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Two Studies of Partnership Approaches to Comprehensive School Physical Activity Programming: A Process Evaluation and a Case Study

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DEDICATION

To my Mom, Dad, Scout, and my sweet Teddy who without none of this would be possible.

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Dr. Webster: Thank you is not enough. You have been my mentor, my teacher, and you believed in me when I did not think I could complete the tasks at hand. Your guidance and support have been invaluable, and I greatly appreciate your investment into my future. Thank you for your continued feedback and patience. I am honored to say that I have worked with you, and I hope to continue to collaborate for many years to come.

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ABSTRACT

This dissertation consists of two studies that examine partnership approaches to comprehensive school physical activity programs (CSPAP). Both studies function in tandem to advance the knowledge base about school – university partnership approaches to CSPAP programming. Study 1 examined the first-year classroom component of the Partnerships for Active Children in Elementary Schools (PACES) intervention, and Study 2 examined the implementation of a Health Optimizing Physical Education (HOPE)-based CSPAP. Both studies utilized school-university partnerships in their design and implementation.

The purpose of Study 1 was to examine the effects of different PACES treatment levels on classroom movement integration promotion during the first year of implementation, and qualitatively examine program implementation processes from the perspective of intervention classroom teachers. Four schools participated in the study. The first school received all three levels of the intervention (Community of Practice [CoP], Community-based Participatory Research, [CBPR], and Service Learning [SL]), the second school received two levels (CoP and CBPR), the third school received one level of the intervention (CoP), and the fourth school served as a waitlisted control. Three teachers from each school (N=12) participated. Process data were collected in the Fall 2014 (baseline) and Spring 2015 (~ four months of intervention) using the System for Observing Student Movement in Academic Routines and Transitions. Semi-structured

interviews with the intervention teachers (n=9) were conducted after ~four months of intervention.

There were no significant differences between intervention classrooms and control classroom in PA promotion, but differences in classrooms receiving two levels of the intervention (CoP+ CBPR) and three levels of the intervention (CoP+CBPR+SL) when compared to classrooms receiving one component of the intervention (CoP) and the control school were found. The difference between the classrooms receiving two or more intervention components when compared to classrooms receiving one component and the control classrooms were approaching significance (U = 5, p = 0.037, d=1.22). Quantitative and qualitative results supported the CBPR component having the most marked impact on classroom-based physical activity promotion. This study provides rich information about process variables in the context of a classroom-based physical activity intervention, and the types of support universities can offer schools for physical activity promotion.

The purpose of Study 2 was to examine the enablers and barriers related to the development, implementation, and sustainability of a two-year university-supported HOPE based CSPAP implemented at a middle school. The study employed a qualitative case study design. The literature on program diffusion and school-university partnerships for CSPAP implementation and sustainability guided data collection, analysis, and interpretation of results. Semi-structured interviews were conducted with each member of the implementation team (n=5), the funding agency (n=1), each health-physical education teacher at the school (n=7), follow-up interviews with the implementation team (n=5), and a focus group interview with students (n=5). Documents were collected from the

implementation team (e.g., field notes, meeting minutes) and from the teachers (e.g., lesson plans, newsletters, etc.). Next, prolonged field observations were conducted at the school during physical education, health, and before and after school programming. Data was coded using the theoretical model of program diffusion. Trustworthiness included member checking, data and researcher triangulation, researcher debriefing, and an audit trail. The findings about the implementation suggest that HOPE and CSPAP programming takes a lot of effort to implement, training should be centered on marketing, advocacy, and physical activity management, and needs assessments should be used before the start of new programming. Several components of the HOPE-based CSPAP sustained including before and after school programming and an annual 5k run. This study provides insider perspectives from health-physical educators, students, and a university intervention team about the implementation and sustainability of a HOPE-based CSPAP. The study suggests that program implementation and sustainability of a CSPAP are linked to strong external support mechanisms.

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CHAPTER 1

INTRODUCTION

This dissertation will consist of two studies that examine partnership approaches to comprehensive school physical activity programming (CSPAP). The first study will be a process evaluation of the first year of a two-year pilot program (Partnerships for Active Children in Elementary Schools [PACES]) implemented in four elementary schools in South Carolina. Study 2 will focus on enablers and barriers related to developing, implementing, and sustaining a two-year university-supported Health Optimizing Physical Education (HOPE)-based program in one middle school in Georgia. This chapter provides a general introduction and overarching purpose with respect to the entire dissertation, brief descriptions of the programs that were investigated, and the specific purpose and hypotheses/research questions for each of the three studies.

Background

Nearly half of America's youth fail to meet the recommended daily 60 minutes of moderate-to-vigorous physical activity (MVPA; Institute of Medicine [IOM], 2013; Troiano, Berrigan, Dodd, Masse, Tilert, & McDowell, 2008). Additionally, children spend 80-93% of their waking hours in sedentary time (Turner, Johnson, & Slater, 2014). Children who are active have healthier bones, muscles, improved health-related fitness, and more positive social and mental status than their sedentary peers (US Department of Health and Human Services [USDHHS], 2008). In 2006, the United States government mandated that schools receiving federal funding for school meal programs must develop

and create a school wellness policy (Public Law 108-265, 2004). The law intended to address children's health issues including childhood obesity, and there was a call for schools to play a leadership role in the promotion of children's health (Pate et al., 2006). School settings provide a centralized location with access to large numbers of children, an existing infrastructure for health-enhancing programs, and the potential to impact the surrounding community through such programming (IOM, 2013; Pate et al., 2006). Furthermore, schools are cost effective sites from which to develop and implement programs designed to addresses public health issues, such as inactivity (McKenzie & Lounsbery, 2013). While schools have traditionally played a role in children's physcial acitivty (PA) and health, recent reductions of physical education (PE) and recess time along with national increases in childhood obesity suggest that school health programs need to be altered to meet rising childhood inactivity and obesity (IOM, 2013; Kann, Collins, Pateman, & Small, 1995).

In 2008, the National Assocation for Sport and Physical Education (now the Society for Health and Physical Educators [SHAPE] America) published a position statement called "CSPAP." The statement delineates a five-component approach to promoting increased PA among school communities. The five components include (a) quality PE (more recently referred to as just "PE"), (b) PA before and after school, (c) PA during school, (d) staff involvement, and (e) family and community engagement. In 2013, the IOM endorsed a multicomponent, or "whole of school" approaches to youth PA promotion and the Centers for Disease Control and Prevention (CDC) partnered with SHAPE America to develop a step-by-step guide for implementing a CSPAP. The CSPAP model provides an overarching conceptual framework for providing children and

adolescents with PA support and opportunities before, during, and after school as a means to achieving the nationally recommended 60 minutes a day of MVPA (CDC, 2013).

At present, little research has investigated the effectiveness of multicomponent approaches through schools to increase youth (Russ, Webster, Beets, & Phillips, 2015). Of those programs that have been tested, the effects on the total daily PA of youth were minimal (Russ et al., 2015). The reasons for the limited effectiveness of previous programs are unclear due to a scarcity of program design and implementation information reported across studies (Russ et al., 2015). Additional multicomponent programs must be developed and tested to identify the most effective strategies for increasing youth PA through schools, to evaluate the implementation process, and to better understand the factors that facilitate or hinder program implementation and sustainability.

The overall purpose of this dissertation will be to examine two multicomponent programs that utilize partnerships to support program development, implementation, and sustainability. Partnerships are identified as an important element of organizational capacity building in public health programs (Crisp, Swerrison, & Duckett, 2000) and may provide critical external support for schools in their efforts to generate and sustain new PA promotion practices (Webster, Beets, Weaver, Vazou, & Russ, 2015).

The programs

Two multicomponent PA programs will be examined in this dissertation. The first program will be PACES, which was designed to investigate the effectiveness of three partnership components (a virtual community of practice, community-based participatory research, and university service learning) in increasing elementary children's (1st-3rd

grade) PA during PE lessons and during time spent in general education classrooms. Study 1 of this dissertation will focus exclusively on year one results and process evaluation, respectively, of the classroom-based PA part of the PACES program.

The second program will examine a two year HOPE-based CSPAP piloted at an urban school in the southeastern United States (Metzler, 2015). The purpose of the study was to conduct an in-depth-analysis of design, implementation, and sustainability in achieving a series of CSPAP outcomes (e.g. expanded teacher expertise, increased student PA, increased parental knowledge and involvement, an overall improved school environment) (Metzler, 2015). HOPE is a curriculum model designed to work within an overarching CSPAP to improve children's PA levels (Metzler, McKenzie, van der Mars, Barrett-Williams & Ellis, 2013a). HOPE includes 8 strands: (a) before, (b) during and after-school extended PA programming, (c) sports, games, dances, and other movement forms, (d) family and home education, (e) community-based PA programming, (f) health-related fitness, (g) diet nutrition for PA, and (h) PA literacy. Each strand has accompanying learning outcomes, target groups, and examples of learning communities (Metzler et al., 2013a).

Study purposes and hypotheses/research questions

Study 1. The purpose of Study 1 will be to conduct a process evaluation of the PACES program (exclusively related to the classroom PA part of the program) in the first year of implementation. The paper will used mixed methodology to (a) examine the effect of the program on the extent of classroom-based PA opportunities for children and (b) to tell the story of the implementation from the teachers' perspective. We

hypothesize that the program will increase the extent of classroom-based PA opportunities for children.

Study 2. The purpose of Study 2 will be to examine the enablers and barriers related to the development, implementation, and sustainability of the university-supported HOPE-based CSPAP. The specific research questions for Study 3 are:

- What are the success stories and what enabled success?
- What were the barriers related to program development and implementation and how were these barriers addressed/overcome?
- What is the sustainability of the program?

Study 2 will employ Durlak and DuPre's (2008) theoretical model of program diffusion as an a priori framework to guide data collection and analysis and interpret the results. The model identifies factors that function as enablers (e.g. intervention support system, i.e. partnership model through training and technical service, innovation characteristics, adaptability) and barriers (e.g. community capacity, policy, and funding) to program implementation (Durlak & DuPre, 2008).

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to provide a comprehensive literature review informing all three studies. The chapter is organized into the following sections: (a) children's PA and its benefits (b) guidelines and policies pertaining to children's school-based PA (c) CSPAPs (d) research, barriers, and teacher preparation (e) partnership approaches (f) theory and (g) results of the two-year pilot study of a HOPE-based CSPAP.

Children's PA and its Benefits

Physical activity is beneficial for children (CDC, 2013; IOM, 2013) and increasing PA in children is associated with reduced risk factors for diseases (e.g., Type 2 diabetes, cardiovascular diseases) as well as reducing the risk of obesity (CDC, 2013; McKenzie & Kahan, 2008; USDHHS, 2008). Children spend 80-93% of their waking hours in sedentary time (Turner et al., 2014).The significant time that children spend being sedentary indicates that reducing sedentary time may be just as important as efforts to increase PA (IOM, 2013). Reducing sedentary time may result in children who are active and that have healthier bones, muscles, improved health-related fitness, and more positive social and mental health than their sedentary peers (USDHHS, 2008).

Along with reductions in hypokinetic disease, increasing PA may have positive effects on academic performance (Dwyer, Coonan, Leitch, Hetzler, & Baghurst, 1983;

Sallis, Alcaraz, McKenzie, & Howell, 1999). Furthermore, results from Shepard (1997) indicate that more curricular time for programs that offer PA (i.e., PE) during the school day does not negatively affect academic achievement. Additionally, other studies have found that there is a positive correlation between academic performance and PA (Field, Diego, & Sanders, 2001, Pate, Baranowski, Dowda, & Trost; Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001). Finally, PA has also been shown to have positive influences on memory and concentration in children (Caterino & Polak, 1999).

Guidelines and Policies Pertaining to Children's School-Based PA

Historically, schools have played a central role in the promotion of children's PA (Pate et al., 2006). Schools are considered critical to children's PA promotion (Pate et al., 2006) because virtually all children attend school and spend the majority of their waking hours during the week at school because of schools' existing infrastructure and unparalleled access to children (CDC, 2013, IOM, 2013; National Physical Activity Plan, 2008). Schools are cost effective sites from which to develop and implement programs designed to addresses public health issues, such as inactivity (McKenzie & Lounsbery, 2013). Furthermore, schools settings provide the existing infrastructure and access to children that is needed for physical activity interventions (Pate et al., 2006).

School health programs aimed at increasing the health status of American children have been around since the colonial era (Allensworth, Lawson, Nicholson, & Wyche, 1997). In the late 19th and early 20th century, PE as part of a school health program was introduced for the first time (Allensworth et al., 1997). Furthermore, early in the 20th century a partnership between the National Education Association and the

American Heart Association was formed, and they published a joint report strongly promoting coordinated school health program (Means, 1975). However, states were slow to provide and/or create these programs (Means, 1975) and as of 2006, existing programs still tend to operate in the absence of certain key elements (e.g., support from national agencies).

In 2004, congress passed the Child Nutrition and WIC Reauthorization Act that required schools to implement a wellness plan by 2006 (Public Law 108-265, 2004; Graber, Woods, & O'Conner 2012). The wellness plan needs to include (a) nutrition and PA goals (b) nutrition guidelines (c) a plan for measuring implementation of the policy and (d) liaisons between parents, students, school board, school administrators, and the public in the development of the policy (United States Department of Agriculture, 2004). As part of the plan, schools are required to specify opportunities they will provide for children to accumulate PA during the school day. The law's intention was to address children's health issues including childhood obesity (Pate et al., 2006) and served as a support mechanism for coordinated school health programs.

CSPAP. Increased focus on standardized testing in schools has led to reductions in curriculum time and funding for PE (IOM, 2013; Kann et al., 1995). Academic testing pressure has made it imperative to re-examine school PA promotion. In 2008, the National Association for Sport and Physical Education (now SHAPE America) published a position statement about CSPAP which called for schools to provide PA to help all children meet nationally recommended PA levels. The five componets of CSPAP include (a) quality PE (b) physical acitvity during the school day (e.g., in classroom movement breaks and lunch time PA programs), (c) physical acitivty before and after school (e.g.,

walk and/or ride bike to school, and physical acitivty clubs) (d) staff involvement (e.g., school employee wellness program and sponsoring physical acitivty clubs), and (e) family and community engagment (e.g., engaging parents in PA and partnerships with community members and organizations, [SHAPE, 2013]). In 2013, the IOM endorsed a "whole of school" or Health Promoting schools apprach to youth PA promotion referencing the need for schools to increase PA oppurtunities for students. Concurrently, the Centers for Disease Control (CDC) partnered with SHAPE America to develop a step-by-step quide for how to implement CSPAP as a means of helping students meet nationally recommneded 60 minutes of daily MVPA (CDC, 2013). The step by step quide includes a 7 step approach to implementing CSPAP: (1) establish a team/committee and designate a physical acitivty leader (PAL), (2) conduct a needs assesment, (3) create a vision statement, goals, and objectives, (4) identify intended outcomes, (5) develop a CSPAP plan, (6) implement the plan, and (7) evaluate (CDC, 2013).

SHAPE America now offers free trainings to school professionals interested in becoming a Physical Activity Leader (PAL) at their school including; *Let's Move Active Schools*, which is free of charge and provides schools with external support for implementing and assessing PA initiatives within their school. Thus, it appears that the idea of a coordinated school health program (e.g., CSPAP) is gaining traction through laws and partnerships from national agencies such as the CDC, IOM, and SHAPE America.

CSPAP is one component of a coordinated school health program now called the Whole School, Whole Community, Whole Child (WSCC) approach (Lewallen, Hunt, Potts-Datema, Zaza, & Giles, 2015). The WSCC has 10 components (health education,

PE and PA, nutrition and environment services, health services, counseling, psychological, and social services, social and emotional climate, physical environment, employee wellness, family engagement, community involvement, and community involvement) and CSPAP is situated within the PE and PA component (Lewalled et al., 2015). The WSCC calls for PE that is part of a CSPAP, which reflects strong coordination across all 5 components (CDC, 2013; Lewalled et al., 2015). While CSPAP is a model within the larger WSCC program, until recently there was no specific way to implement a CSPAP. The HOPE curriculum provides a framework through which a CSPAP can be implemented (Metzler et al., 2013a).

The HOPE Curriculum. The primary goal of the HOPE curriculum model "is to help P-12 students acquire knowledge and skills for lifelong participation in physical activity for optimal health benefits" (Metzler et al., 2013a pg. 42). Rather than content units, HOPE contains strands that are both teaching and learning areas (Metzler et al., 2013a). Specifically, HOPE contains 8 strands which are located within the social ecological model. Each strand provides one or more learning outcomes, the intended learners, and a few suggestions for learning activities (Metzler et al., 2013a). The eight strands of HOPE are (1) before, during, and after school PA programming, (2) sports, games, dance, and other movement forms, (3) family/home education, (4) community-based PA programming, (5) health-related fitness, (6) diet and nutrition for physical activity, (7) physical activity literacy (e.g., consumerism, technology, and advocacy), and (8) integration of HOPE across all school subjects including recess (Metzler et al., 2013a).

HOPE Curriculum as version of CSPAP. The HOPE curriculum draws on the whole of school approach to successfully teach and promote PA behaviors via a CSPAP framework (Metzler et al., 2013a, 2013b). The HOPE curriculum was designed in response to SHAPE America's (2011) report that only 16% of elementary schools, 13% of middle schools and 6% of high schools report using a full CSPAP (Metzler et al., 2013). The curriculum designers of HOPE believe that one of the reasons that a full CSPAP has not been implemented is because teachers may not know what a CSPAP looks like and how to implement a CSPAP in their school (Metzler et al., 2013a). Thus, the HOPE curriculum provides teachers with learning outcomes, content units, program policies, management strategies, instructional methods, and assessment strategies to implement a HOPE-based CSPAP (Metzler, 2013a).

The HOPE curriculum (Metzler et al., 2013a), was designed using the social-ecological model (SEM; Bronfenbrenner, 1992) which has also been recommended as an appropriate framework for research and practice related to CSPAPs (Carson, Castelli, Beighle, & Erwin, 2014). The SEM model draws on work by Bronfenbremmer (1992) that identified bio-ecological systems of human development and Stokol's (1992) social ecological theory of health promotion. As demonstrated in Carson et al.'s (2014) work, the SEM for CSPAP allows researchers to see that PA promotion in a school is interconnected between the individual and their environment. The SEM for CSPAP places daily PA as the epi-center, CSPAP components at the micro level (e.g. the 5 components), CSPAP facilitators at the meso level (e.g. skills, PE programs, PE teacher education programs, and resources), CSPAP physical activity program leaders at the exo level (e.g. CSPAP champion, PAL leaders), and at the macro level CSPAP culture (e.g.

school culture, policy, and beliefs of the community) (Carson et al., 2014). The HOPE curriculum recognizes the importance of surrounding environments for PA and health behaviors and attempts to change the school environment through different programs, policy, and personnel to create an environment where children can accumulate more PA through meaningful experiences that reflect the interconnectedness of the SEM model (Meztler, 2014a). There are similarities between the SEM model used to examine CSPAP and HOPE, which strengthens the implication that HOPE can be used as a way to implement CSPAP.

Research, Barriers, Teacher Preparation

Multicomponent approaches. Research related specifically to CSPAP is still in its infancy, but several studies have still examined multicomponent approaches to increasing children's health status with one of the measures being students' physical activity levels. For example, the Child Adolescent Trial for Cardiovascular Health (CATCH) was able to decrease fat content of school lunches, and increase physical activity behaviors of children across three school years (Luepker et al., 1996). Additionally, Neumark-Sztainer, Story, Hannan, and Rex (2003) report that students perceptions of a multicomponent program (e.g. physical activity, eating patterns, and self-image) were positive however there were no significant differences for the majority of outcome variables (e.g., PA) at post-intervention and follow-up. In a later study, Nuemark-Sztainer et al. (2010) werr able to reduce girls sedentary time ($p<.05$), increase girls portion control ($p<.014$) and increase girls body image ($p=.045$). Pate et al. (2005) also implemented a multicomponent intervention targeting females with the goal being to change the instructional environment and the school environment through the Lifestyle

for Activity Program (LEAP). Results from this study indicate that girls at the intervention school participated in more vigorous activity than girls at the control schools at the end of the intervention (p <.05) as well as at follow-up (p <.05).

Another intervention targeting PA through curriculums used the Sports, Play, & Active Recreation for Kids (SPARK) curriculum. SPARK aimed to improve PA during and after school with results indicating that students in the intervention schools PE classes spent more time being physically active than control schools (p < .001, [Sallis, McKenzie, Alcaraz, Kolody, Faucette, & Hovell, 1997]). There were, however, no effects on PA after school (Sallis et al., 1997). Sallis et al. (2003) implemented a different program, the Middle-School Physical Activity and Nutrition (M-SPAN), to target total energy expenditure from physical activity and total grams of fat ingested at a middle school. The intervention school increased their PA over time at a far greater rate than control schools (p<.0009), and there were no significant results found between control schools and intervention schools for fat intake (Sallis et al., 2003).

In response to limitations set forth by the CDC about the SPARK, CATCH, LEAP, and M-SPAN studies, Webber et al. (2008) introduced the Trial for Activity for Adolescent Girls (TAAG) aimed to develop, implement, and evaluate an intervention that linked schools to community organizations. The purpose of the study was to reduce the age-related decline of MVPA in middle school girls, and looked at girl's PA levels and body mass index (BMI, [Stevens et al., 2005; Webber et al., 2008]). The results indicate that there were no differences in BMI or fitness for girls in intervention and control schools, and initially there was no difference in PA between control and intervention schools (Webber et al., 2008). However, three years after intervention 8th-grade girls at

the intervention schools had 10.9 more minutes of MVPA than 8th-grade girls at control schools (p=.003).

In a study completed by Centeio et al. (2014a) the effects of a 5 component CSPAP revealed that the intervention resulted in a significant increase of MVPA for students during the school day (p <.01) with daily MVPA increased from 7.37-11.67 minutes per day. The results also indicate that parents improved their daily MET-min count from an average of 10,402 to 18,181 (Centeio et al., 2014a). To the best of the author's knowledge, this is one of two studies that reports the effects of a full five component CSPAP. The second study by Metzler (2015) will be discussed in detail later in on in this review. The results of Centeio et al.'s (2014a) study is encouraging, however, questions of sustainability of CSPAP still remain unanswered. Also, Centeio et al. (2014a) makes a call in the conclusion of her paper for more qualitative research about CSPAP that can answer important questions about CSPAP implementation.

Classroom Based PA Studies. One of the recommended strategies for increasing children's daily PA through schools is to provide children with opportunities to be active during normal classroom time (CDC, 2013; IOM, 2103; Pangrazi, Beighle, Vehighe, & Vack, 2003). Classroom PA, also referred to as movement integration (MI), may include PA during academic lessons and during key transition times (Russ et al., 2016) MI can improve children's PA levels (Ahamaed et al., 2007; Batholomew & Jowers, 2011; Erwin, Beighle, Morgan, & Noland, 2014; Goh et al., 2014; Mahar et al., 2006) and reduce sedentary time (Gortmaker et al., 1999; Salmon et al., 2005; Salmon et al., 2015). However, teachers may feel that classroom-based PA takes away from academic learning time (Goh et al., 2014) or that MI can threaten their classroom control (McMullen,

Kulinna, & Cothran, 2014). Many teachers are not trained in MI strategies and are less likely to incorporate MI strategies into their classrooms if they feel that activity would lead to misbehavior, chaos, or took too much time to implement (McMullen et al., 2014). Therefore, it is essential to understand teachers' perspectives of MI so that interventions can be designed to meet the needs of teachers and their students.

Webster et al. (2013) found that efforts to increase PA in the school day and within the classroom should focus on increasing school support, policy awareness, and helping teachers design classroom based PA programs that are compatible with their own classrooms. Furthermore, teachers' enthusiasm for implementing PA in the classroom is a crucial component for successful PA programs in classrooms (Cardon, Haerens, Verstraete, & De Bourdeaudhuij, 2009). Researchers have also found that providing teachers with information about the importance of PA promotion geared towards teachers is one of the most useful strategies for increasing classroom teachers' MI (Cardon et al., 2009; McMullen et al., 2014). Additionally, teachers report that time is a major issue when implementing MI; however, they view MI strategies related to academic content more favorably (McMullen et al., 2014). Since girls are more likely to be physically active when MI strategies are infused with academics (Russ et al., 2016), teachers and participants perceptions of academically infused MI are increasing more important to capture. Children in classrooms that incorporate MI report that MI strategies are pleasant, interesting, and important with 80% of teachers in those classrooms reporting that children increased their PA levels during MI implementation (Cardon et al., 2009).

A major barrier to PA promotion in schools is school support, and teachers are more likely to implement MI strategies when they feel supported by their school (Naylor,

Macdonald, Zebedee, Reed & McKay, 2006; Webster et al., 2013) By providing resources for MI strategies to teachers (e.g., online databases) they were more likely to implement MI strategies (Naylor et al., 2006). Teachers who are invested in implementing MI strategies have a desire to impact the whole student through both academic and wellness opportunities (Cothran, Kulinna, & Garn 2010). However, increasing children's PA opportunities in classrooms is only one component of CSPAP, so the literature base related to multicomponent approaches to CSPAP must be explored.

Preparing In-Service Teachers. Physical educators are increasingly being seen as the experts in schools who possess the knowledge and skills of children's PA and movement to be leaders at their school for CSPAP and other health programs (Centeio, Erwin, & Castelli, 2014b). Thus, it becomes essential to understand how physical educators feel about their new roles as PAL's and how they feel about their programs being the cornerstone of CSPAP (Centeio et al., 2014b; SHAPE, 2013). Centeio et al. (2014b) found that PE teachers felt that it was part of their jobs to promote PA as well as part of their normal responsibilities; however, how they felt about their level of responsibility in CSPAP varied with some teachers feeling that can plan but not necessarily lead all PA programs and other teachers feeling that it was their responsibility to both plan and implement. Physical educators may feel more inclined to promote PA programs and feel better equipped to run such programs with exposure to professional development programs aimed at comprehensive school PA programs, such as SHAPE's professional development programs for PAL (Centeio et al., 2014b).

Preparing Preservice Teachers. As focus of policy and research continues to grow and expand related to children's school-based PA and health programs, focus has

begun to shift towards pre-service teacher education programs and their role in preparing PE and classroom teachers for their roles as PA promoters and implementers (Goh, Hannah, Newton, Webster, & Pillow, 2013; IOM, 2013). The shift in training preservice teachers for their roles in CSPAP is a natural progression strengthened by research findings of classroom and PE teachers who say that professional development based on PA promotion is beneficial in helping them promote PA (Cardon et al., 2009, Centeio et al. 2014b; McMullen et al., 2014). Field experiences that allow pre-service teachers' opportunities to implement MI strategies and PA programs can serve as valuable learning experiences (McMullen et al., 2014). These pre-service experiences are being provided as part of PACES as the SL strand of the partnership model. Furthermore, pre-service classroom teachers who have taught and or coached in PA settings have higher PA teaching competence than their peers who have not had similar experiences (Webster, Monsma, & Erwin, 2010). Pre-service classroom teachers' feelings of capability for promoting PA in the classroom and at recess may be influential in how they conceptualize their role in school-based PA programming (Webster et al., 2010). Thus, field-based experiences for pre-service teachers can provide an avenue for training, experiences, and exposure to school-based PA programs, such as those offered in the PACES program through SL.

Goh et al. (2013) and Webster (2011) found that a course designed to increase awareness and skillfulness of school-based PA programs can change pre-service classroom teachers and attitudes about school-based PA programs. However, some pre-service classroom teachers have reported that they have many responsibilities for which they are held accountable (e.g., test scores), and thus may perceive themselves as less

likely to undertake an additional responsibility (e.g. implementing MI, [Goh et al., 2013]. This finding is similar to perceptions of classroom teachers who feel that they do not have enough time to implement MI strategies on top of their other responsibilities (McMulllen et al., 2014). Yet, professional development programs and field experiences seem to increase in-service and pre-services classroom teacher's beliefs, competence, and willingness to implement MI strategies in their classrooms (Cardon et al., 2009, Centeio et al, 2014b, Goh et al., 2013, Webster et al., 2010; Webster, 2011). Furthermore, positive students' responses to MI increase teacher likelihood of implementing MI strategies (McMullen et al., 2014). Self-awareness of personal health and making changes to personal health may also lead pre-service classroom teachers to view MI strategies as small changes they can implement to make a difference in their students health (Goh, et al., 2013). Furthermore, pre-service classroom teachers reported caring for the students' wellness in addition to academics was a reason to implement MI in their future classrooms (Goh et al., 2013). Many of the issues reported by in-service teachers can be addressed and improved by well-designed PA and MI promotion field experiences for pre-service teachers.

Barriers. One of the barriers to any CSPAP implementation is school support (Doolittle & Rukavina, 2014; Webster, et al. 2013). Dolittle et al. (2014) found that when principals become supporters of school-wide health programs they can increase a physical educators sense of school support by findings ways for increased funding (e.g. grants), soliciting the community support (e.g. alternative physical activity programs sites at community centers), and increasing physical educators pay for the increased workload associated with leading CSPAP. Furthermore, with increased school support many PE

teachers elected to look at the facilitators rather than barriers to promoting PA opportunities for students outside of PE (Centeio et al., 2014b; Dolittle et al., 2014). McKenzie et al. (2013) suggests that measures of teacher effectiveness need to be altered to fit the new model of PE in the public health context. Perhaps if physical educators were being assessed for their contribution to children's PA from a public health context as well as from a quality PE context of CSPAP, their perception of being CSPAP leaders will begin to change.

In 2008, Stone, Mckenzie, Welk, & Booth published a review about the effects of physical activity interventions in youth. The results of the review indicate that very little of the evidence from the studies presented could attribute increases in physical activity to the intervention itself (Stone, et al., 2008). These findings can partially be attributed the use of subjective measures (e.g. self-reporting) and the lack of objective measures of physical activity (Stone, et al., 2008). Furthermore, Metcalf et al., (2012) reported that school-based physical activity programs have been largely ineffective. Russ et al., (2015) tells us that an increased effect size is associated with increased numbers of components of CSPAP implemented. Furthermore, in order to increase the effectiveness and sustainability of CSPAP, CSPAP should not only be implemented as more than one component there is also a call for multi-disciplinary teams of researchers and community patterns to come together to implement CSPAP in schools (Russ et al., 2015).

Partnership Approaches

Most current research about CSPAP focuses on the school's existing infrastructure to design and implement CSPAP programs (Webster et al., 2015). However, Crisp et

al.(2000) suggests that the development of partnerships between organizations or groups is an approach to capacity building that allows for a two-way flow of knowledge and resources for planning and implementing health programs. Capacity building in this context means a strategy for building a healthy society (Crisp et al., 2000). Furthermore, Brusseau, Bulger, Elliot, Hannon, and Jones (2015) state that a "holistic approach to physical activity promotion through the involvement of these partnerships can potentially facilitate changes in physical activity participation" for students, parents, and educators (pg. 373).

Webster et al. (2015) presented three "complementary strategies that have each shown promise for evoking adaptive changes in teacher practices and/or children's PA" (pg. 191). The strategies are communities of practice (COP), service learning (SL), and community-based participatory research (CBPR). Each strategy utilizes partnership building (e.g., between a university, school, and/or teachers) that provides an "expanded and enhanced support system for effective and enhanced" CSPAP implementations (pg. 192). The partnership model provides and expanded focus of the SEM for CSPAP proposed by Carson et al. (2014). Furthermore, each strand of the partnership model is utilized as the framework for the PACES intervention.

The CBPR strategy of the partnership model stems from Israel et al.'s, 2003 idea that community members should be given the opportunity to actively participate in all phases of implementation. Specifically, CBPR in the partnership model will utilize local colleges and universities as part of the external support system for implementing CSPAP (Webster et al. 2015). Researcher's researchers and/or graduate students from a local university will help school administrators, PE teachers, and classroom teachers identify

support mechanisms within their school and or community to implement CSPAP (Webster et al., 2015). An example of CBPR would be helping teachers inform school districts and administrators of federal policies and state policies related to school-based PA requirements as a way to elicit school support (Webster et al., 2010). For the PACES intervention, CBPR will be utilized through the research team by helping classroom teachers set specific goals related to their PA promotion, providing external support through emails and check-ups, and being available for questions and feedback.

The second strand (CoP) identifies a group of people coming together who share a common concern or interest (Cambridge, Kaplan, & Sueter, 2005). For example, a CoP could be participation in a professional learning network amongst teachers and administrators interested in the same topic (Webster et al., 2015). Webster et al. (2015) suggests that PE teachers often work in isolated locations within their school so CoP may provide an opportunity for PE teachers to work with other teachers and administrators within their school and the community at large. Furthermore, an online CoP may be a viable option because most teachers have access to computers and the internet in their classrooms (Webster, 2015). For the PACES intervention, COP will be utilized through an online forum for classroom teachers, pre-service classroom teachers, and physical educators in which lesson plan examples, movement break examples, and a blog are posted and updated by both researchers and members of the forum. The online CoP that teachers in the PACES intervention will use is also presented to SL in the PACES study, and SL is the third partnership strand presented by Webster et al. (2015).

SL can serve as an additional external support system for schools and also relieve some of the burden placed on teachers in a school (Webster et al., 2015) and service

learners are being use more frequently in health promotion contexts (Borges & Hartung, 2007; Carson & Raguse, 2014). In addition, field experiences can increase pre-services classroom teacher's beliefs, competence, and willingness to implement MI strategies in their classrooms (Centeio et al., 2014b, Goh et al., 2013). The use of SL aids the school in their implementation of CSPAP's and helps to prepare pre-service teachers for their potential roles in CSPAP (Webster et al., 2015). For the PACES intervention, pre-service classroom teachers enrolled in a class at the university will learn strategies to increase classroom PA, and then go to PACES intervention classrooms and demonstrate classroom PA promotion through active lessons and movement breaks.

Process evaluations of PA interventions. The lack of empirical evidence supporting CSPAPs coupled with minimal effects of multi-component physical activity interventions when examined as a whole (Russ et al., 2015) has slowed the progress of widespread CSPAP adoption by schools. Thus, measures are needed to better understand the processes of interventions, so they can be better designed in an effort to increase effectiveness of PA interventions. Process evaluations are one such measure and can be employed to monitor and document program implementation, while also assisting researchers in understanding relationships between intervention elements and outcomes (Saunders, Evans, & Joshi. 2005). Saunders et al., 2005 identify a comprehensive and systematic process evaluation framework for health promotion interventions. The framework includes five components: (a) fidelity (i.e., the extent to which intervention was implemented as planned), dose delivered (i.e., the amount of intended units delivered), dose received (i.e., participant satisfaction with investigators), reach (i.e., attendance and barriers to implementation), recruitment (i.e., recruitment and

maintenance of involvement), and context (i.e., environmental influences) (Saunders et al., 2005). Lack of thorough process evaluations can lead to reduced opportunities for intervention leaders to demonstrate positive and sustained outcomes (Webster et al., 2015). Therefore, reports about implementation fidelity are needed to advance the knowledge base related to CSPAP, specifically classroom based MI. Additionally, there is a need to empirically examine CSPAP and provide findings that will increase school's adoption of CSPAP, increase the sustainability of CSPAP programs, and provide useful information to those wishing to implement CSPAP programs.

Theory

Diffusion of Innovation Theory describes how, over time, an idea gains momentum and diffuses through a specific population and social system (Rogers, 1962; 2003). The five adapter categories of Diffusion of Innovation Theory include: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). The innovators are the first to adopt a program and need little if any motivation to try something new; early adopters are considered individuals who enjoy leadership roles and aware are a need for change, so they are willing to try new ideas (Rogers, 2003). Further theoretical models need to be applied to CSPAP research to better understand CSPAP program facilitators and barriers so that we can move CSPAP implementation into Rogers (2003) 3rd and 4th stage of adopter categories, early majority and late majority adopters.

Another theory that has been presented to aid in the diffusion of ideas is the Interactive Systems Framework (ISF) for dissemination and implementation

(Wandersman et al., 2008). ISF identifies three systems (e.g. prevention synthesis and translation system, prevention support system, and prevention delivery system) that aid in bridging the gap between research and practice (Wandersman, 2008). Specifically, the prevention support system provides training and technical assistance to users in the field, the prevention synthesis and translation systems translate information into easily understandable language, and the prevention delivery system implements ideas and innovations in the world of practice (Wandersman et al., 2015). Of particular interest in the ISF theory, is the idea of the prevention support system (Wandersman et al., 2015) because the idea of support system for interventions relates to Webster et al.'s (2015) partnership approach to CSPAP implementation. Furthermore, in the case of the HOPE based CSPAP implemented by Georgia State University, faculty and graduate students at Georgia State University served as the prevention support system for the HOPE based CSPAP implemented at a middle school.

In (2008) Durlak & DuPre completed a review of the literature to assess the implementation of program outcomes and to identify the factors affecting the implementation process of interventions. From the review process, Durlak and DuPre (2008) were able to identify key findings from studies and develop their own model that takes an ecological framework for effective implementation and connects it to Wandersman et al.'s (2008) ISF. The new framework identifies variables in 5 categories (e.g. innovations, providers, communities, the prevention delivery system, and the prevention support system) that in favorable conditions interact with each other and lead to effective implementation (Durlak & DuPre, 2008). Similar to Crisp et al. (2000) Durlak and Dupree (2008) also identify the level of capacity of the implementation site as

crucial for program implementation and diffusion. For study 3, Durlak and DuPre's model will be used for the design (e.g., interview questions), analysis (e.g., coding process) and presentation of the findings (e.g., supporting or challenging the model). For example, enablers (e.g. the intervention support system) and barriers (community capacity) will be used in question design, the coding process, and presented in the findings as either a supports or challenges to Durlak & DuPre's (2008) model.

HOPE based CSPAP

School Setting. In the spring of 2012, a collaborative team of researchers from Georgia State University and the CDC was awarded a Seed Grant ($75,000) to implement and evaluate a two-year CSPAP. The study was conducted at an urban middle school (Charter) in the southeastern United States. Charter middle school is racially diverse with 22% African-American, 22% Hispanic, 9 % Asian, and 45% white students (Metzler, 2015). Of the students attending Charter middle school, 35% qualify for free and reduced school meals. Charter middle school serves students from 6th-8th grades, and at the start of the study there were 450 6th graders and 400 7th graders (Metzler, 2015). Since, the 8th graders would not benefit from the second year of the implementation their numbers re not reported (Metzler, 2015). Charter middle school students take health or physical education as an elective and about 70% of students elect to take one or more 9 week terms in health or physical education, which are offered daily to students for 50 minutes for students enrolled (Metzler, 2015). For data collection, 150 6th and 7th graders were recruited, and 109 returned parental consent forms (54 girls, 54 boys) of those students 99 were still attending in the spring of 2014 and 90 in the spring of 2015.

Project Roles and Responsibilities. Personnel from the CDC served in a technical advisory capacity to review and approve the data collection (Metzler, 2015). The personal from Georgia State University (GSU) provided direct assistance to 6 health and physical education (HPE) teachers at Charter middle school staff for year one, and to 7 HPE teachers in year two. The direct assistance included development, assistance, and training (Metzler, 2015). GSU staff submitted and IRB to the university and Charter middle school's district and approval from both institutions was granted tin the spring of 2013. The GSU staff planned training, the implementation, prepared resources for HPE teachers, and collected and analyzed data over the course of year one of the study (Metzler, 2015). In the second year of implementation, GSU personnel prepared HPE teacher training as well as classroom teacher training, prepared resources for both sets of teachers, and collected and analyzed data (Metzler, 2015).

Implementation. Physical Education. To help the HPE teachers at Charter middle school establish a full 5 component CSPAP the GSU team devolved high MVPA based lesson plans and stored them on web based internet file sharing system. The HPE teachers were provided with 4 IPad's to access the lesson plans as well as to facilitate the tracking of student's physical activity levels on cardiovascular (CV) days that took place every Monday. For physical education, the HPE teachers attended training where they discussed strategies to increase MVPA in PE, and they made changes in their management routines (e.g., using instant activities), offer more high MVPA based units (e.g., Ultimate Frisbee), and provide more MVPA time for students on CV days (e.g., 15 minute run/walk). In addition, the teachers were provided with the SPARK for middle school students. The HPE teachers at the school decided as a whole not to implement the

full SPARK curriculum, but chose to use certain instructional units in place of lower MVPA units currently being used at the school (Metzler, 2015). Furthermore, HPE teachers chose to implement a CV choice day on every other Friday, and employed student goal setting and achievement as the basis for grades on those days instead of previous grading strategies that used student lap counts as the grade (Metzler, 2015).

Before After School Physical Activity Programing. The HPE teachers implemented a before and after school program that started in the second nine week term of the first year of implementation. There was one teacher who assumed primary responsibility for recruiting and instructional responsibilities of the program. The following criteria was set for before and after school programming: open to all students who wished to participate, participation was voluntary, but students had to indicate their plans one day ahead to help with planning, it would not be competition based or team based, and parental permission was required. The teacher did not want to make formal announcements and wanted to the program to grow by "word of mouth" by student's that valued the programming. Initially, attendance was low (n=10 students) but by the end of the school year daily attendance averaged 60 students (Meltzer, 2015). The programs offered including fitness, strength training, low organization games, and aerobic activities.

Family Participation and Parent Education. There were two major events offered at the school each year. The first was run walk event open to all Charter school students, parents, and families. The event included a 3.1kilometer walk/run event and informational booths for physical activity, health, and nutrition. In order for the students to participate in the event, they had to be accompanied by a parent or other adult family

member (Metzler, 2015). The second event was a parent education program held at Charter middle school in the spring of both years of implementation. The event included speakers from GSU, the CDC, and local community physical activity and health organizations. Class projects about physical activity, health, and nutrition designed by 6th graders at Charter middle school were displayed. Furthermore, the HPE teachers introduced parents to the PE program, offered health-related information, health screenings, and offered a suggestion for whole-family physical activity options in the community (Metzler, 2015).

Results. All students who took physical education took five components of the FitnessGram each year. The mean percent of students who met the healthy fitness zone each year from baseline to the end of year one was not significant (p=0.54), but from baseline to the end of year two the results were significant (p=.002) (Metzler, 2015). A test was developed and validated for knowledge of physical activity and healthy eating and given to the selected sample of students from baseline. The results were significant for the end of year one (p=.003) and from baseline to year two the results were significant ($p \leq .000$ [Metzler, 2015]). The selected students also wore accelerometer belts in PE lessons and the mean number of minutes of MVPA during baseline was 12.4 minutes, at the end of year one it was 13.5 minutes, and at the end of year two 14.6 minutes (Metzler, 2015). During CV choice day and typical PE days, there was a significant difference in the amount of MVPA ($p \leq .000$) and between CV days and typical PE lesson days there were significant differences ($p \leq .000$) (Metzler, 2015). The same students also wore accelerometers for four full days during the school week (i.e. from the

start of PE on Monday to the end of PE on Friday). The mean number of total daily MVPA minutes declined over the course of the study ($p \leq .000$) (Metzler, 2015).

Measures of CSPAP Implementation. The walk/run event in the first year of the study had 200 entrants, and in the second year yielded 230 entrants with $7,500 and $8,000 raised respectively (Metzler, 2015). The spring health fairs yielded 40 parents in the first year and 30 parents in the second year (Metzler, 2015). In the spring of the second year (2015) classroom teachers were trained in the Take 10! Program 36 teachers responded to the initial invitation for the training, but in the end only six teachers came to the training (Metzler, 2015). The results of the training and teacher implementation were not assessed.

Measures of CSPAP Feasibility. HPE teachers at Charter middle school devoted nearly 20 hours a week to CSPAP beyond their regular time for PE, which averages 2.5 hours per week per teacher (Metzler, 2015). The weekly averages were highly variable with much of the initial work being doing in the annual pre-planning events, for the after-school PA programming, the walk/run event, and the health fair (Metzler, 2015). The GSU support team spent approximately 1,000 hours per year with the project and spent their time in: (~15%) development, (~10%) training, (~5%) technical support, (~50%) data collection and (~ 20%) data analysis and reporting (Metzler, 2015). The program cost approximately $75,000 to implement and evaluate. Two-thirds of the total cost of the project came from GSU personal for training, support, and evaluation (Metzler, 2015).

Summary

Nearly half of America's youth fail to meet nationally recommend physical activity minutes per day (Troiano et al., 2008; IOM, 2013)). Physical activity leads to healthier bones, muscles, improved health-related fitness, and more positive social and mental statuses in children (USDHHS, 2008). In 2008, NASPE (now SHAPE America) published a position statement called CSPAP and delineated a five step approach to promoting PA among school settings. To help schools implement CSPAP researchers have identified a SEM for CSPAP (Carson et al., 2014), a curriculum for implementing CSPAP (Metzler et al., 2014a, 2014b) and a partnership model for CSPAP implementation and sustainability (Webster et al., 2015).

Despite gains in theoretical models for CSPAP, the research is in its infancy, but many interventions have targeted children's physical activity levels in school settings. Unfortunately, school-based physical activity intervention efforts have been minimally effective (Russ et al., 2015a). The lack of empirical evidence supporting CSPAP, and the minimal effects of PA, when examined as a whole (Russ et al., 2015) has slowed the progress of widespread CSPAP adoption by schools. Thus, there is a need to empirically examine CSPAP and provide findings that will increase school's adoption of CSPAP, increase the sustainability of CSPAP programs, and provide useful information to those wishing to implement CSPAP programs. Through the use of the partnership approach all three of the studies presented in this dissertation will examine the effectiveness and sustainability of CSPAP.

CHAPTER 3: STUDY 1

Partnerships for Active Children in Elementary Schools (PACES): First Year Process Evaluation[1]

[1]Egan, C.A., Webster, C.A., Weaver, R.G.,Stodden, D.F., Brian, A., Russ, L.B., Vazou, S. & Nesbitt, D. (in review). Partnerships for Active Children in Elementary Schools (PACES): First Year Process Evaluation. *Journal of Translational Behavioral Medicine.*

The Institute of Medicine (2013) advocates for a whole school approach to promoting youth physical activity (PA). One example of such an approach is a comprehensive school physical activity program (CSPAP); [Centers for Disease Control, 2013; NASPE, 2008])consisting of five components: (a) physical education, (b) PA during school, (c) PA before and after school, (d) staff involvement, and (e) family and community engagement. Together, these components are intended to provide children with sufficient opportunities to accumulate 60 minutes of PA each day (Institute of Medicine, 2013).

In order to maximize the potential of each CSPAP component for increasing children's PA, it is important to understand the affordances and limitations of promoting PA within each component. The present study focuses on the general education classroom as a key context for PA promotion during school. Integrating movement opportunities within general education classrooms is widely recommended as an evidence-based strategy to increase children's PA during school hours (Centers for Disease Control, 2013: Institute of Medicine, 2013; Pangrazi, Beighle, Vehighe, & Vack, 2003). Movement integration (MI) is defined as infusing PA, at any level of intensity, into regular classroom time (Webster, Russ, Vazou, Goh, & Erwin, 2015). Opportunities for classroom-based PA can be teacher-directed (e.g., organizing and directing the class in a transition between lessons) or non-teacher-directed (e.g., students using stand-biased desks or moving around the classroom to get materials they need) and can include academic movement activities (e.g., integrating PA into a math lesson), and non-academic movement activities, (e.g., providing a "brain break," [Russ et al., 2016]). In a recent meta-analysis, MI interventions revealed a large overall effect size using a (d =

0.99) on children's PA (Erwin, Fedewa, Beighle, & Ahn, 2012). In addition to increasing PA, MI can have academic (Adams-Blair & Oliver, 2011; Donnelly, et al., 2009; Mahar, et al., 2006) and social-emotional (Howie, Newman-Norlund, & Pate, 2014; Vazou & Smiley-Oyen, 2014) benefits for children.

While MI can increase children's PA and simultaneously promote other valued educational outcomes in schools, classroom teachers report numerous barriers to integrating movement in their classroom. A common perception of classroom teachers is that providing opportunities for PA adds to an already overcrowded schedule (Cothran, Kulinna, & Garn, 2010; Gately, Curtis, & Hardaker, 2013; McMullen, Kulinna, and Cothran, 2014; Naylor, Macdonald, Zebedee, Reed, & McKay, 2006). Thus, it is not surprising that classroom teachers have reported lack of time for MI (Allison et al., 2016; Cothran et al., 2010; Dinkel, Lee, & Shafer, 2016; Gately et al., 2013; McMullen, Martin, Jones, & Murtaugh, 2016). Moreover, classroom teachers feel they lack sufficient training for MI (McMullen et al., 2014). Despite these challenges, classroom teachers have expressed positive attitudes towards MI (McMullen et al., 2016; Parks, Solomon, & Lee, 2007; Vazou & Vlachopoulous 2014), and they desire support and resources (e.g., easy to use MI strategies with little to no equipment needed) for integrating movement into their classrooms (McMullen et al., 2016; Naylor et al., 2006).

One approach that might increase MI is to establish school-university partnerships designed for this purpose. According to Crisp et al. (2000) the development of partnerships between organizations or groups is a capacity building approach that allows for a two-way flow of knowledge and resources for planning and implementing health programs. Consistent with this approach, Webster, Beets, Weaver, Vazou and Russ

(2015) proposed a partnership model for implementing and sustaining CSPAPs. The model emphasizes three complementary strategies that could work synergistically to provide external support for school professionals in efforts to increase children's PA. The first strategy is to use university-facilitated communities of practice (CoP; [Cambridge, Kaplan, & Sueter, 2005])to establish professional networks that teachers can use to interact and share ideas related to PA promotion. The second strategy is to use community-based participatory research (CBPR; [Israel et al., 2013]) in which university researchers and community members (i.e., school professionals) collaborate to identify and implement context-sensitive and optimally suitable PA promotion strategies. The third strategy is to use service-learning (SL; [Borges & Hortmug, 2007; Carson & Raguse, 2014]), which involves having university students provide extra support for school professionals as part of formal coursework requirements.

The present study is a mixed-methods process evaluation of the first year of implementing a pilot intervention program called Partnerships for Active Children in Elementary Schools (PACES), which is based on the partnership model proposed by Webster, Beets, Weaver et al. (2015) PACES is designed to provide PA promotion support for school professionals, especially those who currently engage in relatively little PA promotion. The purpose of this study was (a) to quantitatively examine the effect of three different PACES treatment levels (CoP, CoP + CBPR, and CoP + CBPR + SL) on the extent of MI in the classrooms receiving the program (i.e., intervention classrooms) and (b) to qualitatively examine the program implementation process from the perspective of the teachers who taught in the intervention classrooms. With respect to the quantitative focus of the study, we hypothesized that PACES would increase MI in the

intervention classrooms, and that increases in MI would be successively greater with each step up in treatment level. We further hypothesized that increases in MI would be greater in the intervention classrooms (regardless of treatment level) than in comparison classrooms not receiving the program (i.e., control classrooms).

Methods

Design

The PACES intervention is a non-randomized, pre-post with control group study. Specific to the data reported in the present investigation, we employed a sequential explanatory mixed-methods design (Thomas, Nelson, & Silverman, 2011).

Participants and setting

We purposively selected participants for the PACES intervention from four local elementary schools in two school districts from a greater metropolitan area in one southeastern state. School selection was based upon location (close proximity to the researchers' university), access (receptive to participating in research), and stated priorities (three of the schools identified school health as a priority in their strategic plan). We assigned the first three schools that accepted our invitation to participate (referred to from this point onward as Schools A, B, and C) to receive the PACES intervention, which lasted for three consecutive academic semesters (~12 months). The fourth school (School D) agreed to participate as a waitlisted control.

Schools A and B were magnet schools (companion campuses) from one school district and Schools C and D were public schools from a different school district. Schools A and B served a combined total of 376 students across grades K-3. The ethnic/racial makeup of these students was 44% White, 18% Other, and 36% African American. Schools C and D

served a combined total of 964 students in grades K-5. Based on publicly available school data, the ethnic/racial makeup of these students was 56% African American/Black, 0.01% American Indian, 0.05% Asian/Hawaiian/Pacific Islander, 0.05% Hispanic, and 33% White. 58.6% of the students at all schools were eligible for free and reduced lunch (South Carolina State Department of Education, 2013). All students (N = 181) in the participating teachers' classrooms were eligible to participate, and 161 participated (48.45% female). Participating children's ages ranged from 6 – 9 years (Mage = 7.28, SD =0.95). Their ethnicities included 56% White, 32 % African America, 2% Asian, 3% Hispanic, and 7% Other.

During the baseline phase of the intervention (Fall 2014), classroom teachers at all four schools completed a survey to provide background/demographic information and self-report data on current use of MI, which we used to identify the teachers who reported integrating movement the least in Grades 1-3 (for a total of 12 teachers). At the time of the study, Grade 3 was the highest grade in school B, so we made the decision to only include teachers from Grades 1-3 at each school for consistency. Two MI scholars, three elementary classroom teachers from schools not participating in this study, and results from previous research all served to inform the development and adaption of the survey (American Alliance for Health, Physical Education, Recreation, and Dance, 2011; Elmakis, 2010; Webster, et al., 2013). Teachers answered questions about their backgrounds (e.g., age, years of teaching experience, professional training), classroom contexts (e.g., grade level, number of students, number of teaching assistants) and current use of MI (e.g., frequency of use, types of strategies used). Not all lowest-integrating teachers agreed to participate, thus the final sample included eight lowest-integrating

teachers and four additional teachers. While not all study participants were the lowest-integrating teachers at their respective grade levels, the participant teachers' reported levels of MI were similar to those who chose not to participate (see Webster, Zarrett, Cook, Egan, Nesbitt, & Weaver, 2017 for further details). Teachers (female = 10, male =2) ranged in age from 23 to 54 (M = 33.16, SD =10.26) and self-identified as Non-Hispanic White (n = 11) and African American (n = 1). The teachers' years of teaching experience ranged from 1 to 33 (M = 10.17, SD = 11.02).

Intervention

PACES is a pilot intervention program focused on increasing children's PA during regular school hours. It specifically targets two CSPAP components: (a) physical education and (b) PA during school (i.e., opportunities to be active beyond physical education). The data reported in the present study pertain to the PA during school component of the program, which focused on classroom MI implementation. We employed three partnership strategies (CoP, CBPR, and SL) based off Webster , Beets, Weaver et al. (2015) with the aim of providing external support for the participating classroom teachers in the intervention classrooms and, subsequently, increasing the extent of MI in these classrooms. CoP consisted of a member of the research team orienting each teacher to a virtual professional learning community (moveforthought.ning.com). The website includes MI materials, videos, links, and a blog for members to ask questions, share ideas and connect with fellow members. CBPR involved a member of the research team meeting with each teacher individually to share baseline PA and MI results, identify current MI strengths and areas for improvement, collaboratively set personalized MI goals, and consider suitable resources, including

those posted on the CoP. The CBPR component also included identifying each teacher's specific MI requests and preferences (e.g., movement breaks, active transitions, academic lessons with infused PA) and sending tailored emails each week with recommended MI strategies/activities (mostly from the CoP). SL consisted of preservice classroom teachers (enrolled in a school-based PA promotion course at the first author's university) delivering physically active lessons and movement breaks in intervention classrooms a minimum of three times (on data collection days) during PACES program implementation.

In Spring 2015, School C received all three components of the intervention (CoP, CBPR, and SL; referred to as Treatment Level 3), School B received two components (CoP and CBPR; referred to as Treatment Level 2), and School A received one component (CoP; referred to as Treatment Level 1). This tiered implementation approach was based on the expectation that increases in MI would be successively greater with each added intervention component (Webster, Beets, Weaver et al., 2015). Specifically, the CoP was expected to provide teachers with an enhanced professional learning network from which to identify and incorporate relevant new ideas and strategies for MI. CBPR was intended to build on the CoP component by helping teachers select/develop tailored and context-sensitive MI strategies, as well as monitor the effectiveness of these strategies at increasing children's PA and reducing sedentary time. SL was expected to extend the external support system provided by the CoP and CBPR in order to reduce the burden placed on classroom teachers to be solely responsible for providing MI to their students. Additionally, we anticipated that by receiving SL, the teachers might adopt MI strategies they observe preservice teachers implement in their classrooms.

Procedures

Participating schools' principals, districts and the Institutional Review Board at the University of South Carolina approved all procedures prior to data collection. Teachers and the children's parents/guardians provided informed consent. We collected descriptive-analytic data using systematic observation (see below) in two waves, one occurring in the Fall 2014 academic semester (baseline) and the other occurring in the Spring 2015 academic semester (first intervention semester). In both waves, we collected data in each classroom on 2-3 non-consecutive school days. During every visit, trained data collectors video recorded two hours of regular classroom time.

At the end of the spring semester, the first and second authors conducted a one-on-one, semi-structured interview with each teacher participating in the intervention (n = 9). The primary intentions of the interviews were to identify PACES components that teachers perceived as the most and least helpful and why, as well as areas of the intervention that could be improved. During the interviews, participants also responded to questions designed to explore changes in teachers' perceptions and practices related to MI from the beginning to the end of the school year. Sample interview questions include, "What PACES components or resources have been the most helpful to you in your efforts to provide your students with PA opportunities in your classroom?" "Describe your experiences this semester with the online community of practice." and "What factors do you think influence the extent to which you provide physical activity opportunities to children in your classroom?" Interviews lasted between 30 and 56 minutes (M = 43). The lead researcher and a trained data collector transcribed the audio recorded interviews verbatim for analysis.

Quantitative analysis

Twelve research assistants coded video records (n = 57) using the System for Observing Student Movement in Academic Routines and Transitions (SOSMART), which has been shown to produce valid and reliable MI data (Russ et al., 2016). All coders received approximately four hours of training. Each coder initially tested for reliability against an expert-scored video, reaching at least 80% reliability using the scored interval method(Van der Mars, 1989) for each of 11 SOSMART variables with a range of 83.8% - 97.9% (M = 88.9%). During the study, we randomly selected 30% of the videos to test for inter-rater reliability using the scored interval method ([Van der Mars, 1989]; Table 1).

Using the SOSMART data, we calculated an implementation score for each classroom at baseline and outcome to examine the effect of PACES on the extent of MI during the first year of implementation. We calculated the implementation score using a 2-step process. First, we calculated the percent of scans for seven of the SOSMART variables at both baseline and outcome separately to determine the percent of time each variable was observed. These variables included Reward/Incentive, Opening Activity, Teacher Directed Transition, Other Movement Non-academic, Other Movement Academic, Physical Environment, and Non-Teacher Directed Transition (see Table 1). Three of the variables (Physical Environment, Reward/Incentive, and Opening Activity) were not observed in the video records and were therefore removed from data analysis for this study. Second, we summed the percent of time each variable was observed for baseline and for outcome for each teacher to create a baseline and outcome implementation score. After creating the implementation score at baseline and outcome for each teacher, we

calculated the mean implementation score (baseline and outcome) for each group (Treatment Level 1, Treatment Level 2, Treatment Level 3, and control).

Graphical descriptive analyses suggested no differences in the degree of MI implementation between control and Treatment Level 1 groups or between Treatment Level 2 and Treatment Level 3 groups. However, a marked division in MI implementation was apparent when comparing classrooms that received Treatment Level 2 or Treatment Level 3 of the intervention and classrooms that received Treatment Level 1 or were assigned to the control group. We therefore decided to frame our statistical analyses to test for differences between these two groups (Treatment Level 2/3 vs. Treatment Level 1/control), which from this point forward we refer to as the more successful group and the less successful group, respectively. We then performed two separate Mann-Whitney U analyses (at baseline and at outcome), to test for differences revealed from our descriptive analyses in MI implementation between the more and less successful group. Due to multiple comparison procedures, we conducted a Bonferroni adjustment of the alpha level set a priori ($0.05 / 2$; $p \leq 0.025$).

Qualitative analysis

The first author coded the nine interview transcripts using Clandinin's (2013) narrative inquiry. Narrative inquiry is a methodology that brings a story into existence (Clandinin, 2013). Clandinin's work is situated in Dewey's notions of transactional epistemology and allows for the construction of knowledge between the participants (i.e., teachers) and the researchers (Clandinin, 2013). Narrative allows the researchers to work alongside participants examining (a) temporality (i.e., past, present, and future), (b) sociality (i.e., personal and social conditions), and (c) place (i.e., where events take place;

[Clandinin, 2013]). The first author examined each transcript independently, then looked for consistencies and commonalities across transcripts to see how the teachers' experiences intersected and fit together to create a story of the intervention (Burwash, 2013; Kell, 2015). Once the narrative was crafted, the first author asked the second to last author to read the transcripts, the coding procedure, and the narrative. The two authors discussed discrepancies in the narrative and coding process until reaching consensus. Researcher triangulation and negative case analysis were employed to increase trustworthiness (Glense, 2016; Prasad, 2005). Pseudonyms were assigned to protect the privacy of the participants.

Results

MI implementation from baseline to outcome

Differences in MI between the more successful (Treatment Level 2/3) and less successful (Treatment Level 1/control) groups are presented in Figure 1. At baseline, there were no statistically significant differences between groups ($U = 10$, $p = 0.199$). At outcome, the difference between groups approached statistical significance ($U = 5$, $p = 0.037$), with higher scores demonstrated for the more successful group and a strong effect size ($d = 1.22$; [Cohen, 1988]). More successful classrooms had a positive implementation change score from baseline to outcome ($M = 2.24$; $SD = 0.89$), while less successful classrooms had a negative implementation change score from baseline to outcome ($M = -2.48$; $SD = 2.78$). The largest difference in MI promotional behavior between groups was found for the SOSAMRT variable "Other Movement Non-academic" with a mean change score of -0.53 for the less successful group and 7.2 for the more successful group.

Teacher demographics and implementation level

Demographic data collected from the teacher survey provided limited insight into why some classrooms experienced more success than others. Prior experiences with MI professional development and preparation, level of education, age of the teacher, and class size did not appear to be factors in successful implementation of MI. The only notable trends were that (a) the two male teachers in this study were in the less successful group, (b) the only teacher with a full time assistant was in the more successful group, and (c) two of the three teachers who received awards for their teaching were in the more successful group. However, the small number of teachers makes it difficult to determine whether these trends are meaningful.

Telling the implementation story

The following narrative represents the story of the PACES implementation process through the voices of the nine intervention classroom teachers, specifically by using temporality, sociality, and space as lenses to represent both parallel and intersecting parts of the teachers' perspectives (Clandinin, 2013). Each lens provides unique insights into the implementation process and, in some cases helps to explain the quantitative results differentiating more and less successful classrooms. With respect to temporality, six of the teachers (three from each group) reported issues with a new curriculum that required students to read for increments of time (that progressively got longer throughout the intervention semester) during different segments of the school day. Despite this added constraint to MI, the teachers in the more successful group indicated they were able to recognize and capitalize on naturally occurring transition times to integrate new movement opportunities. Mrs. Taylor described her use of MI during transitions:

> What I started doing during each rotation, when we would do their work stations throughout the morning, we would do 10 exercises, and I would pick a student that was following expectations, like a student that did a good job focusing on their work, and I would pick [that] student [to lead] and we would do like 10 quick toe touches or whatever … so I looked at how many learning breaks do we have, and I think it is easy to do [MI] during transitions.

Furthermore, it took many of the teachers in the less successful group longer to understand how to integrate movement because they maintained narrow conceptions of MI. When reminded that MI can be used to reduce sedentary time and does not have to necessarily yield moderate-to-vigorous PA, Mrs. Tatum responded, "Now if you had told me that in the fall I would have had a much better attitude about this because when I hear vigorous, I mean I see the place smelling like a gym."

Another way temporality emerged as an important interpretive lens in this study was through the use of time to frame the teachers' MI goal-setting during CBPR meetings. Almost all of the teachers who received the CBPR component of the intervention reported that providing them with the percent of time their students were engaged in PA, and using these results to set MI goals for the subsequent semester, was not meaningful or helpful to increasing MI. The teachers stated that they preferred to set MI goals in terms of movement opportunities instead of the amount of time their students spend moving. According to Mrs. Williams, "I don't have a stopwatch when I teach, and the way I teach is very much if it is a teachable moment… I don't watch the clock except to know where I need to be at a certain time, so I would think more different opportunities would be better than looking at a goal for time."

The majority of teachers reported that planning for MI and engaging in the CoP took too much time because of their already overcrowded schedules. Mrs. Merriweather said, "I will probably take a look at [the CoP] in the summer as I'm doing my long range goals and kind of incorporate different things but it's hard for me to plan as I'm going." Moreover, the teachers pointed out that they would make more use of the CoP in their planning closer to the beginning of the year when they are establishing their classroom routines. For example, Mrs. Clarke mentioned, "This is something I would definitely incorporate sooner in the year and make sure the kids are learning procedures and my expectations – how to handle [movement opportunities] maturely without anybody getting hurt and that kind of thing." Since the intervention began halfway through the spring semester, it may have been difficult for the teachers to plan for MI, find the appropriate resources, and integrate routine movement opportunities into their classroom management systems.

The second lens that was useful in gaining a more in-depth perspective of the intervention teachers' implementation process was that of sociality, which specifically provided a means of understanding the teachers' social and personal feelings towards the intervention. The teachers desired to feel connected to the intervention team and to their peers. An aspect of the intervention that facilitated this connection was the use of weekly emails, which the intervention team sent to teachers who received the CBPR component. The emails reminded the teachers to provide movement opportunities in their classrooms and contained three new MI ideas each week. Teachers from the majority of the more successful classrooms that received the CBPR component indicated that these emails

helped them to feel connected to the intervention team. When asked what she found most helpful about the intervention, Mrs. Taylor stated,

> The reminders. Again, as teachers we have so much – the standards are changing, and we have testing coming, and we have this special assembly; there is so much going on. Just the 'Hey, how are you doing? Do you need anything?' was just kind of like, oh yeah, cause it is in the back of my head.

Given the numerous demands on the teachers' time and schedules, the emails seemed to serve as friendly reminders that helped place movement at the forefront of the teachers' minds. Ms. Williams described the emails as "a sticky note for your mind." Additionally, the emails made the teachers feel like the intervention team cared about their success and were willing to offer assistance when needed, which in turn fostered feelings of connectedness to the intervention team. Conversely, some of the teachers in the less successful group reported that they were not able to pay much attention to the CBPR emails because they receive so many other emails, which can be overwhelming. Mrs. Tatum remarked, "Well, [the PACES email] wasn't an email I have to respond to so I didn't… I get five emails a day from parents; you are not going to be a priority."

Teachers also discussed wanting to feel connected to other teachers at their school and engage in collaborative planning. Mrs. Garrity said,

> I think one thing that would be great is – I know right now our school is really small and traditional schools are a lot bigger – but one thing [about] traditional schools that I've seen a lot more of is collaboration with your coworkers … I know at our school I have two other teachers with me who are doing PACES, and

> a lot of times we just don't collaborate on it. It's just something we can have more of: an incentive as a whole group to do it together.

As the PACES program was not funded, we limited the intervention to working with and evaluating only one classroom in Grades 1, 2, and 3 at each of the three intervention schools. Thus, collaborative planning among the intervention teachers at each school would not have occurred naturally or often because the teachers worked at different grade levels.

The university service learners aided the teachers' sense of connectedness. The three teachers with service learners reported how positive the experience was and how they were able to generate ideas from the university students. Mrs. Taylor stated, "I would love to have more students in again. I know they are practicing students, but I think it is great to have fresh new ideas." Additionally, Mrs. Clarke said, "I started to have the students coming in on a weekly basis. They started giving me lots of ideas, and then I realized I can adapt these ideas, and now I can be a little bit more creative on my own." All of the teachers who did not receive the SL component of the intervention expressed an interest in having service learners visit their classrooms in the future. Mr. Saracen described how service learners would be helpful to him:

> Well part of me, personally, I just like to help other people out…[also] if they can offer something that's going to be new to me and then it could be helpful to me…you know, you are one person and you can't think outside the box (the box is in your own head).

SL had potential not only as a way to help the teachers generate ideas about how to integrate movement in their classrooms, but also to feel connected to a broader

community of professionals and pre-professionals seeking ways to increase classroom movement opportunities for children.

The third and final interpretive lens – space – added yet another layer of insight into the teachers' perspectives of the implementation process. Place intersected with sociality in that teachers expressed a need to see examples of MI role modeled in their own classrooms. Mr. Street explained, "If there were people available to come out and do a special activity or a special lesson, as long as it is planned within a week, I think it would be a big benefit." He went on to describe how teachers on the MoveForThought website (CoP) adjusted activities to fit their students' needs and that he was starting to feel more comfortable adjusting MI strategies to the needs of his class and classroom size. While many of the teachers lamented that they had limited classroom space for MI, two of the teachers in the more successful group had the smallest classrooms, and another two of the teachers in this group had classrooms designed in an open/community style (i.e., partitions for two walls and an open hallway connecting to other classes in a pod for the other two walls). The teachers in the more successful group discussed finding creative ways to implement MI despite classroom size limitations. For example, Mrs. Merriweather shared how she took her students outside "to do runs … just that fresh air time running outside for a few minutes." Inside her classroom, she also had her students follow dance videos while staying in their personal spaces. Additionally, Mrs. Williams discussed how she creates a "city inside of the classroom" which fosters movement by having supplies, books, and materials located in various locations around the classroom. The city's layout prevents traffic jams (e.g., by putting paper in one location, crayons in another, pencils in another, etc.), which also creates more movement opportunities for

students, as the children are required to move throughout the classroom to gather supplies.

Discussion

The purpose of this mixed methods study was to examine implementation processes in the first year of delivering the PACES pilot program. We hypothesized that PACES would increase MI in the intervention classrooms, demonstrate successively greater increases in MI with each step up in treatment level, and lead to higher MI implementation in the intervention classrooms compared to the control classrooms. These hypotheses were partially supported.

First, while classrooms receiving Treatment Level 2 (CoP + CBPR) and Treatment Level 3 (CoP + CBPR + SL) demonstrated increases in MI from baseline to outcome, classrooms receiving Treatment Level 1 (CoP) showed decreases in MI. This finding was surprising considering that classroom teachers have expressed a desire to work with their peers through school wide collaboration, professional development, and additional opportunities to work together and learn from each other (Dinkel et al., 2016; Webster et al., 2017) and an online CoP could be beneficial for teachers to learn and adopt MI (Trust, 2012; Vazou, Hutchinson, Ames, & Webster, 2015). However, the qualitative data indicated the teachers rarely used the online CoP on their own. The teachers indicated the CoP was largely unhelpful because it took time away from their already overcrowded schedules and it was difficult to plan using the CoP during the school year. This finding aligns with previous studies, in which teachers felt that MI adds too much to their already crowded schedules (Cothran et al., 2010; Gately et al, 2013; McMullen et al., 2016; Naylor et al., 2006, Webster et al., 2017). One of the teachers in

the present study suggested she would be more inclined to use the CoP during the summer when she does her long range planning for the next school year. Future research might investigate whether teachers are more inclined to engage with an online CoP during summer vacation, as this may alleviate stress related to planning for MI amid the many other demands that are placed on teachers during the academic year. Another strategy to improve the effectiveness of a CoP for MI might be to foster and encourage member communication and collaboration within the CoP to help develop a community atmosphere (Zhao, Lu, Wang, Chau, & Zang, 2012; Probst & Borzillo, 2008; Vescio, Ross, & Adams, 2008).

Second, successive increases in MI were not observed across all three treatment levels. Rather, it appeared that the step up from Treatment Level 1 (CoP) to Treatment Level 2 (CoP + CBPR) was the only change in intervention dosage that led to a notable increase in MI. Based on the qualitative findings, teachers in the more successful classrooms responded more favorably to the CBPR component of the intervention than the teachers in the less successful classrooms. Specifically, teachers in more successful classrooms felt connected to the research team through CBPR (i.e., participating in goal-setting, receiving reminder emails) and felt that the research team cared about their progress in implementing the PACES program. However, teachers in less successful classrooms gave little attention to the reminder emails because there was no requirement to read them. These teachers felt that it was important to read other emails sent from the school or school district but that it was not important to read emails from the research team. Teacher engagement in CBPR could vary depending on the extent to which teachers prioritize MI and the level of external accountability placed on teachers to

participate in CBPR. Sending researcher-generated MI reminders through existing school communication networks may increase teacher engagement in CBPR. Overall, it is possible that CBPR had a more substantial impact on MI than the other intervention components because it was delivered on a more frequent (i.e., weekly) basis compared to the other components. This could have promoted continuous learning for the teachers. Teachers engaged in continuous learning are often driven to participate in learning communities based on their personal needs (Vescio et al., 2008) and can see a clear connection between their professional learning and changes in their teaching practices and student learning (Bolam et al., 2005).

Third, our hypothesis that all intervention classrooms would surpass the control classrooms in increasing the level of MI from baseline to intervention was not supported. Rather, we found that between-group differences in successful implementation were more pronounced when we compared Treatment Level 2/3 (i.e., designated the more successful group) to Treatment Level 1/control classrooms (designated the less successful group). The biggest difference in observed MI between the more and less successful groups was that the teachers in the more successful group implemented non-academic movement breaks (e.g., brain breaks, wiggle breaks) more than the teachers in the less successful group. In previous research using self-report data, teachers had some success implementing MI as part of pre-packaged programs that are academic-based (Cardon et al., 2004; Erwin, Abel, Beighle, & Beets, 2011; Kibbie et al., 2011) and non-academic-based (Erwin, Beighle, Morgan, & Noland, 2011; Mahar et al., 2006). However, our study is the first to report systematic observation data of MI and compare teachers' use of non-academic and academic movement breaks within the same intervention. Teachers

have previously reported positive feelings towards both academic and non-academic MI (McMullen et al., 2014). Furthermore, Dinkel et al. (2016) found that while the majority of teachers (304 out of 346) implemented non-academic movement breaks, 73.7 % of those teachers also reported incorporating academics into their movement breaks. Further research is needed to better understand teachers' preferences for, and the overall contribution of non-academic versus academic MI in the successful implementation of PACES and other MI programs.

While there was not a significant between classrooms that received SL and classrooms that did not, the qualitative portion of the study yielded promising findings about this intervention component. Teachers who received the SL component were in the more successful group. They reported that SL was beneficial to their efforts to provide MI. Furthermore, teachers who did not receive SL expressed a desire to receive it. SL has the potential to expand resources for implementing new school-/community-based health promotion programs (Rosencranz, 2012) and shows promise as a support system as the PACES intervention continues.

The qualitative findings also revealed a number of other insights about the implementation process in this study. Differences between the more and less successful groups' MI implementation were related to space, time, and the types of resources provided. For example, similar to previous studies (Gately et al., 2013; McMullen et al. 2016), teachers revealed that space constraints acted as barrier. However, as Mrs. Williams described through her "city" analogy, teachers may be able to find success by allowing students to move through the classroom to gather supplies and to get up and move when they need to. Helping classroom teachers understand how to set up their

classrooms and management routines (e.g., placing pencils on side of the room and the sharpener on the other, moving from one area of the room to the other between tasks) may be a key strategy for helping teachers overcome barriers related to MI (Webster et al., 2017). Additionally, teachers reported time constraints but the teachers in the more successful group were able to find space within their already established routines to implement MI. This finding is consistent with suggestions some of the teachers made in interviews conducted during the baseline phase of the intervention study (Webster et al., 2017). Having teachers consider embedding or increasing PA within naturally occurring transitions between lessons and throughout the school day can help them maximize existing opportunities to promote PA and learn to see movement as integrative, rather than additive, within regular classroom routines. Finally, the teachers reported that being provided with resources and reminders (a) helped them remember to implement MI and (b) gave a quick idea that they could implement. This study supports the notion of providing teachers with MI ideas and strategies, but also highlights the importance of promoting ways for teachers to adapt existing resources to be contextually sensitive within their own classrooms. The types of resources teachers' utilize and find most helpful for MI warrants future exploration.

The use of systematic observation is a strength of this study. Whereas most previous research on MI has relied on teacher self-reports, this study provides valid, reliable, and objective data about the extent and nature of MI in elementary classrooms, which is considered an important step in improving research in this area (Webster, Russ, et al., 2015). Specifically, continued research that objectively reports MI will build the descriptive research base needed to develop MI interventions that are "ideally suited for

different classroom situations and contexts" (Webster, Russ, et al., 2015 pg. 697). Another strength is the use of qualitative data to help explain the quantitative results. We recommend that more intervention researchers' use mixed methods approaches to conduct process evaluations, as such approaches can provide a more complete picture of program implementation successes and challenges. This study also had several limitations. Because the PACES intervention was a pilot study and unfunded, there was a small sample size and the teachers were observed for short bouts of time. Due to scheduling challenges, some teachers were observed on days and times, which they felt were inopportune and did not best represent MI opportunities during a regular school week.

Conclusion

After approximately three months of intervention, the PACES pilot program appeared to be most successful in its implementation of CBPR to increase MI, while the CoP and SL components of the program seemingly did not leverage the teachers' capacity to implement more MI than at baseline. Based on the qualitative findings, it is possible that with continued program implementation, all three PACES components will add significantly to the degree of MI provided in the observed classrooms. Strong professional development programs should allow teachers time to change their practices so they can see change in student outcomes (Guskey, 2002). The crucial element for teacher change occurs when they experience a successful implementation which then shapes their attitudes and beliefs about the change (Gusky, 1989; Gusky, 2002). Consistent with recommended practices in professional development (Armour & Yelling, 2004; Patton & Parker, 2012; Shelton & Jones, 1996; Ward & Doutis, 1999), PACES is

an ongoing program focused on providing continual and sustainable support for school professionals to implement key CSPAP opportunities. The qualitative data from this study also serve as an important reminder about the role of classroom context in the success of MI interventions. Program implementation strategies should allow teachers to develop a sense of ownership in the way they promote PA (Deglau & O'Sullivan, 2006; Patton & Parker, 2012), as teachers may need flexibility and options as PA advocates. Differences in the way teachers perceive and respond to MI programs should be carefully examined when evaluating the implementation process in order to maximize the uptake of program components. .

Implications

Practice: MI trainings should occur prior to the start of school so teachers can implement MI into their long range planning and start of the year classroom procedures.

Policy: MI integration should be designed to be contextually sensitive within each classroom.

Research: Future MI intervention research should include process evaluations that (a) objectively report how MI is implemented in classrooms and (b) include information about the teachers' perceptions of the intervention so that contextually valid interventions can be designed and implemented

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Table 3.1. SOSMART Implementation Score and Variables

SOSMART Variable	Definition*	Reliability Score %	Level 1 School A			Level 2 School B			Level 3 School C			Level 4School D		
			Baseline	Outcome	Change	Baseline	Outcome	Change	Baseline	Outcome	Change	Baseline	Outcome	Change
Implementation Score	NA	NA	44.00	39.13	-4.87	50.9	54.27	3.37	49.63	50.73	1.10	36.30	35.37	-0.93
Teacher Directed Transition	Teacher gave directive for students to move from point A to point B	90.5	17.83	14.87	-2.97	17.03	20.60	3.57	24.40	21.07	-3.33	18.24	20.20	1.95
Other Movement Non-academic	Movement directed by teacher within or between lessons DOES NOT include academic content	87.5	3.23	2.20	-1.00	1.83	4.90	3.07	1.20	12.50	11.33	0.59	0.00	-0.59
Other Movement Academic	Movement directed by teacher within or between lessons DOES review or teach academic content	89.3	2.17	3.60	1.43	0.50	1.17	0.67	1.43	0.80	-0.63	1.18	5.45	4.28
Non-Teacher Directed Transition	Teacher DOES NOT give a directive for students to be active but students still engaged in physical activity (e.g., getting supplies, sharpening pencil)	85	20.77	18.47	-2.27	31.53	27.50	-4.00	22.67	16.37	-6.30	16.16	9.36	-6.79

*Definitions from Russ et al. (2016)

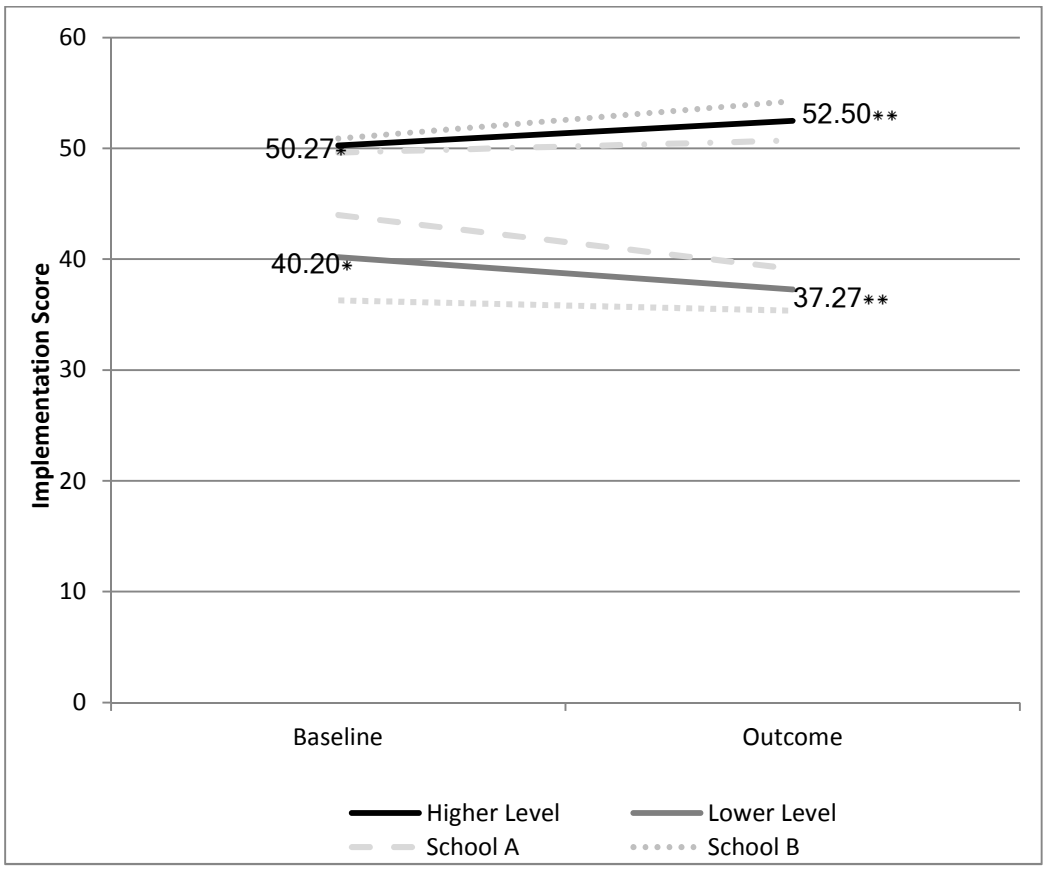

Figure 3.1. More successful verse less successful intervention

* $U = 10$, $p = .199$
** $U = 5$, $p = .03$

CHAPTER 4: STUDY 2

Case Study of Health Optimizing Physical Education based Comprehensive School Physical Activity Program[1]

[1]Egan, C.A., Webster, C.A., Weaver, R.G., Stewart, G., Brain, A., Stodden, D.F., & Russ, L.B. (in preparation). Case Study of Health Optimizing Physical Education based Comprehensive School Physical Activity Program. (*Qualitative Research in Sport, Exercise and Health*).

Physical education (PE) is considered essential for helping children to develop the knowledge, skills, and dispositions they need to build a physically active life (Sallis, et al., 2012). However, recent reductions in PE (Sallis et al., 2012), coupled with objective data showing that over half of America's youth fail to meet the nationally recommended 60 minutes a day of moderate-to-vigorous physical activity (PA; Troiano, et al., 2008) has made it vital to identify opportunities beyond PE to help children increase their PA levels (Institute of Medicine [IOM], 2013). Toward this end, the IOM (2013) called for a whole-of-school approach to increasing youth PA because schools have existing infrastructure to support PA programming and have unparalleled access to children and adolescents (Pate et al., 2006).

In tandem with the call for a whole-of-school approach to PA promotion, the focus of school- based PA promotion has centered on comprehensive school PA programs (CSPAP; Erwin, Beighle, Carson, & Castelli, 2013). The CSPAP model was introduced in 2008 by the National Association for Sport and PE (NASPE), which is now the Society of Health and Physical Educators (SHAPE) America. In its current iteration (Centers for Disease Control and Prevention [CDC], 2013), a CSPAP has five interconnected components including (a) PE, (b) PA during school, (c) PA before and after school, (d) staff involvement, and (e) family and community engagement. The five components are designed to work synergistically as an approach to help children achieve the nationally recommended 60 minutes of PA each day (CDC, 2013).

In 2011, the American Alliance for Health, PE, Recreation and Dance (now the Society of Health and Physical Educators [SHAPE] America) reported that 6% of high schools, 13% of middle schools, and 16% of elementary schools provided a full CSPAP.

One reason for CSPAPs lack of adoption by schools may be that teachers have a general idea of a CSPAP, but they are unsure of how to put one in place and may not know how to fit CSPAP within curricular plans (Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013a). Thus, Metzler et al. (2013a) created a curriculum, Health Optimizing PE (HOPE), based on evidence that public health-aligned (e.g., increased PA opportunities during the school day) PE curriculums are needed (Sallis et al., 2012). HOPE is designed to "help P-12 students acquire knowledge and skills for lifelong participation in PA for optimal health benefits" (Metzler et al., 2013a, pg. 42). The curriculum has eight strands (i.e., teaching and learning areas) that are designed to work within a CSPAP to improve children's PA levels: (a) before, during, and after school extended PA programming, (b) sports, games, dance, and other movement forms, (c) family and home education, (d) community-based PA programming, (e) health-related fitness, (f) diet and nutrition for PA, (g) PA literacy (consumerism, technology, advocacy), and (h) integration of HOPE across all school subjects. Each strand provides one or more learning outcomes, the intended learners for each strand, and several suggestions for learning activities (Metzler et al., 2013a). The HOPE curriculum draws on the whole-of-school approach to successfully teach and promote PA behaviors via a CSPAP model (see Table 1; Metzler et al., 2013; Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013b).

Theoretical lens

HOPE incorporates curricular alignment within a CSPAP and provides guidance for the types of programs (e.g., before and after school PA programs, educational programming for families, training programs for teachers) that can be implemented

through a CSPAP but does not address how researchers and schools can work together to implement CSPAPs that are effective and sustainable. School and university partnerships allow for a two-way flow of knowledge and resources for planning and implementing health programs and are identified as an important element of organizational capacity (Crisp, Swerrison, & Duckett, 2000). Webster, Beets, Weaver, Vazou and Russ (2015) suggest that universities can provide critical external support for schools in their efforts to generate and sustain new PA promotion practices. School-university partnerships show promise in facilitating changes in PA participation for students, parents, and educators (Brusseau, Bulger, Elliot, Hannon, & Jones, 2015). Additionally, Wandersman et al. (2008) identified the prevention support system (i.e., a partner that aids in bridging the gap between research and practice) as one of the key factors for dissemination and implementation of interventions.

Building off Wandersman et al.'s (2008) work, Durlak & DuPre (2008) developed a theoretical model of program diffusion for effective implementation of health interventions. The model is derived from a review of the literature that assessed the implementation of program outcomes and identified the factors affecting the implementation and diffusion process of interventions. The key elements of the model are derived from an ecological framework (i.e., factors within a broad framework that have multiple levels of influence on a behavior; Bronfenbrenner 1977). Durlak and DuPre's (2008) model identifies variables in five categories (community level factors, provider characteristics, characteristics of the innovation, prevention delivery system, and prevention support system) that in favorable conditions interact with each other and lead to effective implementation and program diffusion. Specifically, community level factors

relate to politics, funding, policy, theory, and research relevant to the intervention. Provider characteristics refer to the (a) provider as a non-researcher that implements the program and (b) the extent to which the provider perceives a need and potential benefit for the program and has the self-efficacy and skill proficiency to implement the program. Characteristics of the innovation refer to the compatibility of the program and the adaptability of the program to meet the needs of the provider and community. The prevention delivery system (organizational capacity) refers to general organization factors, specific practices and processes, and specific staffing considerations of the provider. Finally, the prevention support system refers to the training and technical assistance that the prevention support system (e.g., university partner) provides during the program implementation.

HOPE is intended to provide a curricular model for aligning PE with a CSPAP. However, little research has investigated schools' efforts to implement and sustain the HOPE model, particularly through the use of school-university partnerships. Therefore, this study will use Durlak and DuPre's (2008) theoretical model of program implementation/diffusion to examine the enablers and barriers related to the development, implementation, and sustainability of a university-supported HOPE-based CSPAP that was implemented for two-years. The specific research questions were (a) how was the program implemented, (b) what were the success stories and what enabled the successes, (c) what were the barriers related to program development and implementation and how were these barriers addressed/overcome, and (d) what is the sustainability of the program?

Methods

In Spring 2012, a team of university researchers from a state university located in a large city in the southeastern United States was awarded a Seed Grant ($75,000) from a large funding agency in the same city to implement and evaluate a two-year (2013-2015) HOPE-based CSPAP at a local charter middle school (see Table 1). The researchers, in collaboration with school's health and PE (HPE) teachers and the funding agency implemented the program and the researchers evaluated the program's effects on intended program outcomes (Metzler, 2015). In Fall 2015, following the end of the funding for the program, the lead university researcher who helped to implement the program invited our research team to conduct a follow-up external evaluation of the implementation and sustainability of the program. We accepted the invitation and, based on discussion with the original research team, decided to conduct a qualitative explanatory single case study (Yin, 2014) that both retrospectively investigated the initial two-year implementation of the program and examined the current (post funding and university support) implementation processes to assess program sustainability.

Participants and Setting

Before the start of the study, permissions were requested and granted from the University IRB and the School District IRB. The study was conducted at an urban charter middle school (referred to in this paper using the pseudonym "Charter") in the same city as the funding agency and original research team. Charter serves 6th-8th grade and is racially diverse with students (n=1475) who are 43% White, 28% Hispanic, 22 % African-American, and 7% Other. Of the students attending Charter, 35% qualify for free and reduced school meals. Charter students take health or PE as an elective, and

approximately 70% of students elect to take one or more nine-week terms in health or PE, which are offered daily for 50 minutes (Metzler, 2015).

Charter has seven HPE teachers (4 female); four self-identify as African American and three self-identify as Non-Hispanic White. Their teaching experience in HPE ranges from 3 to 30 years (M=15.57), and their teaching experience at Charter ranges from 2-20 years (M= 9.85). One of the HPE teachers has a Ph.D., one has a specialist degree, and four have master's degrees. The school is located in a neighborhood near a major interstate, and there is a large park next to the school that has running and biking trails. Surrounding the school are sidewalks that lead to the front and sides of the school along with bike racks near the front of the school. There is a school garden (approximately 20 feet by 20 feet) located on the side of the school that is easily accessible from the school and parking lot. The gymnasium is centrally located in the school with one regulation size basketball court and retractable bleachers. There is a small workout room located across from the gym that contains cardiovascular equipment, weight machines, and free weights. A pathway leads from the gym to a large field compete with a six-lane asphalt track. Adjacent to the track is a large softball field and an additional large green space. There are bleachers, soccer goals, and water fountains located on the various fields. One of the seven HPE teachers only teaches health and has her own health classroom. The other six teachers in the department teach PE five periods a day and health one period of a day using other teachers' classrooms when these teachers have their planning period. Each period of the day there are five PE classes being taught simultaneously with approximately 40 students per class (~200 students in

the gymnasium each period). During warm and dry weather, some classes are taught outside, but all students meet in the gymnasium for roll call.

The original research team consisted of six members (1 male). Five of those members were from the university with two individuals serving as the principal investigators (they were also faculty members). Also from the university and part of the original research team were three doctoral students, one of whom served as project manager. The final member of the team was a representative from the funding agency.

Data Collection

Data sources for this study included documents, interviews, and field observations (see Table 2 for a complete list of data sources).

Documents. In Fall 2015, the lead author with assistance from the second author obtained documents (e.g., field notes, presentations, meeting minutes, report to funding agency) from the original research team. The first and second author reviewed the documents to broaden their understanding of the intervention and implementation structures and subsequently met informally with four members of the original research team to confirm and extend our understanding of the project, as well as to identify other key informants from the school and funding agency. In Spring 2016, additional documents were collected during field visits (see Field Observations section below). These documents included pictures, fliers, lesson plans, and school demographic information. All documents collected during the study were included in formal data analysis (see Data Analysis section below).

Interviews. Interviews consisted of individual interviews and a focus group interview. All interviews followed a semi-structured format, which allowed for additional

questions and probes when needed (Glense, 2016), and were transcribed verbatim for analysis. Three rounds of individual interviews were conducted with key informants. The purpose of the first round of interviews (n=6, M=48.24 minutes) was to gain a more in-depth understanding of the implementation process from the perspective of the original research team and CDC personnel involved with the intervention. To develop interview protocols, we used the information from the documents and the meeting with the original research team, alongside Durlak and DuPre's (2008) model. Example questions included "Describe your role in the planning and implementation of the HOPE-based CSPAP?" "How closely did you work with the school and with the teachers?" and "What are some barriers to the implementation process that you perceived?" First round interviews were conducted over the telephone. Since the university researchers all worked together in the same academic department, all first round interviews were conducted on the same day to reduce the risk of contamination. The first two authors conducted the interviews. The first author reviewed the transcripts to develop initial hunches and perspectives regarding the research questions. Specifically, the transcripts were examined to identify salient points, negative cases, and ideas that needed further expansion (Glense, 2016). Insights gleaned from this process informed the development of questions used in a second round of interviews.

The second round of interviews (n=5, M= 79.8 minutes) was also conducted with the original research team. The purpose of these interviews was to follow-up on hunches and questions developed from reviewing the transcripts from the first round of interviews, as well as to further explore participants' perspectives of the implementation process over the two-year intervention (Jacob & Ferguson, 2012). As with the first round

interviews, second round interviews were conducted over the telephone and the transcripts were reviewed and drawn upon to inform the development of the interview protocols for the next round of interviews.

The purpose of the third round of interviews (n=7, M=39.65 minutes) was to explore the implementation process from the perspective of school professionals at Charter, including the HPE teachers and the principal. During Spring 2016, the lead author conducted individual interviews with each of the HPE teachers; however, the principal declined to participate in an interview. Example questions include "Describe the extent to which you and the other teachers had a 'shared vision' of the program?" "Did you feel capable of doing what was expected of you?" and "Did you recognize a need for the HOPE-based CSPAP before it was implemented?"

Also during Spring 2016, the lead author conducted a focus group interview (Glense, 2016; Yin, 2014) with 8th-grade students currently at Charter who had participated in both years of the HOPE-based CSPAP implementation (during their 6th and 7th-grade years). The lead HPE teacher at Charter identified 20 8th graders who had participated in HOPE implementation. Of the 20 students, five returned their consent form and assented to be part of the focus group. Questions focused on the students' experiences during HOPE implementation and changes to school programming the students experienced after HOPE was implemented (e.g., "Have you noticed any changes from the last two years in PE to this year," "Do you participate in the school garden, CV day, and/or CV Classic?").

Field observations. The lead author observed HPE classes and before and after school programming at Charter. The observations took place during two PE content units

across two nine-week terms. Field notes were taken during all observations and informed by Durlak and DuPre's (2008) model, the HOPE model, the CSPAP model, and emerging evidence of sustainability (based on interviews and documents of program implementation [Metzler, 2015]). During the initial observations, the lead author first took notes about the setting, events, participants, and interactions using broad sweeps to gain a better understanding of the school context (Glense, 2016). After the initial observations, the first author focused on the PE program, including planned and unplanned aspects and formal and informal interactions (Patton, 2002). After each observation session, the first author revisited the field notes to expand and provide clarification (Glense, 2016).

Data Analysis

The first and fourth author coded all data separately and then met to discuss subcategories, categories, and themes until there were no disagreements. After the initial coding of documents and interview transcripts to inform subsequent interviews, we analyzed all documents, transcripts, and field notes using explanation building logic (Trochim, 1989; Yin, 2014). Durlak and DuPre's (2008) model, the CSPAP model, and the HOPE model were used as lenses during the analysis. Specifically, matrices for each data source were developed using codes that ranged from a short phrase to full sentences, which represented variables outlined in the above models. These codes were organized in terms of their alignment with aspects of program implementation and sustainability. Codes across data sources were then searched to develop categories, subcategories, and eventual themes (Yin, 2014). Pattern matching (i.e., predicting patterns to ones empirically observed), explanation building (i.e., a form of pattern matching that

examines links between how and why something happened), and addressing rival explanations (i.e., plausible alternatives for interpreting the data) was used to address threats to internal validity (Trochim, 1989; Yin, 2014).

Trustworthiness

Multiple strategies were employed to increase the quality and trustworthiness of the study. First, the lead author had extended engagement (Yin, 2014) with the original research team, the HPE teachers, and at Charter. Second, data from six different data sources were used to build convergent evidence and strengthen construct validity (i.e., data triangulation; Yin, 2014). Third, the lead author established a chain of evidence and created a database for all pieces of evidence by keeping analytic memos (i.e., mini-analyses) throughout data collection (Glense, 2016). Fourth, peer debriefing was employed between the first and second author during data collection and between the first and fourth author during data analysis. Fifth, investigator triangulation (Patton, 2002; Yin, 2014) was used by having multiple analysists code data and having the analysts challenge categories, codes, and themes presented until all disagreements were resolved (Glense, 2016; Yin, 2014). Sixth, all individual interview transcripts were sent to participants for member checking. The participants were invited to subtract any content, clarify, add to, or comment on the transcripts. Furthermore, the findings were sent to the original research team and the HPE teachers to check for accuracy of the interpretation of the data (i.e., face validity; Yin, 2014). Finally, negative cases were explored that did not fit within the a priori theoretical framework used in this study (Yin, 2014) and none of the negative cases yielded any themes or salient points.

Positionality

Denzin and Lincoln (2013) state, "qualitative research is a situated activity that locates the observer in the world" (pg. 6). Thus, it becomes essential for qualitative researchers to identify themselves within the research and acknowledge their positionality. The lead author acknowledges herself as knowledge maker and producer (i.e., reflexivity; Macdonald et al., 2002). She was in a relationship with the environment and the participants and grounded the study in constructivism (Guba & Lincoln, 1994). Constructivist ontology situates realities in the form of multiple constructions; the epistemology is transactional, which assumes that the researcher and the researched are linked. Thus, the distinction between ontology and epistemology disappears (Guba & Lincoln, 1994). The knowledge created in constructivist work is transactional, co-created, and subjectivist. Knowledge accumulation is viewed as "more informed and sophisticated reconstructions" of previous knowledge (Lincoln, Lynham, & Guba, 2013 pg. 202). From this perspective, the lead author's background may have produced biases in the research process, as she had previous experience with CSPAP interventions and is a former middle school PE teacher. At the same time, this background also may have aided in the development of interview questions, field observations, and developing rapport with the HPE teachers. The lead author's use of analytic memos (i.e., keeping a researcher diary; Glense, 2016) was intended in part to separate her natural epistemic orientation from the research process and to help her bracket feelings and emotions related to the study.

Findings and Discussion

The findings are represented in the following four themes: (a) a proof of concept study, (b) implementing a HOPE-based CSPAP, (c) sustainability of the program, and (d)

moving forward. Additionally, each theme has several subthemes. The themes and subthemes are discussed below and concurrently considered in light of the variables outlined in the conceptual and theoretical literature used to frame this study.

A proof of concept study

> Eric, the lead investigator from the original research team, described the study as a "proof of concept study"
>
> I had been working with others on the concepts of the HOPE CSPAP model and the thought was it would be nice to find a place and test this out, and sure enough this grant program came to my attention at the same time, so it was basically an opportunity for a proof of concept study about this particular version of a CSPAP. (Round 1 Interview)

The idea of a proof of concept study has been applied in the medical field to describe how a particular drug or treatment is feasible or effective (Rabinowitz et al., 2013) but has also been used to determine the effectiveness of teaching methods (Aagaard, Teherani, & Irbdy, 2004) and the feasibility and effectiveness of collaborations between different health service departments (Lowton, Laybourne, Whiting, & Martin, 2010). In this case, the study conducted by the original research team was utilized to verify whether the HOPE model has any practical potential, and the idea of proof of concept was used to frame how the university researchers would approach implementation.

There were four subthemes as part of the proof of concept theme: (a) hands off approach, (b) existing infrastructure at Charter, (c) Charter's HOPE champion, and (d) initial training and designation of roles.

Hands off approach. Eric described the implementation as an "organic approach," which other members of the university research team (Tammy, Jess, Julie, and Gracie) referred to as a "hands off approach." Eric told us that

> From the beginning, we wanted this to be [the school's] project and we wanted to study it as their project. We wanted it to be – I don't know if this is the right word – but we wanted it to be organic. We didn't want them in any way to feel that they were doing something because they were obligated to us. We wanted to see what would happen if [Charter] teachers took on a HOPE model CSPAP for two years, how that would play itself out…We didn't want this to be an intervention project; we wanted it to be an implementation project. And so it was very difficult to not say things at times when we saw some backsliding, but at the same time we wanted to see how this would play out for two years. We wanted it natural. (Round 1 Interview)

The original research team felt that in order to conduct their proof of concept study, there was a need to leave most aspects of program implementation to Charter. However, the team still provided the school with some support. Julie explained her team's support as

> …obviously, being there, being accessible, responding to any concerns, if they had any questions or emailing us or whatever. But we didn't feel it was our responsibility, or [Eric] didn't want us to, let's say, have me go over and work on the garden, or have me supervise the before and after school program. (Round 1 Interview)

According to Durlak and DuPre (2008), the prevention support system includes technical assistance for the provider (i.e., the site delivering the implementation). Although the original research team provided some ideas and support to the HPE teachers, they did not step in when they saw problems occurring and/or to offer problem solving strategies when backsliding occurred. Such technical assistance can help to maintain the provider's motivation and commitment to the implementation as well as provide an emotional support network (Durlak & DuPre, 2008). Additionally, technical assistance in the form of early monitoring of the implementation, followed by an immediate retraining can greatly improve implementation fidelity when providers experience difficulties with implementation (Dufrene, Noell, Gilbertson, & Duhon, 2005).

Existing infrastructure at Charter. In order to implement the proof of concept study and to utilize a hands off approach, the university research team felt they needed to find a school with ideal resources within the school's current infrastructure. Tammy describes why Charter was selected: "…it was very compatible with it being a charter school… they still have a lot of support from the district but they also have the opportunity to make a lot of their own types of big decisions" (Round 1 Interview). In addition to being able to make decisions (e.g., about implementing programs or being involved with research), the original university research team had strong relationships with Charter. Tammy was the former district PE coordinator in Charter's district, the university placed student teachers at Charter, and two of three doctoral students (Jess and Julie) had completed their student teaching at Charter. Furthermore, Eric indicated Charter "was already doing some CSPAP programming [see Table 1] and they already

had a large enough staff and administrative support in addition to being a Charter school … which would free us up from a lot of administrative red tape" (Round 1 Interview).

Durlak & DuPre (2008) identify compatibility (contextual appropriateness with missions and goals) and adaptability (flexibility) as important elements of a new program being implemented. Since Charter was already implementing various components of a CSPAP, the addition of the new HOPE-based CSPAP strands fit within Charter's pre-existing program and mission. Furthermore, because they were a charter school they had flexibility and less administrative red tape to make decisions about programming, research, and funding. Providing a program that is compatible and adaptable to the needs of the provider increases the provider's chances of effectively implementing the program (Durlak & DuPre, 2008).

Charter's HOPE champion. Once Charter was chosen, the original research team contacted the PE department chair (Deb) and presented the program and the team's ideas about how to implement the program. Deb then proceeded to advocate for the program with her HPE staff. Deb remembered telling her staff, "this is what has been offered and these are some of the perks and benefits and these are some of the things we are already doing" (Round 3 Interview). According to Deb, having the other HPE teachers buy in to the program was essential. She stated, "I was not going to do it without their approval" (Round 3 Interview). There was one objection from a HPE teacher who opted out of the program because of his impending retirement at the end of the school year. While he did abstain from the program, Eric indicated, "He in no way was an impediment to the program or the goals" (Round 2 Interview). Once the rest of the HPE teachers agreed to implement the program, Deb approached Charter's principal for

permission, and he granted permission for the project. Deb's role naturally evolved into the role of the "CSPAP champion" (Carson, 2013 and www.shapeamerica.org) for the school. Jess described Deb's role: "She tried to keep the troops on board, she motivated, [she] was a mediator for communication, a point of contact. She would lead the show at [Charter] and keep them [the HPE teachers] in line. She encouraged them, supported them. She was the point person" (Round 2 Interview).

Durlak and DuPre (2008) identify staff buy in (i.e., a shared vision) as an essential element for program implementation and outcomes. Additionally, shared decision making among the providers and the prevention support system has been linked to better program implementation (Cooke, 2000; Kegler & Wyatt, 2003). Durlak and DuPre (2008), as well as the CSPAP literature (Carson, 2013; Carson, et al, 2014, Heidorn, Hall, & Carson, 2010) emphasize the importance of having clear leadership roles and a program champion. Research has found that having a trained CSPAP leader can lead to increased PA opportunities (Carson et al., 2014) and is a sustainable strategy for implementing CSPAPs (Castelli et al., 2013). In the case of Charter, Deb's leadership enabled the implementation of the HOPE-based CSPAP, despite the original research team's use of a hands off approach.

Initial training and designation of roles. Once buy-in occurred with the HPE staff, the HOPE-based CSPAP and permissions were granted, the original university research team developed and implemented an initial training for the HPE teachers. This training (provided during the summer before the first year of implementation) was primarily informational and consistent with the hands off approach described above. For instance, Jess described what happened in the initial training: "We went through and

looked at what programs were currently existing, what content units they were currently offering, and then from there looked with the purpose of improving PA – we looked at what units we could replace or improve upon" (Round 2 Interview). The original research team tried to help the HPE teachers find what they could add to their existing PE content to improve PA levels without telling them they had to change their content. Additionally, Julie described how the initial trainings were based on the HPE teachers' scheduling preferences:

> We didn't want to overwhelm [the HPE teachers] so we started gradually by giving them choices of what they thought they could feasibly start doing in Year 1 versus Year 2. We did this to fit their different schedules and to try and make it gradual so it was not like we just threw everything at them at once. (Round 2 Interview)

Eric later retrospectively described the trainings as "more of informational sessions" where it was not necessarily a skill-based training, but a training to share information and decide how and what was going to be implemented and in what order. The HPE teachers collectively decided which strands they would implement and in what order they would implement the strands. Each teacher identified one or more strands to focus on and a member of the original university research team was assigned to be the point of reference for each strand. This approach set the groundwork for how the HOPE-based CSPAP would be implemented through Year 1 and what would be the focus in Year 2.

According to Durlak and DuPre (2008), provider trainings should give the provider the skills necessary to deliver the program, aid in the development of the provider's motivation for implementation, and foster self-efficacy. Designing the training

for Charter's HPE teachers as more focused on providing information than on providing PA promotional skills might have limited the effectiveness of the training. However, Durlak & DuPre (2008) also identify shared decision-making, the formulation of workgroups, and communication as elements of the provider's capacity to implement the program. The initial training supported these aspects of capacity building by allowing the HPE teachers to determine what HOPE strands would be implemented and in what order and creating work groups to address the implementation of each strand.

In summary, the proof of concept study came to life through the use of the hands off approach, which likely hindered program implementation in certain ways while enabling it in others. The hands off approach may have limited the technical assistance the university felt they could provide the HPE teachers, but it nevertheless allowed for a self-designated and naturally emerging program champion. The subsequent informational training did not align with Durlak and DuPre's (2008) notion of a competency-based training, and the teachers were not provided with PA promotion skills important to delivering the program. Yet, certain aspects of the training were consistent with what Durlak and Dupre (2008) do recommend, including shared decision making, the formulation of work groups, and communication.

Implementing a HOPE-based CSAP

After the initial summer training, the start of the school year marked the start of the official implementation of the HOPE-based CSPAP. The implementation of the program served as the second theme, within which there were three subthemes: (a) resources, (b) successes, and (c) challenges.

Resources. The overarching goal of the program was to focus on quality PE, so most of the resources were focused on higher moderate-to-vigorous PA lesson content and reducing the time it took to call roll by using active warmups (instant activities). Gracie described the support given: "We just gave them ideas on high moderate-to-vigorous PA content and gave some instant activity ideas; it was something they decided to do straight away, so we gave ideas" (Round 2 Interview). In addition to the content ideas, the teachers were given a copy of the SPARK curriculum. One of the HPE teachers (Haley) told us, "We actually took some of their [SPARK] notecards in there [the gymnasium] to do stuff like the warmup activities on rainy days when we have 200 kids in the gym" (Round 3 Interview).

One of the existing parts (prior to program implementation) of the PE program is cardiovascular (CV) day, which is typically on a Monday. On CV day, the students are required to run two miles during their PE time (Field Notes). In order to boost student participation, the original university researchers provided the HPE teachers with IPads to help teachers keep better track of the timed runs. According to Antwon, "[the IPads] allowed us to be mobile away from the computer. We could take pictures; it helped us move with the students, keep track of time, keep track of heart rates" (Round 3 Interview). The researchers also provided the teachers with ideas on how to motivate their students. Michelle told us how they adapted the resources provided for CV day: "We had a chart the kids would fill out that had their goals and they would write their times down each week, how they felt, and they would go home and talk to their parents about. So it made the kids and parents more involved" (Round 3 Interview). In addition to having the students set goals and share these goals with their parents, other efforts

were made to increase parent and community involvement. For instance, Rachel discussed using "weekly newsletters where we (the HPE teachers) put in information about what was going on and coming up and also a community board with local parks, activities, and programs" (Round 3 Interview). The newsletter served as a new way for the HPE teachers to communicate with parents about the annual CV Classic, which is a five-kilometer annual fun run that the HPE teachers organize. The CV Classic was already in place prior to the start of the HOPE-based CSPAP, but because of its continued success the HPE teachers, in collaboration with the original research team, implemented a parent health night in the spring to compliment the fall CV Classic. Angela described the funding agency's role in the parent health night:

> We were able to play a role of actually being involved…speaking, sharing some guidance related to physical activity, and helping parents be active, kids being motivated and things of that nature. So, again, the scientific nature, it was our strength and that is really what we [the funding agency] were able to contribute. (Round 1 Interview)

The resources both the university and funding agency were able to provide for the health night proved to be extremely helpful for the HPE teachers to plan and implement the event (Documents-Meeting Minutes).

Feedback from the university research team served as a particularly valuable resource for the HPE teachers. Rachel explained what it was like receiving feedback about her students' moderate-to-vigorous PA in PE: "…at first it was like, wow, I didn't realize how much they weren't active, and then it was like wow we are really doing good things now" (Round 3 Interview). It seems that continued feedback from the university

research team initially served as an important motivator for the HPE teachers to buy-in to the program and later served as a motivator for them to keep pushing and trying to implement various components of HOPE. Because of the successes with the feedback and the initial resources provided, the HPE teachers added a non-traditional intramurals program offered both before and after school. While intramural programs are often competitive and team based, Charter's program was an "inclusive, not competitive program aimed at reaching out to more kids that wouldn't participate in a PE setting or interscholastic sports. We wanted to make the programming successful to all students" (Jess, Round 2 Interview). The university "provided sign-up sheets, parent consent forms, and created a bulletin board where the students could vote on the types of programs or activities they wanted during intramurals" (Julie, Round 2 Interview) as well as funding support by paying the leaders of the intramural program (Documents-Meeting Minutes).

None of the HPE teachers had ever been specifically trained for PA promotion, but all of them reported that they felt prepared to implement a PA program. Rachel stated, "[I've had] no official training but I feel like my whole career has led up to this. I mean, we are in the business of getting students active (Round 3 Interview)." Because of their collective experience, the HPE teachers did not seem to perceive a need for training and the original research team agreed and described the teachers as "seasoned and already running a strong program" (Eric, Round 2 Interview). From this perspective, it seemed the support provided by the original research team, specifically providing additional resources, ideas, and being available for questions, was appropriate for the HPE teachers during the HOPE implementation.

The feedback the original research team provided the HPE teachers served as motivation to continue and try new things, which fits with Durlak & DuPre's (2008) notion of technical assistance. Previously, we discussed the lack of technical assistance related to early monitoring and retraining as a potential barrier to program implementation. However, continual feedback from the original research team appeared to be an enabling factor for successful implementation and this may have negated any limitations with the initial training. The HPE teachers and the original research team felt that the HPE teachers had the skills necessary for PA implementation.

Successes. One of the most commonly reported success stories was the strength of the relationships and the shared vison that both the original research team and the HPE teachers experienced during the implementation of the HOPE-based CSPAP. Deb stated

> As a department we talk all the time. I send out different emails sporadically, making sure we are all doing what we are supposed to be doing, but as a group we all had the same focus…everybody wants our program to be an awesome program, everybody wants to work in that direction so that we feel good about it – the kids feel good, the parents, the faculty. We have had a pretty good reputation. We wanted to make it better. (Round 3 Interview)

The university research team cited their comradery as one of their biggest successes and reasons that they were able to continue working well together during program implementation Eric describes,

> I think the biggest success story was having really dedicated and hardworking people on the team. I basically hired (if that is the right word) really good people, so any direct success of the project really came out of this collective hard work

and application and follow through that everybody on [the original research team] demonstrated. (Round 2 Interview)

The unity and shared vision within each implementation team (the HPE teaching team and the original research team) aided in the development program. Additionally, a strong relationship was maintained between the university and Charter during program implementation. Rachel describes this relationship: "The [university] people were wonderful, so much fun to be around, still friends of mine" (Round 3 Interview). The positive relationships reflect the positive work climate and communication structures (both enabling factors in Durlak and DuPre's [2008] model) that were established during the programing, which promoted successful implementation.

Perhaps the biggest success story of the implementation was the intramural program, which started slowly (part of the design), but through student word of mouth advertising (also part of the design) grew into a highly popular and attended program (Documents-Rosters of Intermural Attendance). The leader of the intramural program told us, "[Students] live for it…All of this happened unknowingly. I didn't know that this would be the outcome but…you know, kids live for Intramurals (Antwon, Round 3 Interview). In addition to the students loving the intramural program, the program served as an opportunity for the HPE teachers to develop meaningful relationships with the students. Lucas stated: "It allows us an opportunity to establish a relationship with kids who come in with intramurals probably more than kids that I see in the hallway cause we see each other more often" (Round 3 Interview). The students were given the opportunity to choose intramural activities; also, new activity options are available for each season during the school year (e.g., soccer in the spring, basketball in the winter; (Documents-

Meeting Minutes). Girls attending intramurals expressed an interest in weight training, so Antwon developed a weight training program for anyone interested in participating. The program is mostly attended by girls. According to Antwon, "Girls come in and develop relationships with each other and a commitment to improving themselves through weight training" (Round 3 Interview). Antwon and Lucas are the primary leaders of the intramural program, but Rachel also ran a running program for students and a before school yoga class for teachers. Furthermore, the weight room is open to any teacher or staff member at the school and it is not uncommon to see teachers/staff using this facility either before or after school (Field Notes).

Another success was related to implementation was timing of the trainings (offered over two consecutive summers). Deb said, "A lot of times [the HPE teachers] do not see each other in the summer. It was fun. We got paid, actually. That brought people in, and the financial backing with our sponsors was a real incentive to do the best you can" (Round 3 Interview). These trainings also served as a catalyst for the HPE teachers to want to improve their program. Brooke stated

> The [HOPE] program really strengthened our program. I think it took [our] program to another level…you think you are where you should be but in hindsight, actually, you can take it up another level. How can you take it up another level unless you go out and find the research, you go out and find a program, you go out and implement it? But luckily [the original research team] did all that and brought it to us. Then we are able to join with them and take it to another level. (Round 3 Interview)

Overall, the successes of the implementation can be linked to variables within Durlak and DuPre's (2008) model, specifically the positive work climate (i.e., strong relationships), organizational norms regarding change (i.e., trying new programming), the integration of new programming (i.e., Intramurals), and perceived benefits of the program (i.e., taking a successful program to another level). Providers who feel the program will benefit them are more likely to implement the program at higher rates of fidelity (Durlak & DuPre, 2008). The integration of new programming, as shown through the success of Intramurals, further suggests that the HOPE-based CSPAP was compatible with Charter and the HPE teachers' willingness to try a new approach (Durlak & DuPre, 2008).

Challenges. Despite the successes experienced with program implementation, there were also several challenges. For example, after the initial program implementation communication structure (e.g., assigning original research team members and HPE teachers to specific strands communication structure) communication became an obstacle for the HPE teachers, despite the open lines of communication structure. Rachel said, "[The original research team members] were always saying 'we are here to help you, let us know' but we didn't know what to ask [them]" (Round 3 Interview). While, the teachers valued aspects of the hands off approach, such as the opportunity to have autonomy in what and how they implemented, they often did not know what to do, how to do it, or even how to ask about what to do.

For the original research team, the hands off approach meant that they should avoid stepping in even when they saw backsliding. Eric stated, "It was very difficult not to say things at times when we saw some backsliding, but at the same time we wanted to

see how this would play out naturally" (Round 1 Interview). The tension between offering support and not stepping in was difficult for the original research team. When asked about how the hands off approach affected backsliding, Jess responded, "It definitely impacted the project…but I don't know how much more we could be involved without actually doing it for them" (Round 2 Interview). One of the early instances of backsliding was during the instant activities for PE. By the middle of the first year of implementation, the instant activities had stopped. Haley said," [The instant activities] just took too much time and planning, so we attempted to speed up roll call instead of [doing the] activities" (Round 3 Interview). Nevertheless, students expressed an interest in having the HPE teachers bring back the instant activities, especially since they had to run CV day without warming up first. Taylor said, "We started these warmups, and then they stopped. I don't know why, but I wish we had them. It is hard to run the CV day with no warmup" (Focus Group Interview). Perhaps during this period of program implementation, better communication between the HPE teachers and the students or providing the HPE teachers with helpful time saving strategies to implement the instant activities could have prevented backsliding from occurring.

Another challenge was the integration of HOPE programming into classroom PA programming, which never got off the ground. Classroom PA was the only program component the HPE teachers did not initiate (Tammy and Eric, Round 1 Interview). Rather, the principal investigators of the original research team (Tammy and Eric) attempted to initiate the program but the timing and resources were issues. Tammy explained that the Classroom PA component was introduced "at the end of Year 2 and then we really couldn't find PA with academic content at the middle school [so] the

interest [from classroom teachers] was not that strong" (Round 1 Interview). There were also problems communicating with the classroom teachers (Eric and Tammy, Round 2 Interview). For example, the principal was made aware of the effort to train classroom teachers in PA strategies, and the original research time was given a slot during a professional development day to run their training (Tammy, Round 2 Interview). However, the principal did not clearly communicate with classroom teachers that the training could count as professional development, so there was only a handful of teachers that showed up (Eric, Round 2 Interview). The communication struggle exposed that while the principal was supportive of the HOPE program, and was made aware of school PA policies supporting classroom PA (Eric, Round 2 Interview), he was not an active participant in the program (e.g., he did not communicate with classroom teachers about the program, only wanted to be notified if something went wrong, [Eric, Tammy, Gracie, Jess, Round 2 Interview]). Eric said, "[The principal] was hands off. He wanted to be kept in the loop and he would approve or disapprove but that was really the extent of it" (Round 2 Interview).

The level of extra work involved with implementing HOPE was also a challenge. Eric stated that HOPE was "really labor intensive and required lots of extra hours and [the HPE teachers] got tired, we got tired" (Round 2 Interview). The additional time and planning began to take its toll on the HPE teachers. Aspects of programming, such as the instant activities and the running club, stopped because "it took so much time and planning and there is so much going on" (Rachel, Round 3 Interview). Additionally, Deb told us, "I know it sounds like a little thing (writing the newsletter) but it comes up so fast and it's10 minutes here and there and it all adds up" (Round 3 Interview). Compounding

the time problem, during the second year of the program the funding ran out, so the intramural leaders who were being paid no longer got paid. However, through problem solving, the HPE teachers approached the principal and asked to use funds raised through the CV Classic to fund the intramural program. This allowed the intramural program to continue throughout the second year of implementing HOPE (Documents- Meeting Minutes). Finally, in the first year of implementation, the parent health night was well attended but the students were required to attend with their parents so it created "a social hour for the students and it was loud and nobody really knew what was going on" (Haley, Round 3 Interview). In Year 2, the HPE teachers attempted to improve the event by not allowing students to attend but this reduced attendance from 40 to less than 30 (Documents- attendance sheet). Deb made a suggestion that in the future, "parent health nights should really be attached to things already happening in the school like open houses or something else" (Round 3 Interview).

The major challenges included backsliding, a breakdown in communication structure, the inability to get classroom teachers involved in integrating the HOPE program, running out of funding, and implementing the parent health night. With respect to backsliding and the lack of communication, Durlak & DuPre (2008) suggest training and technical assistance are important enabling factors that the prevention support system should provide. As mentioned earlier, it is recommended that provider trainings give providers the skills necessary to implement the program and that retraining be offered when needed. In the case of Charter's implementation of the HOPE-based CSPAP, such training could have prevented backsliding from occurring and also improved communication between the HPE teachers and the original research team. The tension

between the hands off approach, backsliding, and the communication structure seemed to present a barrier to program implementation and lead to a reduction in the extent of HOPE programming.

Furthermore, while Charter's principal was aware of PA policy (Eric, Round 2 Interview), it is unclear whether he shared this information with classroom teachers. It has been shown that when classroom teachers are more aware of school PA policies, they are more likely to report implementing PA opportunities in their classrooms (Webster et al., 2013). Durlak & DuPre (2008) recommend that the provider and the provider's community be made aware of policy related to the program being implemented. The principal's lack of involvement with the HOPE program can be further examined in relation to Durlak and DuPre's (2008) administrative support variable. More direct support from the principal could have served as a source of encouragement and motivation for the HPE teachers and the classroom teachers, and may have helped to integrate HOPE across the school. Finally, Durlak & DuPre (2008) suggest that funding is not necessary for programs, but often prevention support teams fail to provide sufficient monetary support for implementation, which was the case in the present study. Despite the challenges presented, there were still several implementation successes, including intramurals, the positive work climate, the initial communication structure, and the resources the HPE teachers were provided.

Sustainability of HOPE

The third theme was the sustainability of the program. There were two subthemes: (a) continuation of HOPE programing, and (b) what was needed for better sustainability.

Continuation of HOPE programming. One of the HOPE programs that sustained after implementation (during Year 1 and/or Year 2) is the intramural program (Field Notes). Yet, despite its popularity, late in the Fall of 2016 " the principal cancelled the program because he couldn't afford to keep paying us to run the program, and the funding from the CV Classic was being used to fund the school nurse" (Antwon, Round 3 Interview). A couple of months later, however, the principal reinstated the program. Antwon explained:

> The principal said, 'well coach, I really need to start this back up.' [He] saw the benefit, and the kids that used to come were standing around the school before and after school…and the parents, they supported it. So they found money to compensate us for our time – it's like an extra 15-20 hours a week to run the program. (Round 3 Interviews)

The principal's vacillating support of the HOPE program demonstrates how integral administrative support is to program implementation, consistent with Durlak & DuPre's (2008) model (e.g., direct administrative support).

Despite the non-continuance of most aspects of the HOPE program following the second year of implementation, traces of the program's influence on Charter were observed in the aftermath of the initial two years. In some cases, higher moderate-to-vigorous PA content units were observed in PE. For example, soccer and Ultimate Frisbee were observed being taught, but so were kickball and volleyball (Field Notes). Rachel discussed how she is still searching for and implementing higher moderate-to-vigorous PA content, such as "Tchoukball, because it is novel and the kids loved it and they are moving the whole time and learning skills" (Round 3 Interview). In addition, the

teachers are still using the I-Pads to track the CV day times, take pictures, and keep track of heart rates (Field Notes). The CV Classic, which was in place before the implementation of the HOPE program, is still going strong and continues to be an annual event for Charter (Field Notes, Documents-Picture).

Other pre-intervention aspects of a CSPAP have also continued at Charter, including before and after school programming, staff involvement (but only HPE teachers), PE, and community and parent engagement (through the CV classic). The only CSPAP component missing from the school's approach to PA promotion is PA during school (i.e., beyond PE). If classroom teachers were more involved in the PA programming or were more aware of the program and their potential role as PA promoters, perhaps they would be more inclined to integrate more PA opportunities in their classrooms. The components of the HOPE model that continued are before and after school PA, sports games and other movement forms (offered during PE and intramurals), community-based PA programming (CV classic, was already a part of the school before HOPE), health related fitness (taught in health and PE), diet-nitration for physical activity (taught during health). The components missing are PA literacy, family home education, during school PA, and integration HOPE programming across all schools subjects. In the subsequent section, what was needed to better sustain the HOPE-based CSPAP is discussed.

Linking sustainability with Durlak & DuPre's (2008) model, the funding issue for intramurals stands out. Securing funding for the duration of the intervention may have led to uninterrupted programming and a clearer sustainability path. However, even though Charter's principal maintained distance from the program implementation process and

cancelled the intramurals program, he later reinstated the program when he saw the support it was receiving from students. Administrative support for CSPAPs is a key component of program implementation (Deslatte & Carson, 2014; Durlak & DuPre, 2008; Webster et al., 2013). Additionally, Doolittle & Rukavina (2014) found that administration was supportive of CSPAP programming when the programming benefited all children positively (i.e., the intramural program designed to be inclusive for all students). In the same study, support for programming was garnered and sustained from parents, classroom teachers, and administrators which in turn helped the CSPAP programming sustain (Doolittle & Rukavina, 2014). The support was fostered through the programming having positive benefits for students which increased teacher satisfaction. Teacher and student satisfaction with programming builds organizational capacity (e.g., positive work climate, organizational norms regarding change, [Durlak & DuPre, 2008]). Integrating HOPE programming beyond physical education so that teachers could see the positive benefits may have helped garner more support and help with programming.

What was needed. When asked about any support or sustainability plans that were offered for the continuation of HOPE, Eric told us, "We left [the school] with some resources (the ones we gave and some resources about organizations that might offer funding) but nothing more than that" (Round 2 Interview). Additionally, Gracie commented, "There were no real sustainability plans before we left. Maybe we should of [made some]" (Round 2 Interview). Deb described an issue she had with the sustainability of the funding of the intramural programming:

> Just a little bit like it turned out to be a lot of money, you know that they offered (grant funding), and then to continue that to sustain that, has been kind of an

> issue, not really a big issue, but just like they offered almost an hourly rate, and the school cannot keep that up, so that's something that you know… but if they continue to do that, that is something that you know to communicate with the principal. (Round 3 Interview)

The money for running the intramural program was an incentive, and it seems that the grant offered more money than then the school would be able to sustain the program. This played out in the cancellation of the intramural program post the HOPE implementation. During the implementation, better alignment with payment for intramurals and what the school would be willing to pay after the funding ran out may have prevented the disruption of the intramural programming.

There was also a lack of continued communication from the original research team after the two-year intervention period. Julie stated

> [We] kind of keep in touch casually, socially, but in terms of offering to help [the HPE teachers] sustainability-wise with the program, or them coming to us with any additional ideas or questions or new things they want try, none of that happened to my knowledge. (Round 2 Interview)

Durlak & DuPre's (2008) identify shared decision-making, coordination with other agencies, communication, and the formulation of workgroups as important enablers to program sustainability. The findings presented earlier in this paper that related to program implementation suggested that shared decision-making, the formulation of work groups, and positive communication existed within the HPE teachers and within the original research team. However, these attributes, as well as coordination with outside agencies, were lacking from a sustainability perspective. The original research team

suggested that helping the HPE teachers connect with outside agencies might have helped with funding and sustainability of the HOPE programming. Community engagement is also identified as a key part of a CSPAP (CDC, 2013). The findings from this study suggest that partnerships with other agencies/organizations beyond the school are necessary for sustainable CSPAP programing. Additionally, in this case, there was a mismatch between the funding the prevention support team offered and what the school could sustain when the money ran out. Perhaps a budget could have been part of the sustainability plan and/or one of the resources sought in a partnership with outside agencies. It seems that a clearer sustainability plan, partnerships with other agencies, checks ups and additional communication from the original research team may have helped the teachers sustain the program following the two-year intervention.

Recommendations for the future

The final theme that emerged was recommendations for the future with two subthemes: (a) partnerships and (b) a business approach.

Partnerships. Partners should have clear understanding of their respective roles, a clear commitment, and how the funding structure would work. In this study, there were three distinct partnerships with three different relationships. Partnerships existed between Charter and the original research team, Charter and the funding agency, and the funding agency and the original research team. As discussed earlier, the relationship between Charter and the original research team was strong and the relationship between the Charter and the funding agency was distant. The relationship between the funding agency and the university original research team was challenging. Eric explained, "They had perceived authority with no real partnership commitment on their side. We met monthly

but whenever we had questions about funding they could never answer and had to get back to us" (Round 1 Interview). There were several documented struggles with how funding resources could be used. Angela described how after the completion of the project she learned some important lessons:

> This was the first project where we were collaborating externally with an organization, particularly…where we had funds to give another agency, in terms of my role just being more knowledgeable of the various mechanisms (for example like securing IRB approval, and understanding various ways to allow funding to leave the [funding agency] and go to another agency). I think improving my knowledge, based on my experience, I feel much more confident taking on a project of this scope. However, having it be the first one, that proved a bit of a challenge. (Round 1 Interview)

Beyond the struggles with funding and perceived authority all three partners agreed that they saw partnerships as an ideal and important way to continue school PA programming. Angela states "I think we can play a role or capacity to ensure the program can remain sustainable and provide guidance and support" (Round 2 Interview). Jess follows up this statement by saying "I think partnerships go a long way in improving what we did, and helping them find other partnerships like ones with facilities right around the school might help with sustainability" (Round 2 Interview). Tammy suggested, Student teachers could help with sustainability and partnerships "cause the student teacher supervisors can check in on them" (Round 2 Interview). Michelle echoed this sentiment, describing how student teachers could give "fresh new ideas" (Round 3 Interview) on how to implement PA programming. Finally, Eric suggested, "Particularly

for the assessment part of the project, it was pretty clear that the teachers and Charter didn't have the ability to assess the effectiveness…so that's where we come in" (Round 2 Interview).

Durlak and DuPre (2008) do not address having a sustainability plan as part of the their model. However, within the CSPAP literature, Webster et al. (2015) recommend having university students add to the support structure for school professionals to implement and sustain CSPAPs, particularly through service learning. Service learning has great potential as a flexible component of classwork and has shown great promise in public health and preventive medicine fields (Rosencranz, 2012). Service learners can bring innovative ideas and practices directly to schools, while also equally benefiting the provider and recipient (Cashman, Sarena, & Seifer, 2008).

Business Approach. After the completion of the project Eric stated:

> We learned with this is that in takes a huge amount of resources – time, personnel, materials, funding, support – to get a HOPE CSPAP in place, and that, if it is going to work at all, the conditions have to be just right. I think for me in particular, the biggest thing that I learned about HOPE and a CSPAP is that it is not realistic…or not very sustainable in all but for a very few schools. (Round 2 Interview)

Even though Eric felt that HOPE and a CSPAP was not very realistic, he did offer some insight into how the CSPAP and HOPE models could be approached as a business model for training and sustainability. Eric described this approach as follows:

> You have to know how to get kids up and moving and how to access that, but in terms of implementing all of the components to the CSPAP or the HOPE model,

> it really is a start-up business analogy, and maybe that is what the training needs to be based on, not the physical activity model … do one thing well and then when you are comfortable and able to sustain that one thing well, then pick another one, then when you can sustain that, pick another component. The reality is that for most teachers, especially if you look at the predominance of one PE teacher in elementary schools, trying to do more than have a quality PE program and perhaps an after school program is…that might be the best that can happen in a one teacher school. (Round 2 Interview)

Furthermore, Eric went on to suggest that "They [HPE teachers] don't know how to market, they don't know how to brand, they don't know how to initiate their social marketing, and they don't know how to find potential partners. We need to teach them how to start a program with these components, like a business model" (Round 2 Interview).

Recently, SHAPE America (2014) announced its partnership with Let's Move Active Schools and developed a Physical Activity Learning system, which includes training that is centered on content knowledge, leadership, communications, and collaboration. The findings from this study support the need for in-depth training related to CSPAP promotion, which mirrors results from Carson et al., (2014) supporting the idea that PE teachers need in-depth training related to CSPAP programming. Additionally, a needs assessment might have helped the university research team and the HPE teachers' better target areas that need improvement. Conducting a needs assessment is Step 2 of SHAPE America's and the CDC's (2013) step-by-step guide for implementing a CSPAP. A needs assessment may have strengthened the presence of

Durlak & DuPre's (2008) characteristics of the innovation, specifically related to adaptability. For example, a needs assessment could have been used to adapt the HOPE-based CSPAP to the specific needs of Charter and the HPE teachers, which may have increased program adoption and sustainability.

Conclusion

In this study, the HPE teachers were experienced, had a variety of resources at their disposal, and the HOPE-based CSPAP was implemented in nearly ideal conditions with 7 HPE teachers, ample space, administrative support, external funding and an established school-university partnership. However, the HPE teachers still struggled with various parts of the HOPE programming (e.g., newsletters, marketing, instant activities). One suggestion was to approach CSPAP trainings and implementations as a business model. For example, trainings would provide teachers with advocacy and marketing skills for CSPAP programming. Carson et al. (2014) found that professional development trainings for CSPAP leaders provided the skills necessary to increase students moderate-to-vigorous PA levels, but suggested that trainings move beyond how CSPAPs fit within a schools context to specific implementation strategies for CSPAP. These specific skills (e.g., implementation strategies, marketing skills) are taught with the Physical Activity Leader (PAL) training system (SHAPE America, 2014). Future research should examine the process and effectiveness of the PAL training and other CSPAP trainings to see if they are preparing leaders for their roles in CSPAP. Additionally, future interventions should use needs assessments (see the Let's Move Active Schools website at www.letsmoveactiveschools.org, CDC, 2013), such as the School Health Index Self-Assessment Guide (CDC, 2014) to find components and programming that are the best fit

with their intervention schools, which ties into the business model suggestion (e.g., performing a needs assessment). The use of Durlak & DuPre's (2008) model proved to be a valuable tool for describing the study design, implementation, and sustainability of an ecologically valid CSPAP in this study. The framework helps to explain why some parts of the program were sustained while others were not. For example, early monitoring and training could have prevented some of the backsliding that occurred and is a strategy that future interventions should include. Furthermore, the school-university partnership showed promise because of some of the specific resources provided (e.g., measurement, evaluation, and sharing of initial results) served as a motivator for the HPE teachers (a form of technical assistance, [Durlak & DuPre, 2008]). Finally, the duration of the study allowed for the HPE teachers to see positive change occur. Teachers need to time to see change in their practices so they can see change in outcomes, and the crucial change in teachers' behavior occurs when teachers experience successful implementation (Gusky, 1989; Gusky, 2002). Finally, administrative support was crucial in this study and has been identified as a crucial part of CSPAP implementations (Deslatte & Carson, 2014; Durlak & DuPre, 2008; Webster et al., 2013). Expanding the HOPE-based CSPAP beyond physical education may have garnered more support from administration earlier and helped foster support from other teachers in the school. A limitation of this study was that interviews with stakeholders were conducted between six and ten months after the end of implementation. Nevertheless, to the best of the authors' knowledge, this is the first study to examine implementation and sustainability of a fully implemented HOPE-based CSPAP. Continued research is needed on the implementation and sustainability of full CSPAPs, as well as on the processes and effectiveness of CSPAP staff trainings, so

that we can adequately train staff in the skills they need and design CSPAPs that have the best chance at adoption and sustainability.

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Table 4.1. HOPE strands, CSPAP components, implementation, and sustainability

HOPE Strand	CSPAP Component	Program at School	Year Implemented	Sustainability
Before/During/After School PA Programming	Before and After School PA programming During School PA	Before and After School PA program, Kilometer (K) Kids	Year One	Intramurals sustained K-kids cancelled
High MVPA Connected for PE units and Lessons	Physical Education	Restructure CV days*, Restructure Choice Days* Students setting goals for CV day, Higher PA content Instant Activities (warmup), Resources for high MVPA content, SPARK Curriculum	Year One	Continued to use resources for CV days, choice days didn't change, some higher MVPA content , no use of SPARK
Family Home Education	Family and Community Engagement	CV Classic *, Health/Activity Fair Announcements in school newsletter and website	Year One	CV Classic Sustained
Community Based PA programming	Family and Community Engagement	Announcements in school e-newsletter , Community Board	Year One	None
Health Related Fitness	Physical Education	Increased unit and lesson time for MVPA, Content time for health and PA knowledge, Student Posters and presentations at family night, Fitness testing***	Year One	Some higher MVPA content used
Diet and Nutrition for Physical Activity	Physical Education	Increased content time for PA-diet knowledge in PE and health units, Student posters at parent/family events, School Garden**	Year One	None
PA Literacy	Family and Community Engagement Physical Education	PA Health Fair for parents and families Information in school e-newsletters	Year One	None
Integration of HOPE across the school	During School PA Staff Involvement	Classroom teachers PA training ***	Year Two	None

*Already existed at school prior to HOPE **School garden existed but integration into health and PE classes was added
***Implemented by implementation team

Table 4.2. Key Informants, type of data, length, and description

Key Informants	**Type of Data**	**Length**	**Description**
Implementation Team (Eric, Tammy, Jess, Julie, Gracie)	Round 1 Interview: Individual Semi-structured Interviews	Range=36.55-57.52 minutes Mean= 48.24 minutes	Description of the implementation process, organization, leadership structure, processes
Implementation Team (Eric, Tammy, Jess, Julie, Gracie)	Round 2 Interview: Individual Semi-structured Interviews	Range=61.49 -110.69 minutes Mean= 79.8 minutes	Expansion of first interview with follow up questions, perceptions of the role they played, enablers and barriers, planning, and sustainability
Funding Agency (Angela)	Round 1 Interview: Individual Semi-structured Interviews	27.05 minutes	Description of the implementation process, organization, leadership structure, processes
Health and Physical Education Teachers (Deb, Haley, Rachel, Brooke, Michelle, Antwon, Lucas)	Round 3 Interview: Individual Semi-structured Interviews	Range= 24.39-54.49 minutes Mean=39.65 minutes	Description of their role in the programs, challenges, barriers, take home messages, and sustainability
8th grade students (Jack, Frances, Marcus, Jill, Taylor)	Focus Group Interview	22.30 minutes	Understand student perspectives and experiences with the HOPE based CSPAP that was implemented when they were in grades 6-7th and the sustainability of the program
Field Observations	Field Notes	Not Applicable	Observations during physical education class, health class, and before and after school programming. The observations spanned two different health and physical education 9 week classes.
Presentations	Documents	Not Applicable	Two presentations given about the project at SHAPE-PETE HETE in Atlanta, Ga.
Documents	Documents	Not Applicable	Lesson plans, meeting minutes, organizational charts, field notes, official reports, pictures (taken during implementation and by lead author)

CHAPTER 5

DISCUSSION

This dissertation consists of two studies that in tandem contribute to the literature base on comprehensive school physical activity programs (CSPAP). Specifically, both studies explore the use of school-university partnerships for the implementation of CSPAP. Study 1 examined the implementation of a program targeting physical activity (PA) during school (a component of CSPAP) through movement integration (MI) in elementary general education classrooms. Study 2 examined the implementation and sustainability of a Health Optimizing Physical Education (HOPE)-based CSPAP, which integrated the HOPE curriculum into a full five component CSPAP in a middle school physical education program. The following discussion will explore how the results and findings of both studies support the use of school-university partnerships for the implementation and advancement of CSPAPs.

University trainings and resources

The results and findings of both studies reveal the importance of university-led trainings and resources provided to the teachers for implementing PA programming. In Study 1, classroom teachers reported that they did not use the online community of practice (CoP) offered to them as part of the intervention. The researchers thought that the CoP would connect the teachers with others implementing MI, and this new resource would increase the amount of MI the teachers used. However, teachers who received only

the CoP component of the intervention decreased the extent of classroom-based movement opportunities they provided. The teachers explained that receiving the online resource (CoP) in the summer might have been more helpful for them because they would have more time to work with and learn how to use the resource during their summer planning time. Another strategy to improve the effectiveness of a CoP for MI might be to foster and encourage member communication and collaboration within the CoP to help develop a community atmosphere (Zhao, Lu, Wang, Chau, & Zang, 2012; Probst & Borzillo, 2008; Vescio, Ross, & Adams, 2008).

In Study 2, the teachers attended intervention training during the summer months and the teachers reported that receiving the training during the summer was helpful because it allowed them time to plan for the upcoming year. However, the content of the training may have needed to shift from providing resources and information to an in-depth training focused on PA promotion skills, marketing, and garnering funding opportunities. For example, Durlak & DuPre (2008) suggest that trainings and technical assistance offered to providers delivering interventions should ensure their proficiencies (e.g., marketing skills) at delivering the intervention and foster teachers' self-efficacy. Additionally, the trainings need to be tailored to the teachers' specific needs. After the trainings are completed, provider support should include follow up resources, early monitoring, retraining, and assisting teachers in the development of problem solving skills (Dulak & DuPre, 2008). For instance, early monitoring after the delivery of trainings has been linked to increasing implementation fidelity (DuFrene, Noell, Gilbertson, & Duhon, 2005).

Communication and feedback from the university

In both studies, the university research team offered support to the teachers implementing the programs through the use of goal setting and the sharing of initial results. This was done in an effort to help teachers understand their current PA promotion effectiveness, monitor their progress in implementing the programs, and consider strategies for continued implementation. In Study 1, goal setting, the sharing of initial results, and reminder emails were design features of the community-based participatory research (CBPR) intervention component. The CBPR component of the intervention showed the most promising results for helping teachers increase their use of MI. Additionally, the teachers reported feeling connected to the research team because of the CBPR component, which may have been a reason for the teachers' successful program implementation. CBPR fosters collaboration between researchers and the participants, which helps to develop context-specific (i.e., individualized) goals and PA promotion strategies (Israel et al., 2013).

In Study 2 the teachers reported they enjoyed seeing the initial results (shared by the original university research team) because they were eye opening and inspired them to want to continue implementing and improving PA programming. The research team reported that they felt that the most useful resources they provided the teachers were the measurement (program monitoring), evaluation, and the sharing of initial results with the HPE teachers. The research team had expertise in measurement and evaluation, and this expertise may be important because teachers may not be as comfortable measuring and evaluating PA programming, either due to a lack of time or lack of the appropriate skill base. Measurement and evaluation results are an important part of the prevention support

system, as they can help providers to accurately identify needs and benefits of the programming, which is all linked to better program adoption, implementation and sustainability (Durlak & DuPre, 2008).

Service learning

In both studies, teachers reported that service learners would be beneficial to them in their efforts to try and increase PA programming. In Study 1, only one of the three schools receiving the intervention received the service learning (SL) component. Even though this component did not uniquely contribute to increases in observed MI, teachers who received this component reported that they liked seeing the university service learners implement MI with their students, and it gave them new ideas to try in their own teaching. Additionally, teachers who did not receive the SL component were excited about the possibility of getting service learners later on in the intervention. In Study 2, teachers reported that having service learners come to their school would help them learn new PA promotional skills and programming. Universities provide a particularly amenable platform for the development and sustainability of SL initiatives. For example, universities can train pre-service teachers in PA promotion strategies and then send these students to schools to practice implementing the strategies (Webster et al., 2015). Both the university and the school benefit from this model because school professionals receive external support from the service learners and the service learners receive optimal, authentic learning experiences consistent with the goals of preservice teacher education and other professional preparation programs. Overall, SL has the potential to expand resources for implementing school health promotion programs (Rosencranz,

2012). Continued research on the use of SL as a strategy for school-university partnerships related to CSPAP programming is warranted.

Prolonged partnership and incremental approach

Both studies were implemented over the course of two academic years. In Study 1, the results and findings are only for the first year of the intervention, but many of the teachers reported that they needed additional time to learn MI strategies and implement the strategies. In Study 2, a staggered implementation over 2 years of the HOPE-based CSPAP programming was used as to not overwhelm the teachers. A major finding from Study 2 was that the HOPE-based CSPAP took a lot of work to implement and that implementing one component of a CSPAP at a time may be helpful for sustainability. Growing each component to the point where it is strong and sustainable before adding additional components may be a key strategy for program sustainability. In both studies, the 2-year duration of the intervention seemed to be a strength of the implementation design. Research on professional development has shown that programs should allow teachers time to change their practices so they can see a change in student outcomes (Guskey, 2002). The crucial element for a change in teachers' behaviors occurs when they experience successful implementation (Gusky, 1989; Gusky, 2002), and prolonged professional development is a recommended practice for teacher change (Armour & Yelling, 2004; Patton & Parker, 2012; Shelton & Jones, 1996; Ward & Doutis, 1999).

Both studies were designed with sustainability in mind because the interventions were both run by the teachers at the school, while the university provided what the research teams felt were the training and resources the teachers needed for successful

implementation. The sustainability results of Study 1 are not yet available but the teacher interviews after the first year of implementation suggest there is potential for program continuance. In study 2, portions of the PA programming were sustained a year after the end of the intervention. Universities seeking to partner with schools should consider designing interventions that are implemented by teachers and school personnel with the university serving as part of the support network. University support should be provided over an extended amount of time to allow teachers the time to develop their skill proficiencies and self-efficacy (Durlak & DuPre, 2008), and to allow the change process to occur (Gusky, 2002).

In summary, school-university partnerships show promise for the future of CSPAP programming. Universities can offer valuable support to schools through measurement, evaluation, the sharing of results, and trainings designed to help teachers gain the skills necessary for PA programming. Additionally, these trainings can be on-going through mechanisms such as CBPR and SL. While the school-university partnership approaches explored in this dissertation were relegated to cases where the schools and the university were in close proximity, it may also be possible to use distance education platforms to expand the reach of the university as a support system for schools implementing CSPAPs. Future research should continue to explore the use of partnership approaches as a viable strategy to maximize the capacity of schools to effectively, and sustainably, promote and increase youth PA.

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APPENDIX A: SOSMART DESCRIPTION

SOSMART: System for Observing Student Movement in Academic Routines and Transitions

Technical Description

SOSMART is conceptualized as a two stage decision system.

Stage 1. Classroom teacher involvement.

The first phase requires a decision to be made about the involvement of the classroom teacher by answering the following question: Did the classroom teacher give a direction to be active?

If YES: The observer moves on to code teacher involvement behaviors (teacher directive variables, instruction variables, and movement variables), then proceeds to Stage 2 (student response variables).

The teacher directive **(TD)** variables describe who was in charge when the directive was given: *regular classroom teacher **(ct)** or other **(o)**.*

The instruction variables describe how the teacher gave the direction: teacher-led **(T)** or technology-led **(C)**. If it was teacher-led **(T)**, the following context variables are also identified: verbally **(v)** and/or with demonstration **(d).**

The movement variables classify the activity into one of four different categories: a reward or incentive **(R)**, an opening activity **(O)**, a teacher-directed transition **(TT)**, or other movement **(OM)**. Within these categories, the following context variables are also identified:

- A OM can be infused with academic content **(a)** or non-academic **(na)**. If the OM is **(a)**, the academic content should be coded: language arts **(la)**, math **(m)**, science **(s)**, social studies **(ss)**, or other **(o)**.
- A TT is when the teacher has students walk from point A to point B. If the teacher has students do *anything more than walk* normally from point A to point B (i.e. any other locomotor movement (run, hop, skip) and/or modifies the movement to increase activity (walk by taking 21 steps), it is coded with a **(+)** to denote a TT with added activity.

If NO: The observer moves on directly to code Stage 2 (student response variables).

Stage 2. Student response.

The second phase requires a decision to be made about the response of the class by answering the following question: How did students respond?

If YES to Stage 1: The observer records what part of the class is active (whole class **(W)**, part class **(P)**, or small group **(G)**). Context variables identify how much of their body is active (upper body only **(ub)**, lower body only **(lb)**, or full body **(fb)**) and off-task behavior **(o)**.

If there is a student who cannot participate (due to disability or injury), please make a note in the comment section on the coding form and exclude this student from your coding (i.e. do NOT count this individual as 'inactive').

If NO to Stage 1: The observer records what part, if any, of the class is active (whole class **(W)**, part class **(P)**, small group **(G)**, or none **(N)**) and the observable reason for that movement (as a result of something in the physical environment **(E)** or as a result of a non-teacher directed transition **(NT)** like getting supplies or using the bathroom). Within these categories, context variables identify if the NT reflects added activity **(+)** and/or off-task behavior **(o).**

APPENDIX B: SOSMART CODING AND GROUND RULES

SOSMART: Coding Ground Rules

- Only code what is seen on the screen. If a student or adult goes off-screen, assume the behavior from the previous interval continues, and code it that way, until the individual appears back on screen and you can observe the individual again.

- If you do not clearly hear what the adult says (i.e. directive or reward), do not code it as a directive. If you do not clearly hear the directive, you code it as NO (for TD).

- If you can't identify through observation *who* the person is that gave the directive (i.e. not sure if it's a parent helper or the teacher assistant or a university student), code as (o) for *other*.

- If there is a student who cannot participate (due to disability or injury), please make a note in the comment section on the coding form and exclude this student from your coding (i.e. do NOT count this individual as 'inactive').

- When *a MT continues across multiple consecutive intervals*, use the symbol **(-)** to denote the continuation.

- When a teacher directs a small group to be active (i.e. the teacher calls table by table to do something), code each instance of teacher directed behavior.

    - Recode each new instance and code the students active ONLY in response to the individual directive.
    - If it's close to 50% of the class, and you're not exactly certain, code it as P.

- If, at first glance, more than 1/3 of the class appears to be off-task when you are coding SA, the code **(o)** (off-task) is used as a context code, written in subscript.

- If two different codes occur in one 20 second interval (i.e. there was a teacher directed transition (TT) and then another movement (OM) all in one interval), and one of the (codes) continues into the next 20 second interval then you must re-code it in the next interval. If it continues after that initial re-coding, then you may should use the dash symbol (-) for as long as the code continues.

- In the event of a fire alarm, intruder alert, or other school-wide emergency, please stop coding, make a note in the comment section, and follow school protocols (i.e. do not code as a teacher directed transition (TT)

APPENDIX C: SOSMART CODING SHEET

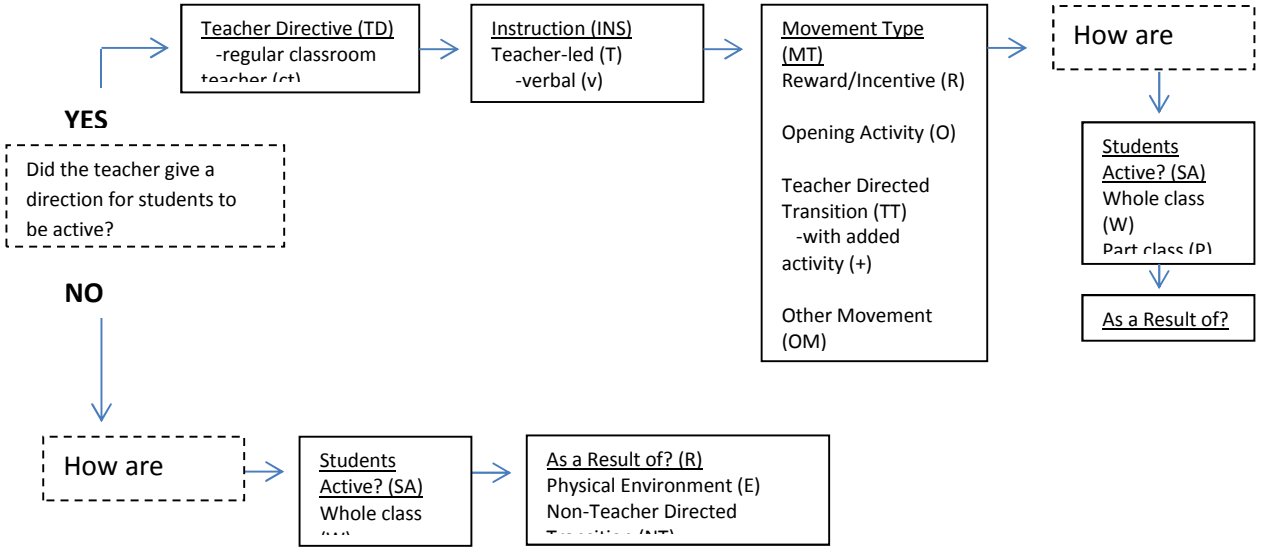
SOSMART Observational System

Recording and Reliability Sheet

		Intervals											Intervals								
		1	2	3	4	5	6	7	8	9			1	2	3	4	5	6	7	8	9
TI	TD										TI	TD									
	INS											INS									
	MT											MT									
SR	SA										SR	SA									
	R											R									

		Intervals											Intervals								
		1	2	3	4	5	6	7	8	9			1	2	3	4	5	6	7	8	9
TI	TD										TI	TD									
	INS											INS									
	MT											MT									
SR	SA										SR	SA									
	R											R									

APPENDIX D: SOSMART FLOW CHART



APPENDIX E: SPRING 2015 TEACHER INTERVIEW PROTOCOLS

Purpose (for the researchers only)

The interview should focus on the teacher's experiences participating in PACES. Questions primarly focus on what helpful, or what could be improved, regarding PACES intervention components (the Move for Thought Community of Practice, Community-Based Particpatory Research, and Service Learning). Additional questions are designed to explore changes in the teachers' perceptions and pracices related to classroom-based phsycial acitivty since the fall semester (baseline).

Introduction (to be read to the particpants)

The purpose of the itnerview is to discuss your viewpoints and expericnes with PACES. In the fall, you were interviewed about yoru perspectives related to physical acitivty promotion during normal classroom time. Today's interview is an extension of that first interview.

Remember that physcial acitivty is defined as any body movmement that owrks your muscles and used more energy than when you are resting. Although phyiscal acitvity is sometimes goal-directed and delibarite such as when people exercise to reach health goals, it does not have to be. For instance, phsycially moving to different centers in a classroom or wlakign to a class are examples of being physically active even though the behavior is incidental. Physical acitvity can also range in both intentsity and duration. It does not have to make you sweat or lose your breath and it does not have to last more than a few seconds. For the purpose of our discussion today, we will be referring to this broad definition of physical acitivty.

We will make sure to not go longer than one hour, whether or not we address every question.

Do you have any questions before we begin?

Questions of All teachers

1. **At the beginning of this semster, we shared information with you about how physically active, and how sedentary, your students were at schol during the fall semester when not in P.E. Based on this information, we established or attempted to establish, classroom physical activity goals for this semester. Did we identify goals for you?**

- If so….
    - What were the goals?
    - Did you reach the goals? How do you know?

    - As we continue the PACES intervetnion, what seem like realistic goals in your classroom with respect to intergrating physical acitivty and reducing sedentary time?
- If not…
    - Did you consider any goals during the semest?
    - As we continue the PACES intervention, what seem like realistc goals in your classroom with respect to intergrating physical acitivty and reducing sedenatary time?
    - What, if anything, would you change about the approach we used to set goals with you this semester?

2. **Describe your experiences this semster with the online comppumity of practice (Move for Thought?**

- In what ways was the resource helpful to you?
- What was it like navigatting the site?
- What activitites did you you use from the site?
- What, if anything, would make the resource more helpful to you?

Question fo CFK-N and HWES Teachers

3. Periodically this semster, the PACES resarch team emailed you with reminders and to ask wheter you needed any addition support pormoting pbhysical acitivty in your clasrooms. Describe what role, if any these communications played in supporting your efforts to intergrate physcial activity into your classroom enviroment?

- In what wyas were you able to take advantage of extra support from the research team to promote physical activity in your classroom?
- How useful was this additional componet of PACES for you compared to the Move for Thought website?

Question for HWES Teachers Only

4. Describe your expereinces this semester with the service learning component of PACES.

- What did you like about the service learning component (scheduling, impact on studetns, impact on teacher)?
- What could the PACES team do to improve the service learning component?

Questions for All Teachers

5**. So far, what PACES components or resources have been the most helpful to you in your efforts to provide your students with physical acitivty opportunities in your classroom (e.g., Move for Thought, additional commmunications/support from research team, service learning, specific activities you found/observed).**

6. Moving forward, what more can the PACES team do to mazimize oppurtunities for your students to be physically active in your classroom?

- What more can we do to facilitate your efforts to promote physical acitivty and reduce sedentary time in your classroom?
- What other resources should we consider to help foster an active classroom enviroment for your students?

7. Based on your experience so far recievng PACES resources, desrcibe any changes since last semester in your perspectives about physical acitivty promotion during normal classrom time?

- What, if any, are the **advantages** of providing children with these oppurtunties (for children, school, teacher)
- What, if any, are the **disadvantages** of providing children with these oppurtunties (for children, school, teacher)
- **Is it realistic** for classroom teachers to intergrate physical acitvity during normal classrom time? (explain your reasoning)
- What types of things might classroom teachers do to intergrate physical acitivty oppurtunties into normal classroom time?

8. **What are your favorite strategies to get your stduents active or reduce sedentary time in your classroom? Why do you like these strategies?**

- Have you used **brain breaks?** (If so, please give an example, if no would you be willing to?)
- Have you **infused activity into academic lessons**? (If so, please give an example, if no would you be willing to?)
- Have you **incorperated activity into transitions?** (If so, please give an example, if no would you be willing to?)
- Have you **incorperated activity into classroom routines**? (If so, please give an example, if no would you be willing to?)

9. **What factors do you think influence the extent to which you provide physical activity opprutnitiy to children in your classroom?**

- Describe how your **personal experiences** outside of school, such as sports particpation, expereines in physical activity settings like physical educaiton, having children, personal and family health history, might influence your ablitiy or tendency to provide physical acitivty oppurtunties in your classroom?
- Describe how your **proffesional experiences** that might influence yoru ablity or tendency to provice physical acitivty oppurtunties in your classroom (e.g., proffesional preperation, previous employment, training)

- Describe how yyour **students** may influcne your ability or tendency to provide physical acitivty opportutnies in your classrooms (e.g., boys/girls, special needs, age, interests, culture/ethnicity, SES, teacher-student ratio).
- Describe any influence **other aspects of your classroom enviroment** might influence your ablitiy or tendency to provide physical activity oppurtunties in your classroom (e.g., space, materials, teaching assistant, parent helpers).
- Describe any influence **other teachers** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom.
- Describe any influence **your school adminstration** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom.
- Describe any influence **policy at the school, district or state level** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom.
- Describe any influence **that your student's parents or other parents at the school** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom.
- Describe any influence **school facilities and/or resources** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom.
- Describe any influence **the media** at your school might have on your ability or tendancy to provide physical acitivty oppurtunities in your classroom (e.g., news, television shows, advertisements).

APPENDIX F: FIRST ROUND INTERVIEWS IMPLEMNTATION TEAM PROTOCOL

Individual Interview Protocol
(for implementation team)

Purpose (for the researchers only)
This interview should focus on the implementation teams' individual description of their roles in the HOPE based CSPAP.

Introduction (to be read to the participants)
This is the first of two interviews we will conduct with you. At the end of this interview, We will contact you by email to schedule the second interview for a later date. This interview will focus on your role with the HOPE-based CSPAP that was introduced at Peachtree Charter Middle School two years ago.

The interview will start now and I will bring it to a close, even if we don't address all of the questions, no later than one hour from now. I would like to confirm that it is okay if I tape-record your responses. Your name or any other identifying information will not be used in any reports of this research. Are you okay with me tape-recording your responses?

Let's begin.

1. **Please describe your role in the design/conception of the HOPE-based CSPAP?**
    - Please describe your role in planning the HOPE- based CSPAP?
    - Please describe your role in implementing the HOPE-based CSPAP?
    - How often did you work with other team members? (In what capacity?)
    - What were some of the success stories related to the role you played?
    - Describe some of the challenges of your role. If you could have changed anything about your role, what would you have changed and why?
    - How were the promotional videos used? (shown where? To whom?)

    - For Metzler (integration of HOPE across all school subjects/diet nutrition for PA)
        - How did the study come about? (funding, picking school)

- Can you describe the relationship between the CDC, GA State, and Peachtree Charter Middle School? (shared decision-making, coordination, communication, formulation of tasks)
- Can you please describe how you developed the relationship with the school? (staff meetings, initial presentation)
- How did you develop the integration of HOPE across all school subjects?
- Was there any measurement? Follow up? Support for the teachers?
- How did you incorporate diet nutrition for PA? How was it measured?

- For Kari (family home education/ health related fitness/Community Based PA programming)
  - Please describe how SPARK and HOPE were used (introduction, team members, measurement, support)
  - Please describe the family home education portion(introduction, team members, measurement, support)
  - Please describe health related fitness? (introduction, team members, measurement, support)
  - Please describe the community based PA programming(introduction, team members, measurement, support)

- For Jenee (Before after school programming)
  - Please describe the before and after school programming? (introduction, team members, measurement, support)

- For Shannon (sports, games, dance, and other movement forms/ diet nutrition and PA)
  - Can you describe the relationship between the CDC, GA State, and the Peachtree Charter Middle School? (shared decision making, coordination, communication, formulation of tasks?)
  - Please describe how SPARK and HOPE were used
  - Please describe the sports, games, dance and other movement forms component(introduction, team members, measurement, support)
  - Please describe the diet and nutrition and PA component(introduction, team members, measurement, support)

- For Margaret PA literacy
  - Please describe PA literacy and how it was implemented (introduction, team members, measurement, support)

2. **Please describe how closely you worked with**

    - School personnel
    - Students
    - What were your feelings about their receptiveness to the program?
    - Can you describe as situation where you felt resistance to the program and how you handled it?

3. **What didn't I ask you that you expected me too?**
    - Please explain

4. **What questions do you have for me?**
5.

APPENDIX G: SECOND ROUND INTERVIEWS IMPLEMNTATION TEAM PROTOCOL

Individual Interview Protocol- Second Round
(for implementation team)

Purpose (for the researchers only)
The purpose of this interview is (a) to further explore participants' responses from the first interview and (b) explore participants' perceptions of the role that theorized enablers and barriers (identified a priori using Durlak & Dupre, 2008) played in the success of program planning, implementation, and sustainability.

Introduction (to be read to the participants)
This is the second interview that we are conducting with you. We do not anticipate a third interview, but would like to be able to do so if that is needed. We may also just choose to follow up with questions via email. Is that ok with you? We will transcribe this interview and send you the transcript for member checking within the next several weeks. This interview will focus on your role planning and implementing the HOPE based CSPAP as well as thoughts you have about the sustainability of this program, and future programs.

The interview will start now and I will bring it to a close, even if we don't address all of the questions, no later than one hour and a half from now. I would like to confirm that it is okay if I tape-record your responses. Your name or any other identifying information will not be used in any reports of this research. Are you okay with me tape-recording your responses?

Let's begin.

1. **During your interview you discussed how the HPE teachers chose which strands to implement and in what order. Were there choices based on the personal preferences or perceived needs? Please explain**.
    a. Did you make recommendations about which strands to choose?
    b. Was a needs assessment conducted before implementing the program?
    c. Were there local, state, or national policies incorporated into the trainings to help HPE teachers understand the current needs of the school community?
    d. From your perspective, how compatible was the HOPE based CSPAP with CMS?

e. Do you think the HPE teachers saw a need for the HOPE-based CSPAP before it was implemented?
f. What benefits do you think the HPE teachers perceived once the program was implemented?
g. Describe the extent to which the HPE teachers felt able to do what was expected of them.
h. Describe the extent to which the HPE teachers could integrate the program into their current practices and routines.

2. **In your interview, you discussed staff buy in or resistance. Describe the extent the HPE teachers had a "shared vision" of the program**.
    a. Was there a designated or self-appointed leader within the HPE program? If so, who was it and what did they do in their leadership role?

3. **In your previous interview, you mentioned that you did not assign specific strands to members of the implementation team until the second year; can you describe why you waited until year two?**
    a. Please describe any issues with not having assigned roles in year one.
    b. In what ways was the delineation of roles helpful in year 2? (In terms of support systems or organizational [program or school not being able to find something] problems)

4. **In your interview you mentioned a "hands off approach" to the implementation? What role did this approach play in the loss of traction or "backsliding" with the HPE teachers?**
    a. What additional support or training was provided during this time?

5. **In your interview you mentioned that there was teacher burn out. Describe what you meant by this (i.e., signs of burn out).**
    a. What parts of the program do you think led the most to teacher burn out? (E.g., PA in the classes)
    b. Was there anything you did, or could have done, to prevent or reverse teacher burn out? (E.g., training, competency building)
    c. How did the training aid the teachers in developing proficiency for implementing the program? (E.g., knowledge, skills)

6. **Was anything done to develop student buy in to the program? (E.g., motivational strategies, social marketing strategies)**
    a. Were any motivational strategies used to increase MVPA and PA during PE?
    b. Was anything done to increase make the before and after school events enticing for students?
    c. Were any marketing strategies used to increase student attendance and/or enjoyment at special events (e.g., parent night and CV classic)?

Mike Metzler

1. You mentioned in your interview that the principal was supportive but also hands off. Please provide more details about the principal's role in the program.
    a. How did the principal's role contribute to program successes or challenges in the first two years of implementation?
    b. Can you describe a particular instance where you felt the principal played a particularly prominent role in program success?
    c. Can you describe a particular instance where you felt the principal posed a barrier to program success?
    d. What attempts were made to increase the principal's awareness of local, state, or national policies or guidelines related to PA?.
    e. What role do you feel that principal support will play in the sustainability of the program?

2. In your interview, you mentioned that several of the teachers were close to retirement. How did this affect the project?
    a. What advantages did this have for the project?
    b. What disadvantages did this have for the project?
    c. How might this affect the sustainability of the program?

3. In your interview, you mentioned that more crosschecks and rigorous training would have led to resistance. Can you describe what you meant by this more detail?.
    a. Did you consider other approaches to training the HPE teachers? If so please describe these (e.g., self-efficacy, autonomy support, scaffolding approach).

4. In your interview you mentioned that the CDC had "perceived authority." What did you mean by this?
    a. What did you mean when you said "no partnership commitment on their side?"

5. In your interview, you mentioned that the implementation was on "their timetable" (the HPE teachers). Please explain why you chose to let them choose the timeline.

6. Regarding the resistance from the classroom teachers, what lessons have you learned about best practices for getting classroom teachers on board with this type of program?

Shannon Williams

1. In your interview you mentioned that others in the school changed their perceptions of the PE teachers as a result of this study. Please describe this change in more detail.

a. Can you provide some examples of this change?

2. In your interview you discussed changes that you saw within the HPE department; that they became more "cohesive." Can you describe these changes in more detail?
    a. Can you provide some examples of these changes?
    b. In what ways was the department less cohesive beforehand?
    c. Were there any remnants of this lack of cohesion during program implementation?

3. In your interview, you mentioned that the implementation was on "their timetable" (the HPE teachers). Please describe why you chose to let them choose the timeline.

4. Regarding the resistance from the classroom teachers, what lessons have you learned about best practices for getting classroom teachers on board with this type of program?

Kari

1. In your interview you mentioned that the community involvement strand had less traction in year two. What are some examples of the community involvement strand loosing traction?

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7. Based on your experience, what are the major lessons learned as far as

    a. Implementation
    b. Planning
    c. Training
    d. External Partnerships
    e. Sustainability?

8. Do you feel that additional partnerships would have added to successful implementation or sustainability of the program? If so, please describe
        A. In terms of capacity building
        B. Funding
        C. Policy Awareness

9. What do you perceive as GSU's role in supporting the sustainability of the HOPE based CSPAP?

a. Did you supply the school with any sustainability plans? If so, please describe. If not, why not? (examples- secure funding)

10. What is a major take home message that you would share about your experiences with the HOPE-based CSPAP?

11. If you were making recommendations for someone who is implementing a CSPAP, what are some key factors they need to consider?
    a. What key factors should be considered related to planning?
    b. What key factors should be considered related to implementation?
    c. What key factors should be considered related to sustainability?

12. As we near the end of your interview, is there anything that I did not ask you that you expected me too? (Mike you asked us to lead with this in your next interview)

13. We would like to assign pseudonyms to every person in this study. What are your top three choices for a pseudonym?

14. Do you have any questions for us?

    Thank you for your time.

APPENDIX H: HEALTH PHYSICAL EDUCTION TEACHERS INTERVIEW PROTOCOL

Individual Interview Protocol
(for HPE teachers)

Purpose (for the researchers only)
This interview should focus on the HPE teachers' individual description of their roles in the HOPE based CSPAP.

Introduction (to be read to the participants)
This is the first interview that we will conduct with you. We do not anticipate a second interview, but would like to be able to do so if that is needed. We may also choose to follow up with questions via email. Is that ok with you? We will transcribe this interview and send you the transcript for your feedback and any revisions within the next several weeks. This interview will focus on your role planning and implementing the HOPE based CSPAP as well as thoughts you have about the sustainability of this program, and future programs.

The interview will start now and I will bring it to a close, even if we don't address all of the questions, no later than 45 minutes from now. I would like to confirm that it is okay if I tape-record your responses. Your name or any other identifying information will not be used in any reports of this research. Are you okay with me tape-recording your responses?

Let's begin.

1. How long have you been teaching physical education?
    a. At Peachtree charter?
    b. In middle school?

2. From what school did you get your teaching credentials?
    a. What is your highest degree?
        i. If masters in what?

3. Before participating in the HOPE-based CSPAP, did you have any previous training related to increasing moderate-to-vigorous physical activity during physical education lessons, or promoting physical activity beyond physical education?

4.
    a. Before/after school
    b. Staff involvement (e.g., training classroom teachers to promote PA)
    c. Family engagement
    d. Community engagement

5. Please describe your role in the design/conception of the HOPE-based CSPAP.
    - Please describe your role in planning the HOPE- based CSPAP.
    - Please describe your role in implementing the HOPE-based CSPAP.
    - How often did you work with other team members? (In what capacity?)
    - What were some of the success stories related to the role you played?
    - Describe some of the challenges of your role. If you could have changed anything about your role, what would you have changed and why?

6. In what ways were the trainings helpful?
    a. Is there anything that could have improved the trainings? If so, what?
    b. The intervention team has mentioned a "hands off" approach to implementation; was that beneficial for you?
        i. How has that affected sustainability?

7. From your perspective, how compatible was the HOPE based CSPAP with the programming and resources already available at CMS when the project started?

8. Did you recognize a need for the HOPE-based CSPAP before it was implemented?

9. How was the program beneficial once it was implemented?

10. Did you feel capable in doing what was expected of you?

11. In what ways were you able to integrate the program into your existing practices and routines?

12. Did you use the SPARK curriculum they provided? If so, explain why; if not, explain why not.
    a. Do you still use the SPARK curriculum? (Why or why not?)

13. Describe the extent to which you and the other HPE teachers had a "shared vision" of the program.

14. Did you ever experience burn out during this program? If so, please provide an example.

a. What could have been done differently to help you during this time?

15. Do you feel that the perceptions that other teachers and school staff had about PE changed during this program? If so, how? Why?

16. Was anything done to develop student "buy in" to the program? (E.g., motivational strategies, social marketing strategies)

17. What is a major take home message that you would share about your experiences with the HOPE-based CSPAP?
    a. For other PE teachers
    b. For classroom teachers
    c. For school administrators
    d. For parents
    e. For university researchers

18. If you were making recommendations for someone who is implementing a CSPAP, what are some key factors they need to consider?
    a. related to planning?
    b. related to implementation?
    c. related to sustainability?

19. Did you feel that the partnership with GSS was necessary to make the program work?

20. As we near the end of your interview, is there anything that I did not ask you that you expected me to?

21. Do you have any questions for me?

Since we were unable to conduct everyone's interview on the same day, I am kindly asking that you not discuss this interview with anyone else being interviewed until I am able to interview everyone.

APPENDIX I: STUDENT FOCUS GROUP INTERVIEW PROTOCOLS

Focus Group Interview
Students

Purpose (for the researchers only)
The purpose of this interview is to understand students' perspectives and experiences related to the HOPE based CSPAP.

Introduction (to be read to the participants)
The purpose of this interview is to understand your perspectives and experiences with the HOPE-based Comprehensive School Physical Activity Program that was implemented at your school when you were 6th graders and 7th graders. Overall, this program included… Before and After School Programming, Quality PE with high rates of MVPA, Nutrition for PA, Knowledge of PA, PA during the school day, Community Involvement, Parent Involvement and knowledge, Knowledge of Health Related PA.

This interview will use a semi-structured format, which means I will ask you some planned questions, but I will also leave room to explore other ideas or issues as they come up. . There are no wrong or incorrect answers. Please give everyone the opportunity to speak, and at times I may call your name to get your perspective. Each time before you speak, please say your name. This will help me to transcribe the interview later on.

The interview will start now and I will bring it to a close, even if we don't address all of the questions, no later than one hour from now. I would like to confirm that it is okay if I tape-record your responses. Your name or any other identifying information will not be used in any reports of this research. Are you okay with me tape-recording your responses?

1. For those of you that have attended the before or after school physical activity program, can you tell my what you enjoy about these programs?
    a. Has anything changed about the program(s) since it/they was/were first introduced?
    b. Why did you attend the program(s) in the first place?
    c. Do you still attend the program(s)? If so, why? If not, why not?
    d. If you're still attending, what would make you want to stop going?
    e. What types of activities do you participate in as part of the program(s)?
    f. Is there anything that you would change about the program(s)?

    g. Do you try harder or participate more in before or after school activities than you do in PE?
        i. If so, why

2. If you have never attended the program, can you tell me why?
    a. What would make you want to attend?

3. Can you describe Cardiovascular Day Monday's to me?
    a. Have they changed since last year?
    b. What makes you want to participate in this day?
    c. What could be done to make it better?

4. Have you noticed any changes from the last two years in PE to this year in PE?
    a. Fitness (more or less)
    b. Knowledge (more or less)
    c. Participation (more or less)
    d. Instant activities during role call (more or less)

5. If your teachers wanted to make you more physically active in PE, what are some things they should do?
    a. Do you like the activities you do?
    b. What activities would you add?

6. Have you ever been to the school garden?
    a. Do you participate in the garden?
    b. What types of things did you learn?
    c. If not, why not?
    d. How did the school garden change during the last three years?

7. What kinds of things would you like to see in PE, before and after school to make you more physically active?

8. Do you participate in the annual cardiovascular fun run?
    a. If so, why?
    b. If so, why not?

9. Do the things you learn in PE make you want to be more active outside of school?
    a. Make healthier choices?

10. Have you noticed any changes in your PE program when you compare your first two years at CMS (6th and 7th grade) to this year (8th grade)?

11. Overall, what impact has the HOPE-Based CSPAP had on your life? (At school? At home?)
    a. Made new friends?
    b. Learned new skills?
    c. Feel healthier?
    d. Made you physically stronger?
    e. Given you more confidence?

12. Are there any questions that you expected me to ask that I did not?

13. Do you have any questions for me?

Thank you for your time. I greatly appreciate your feedback. Please take a moment to fill out this sheet.

APPENDIX J: STUDENT DEMOGRAPHIC QUESTIONAIRE

Name:_____

Name (other than your real one) that you would like used in the study:

Choice 1:

Choice 2:

Choice 3:

Age:_____

Gender:_____

Ethnicity (please circle one): African American Asian American Indian Hispanic White