly qualified teachers. Others have cited offering alternative choices for parents with schools and greater importance on teacher delivery (Kamla, Davis-Brezette, & Leung, 2008). These entire factors place added stress on schools to be held accountable for student academic progress.

The Center on Education Policy (2007) reported in a national survey that since 2001, 62% of elementary schools have increased learning time for English and math. The time spent teaching English and math during a normal week increased on average 43%. In addition, 44% of school districts reported cutting time for social studies, science, art, music, physical education, lunch recess, regular recess, or a combination of multiple subjects. Finally, 84% of school districts have changed their curriculum to place more emphasis on state test content. While the NCLB Act is designed to meet specific goals and objectives, it appears that other curriculum areas are being harmed.

The NCLB Act does not address standards of physical education (Filburn & Fletcher, 2008; Kamla et al., 2008; Tunnicliffe et al., 2006). With increasing pressures for schools to adhere to NCLB protocol, schools could be having difficulties in providing adequate physical education. Budget concerns, limited time in school, and other priorities have been reported as challenges to physical education (Cox et al., 2011). The NCLB Act does offer assistance with grants and contracts to start, broaden, and expand physical education programs for K-12 students, which includes after-school programs. Under the NCLB Act, Section 5503, the focus of these grants and contracts is to provide assistance for equipment and support for participation in physical activity as well as funding for teacher and staff training. All local school affiliations, including private and home schools, and community organizations such as the Boys and Girls

Club, YMCA, or Young Women's Christian Association (YWCA) are eligible for funding. Since this program is designed to supplement existing funding already in place for these entities, the enhancements for physical education classes could be limited, and more emphasis is placed on after-school programs where school districts have limited funding.

A variety of measures by which schools can emphasize physical activity include (a) develop promotional strategies, (b) possess a quality physical education curriculum, (c) offer safe environments for physical activity, (d) offer professional training for instructors and personnel, and (e) provide after-school activities that spark the interest and desires of students (Young et al., 2007). While the promotion of physical activity does not mean requiring all children to participate in extra physical activity initiatives, at least providing additional resources for physical activity could improve national guidelines. Trost and Van der Mars (2009) cited three main criteria in order for policymakers to not eliminate physical education in schools: (a) halt the justification that cutting physical education improves academic achievement, (b) understand that physical education is essential in schools, and (c) provide time for physical education within the curriculum. Administrators must address the need for physical activity in schools, whether it is before, during, or after school.

School leaders provide crucial roles in governing policies, influencing and setting expectations, and embracing accountability for instituting policies to increase physical activity (Cox et al., 2011). Physical education teachers are expected to complete the same professional development and in-service requirements as core curriculum teachers. Even though the NCLB Act does not include physical education as a core component, it does delineate the requirement for highly qualified teachers in the classroom. Napper-Owen, Marston, Van Volkinburg, Afeman, and Brewer (2008) explained that physical education teachers participate in a variety of

functions to become highly qualified. These include pre-service development with pedagogical and content knowledge, field experiences, and professional dispositions. The delivery of physical education standards, assessments, outcomes, and professional development establishes the foundation for highly qualified credentials.

NASPE standards. The National Association of Sport and Physical Education has clarified each standard to explain the specific corresponding intention and description:

- a. Standard One: Demonstrates competency in motor skills and movement patterns needed in a variety of physical activities. This standard is designed to develop physical skills required to participate in physical activities.
- b. Standard Two: Demonstrates understanding of movement concepts, principles, strategies, and tactics as they apply to the learning and performance of physical activities. This standard is designed to develop mental capacities to improve motor skills and performance.
- c. Standard Three: Participates regularly in physical activity. This standard is designed to establish examples of consistent physical activity participation.
- d. Standard Four: Achieves and maintains a healthy-enhancing level of physical fitness. This standard is designed to develop the student's understanding, skills and motivation to accept responsibility for personal fitness, leading to an active, healthy lifestyle.
- e. Standard Five: Exhibits responsible personal and social behavior that respects self and others in physical activity settings. This standard is designed for the achievement of self-initiated behaviors that promote personal and group success in activity settings.
- f. Standard Six: Values physical activity for health, enjoyment, challenge, self-expression, and/or social interaction. This standard is designed to develop an awareness of the

internal values and benefits of participation in physical activity that provides personal meaning. (NASPE, 2004, p. 12-14).

NASPE standards reflect indicators that children should understand and allow them to perform physical activity through a quality physical education program. However, this study is specifically aimed at evaluating NASPE Standard Three and Four in fifth-grade children. In Standard Three, NASPE state appropriate sample outcomes that relate to this study for third-to fifth-grade children are as follows:

- a. Consciously chooses to participate in moderate to vigorous physical activity outside of physical education class on a regular basis.
- b. Chooses to participate in structured and purposeful activity (NASPE, 2004. p. 29).

Therefore, the NASPE has identified that children between third and fifth grade should be able to consciously choose to participate in activities that are moderate to vigorous in nature. If this is the case, then it would be assumed that these children understand which activities require higher levels of physical activity and willingly partake in those activities. In Standard Four, the NASPE lists appropriate sample outcomes that relate to this study for third-to-fifth-grade children as follows:

- a. Participates in selected activities to develop and maintains each component of physical fitness.
- b. Meets age- and gender-specific health-related fitness standards defined by the FitnessGram®.
- c. Identifies his/her strengths and weaknesses based upon the results of the FitnessGram® testing (NASPE, 2004, p. 35).

The NASPE has identified that third-to-fifth-grade children should be able to participate in physical fitness activities at a level appropriate in age, gender, and physical capacities. The challenge of this study is to assess these standards and identify within them whether or not children really understand how to participate in moderate-to-vigorous physical activity outside of school in a consistent manner. In 2013, the NASPE developed new standards that were made available to the public through the association web site; however, printed versions were not available until April 2014. Currently, individual states are addressing standards to meet the new NASPE components.

State standards in general. While the NASPE national standards for physical education are not required for individual states, nearly every state has physical education standards that align with them. An Internet search from the NASPE web site demonstrated that 45 states did include some description of the NASPE standards. The most common variations were in student performance indicators. For example, for third-to fifth-grades, Tennessee indicates in NASPE Standard Four that students achieve and maintain a health enhancing level of physical fitness, students must partake in physical activity that elevates heart rate for an extended period of time. However, in Kansas, indicators state that students monitor their heart rate during aerobic exercise and understand the term target heart rate. Therefore, while each state has its own indicators for physical activity and fitness, the standards are primarily the same.

Kansas state standards. The core standards of the NASPE also reflect the standards set forth by the Kansas State Department of Education (KSDE). Since this study takes place in Wichita, Kansas which is the largest metropolitan community in the state, the relationship between NASPE standards and KSDE standards should be more authentic. For grades three to five, the KSDE has benchmarks and indicators for student performance in physical education.

Various dimensions of motor skills, learning concepts, active participation, physical fitness, personal and social behavior, and activity appreciation are addressed as corresponding content standards (KSDE, 2005, p. 19-24). Interestingly, Standard Four of both the NASPE and KSDE deals with physical fitness, and one of the indicators for success is to meet specific health-related fitness standards (KSDE, 2005, p. 22). However, there are no specific guidelines for the physical education teacher to monitor physical fitness. The only instructional example from the KSDE is for the physical educator to assess and report the student's level of fitness to both the student and parent(s). Therefore, while the NASPE and KSDE have content in physical fitness, there are no specific guidelines or requirements for physical educators to test children in fitness. Most of the emphasis relates to motor competency, movement patterns, participation, social behavior, and activity enjoyment (KSDE, 2005, p. 19-24). The KSDE is currently addressing the new 2013 core standards from the NASPE.

Governmental guidelines. The NASPE has endorsed USDHHS guidelines of at least 60 minutes or more of age-appropriate physical activity on all or most days. In addition, the National Association of State Boards of Education (NASBE) recommends that all grade levels from pre-kindergarten to twelfth grade participate in regular and daily physical education throughout the school year. Elementary schools should allow participation in physical education for at least 150 minutes per week or an average of 30 minutes per day. Middle and high school should allow participation of at least 225 minutes per week or 45 minutes per day (NASBE, 2008; NASPE, 2010). Although many school districts provide physical education, these recommended times can be a challenge. School administrators and school board members are under a constant scrutiny to increase academic achievement scores. Other concerns relate to budget, limited time during the school day, and competitive priorities for the district (Cox et al,

2011). School leaders need to find alternative methods of promoting physical activity in schools. This can consist of enhancing the quantity of physical education, integrating physical activity more often during the day, encouraging active transportation to and from school (i.e., walking), opening facilities for physical activity during non-school times, and arranging after-school programs (Cox et al., 2011).

Self-Efficacy

Self-efficacy refers to the belief in one's capacity to organize and execute a course of action to produce achievements (Bandura, 1997; Bandura, 2006a). Pajares (2006) also suggests that self-efficacy views offer the substance for inspiration, well-being, and individual accomplishments in life. Feltz and Magyar (2006) added that self-efficacy is belief in the capability to learn or perform motor skills or a sport task to achieve a specific outcome. In addition, self-efficacy influences the thought processes of feelings and reactions (Kołodziej, Guskowska, Mazur, & Dzielska, 2012). While this process is likely to be more astute for adults, children, on the other hand, might not have the same processing capabilities. Self-efficacy is affected by an individual's ability to adjust to a situation. Low-efficacy believers tend to think the effort is too much and will stop trying. Also, there are feelings of anxiety, depression, and sorrow. However, high-efficacy people persevere and view barriers as a means to improve effort. Likewise, they tend to have better decision-making abilities, processing skills, and goal attainment (Bandura, 2006b; Kołodziej et al., 2012). Proper habits, especially healthy ones, are embedded in family and parental functions (Bandura, 2004; Caprara, Pastorelli, Regalia, Scabini, & Bandura, 2005). Because children learn these behaviors from parents, their abilities to continue them are very good.

Children learn how to be physically active through their parents and physical education teachers at school. If the child has parents who are physically active, then it would be assumed that the child has some awareness regarding the benefits of activity. Also, if the child has a physical education teacher who regularly promotes physical activity in his/her teaching, then this would help strengthen the child's knowledge of physical activity. Martin, McCaughtry, Hodges-Kulinna, and Cothran (2008a) discovered that teachers who participated in developmental workshops demonstrated effectiveness in their physical education curriculum efficacy and also displayed minor increases in their general education efficacy. Teachers reported having meaningful enhancements in their teaching efficacy to teach motor skills, knowledge of physical activity and fitness, and personal and social objectives. Professional development adds to the effectiveness of their abilities when they utilize the information in a manner of increasing their teaching efficacy. The roles of self-efficacy in physical activity or fitness among genders tend to have differing results (Spence et al., 2010; Valois et al., 2008). Age differences play a critical role in the maturity level of children and adolescents. Valois et al. (2008) reported that the majority of high school students in a southeastern state did not meet moderate activity guidelines. However, Spence et al. (2010) provided a contradiction with significant correlates to physical activity for girls and significantly higher self-efficacy in boys for physical activity for seventh through tenth grades. Also, Dzewaltowski et al. (2010) supported the conclusion that boys were more confident than girls about physical activity. Self-efficacy has also been used to determine physical activity associations in different ethnic groups of children (Bartholomew et al., 2006). The differences between the studies could have been attributed to high school physical education requirements, self-efficacy for younger participants on free play, or after school programs for younger participants.

Self-efficacy scales. Self-efficacy scales have been used in different studies to predict physical activity levels (Annesi, Wescott, Faigenbaum, & Unruh, 2005; Annesi, Faigenbaum, & Westcott, 2010; Bartholomew et al., 2006; Feltz & Magyar, 2006; Foley et al., 2008; Martin et al., 2008b; Ryan & Dzewaltowski, 2002). Feltz and Magyar (2006) studied several scholarly works pertaining to self-efficacy and adolescents in sport and physical activity. Self-efficacy has been shown as a predictor in sports performance, exercise participation adherence, and physical activity. This is often associated with past experience as well. Bandura (2006b) noted that individuals scoring high in perceived self-efficacy should vary from those scoring lower by the specific theory that self-efficacy is testing. McAuley and Mihalko (1998) reviewed numerous studies to determine the outcome of exercise behaviors. The most common constructs for self-efficacy were exercise efficacy (34%), barrier efficacy (30%), disease-specific/health efficacy (16%), general efficacy (11%), perceived behavioral control (5%), and other or diversified measures (4%) (p. 373-374).

Exercise efficacy. Exercise efficacy, also known as “task efficacy,” refers to the outcomes that assess participants’ abilities to complete various sessions of physical activity. This evaluates the participant’s confidence level in completing a physical activity session as determined by minutes or intensity level. Foley et al. (2008) assessed exercise efficacy to evaluate higher levels of exercise intensity and duration of physical activity in children ages 11- to 13. Duration times of 10 to 60 minutes and intensities of light, moderate, and vigorous further clarify the extent of the child’s participation in physical activity. Ryan and Dzewaltowski (2002) used an alternative version of the exercise efficacy, called the “physical activity efficacy,” to focus on the confidence level of the participant to be physically active which also concentrated on exercise duration and intensity. The confidence of the child to perform moderate-to-vigorous

physical activity could be more closely related to their physical abilities. Children who were highly confident in their abilities displayed longer durations and higher intensities of physical activity.

Exercise efficacy has been studied to identify physical activity beliefs in perceived exertion in adolescents (Srof & Velsor-Friedrich, 2006). These results determined that exercise efficacy is a strong predictor of perceived exertion, which aids in understanding exercise intensity levels. Other studies have examined exercise efficacy during the use of specific programs to demonstrate outcomes to healthy behavior (Bush, Laberge, & Laforest, 2010; Slawta & DeNeui, 2010). The utilization of the Fun-Action or Be-A-Fit-Kid program to help promote involvement in physical activity can generate increased participation levels. Therefore, exercise efficacy appears to be a solid construct to determine the strength of physical activity in children.

Barrier efficacy. Barrier efficacy measures the ability to conquer personal, social, or environmental challenges. These challenges can involve parental constraints (i.e., don't like to exercise, don't have a family gym membership, etc.), a network of friends who are physically inactive, neighborhoods without playgrounds, or weather related factors within the living area (Annesi et al., 2005; Annesi et al., 2010; Bartholomew et al., 2006; Martin et al., 2008b; Ryan & Dzewaltowski, 2002). Barrier efficacy measures the participant's confidence level to overcome barriers to participate in physical activity, which should yield possible increased levels of exercise efficacy. Children who do not let barriers thwart their desires to participate in physical activity should show stronger assets of physical fitness.

Disease-specific/health efficacy. Disease-specific efficacy measures the ability to engage in exercise rehabilitation to prevent disease occurrences (i.e., diabetes, chronic

obstructive pulmonary disease, etc.). However, a more specific focus is health efficacy, which can be related to health behaviors. Health-related behaviors can be predicted, both positive and negative, through a variety of mechanisms such as stress, coping, self-efficacy (Klein-Hessling, Lohaus, & Ball, 2005). In addition, Valois et al. (2008) discovered that vigorous and moderate levels of physical activity aid in reducing emotional self-efficacy. Cartland and Ruch-Ross (2006) discovered that as children age, they gain more understanding of healthy behavior but tend not to practice healthy behaviors as much. Practicing health care (e.g., washing hands, brushing teeth, covering mouth,) consistently decrease through the various elementary grade levels. In addition, the same trends occurred for social and risk behaviors, including less talking to adults about problems, setting healthy examples, wearing seat belts, or drinking alcohol, to name a few. Lastly, although not a large noted effect, the outcomes of physical activity decreased with age as well. This appears to be a common trend corresponding with the perceptions of school district needs or priorities with physical activity.

Disease-specific/health efficacy has been studied in adolescent populations of asthma, type 2 diabetes, nutrition, and mental stability (Jasper, Holl, Jefferson, & Grey, 2009; Klein-Hessling et al., 2005; Kaul, 2011; Pérez-Lizaur, Kaufer-Horwitz, & Plazas, 2007; Valois et al., 2008). Disease-specific/health efficacy aids in determining the perceptions of children in order for them to cope with and manage their personal health. Furthermore, other forms of disease-specific/health efficacy involve sexual risk, addiction, exercise, healthy lifestyle, and disease management (Schwarzer & Luszczynska, 2006). As researchers begin to have a better understanding of the personal perceptions and thoughts of children with disease or health related conditions, it is anticipated that physical activity along with self-management would be encouraged as a common prescription.

Perceived behavioral control. Perceived behavioral control measures constructs relating to the ability to control the situation for physical activity. Although this is a predominate construct for the theory of planned behavior, perceived behavioral control has been used to compare variables of exercise and barrier self-efficacy (Foley et al., 2008; Martin et al., 2008b). These studies used perceived behavioral control to measure participants' intentions toward physical activity. Martin et al. (2008b) noted that the correlate of barrier self-efficacy had the strongest influence toward any variable of planned behavior, including perceived behavioral control. Likewise, Foley et al. (2008) found that exercise and barrier self-efficacy were significant forecasters of physical activity intentions and behaviors. There seems to be a more consistent model for the use of perceived behavioral control as a predictor of physical activity than as a means to evaluate self-efficacy (Hagger et al., 2007; Hamilton & White, 2008; Martin et al., 2007)

General efficacy. General efficacy is a vague measure of self-efficacy, which, in a subscale, can measure perceived physical ability. Kimbrough (2007) noted that the general self-efficacy scale was “created to assess the general sense of perceived self-efficacy with the goal to predict how well people cope with daily hassles, as well as adapt after stressful life events” (p. 24). This type of scale was used to evaluate college students' perceptions to outdoor adventure education where students were exposed to rock climbing, canoeing, orienteering, and camping. Lockwood and Wohl (2012) used a general self-efficacy scale to evaluate the impact of a wellness program on college age students. Their conclusions indicated that lifetime wellness can provide a positive influence on behavioral change, specifically to physical activity. General self-efficacy scales have been used to identify physical activity levels in adolescents (Kołolo et al., 2012; Rolim, Matias, Segato, & Andrade, 2007). Adolescents with lower general self-efficacy

possessed inferior physical activity levels, while adolescents having more confidence had higher levels (Kołodziej et al., 2012). Furthermore, differences between active and non-active genders showed that active adolescent boys and girls possessed greater self-efficacy than non-active adolescents, with boys leading both genders overall (Rolim et al., 2007). Block, Taliaferro, Harris, and Krause (2010) discovered that teachers working with disabled students in a general physical education class could deliver self-efficacy through the following: (a) enactive mastery, (b) vicarious experiences, (c) verbal/social persuasion, and (d) physiological states. The ability of the teacher to effectively integrate disabled students in the class was dependent on the teacher's confidence level in his/her teaching ability, past experiences, encouragement, and physical/emotional traits.

Motor competency. Castelli and Valley (2007) addressed self-efficacy through motor competency when they compared motor skill assessments to physical activity and physical fitness measures. Motor competency is defined as “the mastery of physical skills and movement patterns that enable enjoyable participation in physical activities” (p. 359). This study incorporated basketball passing, whiffle ball padding, and ball-throwing activities as motor skill assessments. Their results established that motor competency and physical fitness were predictors of physical activity because participants demonstrated the strongest correlations between physical fitness measures and motor skill success. Haga (2009) also described how children who displayed high levels of motor competence outperformed children with low motor competence on physical fitness testing. Therefore, those children who are proficient in motor competency are more likely to possess better physical fitness.

Variables of application. When addressing physical activity, several variables apply that inhibit or promote the aspects of performing regular exercise. Physical education teachers have

attempted to employ social cognitive theory principles into lesson plans and student fitness assessment. The use of self-monitoring, goal-setting, social support, environmental aid, time management, and self-efficacy have been used to generate active engagement in physical activity monitoring (Grim & Pazmino-Cevallos, 2007). In addition, when physical education teachers stress the importance of participating in regular physical activity, children demonstrate stronger intentions to become physically active (Martin et al., 2007). Physical education teachers should be able to incorporate self-regulatory devices into different lessons on physical activity and fitness. These basic principles can aid in the promotion of physical activity in children and begin to reinforce the importance of living an active lifestyle.

Physical education teachers also possess social cognitive theory variables when delivering instruction within school-based programs regarding physical fitness testing. Keating and Silverman (2009) discovered a strong correlation between the physical education teacher and what that teacher perceives as important factors for implementing youth fitness tests. The focus of their study involved analyzing different influences, such as intentions of student/teacher, perceived benefits, habits, perceived self-efficacy, and overall attitudes of fitness tests. Results indicated that most of those influences played a part in a teachers' ability to implement fitness testing in youth. Teachers implement testing because of their intentions to motivate and evaluate students. Also, teachers understand the benefits to physical fitness testing. The physical education teachers' ability to conduct physical fitness testing with large class sizes, limited space, equipment, and time factored into their perceived self-efficacy. Lastly, the overall attitude of teachers towards physical fitness testing is a huge deterrent to the testing process. If teachers do not want to test or are not in favor of required testing, then validity or reliability of the testing process could be subpar.

The ability of children to engage in regular physical activity is associated with various principles of social cognitive theory and the theory of planned behavior. Perceived self-efficacy, control over health, quality of life, attitude, and/or self-regulation of physical activity all play a vital role in physical fitness behaviors. In addition, a child's motor competency is a direct reflection of his/her perceived abilities. Physical education teachers can provide additional support with lesson plans that focus on aspects of goal-setting, self-regulation, environment, and social interaction among children. Furthermore, the physical education teacher's attitude and behavior need to promote physical fitness in a positive light through lifestyle changes or lesson plans that focus on health-related standards.

Physical Fitness

The subject of physical fitness in children has been debated for many years. Rowland (1995) initiated a fire storm with his editorial titled "The Horse is Dead; Let's Dismount". The essence of this debate centers on whether fitness testing in children is really necessary and what benefits are actually discovered. Two main objectives stand out in this article: (a) health outcomes are more influenced by caloric expense instead of fitness accomplishments, and (b) there is a sense that sedentary or poorly fit individuals are more accepting of physical activity rather than highly intense exercise. This philosophy supports the promotion of physical activity for health over physical fitness. Corbin, Pangrazi and Welk (1995) supported Rowland in his editorial model of lifestyle physical activity as well as instituting concepts of health, activity for everyone, lifetime activity, and personal activity. Basically, these concepts focus on the assumption that physical activity should be tailored to meet the individual and generate lifestyle activities. Other factors that have influenced the change in philosophy away from fitness testing is the use of reliable and valid fitness tests, test batteries, norm or criterion referenced standards,

environmental limitations, relationships between fitness and physical activity, and clarity for implementation into the schools (Cale, Harris, & Chen, 2007).

Physical literacy. Lloyd et al. (2010) argue that physical fitness should not be the primary focus children because it is only one aspect of physical education, sports, programs, and possessing an active lifestyle. Therefore, the need to understand physical literacy must be identified in children. Physical literacy is defined as “a construct which captures the essence of what a quality physical education or a quality community sport/activity program aims to achieve” (Lloyd et al., 2010, p. 179). This involves physical activity behavior, fitness, knowledge awareness/understanding, and motor skills. Physical fitness centers on cardio-respiratory and musculoskeletal factors. Motor behavior is the fundamental skill proficiency of activities. Physical activity behaviors are those that are subjectively measured. Psycho-social/cognitive factors are the awareness, knowledge, and understanding of the issues of physical fitness. While physical literacy seems to be an important avenue to explore in regards to physical fitness in children, these components could be too specific for children to fully comprehend.

Health-related fitness. Even though physical fitness testing has its opponents, there are some who believe that there is a valid place for it within the physical education spectrum. Physical fitness should not be a stand-alone unit, but rather incorporated as an important part of fitness instruction (Silverman, Keating, & Phillips, 2008). Fitness instruction involves several different areas of a curriculum, and one of the major pieces involves health-related fitness. Health-related fitness components relate to body composition, cardiovascular endurance, muscular strength, muscular endurance, and flexibility. Another portion of the curriculum incorporates teaching the disparities between health-related physical fitness and physical activity.

For example, although playing four-square would be considered a physical activity, the physical fitness benefits are very minimal. Therefore, bridging the gap between health-related physical fitness activities and physical activity would disseminate any misconceptions in children.

Psychosocial variables. Just because children are outside playing does not mean they are developing health-related fitness. This is an important concept because children need to understand what fitness tests mean in order to gain an appreciation of self-assessment. Physical education teachers should incorporate lessons within the curriculum that assess health-related physical fitness components and how to utilize these results for healthy benefits (Silverman et al., 2008). Another important construct in the positive debate over fitness testing involves psychosocial variables. Wiersma and Sherman (2008) discuss three integrative psychosocial variables to hopefully boost physical fitness testing results: (a) motivational aspects of goal-orientation, (b) performance competence, and (c) cognitive evaluation. Goal-orientation enhances the motivation of students to improve, learn, and maximize efforts during fitness testing. This helps focus on personal improvement. Performance competence is the ability to understand mastery of a skill and perceive the result as a reward for good performance. This concept provides motivation because the personal self-assessment generally provides positive feedback. Lastly, cognitive evaluation simply applies motivation in the direction of personal effort and enjoyment which in turn influences the perceptions of control and choice. Basically, motivation for engaging in physical activity or fitness is related to positive or negative results. While these psychosocial variables are more or less influenced by factors like the social cognitive theory, successful results in any physical performance domain could lead to positive perceptions toward personal accomplishments. Therefore, it is assumed that children who perform better during physical fitness testing would be more motivated to improve those health-

related components. In addition, children who view themselves as physically fit and demonstrate negative results or lower performance could be motivated to provide more effort to improve.

President's council on fitness, sports, and nutrition. In 1956, President Dwight D. Eisenhower established the President's Council of Youth Fitness to generate public awareness of health in early life. A study by Kraus and Hirschland in 1953 showed that American youth were far less physically fit than European children. The authors tested more than 4,400 American children between the ages of 6 and 16, utilizing the Kraus-Weber fitness protocol to measure muscular strength and flexibility. Of the six tests used, 56.6 % could not meet the minimum level for health, while only 8% of European children failed to meet the standard. In addition, 35.7% of American children failed the muscular strength portion of the tests, compared to 1.1% of European children. Beginning in 1957, a pilot study conducted at the United States Naval Academy lead to the development of a national testing program, known today as the President's Challenge. Almost a decade later in 1966, President Lyndon B. Johnson created the Presidential Physical Fitness Award to recognize exceptional achievements in physical fitness for boys and girls between the ages of 10 and 17. Through the years, there have been changes and addendums made to the executive orders; however, the mission has stayed the same. Today, the President's Challenge is part of several initiatives conducted within the President's Council on Fitness, Sports and Nutrition.

Testing battery. The President's Challenge involves a testing battery of curl-ups or partial curl-ups, shuttle run, endurance run/walk, pull-ups, and v-sit reach or sit and reach. Based on the testing results, participants receive the Presidential Physical Fitness Award, National Physical Fitness Award, or Participant Physical Fitness Award. Participants must score in the 85th

percentile or above on all five tests to receive the President's Award, score above the 50th percentile in all five tests to receive the National Award, and complete the test battery to receive the Participant Award. Although the awards offer incentive children to participate throughout the testing to the fullest extent of exertion, this study does not focus on ranking participants. Beginning fall 2013, the President's Challenge adopted the FitnessGram® protocol for fitness testing.

FitnessGram®. The FitnessGram® was developed in 1981 by the Cooper Institute in Dallas, Texas. The Cooper Institute was the innovative concept of Kenneth Cooper, MD, MPH, a cardiologist in the Dallas area who is world renowned as the "Father of Aerobics." Dr. Cooper has dedicated his life to providing health care and programs for healthier living for his patients. The FitnessGram® provides evaluations of health-related fitness to parents, teachers, and children in areas of muscular strength, muscular endurance, body composition, flexibility, and cardiovascular fitness. The program uses criterion reference standards where children score within a specific sector. Currently, the FitnessGram® focuses on four areas: (a) health-related physical fitness, (b) criterion-referenced evaluation, (c) emphasis on fitness behaviors and physical activity, and (d) utilizing a modern reporting system (Plowman et al., 2008). The FitnessGram® can be a valuable educational tool to develop health-related strategies for children and encourage lifestyle changes.

Testing battery. The FitnessGram® testing battery involves body composition, flexibility, muscular strength and endurance and aerobic capacity. Upon completion of testing, participants are categorized using the criterion-referenced standards into either "Needs Improvement" or "Healthy Fitness Zone" (HFZ). The only difference between the two categories is that the HFZ only identifies a baseline number which, when exceeded, places all

children in the upper category. The recommended target limits to achieve an HFZ do not separate children with higher levels of physical fitness. For example, a boy who records 43 circuits on the PACER test is considered “healthy” or equal to a boy who records 53 circuits. The same is true for all measures of both genders of ages 10 to 11 years old. Therefore, developing a division of HFZ components to distinguish higher limits from lower ones will separate healthy fitness zone scores. In addition, by aggregating all HFZ accomplishments, this will provide children with a composite score for overall physical fitness levels.

Related Research

The review of literature not only focuses on the main scope of this research but also addresses supportive factors regarding physical fitness in children, the most common elements of which are child obesity, physical fitness and academic achievement, parental influence, athletic participation, and activity recommendations.

Child Obesity

Child obesity is a common topic among parents, researchers, schools, and the medical community. A search using the electronic database “Medline” yielded more than 167,000 publications from 1950 to 2013. This topic is so common that during the past five years, more than 51,000 manuscripts were published in peer-reviewed journals. The major concepts relating to obesity and this research project are global issues, growth development, the child’s environment (i.e., home and neighborhood), and school trends.

Global issues. Obesity is a global issue that affects adults and children of all ages. The World Health Organization (WHO) states that since 1980, obesity of global citizens has doubled and more than 1.4 billion adults, age 20 and over, are overweight. These statistics do not appear to be slowing down even with medical intervention. The majority of the world’s population

(65%) lives in areas where more overweight people died more than underweight people (WHO, 2012). The WHO (2012) reported that children under five years of age numbered more than 40 million in the overweight category in 2010. Obesity is a lifestyle generated by choices people make about their nutrition and physical activity.

United States issues. Children and adolescent obesity is not only a global epidemic that appears to be gaining momentum every year but is also a national concern. As stated earlier, the CDC classifies approximately 17% of all youth in the United States are classified as obese. These numbers coincide with the American Heart Association (AHA) who reports that one in six children between the ages of two and 17 are obese with 17.8% boys and 15.9% girls (AHA, 2012). In addition, one in seven low-income preschool children (14.3%) is considered obese (CDC, 2009). The CDC also reports that one in three children will be overweight or obese before the age of five. The ethnicities of children with the highest rates of obesity are Native American/Indian at 20.7%, Hispanic 17.9%, non-Hispanic White 12.3%, and non-Hispanic Black with 11.9%. Ogden and Carroll (2010) identified Hispanic boys and non-Hispanic Black girls as having the highest prevalence of obesity, 26.8% and 29.2%, respectively. With these statistics, the prevalence of continuing those trends into adulthood is highly likely (AHA, 2012; CDC, 2009). Children who are obese have a greater expectancy of elevated blood pressure, type 2 diabetes, high cholesterol, and cardiovascular disease (CDC, 2009). This is not a trend that is solely driven during the later stages of adolescents but is actually a process of aging and development.

Developmental growth. Taveras et al. (2011) used infant developmental growth and weight charts to analyze the prevalence of obesity as infants matured into children. Obesity was defined as “a body mass index (BMI) of \geq 95th percentile of age and sex” (p. 996). Interestingly,

infants who crossed two or more percentiles of development at 6, 12, 18, and 24 months within the 75th – 90th percentile ranges for each age were on average 31.6% more likely to remain obese at age 5 and 30.8% at age 10. Even infants who did not cross any percentile lines were still 13.13% prevalent of being obese at age 5 and 19.83% at age 10. These factors are not encouraging results for the development of children in our society.

Ogden, Carroll, Kit, and Flegal (2012) compared BMIs of infants, children, and adolescents from 1999 to 2010 which demonstrated only minimal increases in the 95th percentile for age groups 2 to 5 (0.4%), 6 to 11 (0.4%), and 12 to 19 (0.9%). Nonetheless, there was a consistent increase in BMI for ages 2 to 19, demonstrating that as children age, BMI steadily progresses on average of 6%. These results are again consistent with research that delineates the physiology of aging in terms of increasing weight. The AHA (2012) states that as overweight children age, the prevalence of them becoming overweight adults is about 70%. In fact, there is a persistent line of transition from severe adolescent obesity to adult obesity (The et al., 2010). The underlying trend is that as people age, they gain more weight, which means a lifestyle adaptation for children. To reverse these developments, parents and the medical community can work together to understand how obesity arises and how changes in lifestyle and home environment can benefit children.

Child's environment. Previous studies have indicated that children from lower socioeconomic status have a tendency to be overweight or have a higher BMI (Drenowatz et al., 2010; Ogden et al., 2012; Singh, Kogan, Siahpush, & van Dyck, 2009; Tandon, Zhou, Sallis, Frank, & Saelens, 2012; Williams, 2011). Factors that influence these results are increased sedentary time, television or gaming system watching, neighborhood environment, and family behavior (Singh et al., 2009; Tandon et al., 2012; Voorhees et al., 2009; Williams, 2011).

Furthermore, Singh et al. (2009) examined state and regional variances to determine if these behaviors contributed to possible reduced physical activity levels. Children who reside in the East South-Central United States (Kentucky, Tennessee, Alabama, and Mississippi) had the highest prevalence of no days of vigorous physical activity, at 13.44%. The more time children spend with no physical activity, the perceived correlation to increased body weight grows. The importance of the Singh study to this research is that Kansas ranked higher than the East South-Central United States average at 13.58%. In addition, Kansas ranked above Alabama and Mississippi in terms of higher odds with no days of vigorous activity. When evaluating the physical activity correlates of children and adolescents residing in Kansas, the prevalence of no days of vigorous activity places Kansas among the highest levels, with only four other states reporting higher values.

School trends. Schools have been considered a place for children to participate in physical activity. However, the NCLB Act has dampened the availability of physical education and activity time due to rising pressures on academic testing (Kim, 2012). Schools have extended the learning time for English and math, and, at the same time, reducing the time for other subjects. In addition, schools cut time for physical education for other school-related activities (e.g., taking pictures) or waive students from taking physical education (Young et al., 2007). All of this can send a message to students that physical education is not important. Because of these formalities, schools must look for alternative solutions for children to gain physical activity opportunities. According to Kim (2012), when schools implemented state requirements for physical education, student physical activity opportunities were increased. The major disparity occurs when schools do not incorporate state requirements in lieu of extra learning time.

Beaulieu (2010) studied regions of the United States to evaluate approaches made by elementary schools to foster physical activity. The majority (64.3%) used non-traditional activities (e.g., dance, martial arts, and outdoor adventure activities) to augment their physical education program. However, schools with higher minority enrollment and lower socioeconomic status were less likely to use these methods. The same trends followed with schools participating in the President's Challenge Physical Activity and Fitness Award Program. Schools must look for alternative methods and establish policies of incorporating additional physical activity time for children. Some of these opportunities could be formed by community partnerships or by closing the gaps in physical education requirements (Kim, 2012; Young et al., 2007). Whatever the case, school leaders cannot continually disregard the need for increased physical activity in children.

Physical Fitness and Academic Achievement

Studies have identified that physical fitness levels in children and adolescents ranging from third grade to high school can be associated with academic performance (Ahamed et al., 2007; Castelli et al., 2007; Grissom, 2005; London & Castrechini, 2011; Van Dusen, Kelder, Kohl, Ranjit, & Perry, 2011; Wittberg, Cottrell, Davis, & Northrup, 2010). The majority of these studies utilized the FitnessGram® test battery to determine physical fitness levels. The FitnessGram® examines characteristics of body composition (percent body fat), flexibility, muscular strength and endurance, and aerobic capacity (Welk & Meredith, 2008). These scores are then compared to state achievement scores in reading, mathematics, or other subject areas. Positive results were achieved within the individual dimensions of the FitnessGram® when comparing sit-ups to reading or flexibility to mathematic scores (Ahamed et al., 2007; Castelli et al., 2007; Wittberg et al., 2010).

Large sample studies. While most sample population studies have been limited in supplying research data, two studies have offered some conclusive results in establishing a correlation between academic achievement and physical fitness. Grissom (2005) studied 884,715 fifth, seventh, and ninth grade children using reported FitnessGram® data on six physical fitness standards from a West Coast state. FitnessGram® data was reported to that state's department of education along with state assessment scores in mathematics and reading. Results demonstrated an association between the number of physical fitness standards achieved and higher scores in mathematics and reading. On average, for every physical fitness standard achieved, math scores rose 3.0 points and reading scores rose 2.5 points. Van Dusen et al. (2011) evaluated 254,743 children in third through eleventh grades from 13 school districts in the southwestern United States. Correlations between FitnessGram® testing and state math scores demonstrated stronger associations on all five fitness variables. These two large scale sample population studies add to the growing body of literature regarding the positive conclusions that academic performance is associated with physical fitness in children.

Contrasting research methods. Different methods have been utilized to study the relationship between physical fitness and academic performance in children. Chomitz et al. (2009) developed a "passing score" construct for each FitnessGram® measure (cardiovascular, endurance, abdominal strength, flexibility, agility, and upper body strength) to correlate with mathematics and English scores for fourth, sixth, and eighth grade students in a northeastern state. Results confirmed that students who scored higher in math and English also scored higher on the FitnessGram®. Wittberg et al. (2009) performed FitnessGram® testing on children using the "Healthy Fitness Zone" table and state standardized testing in a northeastern state. The HFZ is a physical activity performance table that identifies the minimum time limit, number of

repetitions, or circuits for a “healthy” child. The performance table categorizes each component of the FitnessGram® into two groups: (a) healthy fitness, where the child exceeds a target limit, or (b) needs improvement, where the child fails to meet the target limit (Welk & Meredith, 2008). In the Wittberg 2009 study, 67.2% of children tested exceeded the healthy fitness zone targets in aerobic capacity, 85.8% in abdominal strength, 72.5% in upper-body strength and 86.0% in flexibility. State academic achievement scores yielded positive associations. Children performing within the healthy fitness zone for upper body strength and flexibility had significantly higher mathematics scores. Science scores were also significantly higher for children when compared to flexibility. London and Castrechini (2011) studied the longitudinal relationships between academic achievement and physical fitness to determine if an academic gap is present over a four-year period. Using the California Physical Fitness Test, which relies on the FitnessGram® Healthy Fitness Zone standards, children must pass five of the six physical fitness components to qualify for a pass rating. Children complete this physical fitness testing in the fifth, seventh, and ninth grades respectively. In comparison to state academic tests, the authors discovered that children who did not pass the physical fitness testing in the fifth and seventh grades, scored below the standard deviation on the academic portion as well. The same results occurred in children who did not pass the seventh and ninth grade physical fitness testing. Although gaps in the seventh to ninth grades were slightly lower, there was still a correlation to academic scores and physical fitness outcomes. The longitudinal study concluded that unfit younger children presented more of an academic gap than older unfit children and children who would later pass the fitness testing. The foundation for this study yields a perspective value for physical fitness in younger-age children. However, the conclusions are not concrete enough to offer a specific correlation between academic performance and physical fitness.

Additional variables. Other studies have evaluated the effects of physical fitness in children in level of cognition, working memory, or task performance (Hillman, Buck, Themanson, Pontifex, & Castelli, 2009). This study reported that children with higher levels of performance on specific domains also have better physical fitness results. Ahamed et al. (2007) reported that devoting additional time for physical activity in the classroom did not result in decreased academic performance. These studies challenge the connections between academic performance and physical fitness through alternative variables.

Parental Influence

Parents possess an enormous amount of influence on their children. It is often said that in different settings, parents are really the first teachers of their children's lives. These influences can lead to lifelong philosophies, personal attributes, and moral characteristics. With the national epidemic of childhood obesity, it seems that parents could be neglecting to teach their children about physical fitness or healthy lifestyles. To assist children in valuing physical fitness and exercise, parents should participate in an active program of physical fitness (Alderman, Benham-Deal, & Jenkins, 2010; Welk, Wood, & Morss, 2003). Alderman et al. (2010) describes early promotions of physical activity that relate to motor skill development during ages 4 to 6 years. When the child develops to age 10 to 12, promotions should focus on physical fitness. Lastly, participating in physical fitness as a family can have lasting benefits of influencing a child or adolescents to engage in a healthy lifestyle.

Physical fitness levels in adults have seen some fluctuations, mainly downward, over the past years. For parents to promote physical fitness, they need to be consistent in participating in a regular exercise program. Knuth and Hallal (2009) described different tendencies in physical activity for adults, adolescents, and children. Adults were spending a great deal more time

enjoying leisure based activities instead of concentrating on physical fitness. In addition, children and adolescents were showing a reduction in physical fitness. The necessity for parents to actively endorse a lifestyle of physical fitness is becoming more significant each year. Parents and children who are energetically involved in physical fitness make enhanced and positive connections between them. Furthermore, any socialization between the parent and child can be a huge inspiration and introduce effects on the child's behavior (Welk et al., 2003).

Family socioeconomic status. The socioeconomic status (SES) of children has most commonly been measured using parental level of education, occupation, annual income, and neighborhood environment (Stalsberg & Pedersen, 2010). Stalsberg and Pedersen (2010) conducted a review of the literature, examining associations between SES and physical activity in adolescents from different countries. In the United States, 7 of the 12 (58%) articles examined demonstrated some positive relationships. These results concluded that SES is associated with physical activity by the following:

- a. Teens from lower SES reported less physical activity.
- b. Family activity was superior in families with a higher income.
- c. Lower neighborhood safety yielded less activity
- d. Participation in team sports was greater with higher SES.
- e. Higher family income was associated with increased moderate-to-vigorous activity.

Negative relationships were associated in 2 of the 12 articles (17%), and results showed that children in a lower SES walked to school more and demonstrated higher scores and levels of physical activity. Finally, three of the 12 articles (25%) reported no relationships between SES and physical activity. Since these studies measured multiple SES factors, it was difficult to assess an exact single factor to associate SES and physical activity. Interestingly, on a global

basis of all articles examined, 58% demonstrated a positive relationship. Therefore, it appears that the United States is following the same trends as global societies.

A variety of other socioeconomic factors influences the physical activity behaviors of children. Home environment, school environment, neighborhood boundaries, sedentary time, and sport participation appear to effect the level of physical activity in children (Drenowatz et al., 2010; Kelly et al., 2010; Santos, Esculcas, & Mota, 2004; Tandon et al., 2012; Voorhees et al., 2009; White & McTeer, 2012). However, certain factors are self-regulated. Tandon et al. (2012) compared the home environment to physical activity, sedentary time, and screen time in 6-to-11-year-old children. Surprisingly, they discovered that children from lower socioeconomic status had more types of media (e.g., TV, DVD/VCR, and gaming systems) in their bedrooms compared to those at higher levels of socioeconomic status. Since prior studies have identified the length of television watching as a means of longer sedentary time, it is not too startling that these children have lower physical activity levels (CDC, 2011; Drenowatz et al., 2010; Vader et al., 2009). However, these factors can be controlled by parents. Longer time spent watching television or a DVD, playing X-box, W ii, IPod, or other media devices have played a role in increasing sedentary time. Parents must monitor their child's sedentary time with these devices in order to better promote physical activity.

SES factors that cannot be controlled by the parents are neighborhood and school environment. Voorhees et al. (2009) determined that girls living in neighborhoods with lower SES were more active within these boundaries and in the home, than in school. However, these girls participated less in organized activities such as programs and classes, team-based or work-based. While this seems to contradict Tandon et al. (2012), lower SES children do tend to participate less in organized activities (Santos et al., 2004; White & McTeer, 2012). The school

environment plays a role in physical activity for children in terms of access to facilities. After-school programs, required physical education classes, intramural programs, playground equipment, and allocated physical education all increase opportunities for physical activity (Brink et al., 2010; Davison, 2009; Kelly et al., 2010; Kriemler et al., 2011; ; Farley et al., 2008; Nichol et al., 2009). However, schools within boundaries of lower socioeconomic regions that do not provide access to physical activity opportunities hinder a child's activity level. Children who live in lower socioeconomic areas; attend school within those boundaries; are too sedentary in terms of television; gaming systems, or DVD's; and have parents who are sedentary have little chance to display appropriate levels of physical activity.

Parenting style. Kimiecik and Horn (2012) reported that parenting style provides children with the constructs of physical fitness. Parenting style refers to the ability of the parent(s) to challenge and support their children in various activities. In this study, the authors discovered that children who view their parents as high challenge/high support demonstrated significant fitness goal orientation. In addition, high-challenge and high-support parents were linked to elevated perceived fitness competence and perceived parent-communication patterns respectively in their children. Parents should want to be involved with their children in various aspects of physical activity. If parents regularly participate in physical fitness activity, their children are more likely to be involved as well. Lee et al. (2010) concluded that 77.6% of parents participate in a co-physical activity with their children at least one day per week. In addition, co-activity participation increased when the children were competing in team sports. Furthermore, children who perceived a higher level of parental support for physical activity tend to possess a greater probability of co-physical activity.

Parental support. Parents and children who display physical activity assets within the family will hopefully be able to generate a life-long affiliation with physical fitness. However, not all family connections stay linked throughout the developmental years of children. Davison and Jago (2009) confirmed that parental support for physical activity tends to decrease during adolescent ages, particularly in girls. Interestingly, this coincides with an increase in peer support. Between the ages of 9 and 11, a greater increase of peer interaction occurred, which seems to reflect the transition of independence in children. This is an important factor in parenting style. Parents who continue to provide support for physical activity in their children reported sustained levels of involvement between the ages of 9 and 15, compared to non-supported parents (Davison & Jago, 2009). Parental support can be provided in a number of ways. These include encouragement, transportation, watching games, assisting with activities, paying fees, and, most importantly, parents attitude of physical activity (Edwardson & Gorely, 2010).

Athletic Participation

Not only does school physical education offer children opportunities to increase their understanding of physical fitness, but participation in different sports does as well. Cognition factors play a vital role in the representation of skill development (Bandura, 1997). A study by Fox, Barr-Anderson, Neumark-Sztainer, and Wall (2010) determined that 53% to 71% of middle and high school students in a Midwestern state participated in at least one team sport. In addition, the correlation between boys and girls involved in moderate-to-vigorous activity most days per week was 60% and 41%, respectively. These results support the fact that many children have exposure to physical fitness outside of the normal school curriculum. In addition, Saar and Jürimäe (2007) earlier demonstrated correlations between participation in organized physical

activity outside of school and reported physical activity indexes in boys and girls between the ages of 10 and 17 years. It would seem reasonable to assume that children who participate in regular sporting competition outside the school curriculum would have a greater correlation to physical fitness.

Organizations such as the Boys and Girls Club, YMCA, YWCA, Bidy Basketball, Pop Warner Football, or Youth Baseball and Softball offer a variety of skill acquisitions through different coaching styles and organized participation in sporting events. Even though not all children or families have access or can afford the cost to join these organizations or teams, such opportunities provide a great alternative to school physical activity. Micheli et al. (2011) discuss the global importance of addressing fitness and health of children by utilizing sports as a mechanism. Several elite organizations such as the International Olympic Committee, International Sports Federations, National Olympic Committees, WHO, International Physical Activity Networks, and non-governmental organizations should provide models to incorporate sport programs for various ages and promote healthy benefits.

Activity Recommendations

The AAP, CDC, and USDHHS have established recommendations for physical activity in children. Their primary goal is to develop an active lifestyle for children so they will transfer those goals and activities to adulthood. The AAP, CDC, and USDHHS recommend that children perform moderate-to-vigorous physical activity for 60 minutes or more each day. Moderate physical activity involves hiking, skateboarding, bicycle riding, or brisk walking and vigorous activities includes bicycle riding, jumping rope, running, and sports such as soccer, basketball, and ice or field hockey (USDHHS, 2008). These recommendations are suggested for aerobic activity (e.g., running, jump roping, skipping, etc.), muscle strengthening activities, (e.g., rope

climbing, sit-ups, etc.), and bone-strengthening activities (e.g., jumping rope or running) at least three days per week (USDHHS, 2008). The incorporation of all three categories enables the child to have a well-rounded development pattern.

Alternative organizations have joined the AAP, CDC, and USDHHS to endorse activity recommendations and promote physical activity in children. The Let's Move campaign developed by First Lady Michelle Obama is used to encourage children to become physically active for 60 minutes per day at least five days per week. The focus is generated around building active families, schools, and communities. Families should engage in daily physical activity 60 minutes for children and 30 minutes for adults. Schools should offer more physical activity time during the day (i.e., more classes for physical education and longer recess), before-school and after-school programs, and open facilities for recreation during off days. Last, communities should renovate playgrounds, parks, and recreation centers and develop safe routes to walk or ride bicycles to schools to help promote physical activity in children. The National Football League (NFL) has constructed the NFL Play 60 to foster more physical activity in children. This diverse program provides adults and children opportunities to get involved with community and school programs to by pledging 60 minutes of daily physical activity. The NFL wants to generate a change in children to become healthier and understand the benefits of an active lifestyle.

Summary

Social social cognitive theory features areas of human behavior using thoughts and feelings (Martin & Kulinna, 2005). Human agency directs the control over health behavior and quality of life (Bandura, 2001; Bandura, 2006a; Bandura, 2012). The theory of planned behavior reflects the intentions of individuals based upon their attitude, stress, and abilities (Ajzen, 1991).

It appears that intentions are the major predictor for exercise (Hamilton & White, 2008). As children develop and mature, these behaviors are learned or reinforced by the educational environment, parents, and teachers. The educational environment plays a critical role in providing children with opportunities for physical activity. Home schooled children seem to have a lower level of physical activity than public schooled children (Long et al., 2010; Welk, et al., 2004). This may be related to characteristics of their school environment. Religion creates some challenges to physical activity in children due to the parent's commitment to faith (Kahan, 2004; Kahan, 2005; Martin et al., 2008b), while public schools students do not meet requirements for moderate physical activity (Valois et al., 2008). However, school facilities, intervention programs, and recess times all contribute to positive influences toward physical activity (Beighle et al., 2006; Brink et al., 2010; Kelly et al., 2010; Kriemler et al., 2011). The increase of sedentary behaviors in children results in health concerns due to a lack of physical fitness and lifestyle (Strong et al., 2005). National and state education standards are published to provide guidance for physical education teachers to incorporate physical activity for children in all grade levels (KSDE, 2005; NASPE, 2004). Conversely, the NCLB Act does not address these standards, and consequently, school districts have decreased physical activity opportunity for increased learning (Center on Education Policy, 2007). Therefore, the educational environment can be an influencing factor for physical activity in children.

Self-efficacy provides a variety of factors that aid in behaviors such as the capabilities to organize and execute actions, provide inspiration, perform motor skills, achieve outcomes, and influence feelings and reactions (Bandura, 1997; Bandura, 2006a; Feltz & Magyar, 2006; Kołolo et al., 2012). In addition, self-efficacy towards physical fitness in children can vary by different areas of the environment, parental influence, self-regulated barriers, or performance tasks.

Teachers can influence children's physical well-being by providing activities that focus on fitness and by enhancing their teaching skills (Martin et al., 2008a). However, research shows that the majority of adolescents do not participate in at least moderate exercise (Valois et al., 2008). Self-efficacy has a variety of constructs that can be utilized to study children's behavior toward physical activity (Bandura, 2006b; McAuley & Mihalko, 1998). These constructs present a wide dimension to understanding these aspects which plays a vital role in promoting an active lifestyle. In addition, motor competency allows for the mastery of skills and movements, which fosters participation enjoyment (Casteli & Valley, 2007).

Physical fitness testing has been debated for the past 20 years to determine its value within children (Cale et al., 2007; Corbin et al., 1995; Rowland, 1995; Silverman et al., 2008). While some argue that physical fitness testing is outdated, others see value in health-related fitness. Historically, physical fitness testing has been delivered through either the FitnessGram® or the President's Challenge. While both protocols utilize different markers for determining physical fitness in children, their focus is consistently in flexibility, muscular strength, muscular endurance and aerobic capacity.

Child obesity has been reported to be increasing globally and also within the United States, and is considered a barrier to physical activity in children (AHA, 2012; CDC, 2009). Physical fitness has been identified as being linked to increased academic achievement (Ahamed et al., 2007; Castelli et al., 2007; Grissom, 2005; London & Castrechini, 2011; Van Dusen et al., 2011; Wittberg et al., 2010). Most of these studies incorporate the FitnessGram® protocol to establish any relationship; however, the conclusions only compare individual physical fitness measures to state achievement scores. Alternative methods to employing the FitnessGram® were employed by developing a "passing score" for each fitness measure, passing a specific number of

tests and counting the number of healthy fitness zone accomplishments (Chomitz et al., 2009; London & Castrechini, 2011; Wittberg et al., 2009). However, these studies failed to process a true level of physical fitness in the children being tested.

Parental influence, socioeconomic status, physical education in schools, and athletic participation in team sports also influence activity levels in children. Parents can sway children by being active and regular participants themselves in physical fitness (Alderman et al., 2010). Family SES provides barriers to physical activity in children due to lower family income, family activity, neighborhood areas, and team sport participation (Stalsberg & Pedersen, 2010). Parents can help their children participate in physical activities by engaging and supporting them with encouragement, helping with activities, and having a positive attitude (Edwardson & Gorely, 2010). School physical education needs to be a regular part of a child's daily activity. Elementary children should participate in 30 minutes of physical education per day, and secondary students should have 45 minutes of physical activity per day (NASBE, 2008; NASPE, 2010). Participating in athletics or team sports offers students additional opportunities for physical activity. Furthermore, team sports also add a sense of community that strengthens the connections to physical fitness. Recommendations by the AAP, CDC, and USDHHS provide established guidelines for parents, schools, and children. The major considerations for research should concentrate on aggregated physical fitness and not isolating different fitness components. The study in this dissertation will bridge the gap between individual achievements and overall physical fitness levels in children.

CHAPER THREE: METHODOLOGY

This quantitative research study determined if the educational environment and physical activity self-efficacy are related to the aggregate physical fitness level in elementary school children. The school setting (e.g., home, religious, or public) determined the educational environment. The researcher utilized the physical activity self-efficacy scale to measure elementary students' self-efficacy (McAuley, 1992; McAuley, 1993; McAuley & Mihalko, 1998). The physical activity self-efficacy scale was divided into exercise and barrier modes. Exercise modes help define the child's personal perceptions of physical activity, while barrier modes define any perceptions of challenges relating to physical activity. Aggregate physical fitness was measured using the FitnessGram® protocol to determine a composite physical fitness score based on standards within a specific healthy fitness zone (Welk & Meredith, 2008). The composite score was determined by an accumulation of measures from the health related assessments. This research design is correlational in nature. The purpose of this study was to determine if the educational environment influences self-efficacy and whether it correlates to higher levels of physical fitness in children.

This methodology chapter examines the research design, selection of participants, test setting, instrumentation, procedures for collecting data, and data analysis. Participants were selected from different elementary schools within the same Midwestern metropolitan community. Students' exercise and barrier self-efficacy scores were collected and compared to their FitnessGram® measurements for aerobic capacity, flexibility, muscular strength, muscular endurance, and body composition. Multiple regression analysis and assumption testing was used to determine if the relationships are statistically significant. Statistical analysis was performed at the $p < .05$ level.

Research Design

This quantitative study employed a correlational research design to determine if the educational environment and high levels of physical activity self-efficacy are related to aggregate physical fitness levels in children. By using a correlational research design, relationships between the predictor variables (independent) and the criterion variable (dependent) will help establish the accuracy of the prediction (Thomas, Nelson, & Silverman, 2005).

Research Questions and Null Hypotheses

The following research questions and null hypothesis were focused in this study:

Research Question 1: Does the educational environment relate to physical activity self-efficacy levels in elementary school children?

Null Hypothesis (H₀₁): There will be no statistically significant relationship between educational environment and physical activity self-efficacy levels in elementary school children as indicated by the type of school setting and physical activity self-efficacy score.

Research Question 2: Does the educational environment relate to aggregate physical fitness levels in elementary school children?

Null Hypothesis (H₀₂): There will be no statistically significant relationship between educational environment and aggregate physical fitness levels in elementary school children as indicated by the school setting and aggregated FitnessGram® score.

Research Question 3: Does the educational environment and level of physical activity self-efficacy relate to aggregate physical fitness levels in elementary school children?

Null Hypothesis (H₀₃): There will be no statistically significant relationship between educational environment, physical activity self-efficacy levels and aggregate physical

fitness levels in elementary school children as indicated by the school setting, physical activity self-efficacy score, and aggregated FitnessGram® score.

The elementary school children's physical activity self-efficacy and aggregate physical fitness levels determined if any relationships exist relative to type of educational environment. A linear or non-linear relationship determined the best fit for the correlations (Howell, 2008). This research design was chosen because it allows the research to determine if a participant who displays the highest level of physical activity self-efficacy also possesses the highest level of physical fitness. Therefore, if educational environment and physical activity self-efficacy has a strong relationship to overall physical fitness, this could strengthen the promotion of physical activity in home, religious, and public school children.

Participants

This study's sample population consisted of fifth-grade students in home, religious, and public schools. When compared to younger students, fifth-grade students should have more maturity levels, physical abilities, and academic skills to understand their physical activity self-efficacy scores; in addition, they should be able to handle the inherent physical risks of performing the FitnessGram® tests such as injury, illness, and fatigue. Schools were selected based on similar demographic areas within the metropolitan community and close proximity distance between public and religious schools. Home schooled students were chosen within the boundaries of the public and religious schools to ensure close geographic relationships. They were identified through the Kansas Parents as Teachers Association (KPATA) and Teaching Parents Association (TPA) of Wichita. Previous studies have supported using this age group for self-efficacy to predict physical activity levels in children (Bartholomew et al., 2006; Foley et al., 2008; Martin et al., 2008b; Martin et al., 2011)

The study sample size was 471 fifth-grade students from different educational environments within a metropolitan community. The numbers of participants from each educational environment were determined by the percentage from each category (e.g., home, religious, or public) schools located within the metropolitan community. The sample size is a reflection of previous studies where children have been studied for physical activity self-efficacy (Bartholomew et al., 2006; Foley et al., 2008; Martin et al., 2008b; Martin et al., 2011). There are several public and religious elementary schools in the area by which to determine a quality sample size. Furthermore, the metropolitan community has an established network of home school students through the KPATA and TPA.

Participants within the public and religious schools were chosen during physical education classes. Home schooled participants were chosen from parent's participation within the KPATA and TPA who are also identified as having children enrolled in a physical education component. In order to control threats to validity, class sizes, gender majorities, FitnessGram® experience, and testing facilities were evaluated. Participation was voluntary, based upon returned parental consent and student assent forms, school administration approval, and physical education teacher authorization. While some participants could display sadness, depression, or low self-esteem because of the FitnessGram® scores, this was minimized by keeping the scores confidential. Student identification numbers were utilized for data entry and only the researcher had access to the completed documentation. This study excluded participants who return unsigned consent and assent forms or incomplete self-efficacy forms, and those who did not complete all physical fitness tests, or voluntary withdrew.

Setting

The setting included local home, religious, and public schools in a Midwestern metropolitan community. Home schools in the metropolitan community can be connected with the KPATA and TPA, which provides parents with curriculum, legal, and activity related information. While the core curriculums for these schools are only identified as general education courses, physical education or physical activity information is not provided. However, physical education for home schooled students is offered through the TPA as well as various YMCA locations and Wichita Parks and Recreation.

Religious schools offer a diversity of faith associations including Catholic, Christian, and Lutheran. The Catholic Diocese covers 15 different communities, many of them rural, which are overseen by the appointed bishop. The metropolitan region encompasses 19 schools, kindergarten through eighth grade and two high schools, with an approximate student population of more than 8,000. Catholic schools have their own superintendent and school board, are identified through the diocese office, and are accredited by the KSDE. The Catholic school diocese publicly reported the free or reduced-price lunch percentage as 22.2% (Tobias, 2012). The core curriculum is mathematics, science, social studies, reading/language arts, fine arts, physical education, and religion. Fifth grade students participate in 100 minutes of physical education weekly. Religious education is 150 minutes per week and all students are required to attend mass at least twice a week. Christian and Lutheran schools include a variety of independent schools that do not have any association or organizational bond. The five Christian schools and one Lutheran school within the community range from grades kindergarten through eighth grade. Only one Christian or Lutheran school publicly reported its free and reduced-price

lunch percentage, which was 44.5% (Tobias, 2012). Each school offers physical education for fifth-grade students; however, there was no reported weekly physical education time.

Public schools were identified through KSDE sponsorship. The metropolitan community has a population of approximately 375,000 citizens and a public school district population of approximately 55,000 students. This includes 60 elementary, 17 middle, and 11 high schools. The public school district reports that 75.2% of its students receive free or reduced-price lunches (Tobias, 2012). The standard program of education includes mathematics, science, social studies, readings/language arts, and specials (e.g., physical education, music, art, band, computers, and choir). The public school district's fifth grade students receive 90 minutes of physical education instruction per week. The diversity of schools allowed the study to be conducted with a population that could be selected from demographics providing the most consistent averages of socioeconomic status, ethnicity, and overall school academic performance.

Instrumentation

The FitnessGram® was developed by the Cooper Institute in Dallas, Texas to evaluate health-related physical fitness. Validity and reliability have been well established through the evolution of the FitnessGram® and historical perspective (Plowman et al., 2008). Cureton and Plowman (2008) cited five studies on children or adolescents that demonstrated reliability of the PACER test to have an average reliability coefficient of $R = .64$ or greater, with three studies above $R = .84$. Plowman (2008) determined that the muscular strength of curl-up tests had a reliability coefficient of $R = .70$ or greater, while validity reports a variance of approximately 16%. Push-up test possessed a reliability coefficient of $R = .64 - .99$ and a validity of $r = .31$ to r

= .81. Flexibility sit and reach tests were concluded to have a reliability of $R = .93 - .95$ and validity ranging above $R = .60$ in numerous studies.

Participants in this study performed the FitnessGram® protocol to measure body composition, flexibility, muscular strength and endurance, and aerobic capacity (Welk & Meredith, 2008). Body composition was measured using BMI and was calculated using the following equation: $BMI = \text{weight in kilograms} / \text{height in meters}^2$. Participants had their weight and height recorded and the measurements were converted to the appropriate parameters. Flexibility was measured using the standard sit- and-reach method, which required participants to bend slowly and reach past their toes while in a seated leg extended position. Muscular strength and endurance was measured using push-ups and curl-ups. Boys performed traditional push-ups while girls performed push-ups using a modified technique of weight on the hands and knees. Curl-ups for both genders were measured using a distance-achievement marker in which the participant glides their hands along the floor until they touch the marker. For both tests, a timing system was incorporated, allowing minimal rest and an even tempo. Aerobic capacity was measured using the PACER test which employs a 20 meter shuttle at a specific speed to complete the cadence. If a participant was unable to complete two shuttles before the timer sounds, she/he was eliminated.

Based on the Healthy Fitness Zone standards, the researcher calculated the measurements for the FitnessGram® and develop a composite scale score (Welk & Meredith, 2008). The HFZ is a criterion reference standard based on levels of fitness needed for good health. The recommended fitness measurements for fifth-grade boys (approximately age 11) for this study are as follows:

- a. BMI: score of 14.6 – 19.7 (highest numbers represent heavier weight)

- b. Flexibility: plus 8 inches
- c. Push-ups: 8 repetitions
- d. Curl-ups: 15 repetitions
- e. 20 meter PACER test: 23 (defined as one 20 meter run)

The recommended fitness measurements for fifth-grade girls (approximately age 11) for this study are as follows:

- a. BMI: score of 14.5 – 20.4 (highest numbers represent heavier weight)
- b. Flexibility: plus 10 inches
- c. Push-ups: 7 repetitions
- d. Curl-ups: 15 repetitions
- e. 20 meter PACER test: 15 (defined as one 20 meter run)

Measurements above the HFZ were given a point score for each repetition, inch, value (BMI), or lap. Therefore, the absolute zero for each measurement was the minimum HFZ score. While the objective here was to have all participants reach minimum values in all categories, those who successfully surpassed any minimum value were analyzed with a numerical value greater than zero. After testing, all scores for the HFZ were tabulated and divided by the total number of measurements to get an average score. This total represents the participants' aggregate physical fitness composite score.

The physical activity self-efficacy scale was used to measure exercise and barrier modes (Baudura 2006b; McAuley, 1992; McAuley, 1993; McAuley & Mihalko, 1998). This scale represents strategic perceptions to participants' physical activity self-efficacy. Exercise modes evaluate frequency, intensity, and duration of physical activity, and barrier modes examine challenges to physical activity. Foley et al. (2008) rated participant confidence on physically

active time periods (10, 20, 30, and 60 minutes) and intensity levels (light, moderate and hard). Frequency was measured by the number of days incurred participating in physical activity (e.g., one, two, and three). Exercise modes were classified from no confidence (0%) to completely confident (100%). Barrier modes were classified into the same confidence levels against common barriers (e.g., I think it is too cold outside, I have lots of homework, etc.). Barriers were labeled into reasons as to why the participant felt they could not perform physical activity.

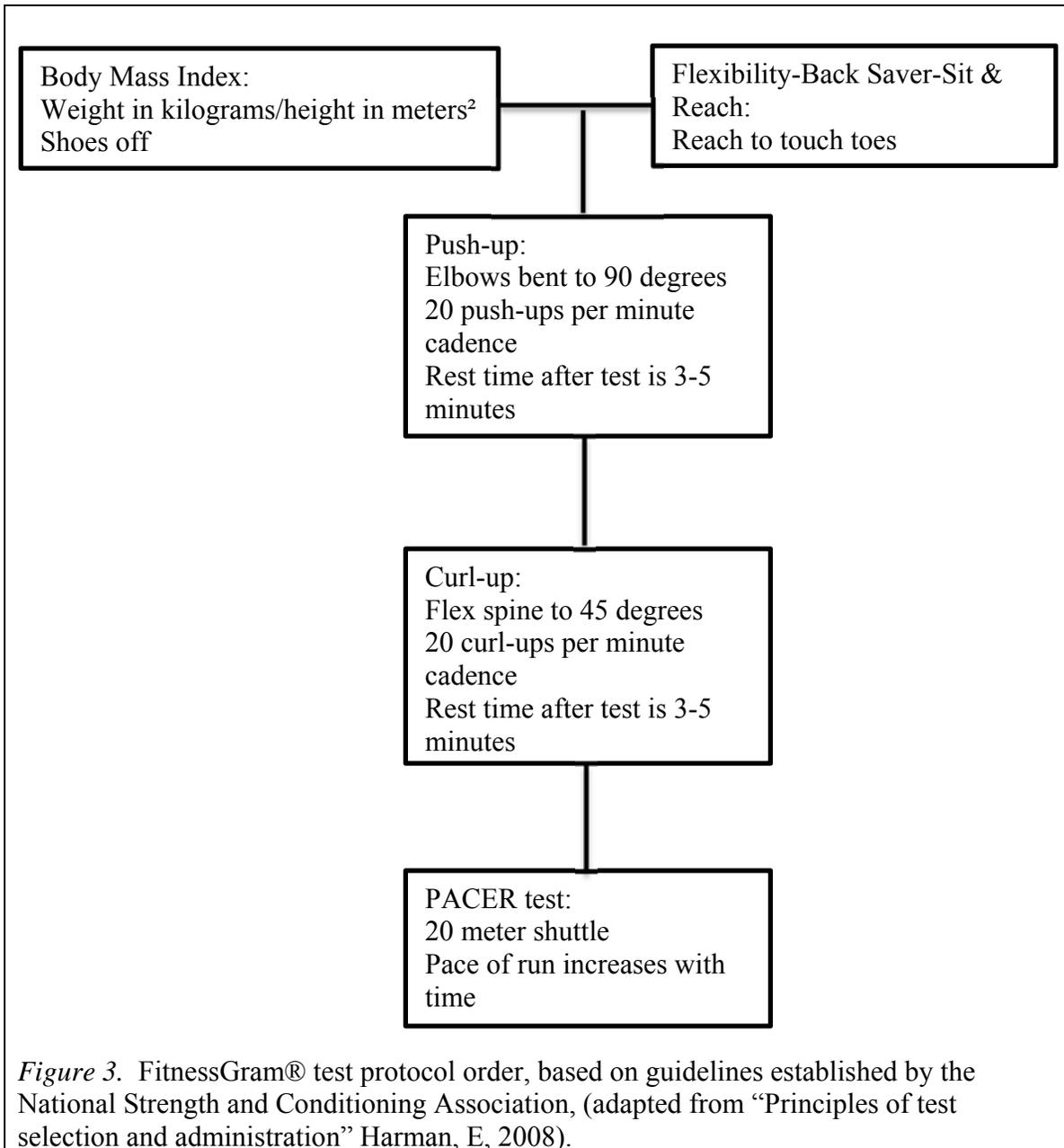
For this study, scores for both exercise and barrier self-efficacy were tabulated separately by percentage level from 0% to 100% confidence. Each question was scored by the level of confidence in ten-percent ranges: (a) 10% confidence scores were rated as one, (b) 20 % confidence scores were rated as two, (c) 30% confidence scores were rated as three, etc...Bandura (2006b) determined that the range format of 0 –100 provides a stronger predictor of performance in comparison to a lesser scale. The scores were totaled and divided by the total items in each category to develop a composite score for both exercise and barrier self-efficacy. Participants scoring higher on exercise efficacy were considered to perform physical activity longer with higher intensity. Participants scoring lower in barrier efficacy displayed lower physical activity levels. The higher of the two scores were used as the variable to predict aggregate physical fitness. Reliability and validity was established through previous studies for this age group in which self-efficacy produced an internal consistency average of 0.87 (Annesi et al., 2005; Annesi et al., 2010; Foley et al., 2008; McAuley, 1992; McAuley, 1993; McAuley, Lox, & Duncan, 1993; Resnick & Jenkins, 2000; Ryan & Dzewaltowski, 2002).

Procedures

Institutional Review Board (IRB) approval from Liberty University, the metropolitan school district, religious schools, and home school associations were secured to ensure

appropriate endorsement to use human subjects for this study. Initial contact with various school administrators via e-mail regarding the study and their willingness to participate in the project were conducted. Visitations with individual administrators, principals, or home school leaders are necessary to access questions and authorization to use their students as participants and facilities. This authorization was gained through written permission and submitted with the respective IRB approvals. Parental consent forms were sent home to gain permission for their child to participate in the study. Assent forms, in grade-level terms, was disseminated to children in physical education classes to explain the process of the FitnessGram® and physical activity self-efficacy. The principle investigator addressed any of the participants' concerns or issues by the participants before testing began. In order to accommodate language barriers, parental consent and participant assent forms were converted into native languages (e.g., Spanish, Vietnamese) when appropriate. At any time that the participant wished to not participate, she/he was excluded from the study. Upon accumulation of all required materials, documents, IRB approval, and assent and consent forms, a sample population was be isolated.

Physical activity self-efficacy and FitnessGram® testing was conducted in a physical education class at the participating schools during the same week to help maintain consistency throughout all schools and schedules. Physical activity self-efficacy was administered by physical education teachers and the principle investigator. Physical education teachers were trained by the principle investigator in FitnessGram® testing procedures to reduce variations in inter-rater reliability. Training was conducted during a time that was convenient with each teacher. Figure 3 provides an outline of the testing protocol. FitnessGram® tests were performed in the following order: (a) BMI, (b) sit and reach, (c) push-up, (d) curl-up, and (e) PACER test last so participants are not fatigued for all other measures.



Results of the physical activity self-efficacy and FitnessGram® were tabulated into respective scales by the principle investigator after conclusion of the testing session. Each score was inserted into a data spread sheet to outline participant results. Composite scores were generated by an aggregate score of FitnessGram® measures for all assessments. An exercise and barrier self-efficacy score was produced based on the response totals. Primary relationships to

be evaluated were high levels of exercise self-efficacy, low levels of barrier self-efficacy, and high levels of aggregate physical fitness scores for the participants.

Data Analysis

Multiple linear regressions (R) was used to calculate the size relationship of the dependent variable to the independent variables (Gall, Gall, & Borg, 2007, p. 358). The data analysis also determined the correlations between the two independent variables (educational environment and physical activity self-efficacy) and the dependent variable (aggregate physical fitness level). Multivariate correlations examined the direction and strength of those relationships. The Pearson product moment correlation (r) was used to measure the dependent variable (FitnessGram® score) and both independent variables (exercise and barrier self-efficacy) to determine of any relationship among the variables (Gall et al., 2007, p. 347; Thomas et al., 2005, p. 131). Independent observations regarding physical activity self-efficacy and educational environment were also made. Descriptive statistics assisted in describing the sample population. Central tendency was developed for exercise self-efficacy, barrier self-efficacy, and FitnessGram® testing battery to isolate the distribution scores (Howell, 2008, p. 61). This helped determined the average, common, and center scores. In addition, the range, variance, and standard deviation demonstrated the variability in the sample population (Howell, 2008, p. 79 – 83). The sampling size consisted of 471 participants within the metropolitan community. The percentage of participants from home, religious, or public school were determined by the number of schools within the community. Sample size and level of confidence helped produce the power of the study. The level of confidence for statistical analysis was $p < .05$, which separated the non-significant results. The $p < .05$ level of confidence allowed for variability within the sampling size (Thomas et al., 2005, p. 105). The data analysis of the study attempted to

demonstrate a correlation to educational environment, physical activity self-efficacy, and aggregate physical fitness levels. In addition, if correlations did exist between the variables, then the hypotheses would be correct in predicting that the type of educational environment and higher levels of physical activity self-efficacy relate to greater aggregated physical fitness levels.

CHAPTER FOUR: FINDINGS

This chapter will review the results of this correlational design study, the purpose of which was to examine the hypotheses that educational environment and level of physical activity self-efficacy relates to aggregate physical fitness levels in fifth-grade children. The following research questions were involved in this study:

Participants

The sample population was fifth-grade students who attended religious and public schools. The participating schools were identified during the 2013 spring semester through correspondence by the researcher with school administrators and physical education teachers. Participating schools represented a sample demographic of the mid-western community within different geographical regions. The researcher identified a total of 471 participants for the study. The sample population of religious and public schools consisted of 421 participants enrolled in school for fall 2013. The home school population was sent 50 parental consent forms and did not return any forms authorizing participation. Consent forms from 203 parents permitting their child to participate in the study were returned; at a rate of 43.10%. Of the possible 203 participants, 19 were eliminated due to failure of the child to sign the assent form, complete the barrier or exercise self-efficacy, any portion of the FitnessGram, or be present in school on the day of testing. Therefore, a total of 184 participants ($N = 86$ boys and $N = 98$ girls) completed the study for a 39.06% participation rate. Home school students were originally identified and supported for this study through local home school agencies; however, no home school parents provided consent for their children to participate. A complete breakdown of the educational environment can be found in Table 1.

Table 1.

Participation and Consent Rates

Consent Forms	Sent	Received	Eliminated	Participated	Percent
Home School	50	0	0	0	0
Religious School	142	95	5	90	63.38
Public School	279	108	14	94	33.69

Research Question One

Does the educational environment relate to physical activity self-efficacy levels in elementary school children? The null hypothesis tested for research question one was: H_{01} - there will be no statistically significant relationship between educational environment and physical activity self-efficacy levels in elementary school children as indicated by the type of school setting and physical activity self-efficacy score.

Physical Activity Self-Efficacy

The participants completed physical activity self-efficacy scales that were divided into two areas: barrier and exercise. Barrier self-efficacy determined any challenges children had when participating in regular physical activity. This scale used daily lifestyle influences as potential impediments for physical activity. Exercise self-efficacy evaluated the child's adherence to completing moderate intensity exercise, most days per week, for 60 minutes per day. The scale gages the participants' devotion to regular exercise for an eight week period.

Barrier self-efficacy. Internal consistency demonstrated a Cronbach's alpha reliability of $\alpha = .914$ for the barrier self-efficacy scale. Barrier scores were in the range of 96.92, with the lowest score of 3.08 and a high score of 100 with a median score was 62.70. Mean and standard deviation scores were $M = 61.13$ and $SD = 23.19$. In addition, skewness was observed at $-.270$

and kurtosis at $-.679$. The means and standard deviation scores for the barrier self-efficacy scale are listed in Table 2.

Table 2.

Overall Means and Standard Deviations for Barrier Self-Efficacy:

Characteristic	<i>M</i>	<i>SD</i>
1. The weather was bad (hot, humid, rainy, cold).	61.07	28.19
2. I was bored by the program or activity.	67.22	30.86
3. I was on vacation.	54.47	34.91
4. I was not interested in the activity.	58.08	32.31
5. I felt pain or discomfort when exercising.	59.10	34.11
6. I had to exercise alone.	67.91	33.70
7. It was not fun or enjoyable.	56.59	33.58
8. It became difficult to get to the exercise location.	63.96	33.06
9. I didn't like the particular activity program.	60.72	32.07
10. My schedule conflicted with my exercise session.	60.43	33.55
11. I felt self-conscious about my appearance.	68.55	33.36
12. An instructor does not offer me any encouragement.	69.00	35.75
13. I was under personal stress of some kind.	55.76	35.37
Composite Score:	<u>61.13</u>	<u>23.19</u>

Comparisons between religious and public schools yielded some interesting differences, as shown in Table 3. Six of the 13 questions had a separation of 10% or more, with the religious group scoring higher on those questions. The largest difference was in question 12 “An

instructor does not offer me any encouragement” where the religious group averaged 78.46 and the public population scored 59.95. Question 8 regarding the inability to get to an exercise location reported the second largest disparity between the two cohorts (71.98 and 56.28 percent, respectively). Overall, the religious school population scored 7.33% higher than the public school population. The means and standard deviations are listed in Table 3.

Table 3.

Religious versus Public School Means and Standard Deviations for Barrier Self-Efficacy

Characteristic	<u>Religious Schools</u>		<u>Public Schools</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. The weather was bad.	60.93	25.77	61.21	31.31
2. Bored by the program or activity.	71.61	27.90	63.02	33.05
3. I was on vacation.	54.92	32.56	54.03	37.19
4. I was not interested in the activity.	60.30	32.18	55.96	32.47
5. Felt pain/discomfort.	63.61	32.27	54.70	35.40
6. I had to exercise alone.	74.78	29.50	61.33	36.22
7. It was not fun or enjoyable.	58.36	32.74	54.90	34.45
8. Difficult to get to exercise location.	71.98	27.45	56.28	36.15
9. I didn't like the particular activity.	62.57	28.75	58.95	35.02
10. Schedule conflicted with exercise.	66.12	30.71	54.99	35.38
11. Felt self-conscious w/appearance.	74.14	31.95	63.19	33.96
12. Doesn't offer me encouragement.	78.46	29.81	59.95	38.68
13. Under personal stress.	61.68	32.41	50.10	37.29
Composite Score:	<u>64.87</u>	<u>20.26</u>	<u>57.54</u>	<u>25.26</u>

Preliminary analyses determined whether the barrier or exercise self-efficacy demonstrated the strongest predictive variable to educational environment. The researcher used a Pearson product-moment correlation coefficient (r) to evaluate the relationship between educational environment and barrier self-efficacy. These correlations ($r(182) = .158, p = .032$), demonstrated a significant correlation between educational environment and barrier self-efficacy.

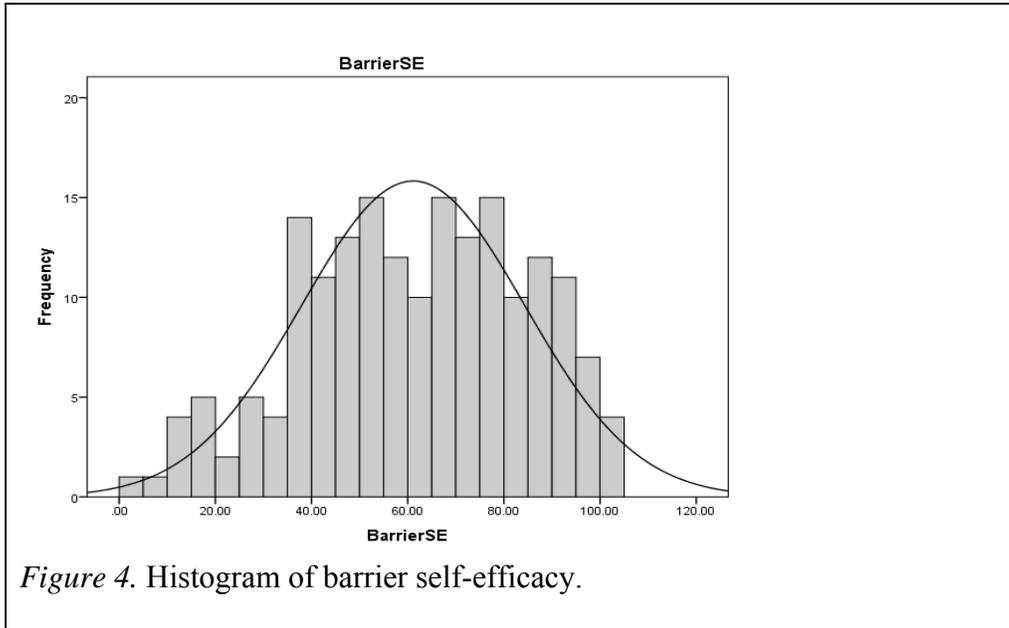
The researcher utilized a simple linear regression model to determine if educational environment predicted the level of barrier self-efficacy. The linear regression determined a significant linear relationship between educational environment and levels of barrier self-efficacy in the participants ($F(1,182) = 4.69$, $\beta = .158$, $R^2 = .025$, $r = .158$, $p = .032$). The effect size was established using the coefficient of determination or R^2 of .025, which produced a small effect. Cohen (1988) stated “the coefficient of determination is the proportion of variance in either variable which is linearly accounted for by the other” (p. 114). Cohen (1988) cited the coefficient of determination effect sizes as small ($R^2 = .01$), medium ($R^2 = .09$), and large ($R^2 = .25$). Approximately 2.5% (taking the R^2 of .025 x 100) of the variance accounted for the prediction of barrier-self-efficacy. Therefore, the researcher rejected the null hypothesis when using the barrier self-efficacy scale.

Assumption Testing

Preliminary analyses on the assumptions of normality, linearity, homoscedasticity, and independent observations was performed to assure there were no violations with the variables of barrier self-efficacy, exercise self-efficacy, and aggregate physical fitness. Cohen, Cohen, West and Aiken (2003) stated that problems within the set of data, using an incorrect regression model or both can result in violation of assumptions. Assumption testing aids in the reduction of bias towards the data and regression model (Cohen et al., 2003).

Normality. Any assumption regarding normality was to determine whether the sample population is normally distributed (Howell, 2008; Szapkiw, n.d.). A one-sample Kolmogorov-Smirnov test yielded a significance level of $p = 0.406$. Further evaluation using a histogram confirmed the presence of a symmetrical shaped curve; therefore, normality can be assumed

from the sample population within the variable of barrier self-efficacy. The histogram in Figure 4 represents the means and standards deviations of the barrier self-efficacy scale.



Normality was further assessed using a Normal Probability Plot of the regression-standard residual, as shown in Figure 5. For the assumption of normality to be acceptable, the values should follow a reasonable straight line. Based on this diagram, normality is again accepted.

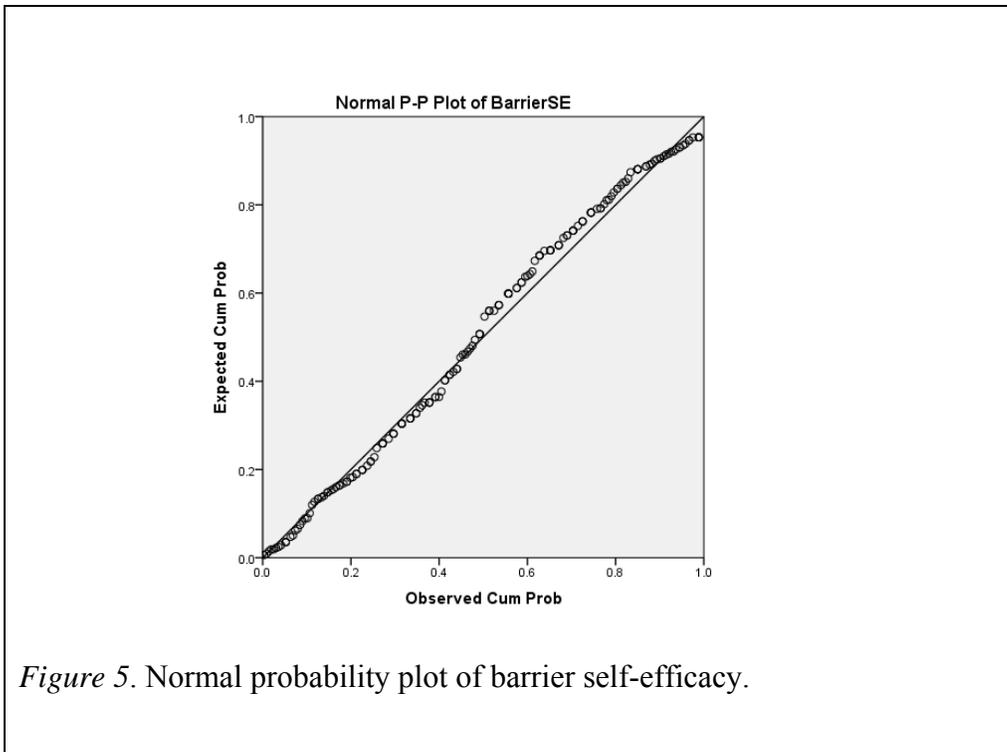
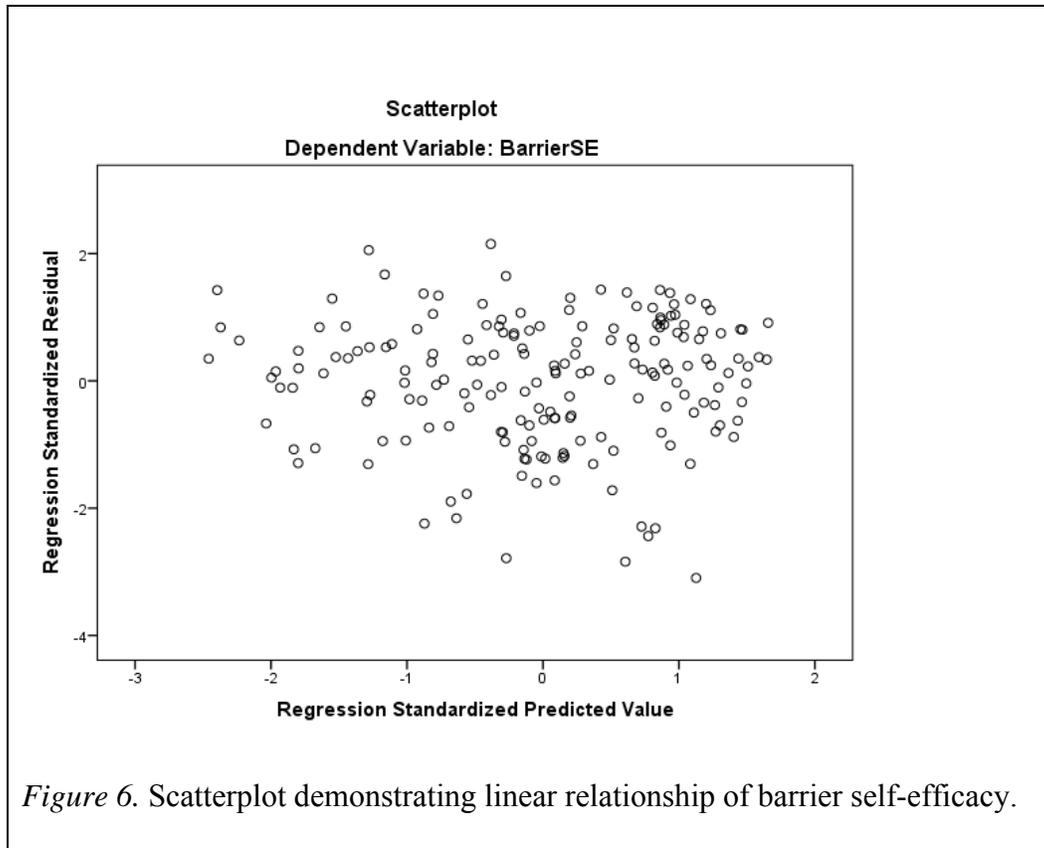


Figure 5. Normal probability plot of barrier self-efficacy.

Linearity. The assumption of linearity presumes the relationship between the variables is linear and not curved (Szapkiw, n.d.). The scatterplot in Figure 6 demonstrates straight line with no arc or curve and therefore the assumption of linearity is tenable.



Homoscedasticity. Homoscedasticity refers to the “variance of one variable is the same at all values of the other variable” (Tabachnick & Fidell, 2007, p. 78). To determine homoscedasticity, a scatterplot was evaluated for shape and direction is considered to have a linear relationship. The shape presented in Figure 6 indicates this assumption is tenable.

Independent observations. The assumption of independent observations centers on observations within each variable that must be independent of one another (Cohen et al., 2003; Howell, 2008; Szapkiw, n.d.). Since this was the first time the barrier self-efficacy has been administered in the schools, participants had no prior knowledge of the questions and answered the scale individually. Therefore, this outcome did not influence the measures of exercise self-efficacy and aggregate physical fitness.

Exercise self-efficacy. Internal consistency revealed a Cronbach’s alpha reliability of

$\alpha = .959$ for the exercise self-efficacy scale. Exercise scores were in the range of 93.75, with 6.25 registering the lowest, 100 registering the highest, and a median score of 67.81. Mean and standard deviation scores were $M = 66.91$ and $SD = 26.42$. Skewness and kurtosis were $-.430$ and $-.836$. The mean and standard deviation scores from the exercise self-efficacy are listed in Table 4.

Table 4.

Overall Means and Standard Deviations for Exercise Self-Efficacy

Characteristic	<i>M</i>	<i>SD</i>
1. The next week.	84.41	21.03
2. The two weeks.	76.15	26.48
3. The three weeks.	72.80	26.62
4. The four weeks.	67.58	28.47
5. The next five weeks.	65.36	29.30
6. The next six weeks.	60.50	32.26
7. The next seven weeks.	56.51	33.46
8. The next eight weeks.	53.49	35.72
Composite Score:	<u>66.91</u>	<u>26.42</u>

When comparing the religious participants' and the public school participants' self-efficacy scores, the researcher found minimal significances throughout the exercise self-efficacy scale. The overall scores for religious and public schools were 67.00 and 66.81, respectively. Religious participants had higher mean scores (83.03% vs. 77.65%) during the first two weeks while public schools were higher (5.93%) in week eight. Further analysis of weeks three through

seven revealed only a couple of percentage point variances between the populations. The means and standard deviations for religious and public schools are listed in Table 5.

Table 5.

Religious versus Public School Means and Standard Deviations for Exercise Self-Efficacy

Characteristic	<u>Religious Schools</u>		<u>Public Schools</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. The next week.	86.96	16.68	81.97	24.33
2. The two weeks.	79.10	22.70	73.33	29.50
3. The three weeks.	73.89	26.12	71.76	27.18
4. The four weeks.	68.10	26.67	67.07	30.24
5. The next five weeks.	65.74	27.29	64.99	31.25
6. The next six weeks.	60.97	30.84	60.06	33.74
7. The next seven weeks.	55.00	33.19	57.96	33.83
8. The next eight weeks.	50.46	36.29	56.39	35.10
Average Score:	<u>67.00</u>	<u>25.16</u>	<u>66.81</u>	<u>27.70</u>

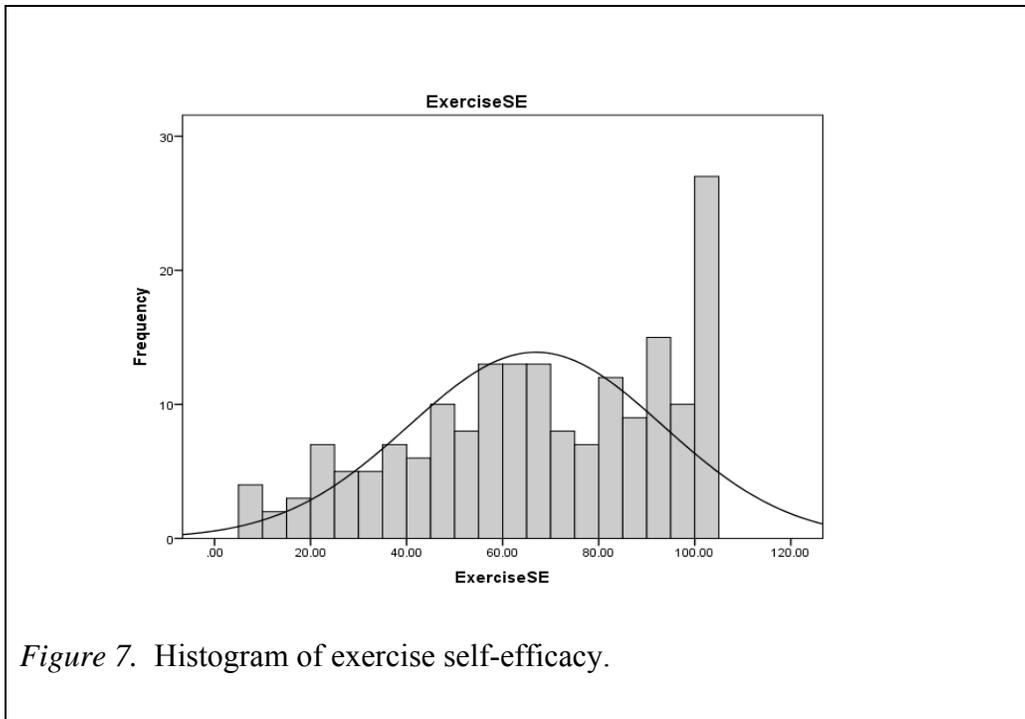
The exercise self-efficacy scale mean is 66.91 and the standard deviation is 26.42, which are presented previously in Table 4. Pearson product-moment correlation coefficient ($r(182) = .004, p = .961$) was also used to compare educational environment with exercise self-efficacy. Exercise self-efficacy yielded a much weaker correlation of $r = .004$ as compared to the barrier self-efficacy which provided a correlation of $r = .158$. Simple linear regression ($F(1,182) = .002, \beta = .004, R^2 = .000, r = .004, p = .961$) did not reveal a significant linear regression using the exercise self-efficacy. The coefficient of determination ($R^2 = .000$) provided no effect size between education environment and exercise self-efficacy. Because the coefficient of

determination is zero, there is no variance that can be accounted by the comparison of educational environment and exercise self-efficacy. From these results, the researcher fails to reject the null hypothesis when using the exercise self-efficacy. When comparing the two physical activity self-efficacy scales, the barrier self-efficacy scale demonstrated a stronger relationship and linear regression to the educational environment than the exercise self-efficacy.

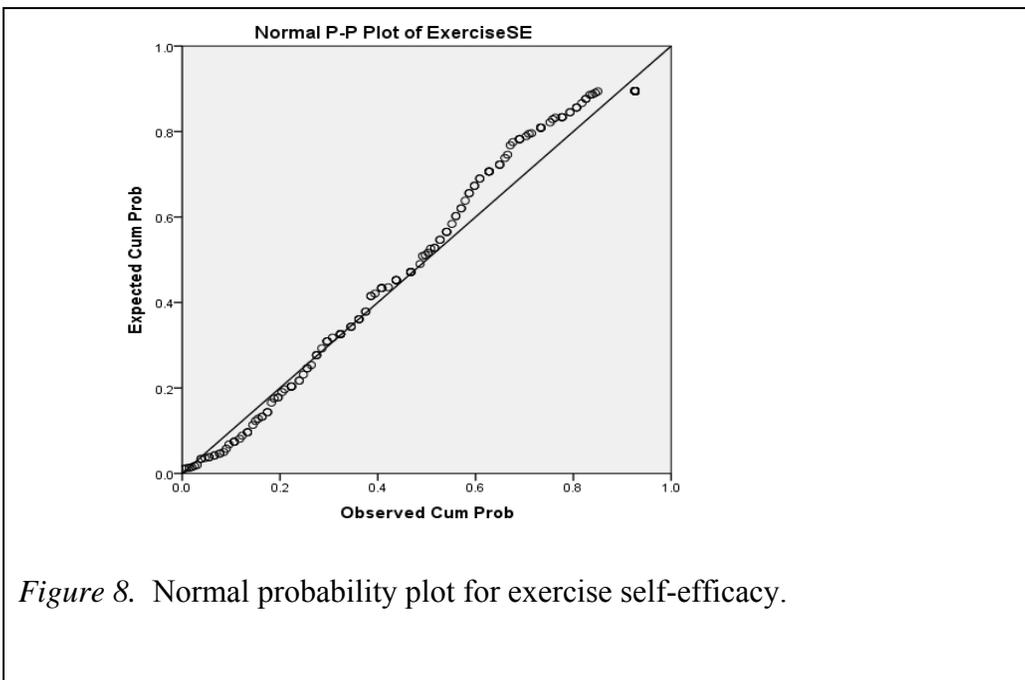
Assumption Testing

Preliminary analyses on the assumptions of normality, linearity, homoscedasticity, and independent observations were performed to assure there were no violations with the variable of barrier self-efficacy, exercise self-efficacy and aggregate physical fitness.

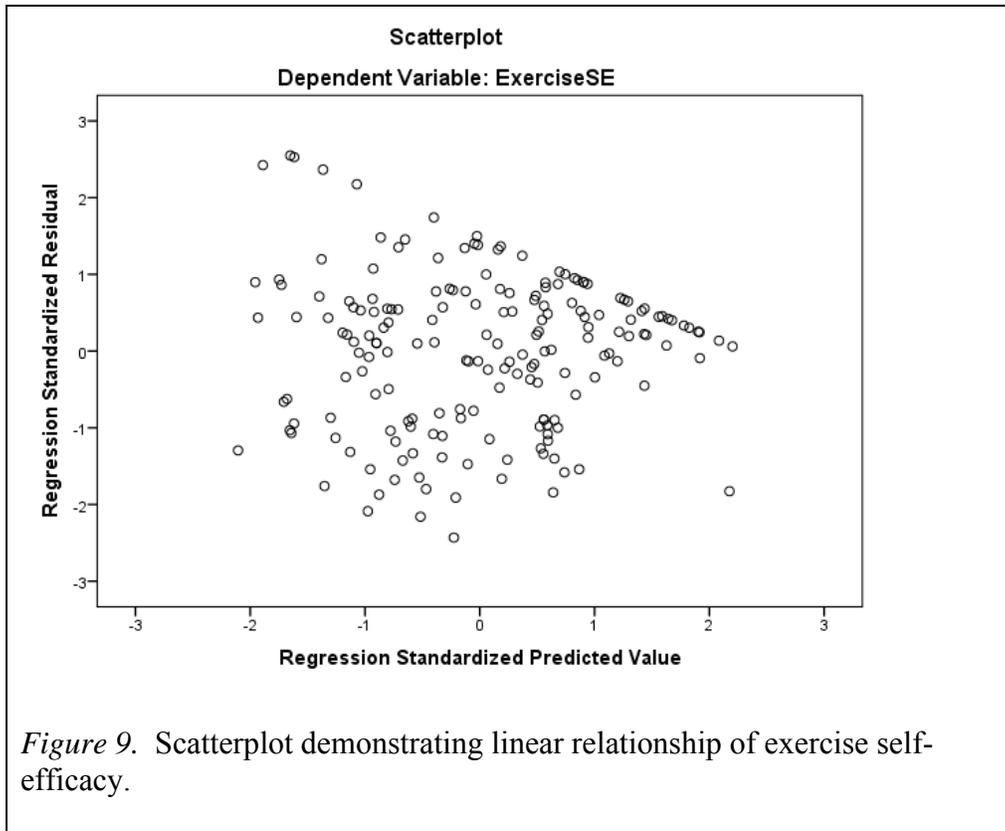
Normality. The researcher used a one-sample Kolmogorov-Smirnov test that yielded a significance level of $p = .034$. Further evaluation using a histogram confirmed the presence of a skewness that is asymmetrical. This could be due to the fact that 24 students (13.04% of participants) scored 100 on the scale. Therefore, a Spearman's Rank Order test was completed to determine any relationship between educational environment and exercise self-efficacy. These results ($\rho (182) = -.014, p = .847$) demonstrated no statistical difference to the Pearson product moment correlation coefficient. The histogram shown in Figure 7 represents the means and standard deviations of the exercise self-efficacy.



Normality for exercise self-efficacy was analyzed through the Normal Probability Plot. The Normal P-P plot line shown in Figure 8 is considered reasonably straight and is therefore viewed as acceptable.



Linearity. The assumption of linearity presumes the relationship between the variables is linear and not curved (Szapkiw, n.d.). The scatterplot shown in Figure 9 demonstrates straight line with no arc or curve and therefore the assumption of linearity is tenable.



Homoscedasticity. Homoscedasticity refers to the “variance of one variable is the same at all values of the other variable” (Tabachnick & Fidell, 2007, p. 78). To determine homoscedasticity, a scatterplot was evaluated for shape and direction and is considered to have a linear relationship. The shape presented in Figure 9 indicates this assumption is tenable.

Independent observations. The assumption of independent observations centers on observations within each variable that must be independent of one another (Cohen et al., 2003; Howell, 2008; Szapkiw, n.d.). Since this was the first time the exercise self-efficacy has been administered in the schools, participants had no prior knowledge of the questions and answered

the scale individually. Therefore, this outcome did not influence the measures of barrier self-efficacy and aggregate physical fitness.

Research Question Two

Does the educational environment relate to aggregate physical fitness levels in elementary school children? The null hypothesis for question two was: H_{02} – there here will be no statistically significant relationship between educational education environment and aggregate physical fitness levels in elementary school children as indicated by the school setting and aggregated FitnessGram® score.

FitnessGram® Testing

The FitnessGram® results are divided into boys and girls because the benchmarks for both genders are different. As stated earlier, the recommended fitness measurements for fifth-grade boys for this study were as follows:

- a. BMI: score of 14.6 – 19.7 (highest numbers represent heavier weight)
- b. Flexibility: plus 8 inches
- c. Push-ups: 8 repetitions
- d. Curl-ups: 15 repetitions
- e. 20 meter PACER test: 23 (defined as one 20 meter run)

The recommended fitness measurements for fifth-grade girls for this study were as follows:

- a. BMI: score of 14.5 – 20.4 (highest numbers represent heavier weight)
- b. Flexibility: plus 10 inches
- c. Push-ups: 7 repetitions
- d. Curl-ups: 15 repetitions
- e. 20 meter PACER test: 15 (defined as one 20 meter run)

FitnessGram®. Based on these recommendations, overall performances for the boys proved to be above health fitness zone levels. The range for the aggregate physical fitness was 40.83 from -7.33 to 33.50 , and the median score of 6.80 . Mean and standard deviation scores were $M = 7.19$ and $SD = 8.59$ for boys and $M = 7.59$ and $SD = 7.33$ for girls. Also, skewness was observed at $.471$ and kurtosis at $-.007$. The two lowest variables were are the sit/reach and BMI. The sit/reach was 1.87 inches above standard and the BMI was $.29$ below the threshold. This shows that, overall, the sample population was limited in flexibility and is on the verge of being overweight according to the BMI scale. The aggregate score represented the average number of repetitions above the base line for healthy fitness zone standards. Overall scores for girls were similar to those of boys with regard to sit/reach, which yielded 1.27 inches above standard, and their BMI scores were 1.0 below the cutoff. In addition, aggregate scores for the girls were close to the standard deviation which represented less variation in scores for the total group. The means and standard deviations for the boys and girls are listed in Table 6.

Table 6.

Boys and Girls Overall Means and Standard Deviations

Characteristic	Boys ($N = 86$)		Girls ($N = 98$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PACER:	33.93	17.12	28.97	13.70
Curl-Up:	34.73	25.02	32.96	23.02
Push-Up:	13.66	10.08	12.63	9.65
Sit/Reach:	9.87	2.36	11.27	2.42
BMI:	19.41	4.22	19.04	4.20
Aggregate Score:	<u>7.19</u>	<u>8.59</u>	<u>7.59</u>	<u>7.33</u>

Boys' scores between the religious and public schools were consistent with all FitnessGram® testing, except for curl-ups. The religious school boys completed an average of 28.93 curl-ups, while the public school boys completed an average of 40.91 curl-ups. Girls' scores provided some interesting results. The religious girls completed five more laps on the PACER test and nine more push-ups. In addition, the average BMI for the religious school girls was 17.86 and the public school girls were 20.09. Lastly, the aggregate scores for the religious school girls was 9.14 and the public school girls was 6.22. The means and standard deviations comparing religious and public school boys are listed in Table 7 and the girls are listed in Table 8.

Table 7.

Boys Religious versus Public Means and Standard Deviations

Characteristic	<u>Religious Boys (N = 44)</u>		<u>Public Boys (N = 42)</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PACER:	34.80	16.97	33.02	17.44
Curl-Ups:	28.93	17.07	40.81	30.29
Push-Ups:	14.52	8.79	12.76	11.32
Sit/Reach:	9.97	2.02	9.76	2.69
BMI:	18.98	4.09	19.86	4.37
Aggregate Score:	<u>6.45</u>	<u>6.55</u>	<u>7.96</u>	<u>10.34</u>

Table 8.

Girls Religious versus Public Means and Standard Deviations

Characteristic	<u>Religious Girls (N = 46)</u>		<u>Public Girls (N = 52)</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PACER:	31.83	13.59	26.44	13.42
Curl-Up:	32.33	19.28	33.52	26.06
Push-Up:	17.30	9.71	8.50	7.53
Sit/Reach:	11.49	2.36	11.07	2.49
BMI:	17.86	3.67	20.09	4.38
Aggregate Score:	<u>9.14</u>	<u>6.75</u>	<u>6.22</u>	<u>7.61</u>

The composite score for the aggregate physical fitness was a means of $M = 7.40$ and a standard deviation of $SD = 7.92$ for boys and girls combined. This represents the average score above the baseline for the FitnessGram®. The same statistical analysis was used in analyzing the second research question. The Pearson product-moment correlation coefficient ($r(182) = .052, p = .484$) did not show a correlation between educational environment and aggregate physical fitness levels in fifth-grade children. Using a simple linear regression model, the researcher found no demonstration of significant linear regression ($F(1,182) = .491, \beta = .052, R^2 = .003, r = .052, p = .484$), there was no demonstration of a significant linear regression. The coefficient of determination ($R^2 = .003$) provided no effect size in the relationship. Also, variance of educational environment and aggregate physical fitness ($R^2 = .003$) showed little accountability. Consequently, the null hypothesis is accepted that there is no significant relationship between education environment and aggregate physical fitness.

Assumption Testing

Preliminary analyses on the assumptions of normality, linearity, homoscedasticity, and independent observations was performed to assure there were no violations with the variable of barrier self-efficacy, exercise self-efficacy, and aggregate physical fitness.

Normality. The researcher used a one-sample Kolmogorov-Smirnov test that yielded a significance of $p = .836$. Further evaluation using a histogram confirmed the presence of a symmetrical shaped curve; therefore, normality can be assumed from the sample population within the variable of aggregate physical fitness. The histogram in Figure 10 demonstrates the means and standard deviations of the aggregate physical fitness.

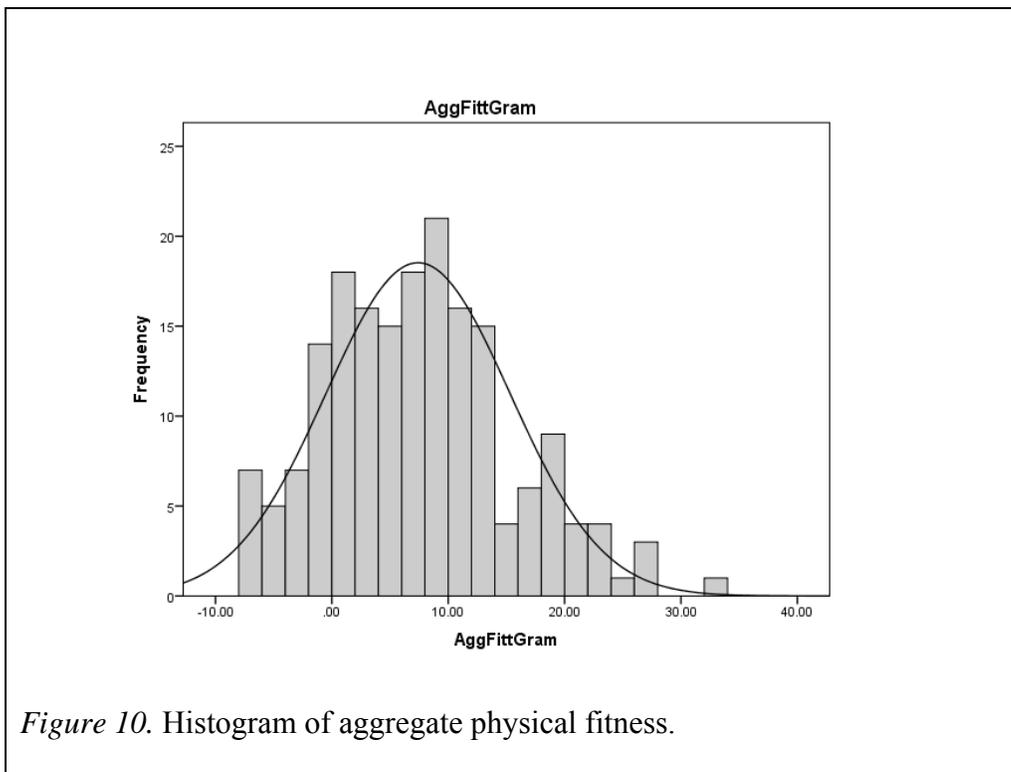


Figure 10. Histogram of aggregate physical fitness.

Normality for aggregate physical fitness was analyzed through the Normal Probability Plot. The Normal P-P plot line shown in Figure 11 is considered reasonably straight and is therefore viewed as acceptable.

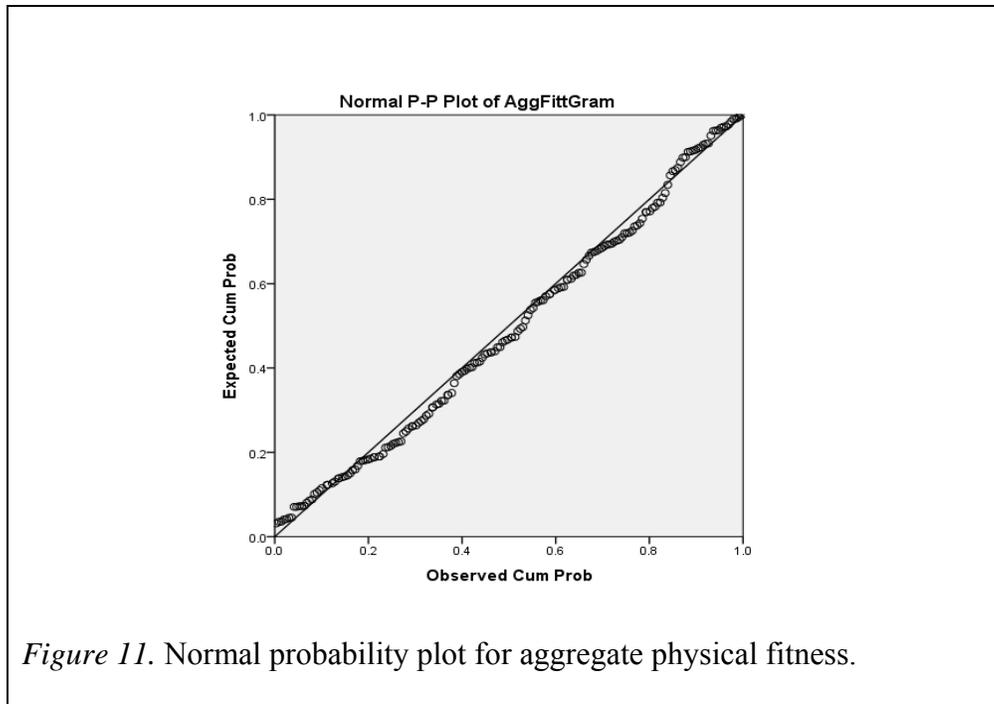
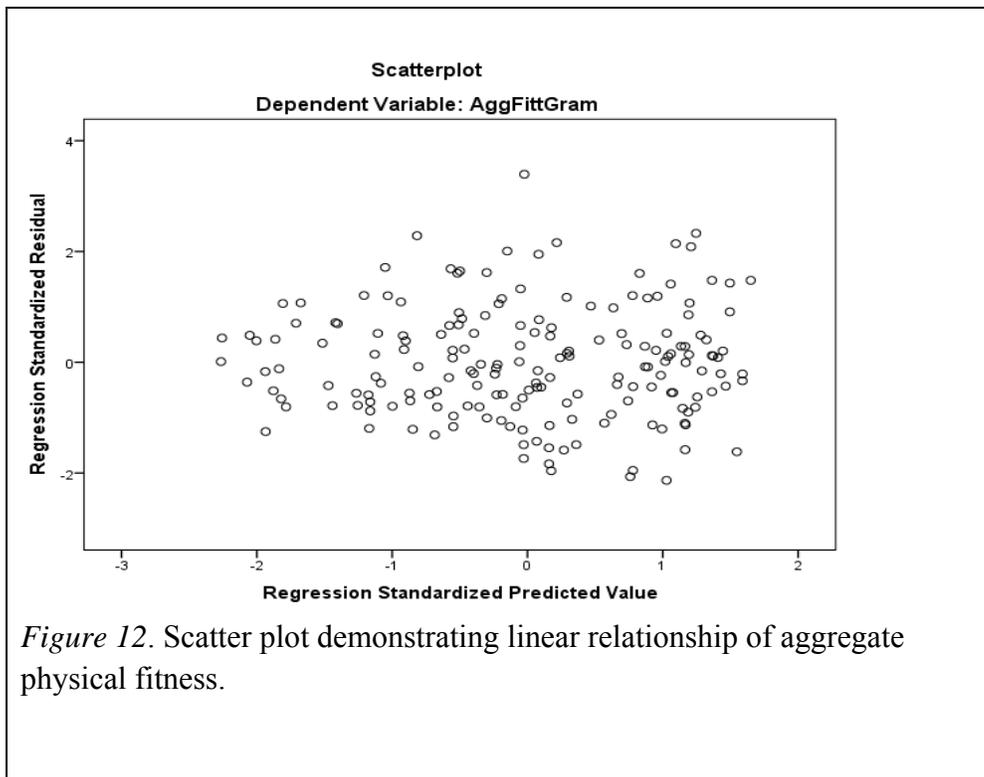


Figure 11. Normal probability plot for aggregate physical fitness.

Linearity. The assumption of linearity presumes the relationship between the variables is linear and not curved (Szapkiw, n.d.). The scatterplot in shown Figure 12 demonstrates a straight line with no arc or curve and therefore the assumption of linearity is tenable.

Homoscedasticity. Homoscedasticity refers to the “variance of one variable is the same at all values of the other variable” (Tabachnick & Fidell, 2007, p. 78). To determine homoscedasticity, a scatterplot was evaluated for shape and direction and is considered to have a linear relationship. The shape presented in Figure 12 and indicates this assumption is tenable.

Independent observations. The assumption of independent observations centers on observations that each variable that must be independent of one another (Cohen et al., 2003; Howell, 2008; Szapkiw, n.d.). The FitnessGram® or other forms of physical fitness testing has been administered in the schools previously. A specific testing protocol and instruction while closely monitoring of each participant and test measure provided individual results. Therefore, this outcome did not influence the measures of barrier self-efficacy and exercise self-efficacy.



Research Question Three

Does the educational environment and level of physical activity self-efficacy relate to aggregate physical fitness levels in elementary school children? The null hypothesis for research question three was: H₀₃- there will be no statistically significant relationship between educational environment, physical activity self-efficacy levels and aggregate physical fitness levels in elementary school children as indicated by the school setting, physical activity self-efficacy score, and aggregated FitnessGram® score.

A Pearson product-moment correlation coefficients were used to compare the relationships between educational environment to physical activity self-efficacy scales (barrier self-efficacy and exercise self-efficacy) and aggregate physical fitness. Results showed that barrier self-efficacy had the strongest relationship ($r = .158, p = .032$) aggregate physical fitness

was second ($r = .052, p = .484$), and exercise self-efficacy finished with ($r = .004, p = .961$).

Multiple linear regressions ($R = .264, p = .004$) determined the prediction of aggregate physical fitness levels from educational environment and levels of physical activity self-efficacy ($F(3,180) = 4.51, \beta = .207$ [ESE], $\beta = .082$ [BSE], $\beta = .038$ [EE], $R^2 = .070, r = .264, p = .004$).

When comparing the relationship between all variables, there appears to be a little stronger correlation when $r = .264$, which is a .106 margin gain to the barrier self-efficacy score. In addition, the effect size of R^2 registers a coefficient of determination of .070. This is closer to a medium range of difference or relationship. Furthermore, approximately 7 percent ($R^2 = .070$) of variance account for the combination of barrier self-efficacy, exercise self-efficacy, and aggregate physical fitness. Therefore, the null hypothesis can be rejected and there is a significant relationship between educational environment, barrier and exercise self-efficacy, and aggregate physical fitness.

CHAPTER FIVE: DISCUSSION

Introduction

This quantitative correlational study evaluated the hypothesis that educational environment and level of physical activity self-efficacy relates to aggregate physical fitness levels in fifth-grade children. Educational environment consisted of utilizing home, religious, and public schools within a Midwestern metropolitan community. In this study, fifth-grade children were administered two physical activity self-efficacy scales: barrier self-efficacy and exercise self-efficacy. These scales identify any predictors of level of physical activity self-efficacy to the educational environment. Aggregate physical fitness levels were determined through a test battery of FitnessGram® test variables utilizing the PACER run, push-ups, curl-ups, sit and reach, and BMI. The aggregate total is a composite score based on the average of measures above the healthy fitness zone threshold.

The sample population was 184 fifth-grade children attending religious and public schools. The researcher examined composite scores of the barrier and exercises self-efficacy as well as the aggregate physical fitness scores of religious and public school participants. . Pearson product-moment coefficient correlations determined the strength of the relationship between participants' educational environment and their barrier and exercise self-efficacy as well as aggregate physical fitness. Bivariate linear regression analysis was used to evaluate any linear relationships. Multivariate linear regression determined any linear relationships between all variables. Within this chapter, discussion will be directed toward the findings, implications for practice, future research, limitations, and conclusion.

Findings

Educational Environment and Self-Efficacy

Research question one asks, whether the educational environment relates to physical activity self-efficacy levels in elementary school children. Self-efficacy refers to the belief in one's capacities to organize and execute a course of action to produce achievements (Bandura, 1997; Bandura, 2006a). Diverse correlates of self-efficacy that could influence the augmentation of physical activity in children's perspectives relate to motor skills or sport tasks, inspiration, personal feelings and reactions, decision making, goal attainment, family and parental health habits (Bandura, 2004; Bandura, 2005; Caprara et al., 2005; Feltz & Magyar, 2006; Kølølo et al., 2012; Pajares, 2006). Many of these connections can be seen through the theoretical framework patterns of the social cognitive theory and theory of planned behavior. However, there are two major elements that drive the focus of self-efficacy. First, Bandura (2004) determined that highly motivated people hold a higher degree of self-efficacy and are able to accomplish goals, while unmotivated people possess low self-efficacy and need more support and guidance. Second, Bandura (2006b) and Kølølo et al. (2012) observed that people with low self-efficacy view the effort as too much to overcome whereas people with high self-efficacy are just the opposite and display increased effort. This was a definite observance seen when transitioning to different schools as some children did not seem to be motivated to complete the FitnessGram®.

Previous research utilized barrier and exercise self-efficacy to predict children's physical activity levels (Annesi et al., 2005; Annesi, et al., 2010; Bartholomew et al., 2006; Feltz & Magyar, 2006; Foley et al., 2008; Martin et al., 2008b; Ryan & Dzewaltowski, 2002). However, by using the revised scales developed by McAuley and Mihalko (1998), barrier self-efficacy has demonstrated positive results toward physical activity in children (Annesi et al., 2005; Annesi, et

al., 2010; Foley et al., 2008). Furthermore, exercise self-efficacy has also shown some optimistic patterns of physical activity as well (Foley et al, 2008; Ryan & Dzewaltowski, 2002).

The barrier self-efficacy in this study showed a decent correlation to educational environment than the exercise self-efficacy. The results showed a Pearson product-moment correlation coefficient of ($r = .158, p = .032$) and a linear regression of ($F(1,182) = 4.69, \beta = .158, R^2 = .025, r = .158, p = .032$) when compared to exercise self-efficacy of ($r = .004, p = .961$) and a linear regression of ($F(1,182) = .002, \beta = .004, R^2 = .000, r = .004, p = .961$). However, when the school environment is compared to physical activity self-efficacy, the barrier self-efficacy demonstrated a correlation of ($r = .205, p = .005$) and a linear regression of ($F(1,182) = 7.98, \beta = .205, R^2 = .042, r = .205, p = .005$). Exercise self-efficacy produced a correlation of ($r = .030, p = .687$) and a linear regression of ($F(1,182) = .163, \beta = -.030, R^2 = .001, r = .030, p = .687$). It would appear that school provides a stronger relationship to physical activity self-efficacy, with barrier self-efficacy having a larger significant correlation value. Consequently, the null hypothesis was rejected using the barrier self-efficacy.

Educational Environment and Aggregate Physical Fitness

Research question two asks, whether the educational environment relates to aggregate physical fitness levels in elementary school children. The educational environment can hold several positive dimensions toward physical fitness. Playground equipment, school intervention programs, recess and activity programs have provided opportunities for children to display increased levels of physical activity (Beighle et al., 2006; Farley et al., 2008; Kelly et al., 2010; Martin et al., 2010). In addition, several studies have linked academic achievement to higher levels of physical fitness (Ahamed et al., 2007; Castelli et al., 2007; Grissom, 2005; London & Castrechini, 2011; Van Dusen et al., 2011; Wittberg et al., 2010). Grissom (2005) and Van

Dusen et al. (2011) compared the FitnessGram® data of more than a million children against reading and math scores to support the associations between physical fitness and academic achievement. It is very evident in the existing research that the educational environment provides a strong correlation to physical activity levels in children.

FitnessGram® data have been used in different forums to research physical fitness levels in children. These studies used the healthy fitness zone threshold measure to a passing score (Chomitz et al., 2009; London & Castrechini, 2011; Wittberg et al., 2009). Chomitz et al. (2009) used a passing score for each FitnessGram® variable, London and Castrechini (2011) used a tabulate a number of FitnessGram® healthy fitness zone accomplishments to establish their passing measure (i.e. pass five of six tests), and Wittberg et al. (2009) used the baseline healthy fitness zone measure to establish a passing variable. While each of these studies has provided some strong research attributes, none of them delineated the differences exceeding the healthy zone standards. Conversely, this study established a higher rating for students exceeding the healthy fitness zone standards and provided an overall aggregate score representing a total physical fitness composite variable.

Educational environment was again analyzed to determine if it would have a relationship to aggregate physical fitness levels in children. The researcher found there was no relationship between educational environment and aggregate physical fitness levels ($r = .052, p = .484$); in addition, there was no demonstration of significant linear regression ($F(1,182) = .491, \beta = .052, R^2 = .003, r = .052, p = .484$). Therefore, the researcher accepted the null hypothesis. When aggregate physical fitness was measured using school, Pearson product-moment correlation coefficient ($r = .090, p = .225$) and a linear regression of ($F(1,182) = 1.484, \beta = .090, R^2 = .008,$

$r = .090, p = .225$) showed a stronger relationship than educational environment. This would make sense in that individual schools can have their own climate for physical activity that would be different than the overall home, religious or public school environments.

Educational Environment, Self-Efficacy, and Aggregate Physical Fitness

Research question three asks, whether the educational environment and level of physical activity self-efficacy relates to aggregate physical fitness levels in elementary school children? Educational environment and physical activity self-efficacy levels were compared with aggregate physical fitness levels. Pearson product-moment correlation coefficients was used to compare the relationships between educational environment, physical activity self-efficacy scales (barrier self-efficacy and exercise self-efficacy), and aggregate physical fitness. Barrier self-efficacy has the strongest relationship ($r = .158, p = .032$), followed by aggregate physical fitness ($r = .052, p = .484$), and exercise self-efficacy ($r = .004, p = .961$). Multiple linear regressions were used to determine the prediction of aggregate physical fitness levels using the educational environment and levels of physical activity self-efficacy. Multiple linear regressions were ($F(3,180) = 4.508, \beta = .207$ [ESE], $\beta = .082$ [BSE], $\beta = .038$ [EE], $R^2 = .070, r = .264, p = .004$). When comparing the relationship between all variables, there appears to be a significant correlation when $r = .264$, which is a .106 margin gain over to the barrier self-efficacy. From these conclusions, the researcher can reject the null hypothesis. Pearson product-moment correlation coefficients were used to compare the relationships between school environment to physical activity self-efficacy scales (barrier self-efficacy and exercise self-efficacy) and aggregate physical fitness. Barrier self-efficacy had the strongest relationship ($r = .205, p = .005$), followed by aggregate physical fitness ($r = .090, p = .225$), and exercise self-efficacy ($r = .030, p = .687$). Multiple linear regression ($R = .282, p = .002$) analysis was again used to predict

aggregate physical fitness levels from the school variable and physical activity self-efficacy. These comparisons of ($F(3,180) = 5.198$, $\beta = .183$ [ESE], $\beta = .124$ [BSE], $\beta = -.110$ [SCH], $R^2 = .080$, $r = .282$, $p = .002$) demonstrated similar results as with previously examined areas which showed school environment being a stronger predictor than educational environment.

Study Limitations

A few limitations of this study must be examined. By contacting homeschool and private secular environments, this study attempted to include a diverse educational environment. However, only Catholic and Christian schools responded and expressed a desire to participate in this study. The home school population did not demonstrate any interest in participating in the research study. Although home school agency leaders provided support letters, obtaining parental contact and consent was very challenging. Private secular schools did not respond to any form of communication. Further research that includes these two educational environments would assist in establishing a solid comparison with the religious and public school population. Furthermore, parental consent would have provided a larger sample population with the public schools if the documents were returned before testing. Since parental consent forms were developed in English, Spanish, and Vietnamese, parental consent could have been influenced by receiving a consent form in a non-native language.

Participation in this study was voluntary, and the researcher assumed that participants understood each question and provided honest responses to the physical activity self-efficacy scales. However, limitations in using these scales were noticed in the types of questions the children asked had about how to complete them. In discussions with physical education teachers, this was the first time the physical activity self-efficacy scales were administered in the schools. Being a novelty items for the participants, this scales could have been an external threat to their validity. The methodology of the study was a quantitative correlational design.

However, to fully understand the physical activity self-efficacy of children, perhaps a qualitative approach would isolate any specifics behind the limitations of the barrier self-efficacy.

Physical fitness is a regular component of the physical education curriculum for the fifth-grade students. Therefore, it is assumed that all participants put forth their best effort during the testing sessions. Limitations in this category relate to classroom management, physical education teacher experience with the FitnessGram®, and school facilities. Some physical education teachers previously performed different versions of the FitnessGram® or in a different order. Prior communication and planning with the physical education teachers aided in completing the FitnessGram® protocol without any major challenges.

Implications

Theoretical Implications

The theoretical implications of this study are associated with the social cognitive theory and the theory of planned behavior. Prior studies found correlations between these theories and children's level of physical activity (Dzewaltowski et al., 2009; Foley et al., 2008; Martin et al., 2007; Martin et al., 2008b; Martin et al., 2011). Bandura (1997) described social cognitive theory as a means of examining the influences of cognition and environmental factors that affect people. Cognition has shown to be increased by physical fitness in children (Hillman et al., 2009). However, the school environment is also a contributing factor of physical fitness in children (Durant et al., 2009; Kelly et al., 2010).

Other constructs that contribute to a child possessing quality physical activity are behavior, emotional condition, family practices, social relationships, school practices, self-management and self-regulation (Bandura, 2004; Bandura, 2005). Social cognitive theory is based on the theory that individuals who perceive a high level of self-efficacy have outcome expectations and sociocultural factors that facilitate goal attainment and behavior (Bandura,

2004). The outcome expectations and sociocultural factors from children have appeared as connections to physical activity behavior in children (Ramirez et al., 2012). The researcher concluded that barrier self-efficacy was the strongest predictor of aggregate physical fitness in fifth-grade children. Likewise, Foley et al. (2008) and Martin et al. (2008b) made similar conclusions regarding barrier self-efficacy as a predictor of physical fitness in children. This study focusing on self-efficacy and social cognitive theory adds to the body of existing literature.

The theory of planned behavior centers on the elements of attitude, social norms, and perceived abilities. (Ajzen, 1985; Ajzen, 1991; Dimmock & Banting, 2009; Hagger et al., 2007). While this study did not specifically examine elements of the theory of planned behavior, the results can be closely compared to existing school attitudes, social norms, and perceived abilities. This study determined that the school environment was a better predictor of physical activity self-efficacy and physical fitness levels in children. Prior studies also found that the school environment was a predictor factor of physical education and physical activity (Durant et al., 2009; Kelly et al., 2010; Nichol et al., 2009). Martin et al. (2007) concluded that children had stronger intentions toward moderate-vigorous physical activity when they had a positive attitude toward physical activity and a physical educator who encouraged physical activity. Behavioral intentions for predicting physical activity of adolescents and children in schools has been seen as influencing participation (Foley et al., 2008; Hamilton & White, 2008). The school environment provides an environment for the promotion of physical activity as well as a supportive climate. The results of this study can aid in the current research that school environment provides a stronger association to predicting physical activity intentions in children.

Methodological Implications

The results of this study show the strength of the individual school environment and not educational environment. The methodology of existing research that focus on school environment is diversified. Numerous factors within the school play an important role in establishing a climate that promotes physical activity. As mentioned earlier, school-based intervention programs, after-school programs, playground equipment, intramural programs, and required physical education classes all help in promoting physical activity in the school (Brink et al., 2010; Davidson, 2009; Farley et al., 2008; Kelly et al., 2010; Kriemler et al., 2011; Nichol et al., 2009). However, the physical education teacher also plays a vital role by attending developmental workshops, incorporating national and state physical education standards, establishing a strong physical education curriculum, and opening facilities for additional physical activity time (Cox et al., 2011; KSDE, 2005; Martin et al., 2008a; NASPE, 2004; Young et al., 2007). The diversity of these factors within schools can influence children's beliefs toward physical activity.

Research focusing on physical activity self-efficacy and predicting physical fitness in children has been noted in prior research (Bartholomew et al., 2006; Foley et al., 2008; Kahan, 2004; Martin et al., 2008b; Martin et al., 2011; Spence et al., 2010; Valois et al., 2008). However, there is scant research comparing physical activity self-efficacy scores to FitnessGram® outcomes. Annesi et al. (2005) utilized a Youth Fit For Life™ program (i.e. similar to FitnessGram® variables) and barrier self-efficacy to assess changes over a 12 week period in children ages five to twelve. They found that children had improved physical fitness and stronger barrier self-efficacy scores, which establishes a decrease in challenges for physical

activity. The results of this study further support the limited research that a child's physical activity self-efficacy can predict his/her physical activity level.

Prior research has utilized the FitnessGram® to identify strengths and weaknesses in physical fitness levels in children (Chomitz et al., 2009; London & Castrechini, 2011; Wittberg et al., 2009). While these researchers incorporated different benchmarks for the FitnessGram® (i.e. passing scores, number of tests passed), this is the only study that has used a composite score to represent the FitnessGram® data. When taking into account the diversity of fifth-grade children and physical fitness levels, the aggregate score evens the playing field for the participants. In addition, the aggregate score exemplifies the components of physical fitness in body composition, muscular strength, muscular endurance, flexibility, and aerobic capacity. Therefore, continued research with the aggregate score could provide physical educators with a better comparison model for physical fitness.

Practical Implications

The practical implications from this study provide an understanding of how children perceive their physical activity habits in relation to their actual physical fitness. Barrier self-efficacy focuses on the challenges children have in completing physical activity for 60 minutes most days per week. The use of this measure could provide physical educators and researchers with valuable information on how children perceive different obstacles in their lives. This could lead to new strategies to educate children and parents on the necessity of physical activity and physical activity recommendations into their daily lifestyle. While exercise self-efficacy had shown to have a weaker correlation, it is still an important measure for children to understand as the scale utilizes national recommendations. Physical education teachers could utilize the barrier

self-efficacy scale to establish baseline measures and discuss alternative methods to be successful in completing recommended physical activity guidelines.

FitnessGram® components serve as a benchmark for physical fitness. Children need to understand the vast types of physical activity. What appears as physical activity to some children does not equate to actual physical fitness. The inability of children to understand barrier and exercise self-efficacy scales leads to misrepresentation of factual outcomes. This was observed during data collection and analysis. While 13.04% of the participants marked 100% confidence on the exercise self-efficacy scale, 23% of those scores measured in the lower portion of the aggregate physical fitness scale. Therefore, children need to not only fully comprehend the national recommendations, but they need to make the association between a basic physical activity (i.e. kicking a soccer ball) and an activity that stresses muscular and physical exertion (i.e. playing in a soccer game).

Recommendations for Future Research

Considerations for future research should focus on attracting homeschool and private secular schools. The involvement of private secular schools would provide another dimension to the research by strengthening the comparisons between school environments. For the home school area, isolating additional agency meetings and formal discussions with home school parents could possibly encourage more parents to provide consent. In addition, the public school parental responses were also less than desirable. Since the FitnessGram® is administered yearly in the public schools, the impression was that this group would have a much higher participation rate.

The administration of barrier and exercise self-efficacy scales has not been completed in local schools; therefore, participant responses could have been swayed due to a lack of

understanding. The researcher believes further explanation of self-efficacy scales is needed so participants fully understand each question. This would be beneficial in order to obtain the most accurate responses from children. Future studies using barrier and exercise self-efficacy scales could help participants gain additional experience.

Conclusion

This study examined the relationships between education, self-efficacy, and aggregate physical fitness in fifth-grade children. Prior research has shown educational environment to have a solid relationship with physical activity in children (Boyle-Holmes et al., 2010; Brink et al., 2010; Kriemler et al., 2011; Rigers et al., 2010; Trost et al., 2008). However, this study revealed that the educational environment needs to be further investigated through the actual school, not just isolating the environment as a whole. Physical activity self-efficacy has been studied to predict physical activity levels in children (Bartholomew et al., 2006; Foley et al., 2008; Kahan, 2004; Martin et al., 2008b; Spence et al., 2010; Valois et al., 2008). The results of this study found that barrier self-efficacy showed a stronger prediction for physical activity. This would prove beneficial in future studies.

The current study focused primarily on utilizing the educational environment to predict levels of physical activity and aggregate physical fitness levels in fifth-grade children. Further research exploring the school environment as a measure to predict physical activity and physical fitness is warranted, because this appears to be a better correlation. The results of this study can contribute to the growing body of research as a conduit to evaluate school environment and barrier self-efficacy in the sample population. In addition, further development and research using the aggregate physical fitness scale could foster more research toward evaluating total body physical fitness in children.

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Appendix A

Student ID: _____

School: _____

Barrier Self-Efficacy Scale

The items reflect common reasons preventing people from participating in exercise sessions or, in some cases, dropping out or quitting exercise altogether. Using the scale below please indicate how confident you are that you could exercise in the event that any of the following circumstances were to occur.

FOR EXAMPLE: if you have *complete confidence* that you can continue to exercise, even if you are bored by the activity, you would circle 100%. However, if you are absolutely sure that you could not exercise if you fail to make or continue to make progress you would circle 0%.

0	10	20	30	40	50	60	70	80	90	100
Not at all			Moderately				Highly			
confident			confident				confident			

I believe that I could exercise most days per week for 60 minutes for the next three months if:

1. _____ The weather was bad (hot, humid, rainy, cold).
2. _____ I was bored by the program or activity.
3. _____ I was on vacation.
4. _____ I was not interested in the activity.
5. _____ I felt pain or discomfort when exercising.
6. _____ I had to exercise alone.
7. _____ It was not fun or enjoyable.
8. _____ It became difficult to get to the exercise location.
9. _____ I didn't like the particular activity program that I involved in.
10. _____ My schedule conflicted with my exercise session.
11. _____ I felt self-conscious about my appearance when I exercised.
12. _____ An instructor does not offer me any encouragement.
13. _____ I was under personal stress of some kind.

Average Score: _____

McAuley, E. (1992). The role of efficacy cognitions in the prediction of exercise behavior in middle-aged adults. *Journal of Behavioral Medicine*, 15(1) 65-88. Reproduced with permission.

Permission to reproduce per Edward McAuley, author and developer of both scales.

From: McAuley, Edward [emcauley@illinois.edu]
Sent: Thursday, May 22, 2014 6:27 PM
To: Bomgardner, Richard
Subject: Re: self-efficacy scales

Rich

Permission granted.

EM

Sent from my iPad

On May 22, 2014, at 10:55 AM, "Bomgardner, Richard"
<rich.bomgardner@wichita.edu<mailto:rich.bomgardner@wichita.edu>> wrote:

Hello Dr. McAuley,

I am writing you today as per the instructions on the exercise psychology lab web site regarding the use of the self-efficacy scales. I used the barrier and exercise scales for my dissertation research. I was wanting to ask to permission to reproduce the scales in my dissertation? I know the web site already states the scales can be used and are open for public use. However, my university would like permission to reproduce for publication. I have properly cited each scale per the web site and original manuscript. Please let me know if permission to reproduce is acceptable. Thanks.

Rich Bomgardner

Appendix B

Student ID: _____

School: _____

Exercise Self-Efficacy Scale

The items listed below are designed to assess your beliefs in your ability to continue exercising most days per week at moderate intensities (upper end of your perceived exertion range), for 60 minutes per session (day) in the future. Using the scales listed below please indicate how confident you are that you will be able to continue to exercise in the future.

FOR EXAMPLE: If you have complete confidence that you could exercise most days per week at moderate intensities for 60 minutes for the next four weeks without quitting, you would circle 100%. However, if you had no confidence at all that you could exercise at your exercise prescription for the next four weeks without quitting, (that is, confident you would not exercise), you would circle 0%.

Rate your level of confidence by recording the number from 0 to 100 using the scale below:

0	10	20	30	40	50	60	70	80	90	100
Not at all						Moderately		Highly		
confident						confident		confident		

1. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT WEEK.
2. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT TWO WEEKS.
3. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT THREE WEEKS.
4. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT FOUR WEEKS.
5. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the next FIVE WEEKS.
6. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT SIX WEEKS.
7. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT SEVEN WEEKS.
8. _____ I am able to continue to exercise most days of the week at moderate intensity, for 60 minutes without quitting for the NEXT EIGHT WEEKS.

Average Score: _____

McAuley, E. (1993). Self-efficacy and the maintenance of exercise participation in older adults. *Journal of Behavioral Medicine*, 16, 103-113. Reproduced with permission.

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Rich Bomgardner

APPENDIX C

Liberty University Institutional Review Board Approval of Study

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

August 15, 2013

Richard Bomgardner
IRB Approval 1639.081513: The Relationship between Education, Self-Efficacy, and
Aggregate Physical Fitness in Children

Dear Richard,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

Fernando Garzon, Psy.D.
Professor, IRB Chair
Counseling

(434) 592-4054

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