United States Principals’ Involvement in Comprehensive School Physical Activity Programs: A Social-Ecological Perspective

Karie Lee Orendorff

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United States Principals’ Involvement in Comprehensive School Physical Activity Programs: A Social-Ecological Perspective

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Dedication

To my friends, thank you so much for understanding (or pretending to understand) when the answer from me was, “no, I am sorry I can’t, I have school” for the past three years. Missing out on so many life moments and adventures with has been so hard for me. The phone calls, text messages and emails have helped me accomplish this goal more than you will ever know!!

Jimmy and family, thank you so much for understanding that during family time I had to be doing school work. I cannot wait to be able to give 100% to seeing Luke, Audrey and Sadie grow up and be a part of their lives, finally!!

To Mummy and Daddy, CAN YOU BELIEVE IT IS DONE?? You have always supported and encouraged my hopes, dreams, adventures and journey’s, even when you didn’t understand them. THANK YOU SO MUCH!! I would not be the person I am today without you!! Without your guidance, encouragement and support, this PhD would never have happened! I cannot wait to get back to work and make you proud!!

Lastly, to all the future teachers I am going impact, look out, get ready; you are going to become amazing Physical Education teachers!
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**USC GA’s 2016-2019:** I am proof it can be done! You got this! Continue to support each other. It is through the text messages, emails and “closed door” conversations that survival happens. Adam, STATS, that is all I have to say about that.
Abstract

Principal involvement is essential to the successful uptake of new school programs and initiatives. Recommendations and research underscore the key role of principals in supporting a comprehensive school physical activity program (CSPAP), which is a coordinated and synergistic approach to ensuring school-age accumulate the nationally recommended amounts of daily physical activity (PA), as well as develop the knowledge, skills and confidence for lifetime participation in PA. Little is known about the extent to which principals in the United States are involved in CSPAPs or about the factors that are associated with such involvement. The purpose of this dissertation was to examine principals’ CSPAP involvement in the United States from a social-ecological perspective, which considers multiple levels of influence on a targeted behavior.

Two studies were conducted. In the first study, a survey was developed to measure principal’s CSPAP involvement and social-ecological variables that may be associated with such involvement. Items were constructed using existing literature and pilot tested with content experts in the areas of CSPAP, social-ecology theory, and school leadership. A preliminary version of the survey was then sent to a convenience sample of principals for their feedback and to explore item loadings. Based on the results, the survey was finalized and sent to the main study sample, which was identified using stratified random sampling from a list of all U.S. public schools. The survey remained open for three weeks. A total of 291 principals completed the survey (10% response rate).
Exploratory factor analysis (EFA) found a four-factor solution to be the best-fitting model for the data. The factors included (a) involvement, (b) intrapersonal level of influence, (c) interpersonal level of influence, and (d) environmental level of influence. All four factors were significantly associated.

The second study adopted a person-centered perspective of principals’ CSPAP involvement. Using data from the first study’s main study sample, latent profile analysis incorporating the three social-ecological factors (intrapersonal, interpersonal and environmental levels of influence) was used to distill distinct groups of respondents. The best-fitting model included four groups: (a) high perceptions of environmental support but low perceptions of intrapersonal and interpersonal support, (b) slightly below average perceptions of support at all three levels of influence, (c) lowest perceptions of support, particularly at the intrapersonal and interpersonal levels of influence, and (d) slightly above average perceptions of support at all three levels of influence. In reference to the fourth group, scores on CSPAP involvement were significantly lower for the other three groups. Additionally, in relation to the fourth group, as scores on a scale measuring satisfaction with personal K-12 physical education experiences increased, the likelihood of membership to the third group (arguably the least adaptive group) significantly decreased.

Overall, this dissertation provides initial validity and reliability evidence for a survey instrument to assess principals’ CSPAP involvement and social-ecological factors associated with such involvement and shows that a social-ecological perspective has utility in understanding differences in principals’ CSPAP-related perceptions. The results
can inform professional development efforts aimed at increasing principals’ involvement in, and support of CSPAPs.
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CHAPTER 1

INTRODUCTION

The overall purpose of this dissertation will be to examine school principals’ perceptions related to their involvement in a CSPAP, based on a social-ecological perspective. Given that CSPAP is a national initiative (e.g., a major focus of SHAPE America in line with 50 Million Strong), canvassing principals’ perspectives of CSPAPs, and their role within these programs, should span nationwide. Surveillance research using a national sample of principals is critical to laying the foundation for the knowledge base needed to identify the factors that might influence principals’ involvement and support of CSPAP implementation. This information will in turn help to guide the development of evidence-based recommendations for principals in their role as key advocates for CSPAPs. This chapter provides an overview of the background, rationale, and theoretical framework for this dissertation, which will consist of two studies, and presents the specific purpose for each study.

Background

Almost half of America’s youth do not 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). Children also 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 required that schools receiving federal funding for school meal programs create a school wellness policy (Public Law 108-265, 2004). Schools have been called upon to play a key leadership role in the promotion of children’s health (Pate et al., 2006). School settings allow for a centralized location and have access to large numbers of children. There is an infrastructure for health-enhancing programs already established, and there is also potential to impact the surrounding community (IOM, 2013; Pate et al., 2006). While schools have traditionally played a role in children’s physical activity (PA) and health, recent reductions of physical education (PE) and recess time suggest that school health programs need to be re-examined to meet the rising levels of childhood inactivity and obesity (IOM, 2013; Kann, Collins, Pateman, & Small, 1995).

In 2008, the National Association for Sport and Physical Education (now the Society for Health and Physical Educators [SHAPE] America) published a position statement (updated in 2015) called Comprehensive School Physical Activity Programs (CSPAP). A CSPAP is described as a five-component approach to promoting increased PA among school communities. The five components include (a) Physical Education, (b) PA before and after school, (c) PA during school, (d) staff involvement, and (e) family and community engagement (SHAPE America, 2015). 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 a complete conceptual framework for providing children and adolescents with PA support.
and opportunities before, during, and after school as a means to achieving the recommended 60 minutes a day of MVPA and (CDC, 2013).

Rationale

One factor that has consistently been cited as critical in school reform efforts and in creating and maintaining an effective school is the principal and his or her leadership (Dow & Oakley, 1992; Fullan, 2001). Strong leadership has two functions: exercising influence and providing direction (Leithwood & Riehl, 2003). School governance leaders (school board members, superintendents, and senior administrators) play important roles in school program adoption, implementation, and sustainability because they can introduce and advocate for policies to support new initiatives (Cox, et al., 2011). Successful implementation of new programs was related to both perceived school environment and perceived support from school administrators (Lochman, 2003). In particular, principals who can genuinely establish a trusting school environment for all school members (e.g., parents, teachers, students, community) can become drivers of change (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010). The principal is in a unique position to influence the implementation of guiding principles and to affect the overall quality of teacher professional development (Bredeson, 2000). Functioning as leaders, principals can serve either to transform or to maintain school cultures (Leithwood & Jantzi, 1999).

The success of a school-based health promoting program depends on an administration that is supportive in the creation, implementation and maintenance phases of the program. (Greaney et al., 2002; Weiler, Pigg & McDermott, 2003). Principals have a positive perception of PA citing reasons such as academic benefits, physical health
benefits, social and emotional benefits. However, the barriers for PA in schools were stronger. Those barriers are time, priority, space constraints, and financial issues (Van den Berg et al., 2017). There is a gap in the research literature specific to principals’ perceptions of CSPAPs. It is important to measure these perceptions to understand key factors of influence that should be taken into consideration with respect to initiatives that include principals’ involvement in CSPAP implementation and/or sustainability. Moreover, research aimed at classifying subgroups of administrators would help to offer differentiated professional development to school leaders in regards to CSPAP. Research with students in physical education has used a person-centered approach to distill distinct profiles of learners from various theoretical and biographical perspectives (Haerens, Kirk, Cardon, De Bourdeaudhuij, & Vansteenkiste, 2010; Webster, Mîndrilă, & Weaver, 2013). A person-centered approach describes differences among individuals in how variables are related to each other: “the identification of groups of individuals who function in a similar way at the organism level and in a different way relative to other individuals at the same level” (Magnusson, 2003, p. 16). In other words, this approach identifies groups or types of individuals who share particular attributes or relations among attributes (Laursen, & Hoff, 2006).

**Theoretical Framework**

Social ecological models (SEMs) are used to show the dynamic relationships among individuals, groups, and their environments (Golden, et al., 2015). Bronfenbrenner (1976) created a model explaining how the environment and a person’s development are connected and the influence from that connection lasts throughout their lifetime (Hess & Schultz, 2008). Bronfenbrenner (1976) believed environment is fundamentally connected
to the development of an individual’s actions. Bronfenbrenner (1977) popularized the concept of social ecological theory, suggesting that behavior is affected by numerous levels within an environment, from face-to-face interactions (microsystem) to cultural beliefs and values within a population (macrosystem). SEM assumes that individuals within each level will influence their environment (Green, Richard, & Potvin, 1996). For implementation and environmental changes to occur, individuals within that population must be supportive (McLeroy, Bibeau, Steckler, & Glanz, 1988). Also, the effectiveness of an intervention depends on the fit between individuals and their environment (Green, Richard, & Potvin, 1996). In this study the individuals are the school administration and their environment is their K-12 schools.

In the health promotion field, ecological models have been used to understand and identify targets for both general and specific health behavior interventions (McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis, Owen, & Fisher, 2008; Stokols, 1996). SEM’s have also been used in previous studies on school-based programs and interventions on multiple topics. Swearer and Doll (2001) used SEM in a study on bullying in schools. Comer and Hayes (1991) used SEM to demonstrate how a school’s planning and management team promoted and increased parent involvement at their school. Gregson et al. (2001) used SEM to examine nutrition education. Langille and Rodgers (2010) interviewed numerous stakeholders (government officials, the school board, principals, and teachers) to qualitatively investigate how PA is promoted in schools within a school district in Canada. Webster et al. (2013) used SEM and diffusion of innovations theory to explore elementary classroom teacher’s adoption of PA promotion in the context of South Carolina state policy. Webster and Suzuki (2014) conducted a qualitative study using
multiple SEM perspectives and inductive techniques to examine PA opportunities and the factors that influence these opportunities in five school districts in Japan. Carson, Castelli, Beighle & Erwin (2014) proposed a SEM to apply in research specific to CSPAP implementation.

**Study Purposes**

**Study 1.** The purpose of Study 1 will be to develop a survey instrument for assessing principals’ self-reported involvement in CSPAPs, and the factors that may be associated with such involvement from a social-ecological perspective.

**Study 2.** Using survey data from Study 1, the purpose of Study 2 will be to determine a typology of principals based on their self-reported CSPAP involvement, social-ecological perceptions related to CSPAPs, and biographical, professional context, and demographic characteristics.
CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to provide a comprehensive literature review informing both studies included in this dissertation. The chapter is organized into the following sections: (a) the need for children to be physically active; (b) the role of schools in youth PA promotion; (c) the whole-of-school approach to PA promotion and the CSPAP model; (d) recommended approaches to CSPAP implementation; (e) the importance of administrator support in the implementation of new school programs; (f) social ecological perspectives of human behavior; (g) the importance of a person-centered perspective in theoretically-driven research, and (h) survey research and design.

The Need for Children to be Physically Active

Regular physical activity (PA) in children and adolescents promotes health and (Office of Disease Prevention and Health Promotion [ODPHP], 2015). When youth participate at least 60 minutes of PA every day, health benefits accrue, such as healthy bones muscles, improved muscular strength and endurance, reduced development of chronic disease risk factors, improved self-esteem, and reduced stress and anxiety (Physical Activity 2008). Compared to those who are less active, more physically active youth have higher levels of cardiorespiratory fitness, stronger muscles, and lower body fatness (ODPHP, 2015).
Their bones are stronger, and they may have reduced symptoms of anxiety and (ODPHP, 2015). Physiological benefits experienced by children who regularly participate at moderate to vigorous intensities include reduced incidences of obesity and risk of heart disease, diabetes, high blood pressure and cholesterol (CDC, 2011; Society for Health and Physical Educators [SHAPE] America, formerly the American Alliance for Health, Physical Education, Recreation and Dance [AAHPERD], 2013). Academic achievement, on-task behaviors, and various cognitive skills also are positively associated with PA (CDC, 2011). Research shows children who regularly participate in PA and have enhanced aerobic fitness may experience higher cognitive function and improved brain health when compared to children who are not regularly active. Preadolescent children who are more fit display greater attention (Hillman, Buck, Themanson, Pontifex, & Castelli, 2009), demonstrate faster information processing speed (Hillman, Castelli Buck, 2005), and achieve higher scores on standardized achievement tests (Donnelly et al, 2009; Castelli, Hillman, Buck, & Erwin, 2007).

A physically active lifestyle is established early on in childhood; from youth to adulthood PA is shown to “track” from moderate to high levels (Tammelin, et al., 2014). Youth who are regularly active also have a better chance of a healthy adulthood (ODPHP, 2015). Children and adolescents do not usually develop chronic diseases, such as heart disease, hypertension, type 2 diabetes, or osteoporosis (ODPHP, 2015). Still, risk factors for these diseases can begin to develop early in life. Regular PA reduces the likelihood that these risk factors will develop while increasing the chances that children will remain healthy as adults (ODPHP, 2015). The link between childhood PA and adult health status becomes more evident as several of the health outcomes (e.g., Body Mass
Index [BMI], reduced blood pressure, reduced high cholesterol levels) associated with PA track from childhood into adulthood, suggesting that regular PA during childhood and adolescence may be of critical importance in the prevention of chronic disease later in life (Telama, Yang, Laakso, Viikari, 1997; Warburton, Nicol, & Bredin, 2006).

In the past few decades, researchers are noting compelling changes in lifestyle practices and reduced opportunities for PA, which points to many children and adolescents not being sufficiently active to realize health benefits (Hills, Dengel, & Lubans, 2015). Children and adolescents today demonstrate metabolic and cardiovascular problems previously limited to adults (e.g., type 2 diabetes mellitus, atherosclerosis; Hills, Dengel, & Lubans, 2015). Children now spend nearly a third of their day in front of a screen (e.g., TV, videogames, computer; Rideout, Foehr & Roberts, 2010). Environmental factors (i.e., proximity, cost, facilities, and safety) are important for youth living in low socio-economic status (SES) areas to ensure participation in PA (Humbert et al., 2006). Results also show that intrapersonal (e.g., perceived competence, confidence) and social factors (e.g., friends, adult support) must be considered to help improve participation rates among both high- and low-SES youth (Humber, et al., 2006). Some of the main barriers for young people to being physically active include negative PA experiences at school, such as in physical education; personal factors (e.g., motivation, self-consciousness about appearance); family and friends; and practical and material resources (e.g. time, money) (Martins, Marques, Sarmento & Carreiro da Costa, 2015).

**The Role of Schools in Youth PA Promotion**

National organizations (e.g. Centers for Disease Control and Prevention [CDC];
National Academies of Science) suggest that schools should be the key focus of intervention efforts when attempting to increase youth PA given the number of waking hours children and adolescents spend in schools (Cooper et al. 2016). Schools directly reach approximately 25% of the US population. From this perspective, education settings can play a major role in public health initiatives related to PA (National Physical Activity Plan). School-based personnel, such as teachers, administrators, and other staff, as well as education decision-makers and policy leaders can significantly influence the development and delivery of school-based physical education and PA, ensuring initiatives provide all the essential components of a comprehensive and high-quality program (National Physical Activity Plan). In addition to the hours spent in school, in most countries, children spend almost half of each calendar year in school (USDHHS, 2010). Therefore, schools are responsible for a large amount of contact time with youth and have the potential to assist children and adolescents in meeting daily PA guidelines (USDHHS, 2010).

The normal school day is usually 8–9 hours long and in most cases, a considerable proportion of this time is composed of sedentary activities (USDHHS, 2010). Children are sedentary for much of their school day. Developing evidence suggests that long periods of inactivity should be avoided (Kohl III & Cook, 2013). Thus, even though schools present an existing venue with extensive reach and numerous resources for youth PA promotion, efforts are needed to stimulate and shift the student environment toward supporting an active school culture (Kohl III, & Cook, 2013).
The Whole-of-School Approach and the CSPAP Model

PA Programs are needed in schools to provide students with 60 minutes or more of vigorous- or moderate-intensity PA each day (Kohl III, & Cook, 2013). PA programs should complement physical education, not be a substitute or be considered equal to physical education (American Heart Association [AHA]; SHAPE America, formerly the National Association for Sport and Physical Education [NASPE], 2012). Current recommendations for promoting PA through schools focus on adopting a whole-of-school (WOS) approach where administrators, teachers, and parents advocate for and implement comprehensive and coordinated PA programs to provide all students with opportunities to meet PA guidelines (Colabianchi, Griffin, Slater, O’Malley & Johnston, 2015). Schools have the potential to influence the PA behaviors of their students in various contexts such as physical education, recess, general education classrooms, and before and after school programs (van Landeghem, 2003). Both teachers and students have found WOS approaches beneficial and welcome the opportunity to participate (Macdonald et al., 2014).

There has been a substantial decline in time dedicated to Physical Education (PE) classes in the past few decades (Sallis, McKenzie, Beets, Beighle, Erwin, Lee, 2012). The Institute of Medicine (IOM) suggests that schools provide opportunities for moderate-to vigorous-intensity PA (MVPA) throughout the school day and outside of school hours on school grounds (Colabianchi, Griffin, Slater, O’Malley & Johnston, 2015). Further, the IOM recommends schools provide at least 60 minutes of PA daily, with half of those minutes taking place during school hours (Colabianchi et al., 2015). The IOM report builds on calls by other organizations (e.g., World Health Organization [WHO], SHAPE
America, National Association of State Boards of Education [NASBE]) for the development of comprehensive approaches to PA in schools (Colabianchi et al., 2015). A WOS approach to PA involves prioritizing regular, highly active physical education classes; providing suitable physical environments and resources to support structured and unstructured PA throughout the school day; supporting walk/cycle-to school programs; enabling program implementation through supportive school policy; and engaging staff, students, parents and the wider community in PA and PA promotion.

The most widely recommended example of a WOS approach to PA promotion is the comprehensive school physical activity program (CSPAP) model (CDC, 2013; SHAPE America, 2015). A CSPAP model was first presented in 2008 by NASPE (now SHAPE America). This model came from a rich history of proposed comprehensive school-based approaches to health and wellness (Carson, Castelli, Beighle, & Erwin, 2014). 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). A CSPAP typically is espoused as a coordinated, multicomponent approach by which schools, school districts and community partners optimally use all school-based PA opportunities available to develop educated individuals with the knowledge, skills, and confidence to participate in daily PA and sustain a physically active lifestyle (SHAPE America, 2015). Program components can include (a) physical education (i.e., a planned, sequential, K-12 standards-based program of curricula and instruction designed to develop motor skills, knowledge, and behaviors for healthy active living, physical fitness, sportsmanship, self-efficacy, and emotional intelligence), (b) PA
before and after school (e.g., a walking and biking to school program, PA clubs, intramural programs), (c) PA during school (e.g., recess, PA integrated into classroom lessons, PA breaks in the classroom, lunch time clubs or intramural programs), (d) staff involvement (e.g., staff wellness programs, teacher and administrator promotion of students’ PA), and (e) family and community engagement (e.g., participating in evening or weekend special events, providing programs before or after school, establishing joint-use or shared-use agreements with schools) (SHAPE America, 2015). However, the nature of CSPAPs in the “real world” remains relatively unknown due to a lack of empirical investigation aimed at “groundtruthing.” It is possible that some programs may reach program goals via one component of the model or with other permutations that deviate from the prevailing framework. As such, it is prudent for current research to approach the conceptualization of CSPAPs cautiously and in ways that allow for multiple interpretations of relevant programming that serves similar purposes.

**Recommended Approaches to CSPAP Implementation**

In 2013, the CDC partnered with SHAPE America to develop a step-by-step guide for implementing a CSPAP. Step One is to establish a team/committee and designate a Physical Activity Leader (PAL). This committee should be made up of members that are invested in youth PA and the overall health of youth. The PAL takes on the lead role in the committee and also works alongside the school health coordinator, classroom teachers, school nurses, and to promote the CSPAP at the school. Step Two is to do a needs assessment of the school to determine current PA policies, programs, and practices at the school. Step Three is to create a vision statement, goals, and objectives for the CSPAP. Step Four is to identify outcomes or specific changes that will be direct
results of program implementation. Outcomes can include changes in knowledge, attitudes, skills, behaviors, status, or level of functioning. Step Five is to identify and plan activities that are appropriate for the school. Step Six is to implement the CSPAP at the school. The implementation plan is a straightforward document that outlines exactly what will be done, by whom, when, and how. Step Seven is to evaluate the CSPAP. This can be done in two ways: (a) process evaluation, where information is collected to see how well the CSPAP has been implemented, and (b) outcome evaluation, where information is collected to help assess what happens as a result of program activities.

In addition to these recommended steps for implementing a CSPAP, there are two CSPAP implementation models that have been proposed. Carson et al. (2014) suggested a model that focuses on resources that are within the school and that should be integrated to implement the program. Carson’s model presents three levels of support in connection with implementing the CSPAP components: (a) program facilitators, (b) program leaders and (c) program culture.

Program facilitators include knowledge, skills, dispositions, resources and safety. The facilitators do not work independently but rather collaborate to design, develop, and implement the CSPAP. At level two it is suggested that there be three program leaders to help advocate for the CSPAP: (a) a champion or school leader (i.e., someone to launch CSPAP efforts and be the point person for the school as the central coordinator and contact for PA promotion), (b) supportive administration, be it at the school level or district level, and (c) a CSPAP committee, consisting of the CSPAP Champion, school administration, classroom teachers, the school nurse, parents and community members.
The third and final level of Carson’s model is program culture, which includes school policy and normative behaviors and beliefs shared by the entire school community.

The second model, proposed by Webster et al. (2015), focuses on connecting internal (within-school) and external (outside of the school) resources to implement and sustain CSPAPs. In this model, three partnership approaches are recommended, including (a) communities of practice (CoP), (b) community-based participatory research (CBPR), and (c) service learning (SL). A CoP is a group of individuals who share common goals and coordinate ideas to help solve problems or advance practice. A CoP can exist within a physical (e.g., school building) or virtual space (e.g., via the Internet). CBPR is the process of engaging community members (e.g., school professionals) and researchers in collaborative research that supports the specific needs of the community (e.g., school). SL involves learners (e.g., university students) providing civic engagement and service (e.g., CSPAP support) to communities/organizations (e.g., schools) as a way to achieve mutually beneficial outcomes (e.g., enhanced school programming, more authentic learning experiences for university students).

**The Importance of Administrator Support in the Implementation of New School Programs**

Next to a mission and vision statement for the school, an important driver toward the creation of any kind of school culture is the school leadership (Bryk, Sebring, Allensworth, Easton & Luppescu, 2010). School governance leaders (school board members, superintendents, and senior administrators) play important roles in school program adoption, implementation, and sustainability because they can introduce and advocate for policies to support new initiatives (Cox, et al., 2011). Successful
implementation of new programs, according to Lochman (2003) were related to both perceived school environment and perceived support from school administrators. In particular, principals who can genuinely establish a trusting school environment for all school members (e.g., parents, teachers, students, community) can become drivers of change (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010). Within schools, the principal is in a unique position to influence the implementation of guiding principles and to affect the overall quality of teacher professional development (Bredeson, 2000). Functioning as leaders, principals can serve to transform school cultures or to maintain them (Leithwood & Jantzi, 1999). Principals are cited as key players who provide strong leadership in staff development through their advocacy, support, and ability to influence others (NSDC, 1995). Providing support for teacher learning and growth is also a vital role for school principals (Bredeson, 2000).

Environments where teachers feel they can take risks, experiment with new ideas and practices and exercise creativity are established by the principal (Bredeson, 2000). If teachers are aware that they have the professional, psychological, and emotional support of their principal they will be more willing to try new skills in order to grow as teachers (Bredeson, 2000). The most impactful time during change efforts is when teachers face problems or even failure while taking teaching risks (Bredeson, 2000). Teachers believe the principal to be the point person for providing them with professional knowledge and expertise (Bredeson, 2000). Principals may play leading roles in supporting the school’s professional learning community; making teachers aware of changes in school law and legislative mandates; supporting teachers seeking to improve professional practice;
overseeing school change efforts; facilitating group development processes; and promoting technology integration (Bredeson, 2000).

Supportive school principals look for quality instruction using research-based strategies as ways to improve what is going on in the classroom and as a starting off point for discussions on instructional approaches at their school (Mendels, 2012). Principals are the main source of knowledge when it comes to their school’s budget, staff, resource allocations, how information is used and communicated and how their school days are organized (Nanus, 1992). Teachers believe their principals to be the key in building the conditions to make programs successful at their schools (Hipp, & Huffman, 2000).

“Proactive” and “innovative” are terms used to describe principals that encourage their teachers to try changes in their classrooms, provide the resources for these changes and find ways to make things happen instead of saying “no” (Hipp, & Huffman, 2000). Supportive principals promote a sense of confidence among their teachers; provide a positive direction through their vision and enthusiasm; hold high expectations for staff and students; focus on students as well as students’ families; empower staff; align the community, staff and school goals; promote change in teaching and learning; and build school capacity (Gurr, Drysdale, & Mulford, 2005).

If a principal supports a school program by actively assisting in its development and taking part in its promotion, teachers will believe that they are supported and will show more commitment to the initiative (Leithwood & Jantzi, 1999). The principal is the main reason programs are or are not successful in schools; they hold the most influence for implementation of programs and policies (Datnow & Castellano, 2001). Fullan (2001)
discovered innovation, change and school effectiveness are very powerfully swayed by the principal.

**Role of Administrator Support in School PA Programming**

In order for schools to care for the whole child there needs to be encouragement for making both health and education a priority (Greaney et al., 2002; Weiler, Pigg & McDermott, 2003). The success of a school-based health promoting program depends on an administration that is supportive in the creation, implementation and maintenance phases of the program. (Greaney et al., 2002; Weiler, Pigg & McDermott, 2003). Very little research has been done on principals support of PA. One study found that principals have a positive perception of PA citing reasons such as academic benefits, physical health benefits, social and emotional benefits (Van den Berg et al., 2017). However, the barriers for PA in schools were stronger. Barriers included time, priority, space constraints, and financial issues (Van den Berg et al., 2017). For CSPAP implementation at a school, it is recommended that the school administration is supportive of the program (Carson, 2012). Gamble et al. (2017) found that physical educators appreciated the support and encouragement from their principals when trying to show value and passion in promoting school wide PA (McKey et al., 2014).

Using local policies and regulations, school administration can make a positive impact on PA opportunities before, during, and after school (Cox et al., 2011). Schools that showed CSPAPS to have a positive impact on their campus also had the support network of administrators and classroom teachers (Carson, 2012; Graber, Woods, & O’Connor, 2012; Rink et al., 2010). Centeio, Glowacki, Castelli, Carson and Beighle
(2014) propose that polices focusing on PA, proper facilities and administrator support are important components in implementing a CSPAP (Centeio et al., 2014).

Support from school administration can come in many different forms. Examples of support are (a) emotional support by encouraging a physical education teacher to become a CSPAP champion and praising all students and faculty who are promoting schoolwide PA; (b) instrumental support by supplying specific resources and training opportunities (i.e., staff development days, guest presentations to faculty, or sample PA breaks offered during faculty meetings) to make CSPAP programming happen; and (c) informational support by providing tips and feedback regarding the vision and progress of CSPAP efforts (Carson et al., 2014). School administrators also can provide psychosocial support by demonstrating their commitment to PA and nutrition programs through simple gestures (e.g., periodically attending lunch and recess periods, honoring/recognizing students in the intramural program, regularly including news about PA and nutrition programs in the school newsletter and in presentations at parent or staff meetings (Wechsler, Devereaux, Davis, & Collins, 2000). Another form of support is aiding with necessary resources (e.g., registration expenses or paid leave) for staff to attend professional development workshops related to CSPAPs; these workshops can focus on developing an in-depth understanding of the CSPAP model; building competencies in how to plan, communicate, and market CSPAP events; fostering a greater appreciation for the value of a CSPAP; and increasing confidence in how to foster healthful living in school children (Carson, 2012).
Social Ecological Perspectives of Human Behavior

When policy is supportive of healthy options, individuals are more inclined to refer to policy in the choices they make (Canadian Public Health Association, 1986). Social ecological models (SEMs) acknowledge the relationships between personal and environmental factors and the assumptions that behavior is shaped by multiple levels of influence (e.g., intrapersonal, social and physical environment, policy) (Sallis, Owen, & Fisher, 2015). SEMs can provide the groundwork for factors (e.g., individual, interpersonal, environmental and policy) that should be taken into consideration when trying to establish comprehensive approaches to examining and intervening on health behaviors (Sallis, Owen, & Fisher, 2015). One premise of SEMs is that a combination of interventions at multiple levels of influence (e.g., individual, environmental, policy) is needed to accomplish the changes in health behavior in a more positive and sustainable manner (Sallis, Owen, & Fisher, 2015). SEMs takes into account the environment where the change is occurring, the characteristics of the individual and growth through which the individual emerges. SEMs include the context in which development is taking place, the personal attributes of the individuals present in that context, and the process through which the individuals’ development evolves (Bronfenbrenner, 1989).

Bronfenbrenner: The Foundation of SEMs

Hess and Schultz (2008) use the example of a stone dropping into water and the rings that surround the stone to show how interconnected rings can influence the development of a person. The pioneering work of Urie Bronfenbrenner, and the development of his SEM, has made a formidable impact on research in terms of understanding human behavior from a social-ecological perspective.
(1976) created a model explaining how the environment and a person’s development are connected and the influence from that connection lasts throughout their lifetime (Hess & Schultz, 2008). In Bronfenbrenner’s model, behavior is situated within multiple levels of influence (McLeroy, Bibeau, Steckler, & Glanz, 1988). Bronfenbrenner (1976) believed environment is fundamentally connected to the development of an individual’s actions; when citing environment, he would use the phrase “ecological”. Bronfenbrenner did not target just the environment or context but the ecological system as a whole in its relation to the development of an individual. Bronfenbrenner identified and labeled five interconnected and concentric rings encircling the developing person. The rings represent levels of influence on the individual’s behavior; they include: the microsystem, the mesosystem, the exosystem, the macrosystem and the chronosystem (Hess & Schultz, 2008).

Bronfenbrenner (1974) described the microsystem as the most proximal setting with the most direct influence on the individual’s behavior; the interaction is face-to-face. It is the first ring of influence. This ring includes the physical environments that a person engages with (i.e., home, child care, playground, and place of work). He defined the mesosystem, the second ring of influence, as the interactions between two or more microsystems. The mesosystem grows when an individual enters a new context and recedes when the individual is no longer involved in that specific setting (Bronfenbrenner, 1977). The activities and interpersonal roles and relations occurring in each single microsystem interact within the mesosystem. The exosystem is the third ring of influence. Unlike the first two rings, factors at the exosystem level (e.g., the workplace, neighborhood environment, mass media, government agencies, informal
social networks) do not directly influence the individual (Bronfenbrenner, 1977). Within the fourth level (the macrosystem), are the institutional systems of a culture or subculture, such as the economic, social, education, legal, and political systems (Bronfenbrenner, 1976). These factors have a direct influence on all of the other layers of the system due to the interactions within the different cultures (Gray, 2015). For example, your beliefs in the political systems will have a direct influence on how you act and react to different situations. The macrosystem influences what, how, when and where individuals carry out their relationships between the other systems (Bronfenbrenner, 2005).

**SEMs Applied to School-Based Health Promotion**

Using SEMs for research with school-based health promotion is not new and several researchers have developed their own models. Jackson (1985) advocated for health promotion programming using a behavioral-environmental model of health problems that he designed (McLeroy et al., 1988). Jackson’s model uses four levels which strengthen the health or ill-health of an individual: the physical environment, the socio-economic environment, the family environment and behavior (Jackson, 1985). Quality of air is one example of how a person’s physical environment could contribute to their overall health. Industries that use the atmosphere to absorb and disperse gaseous industrial wastes, preferred sources and use-levels of energy, and favored means of transportation, can use acceptable margins of profit policies to determine whether the healthfulness of the physical environment is compromised (Jackson, 1985). Looking at distribution of income and social power in society through housing standards, nutrition levels and sense of social worth would be an example of the social-economic level (Jackson, 1985). Social and economic factors can be a possibility of risk that the family
environment could damage (Jackson, 1985). Individuals learn about society’s beliefs and values through their family. It is through socialization of the family unit that self-esteem can develop as well as proper coping mechanisms to handle stress (Jackson, 1985). Behavior is the fourth level in Jackson’s model. The physical, socio-economic and family environments are such an informing part of a person’s life, it is hard to find situations where behaviors that would not have any effect on these relationships (Jackson, 1985).

McLeroy, Bibeau, Steckler and Glanz (1988) provided another early SEM, basing their work on two key approaches: (a) behavior influences and how the behavior influenced factors into multiple levels within a social-ecological system, and (b) how individual behaviors shape social environment. There are five levels outlined in McLeroy et al.’s (1988) model. The first is intrapersonal, where individual characteristics (e.g., knowledge, skills, and self-efficacy) influence behavior. Interpersonal factors are at the second level of the model. This level focuses on the influence of those who directly interact with the individual (e.g., family, friends, peers) and provide social identity and support (e.g., emotional support, access to new social contacts, aid and assistance in fulfilling social and personal obligations and responsibilities). At the third level are institutional factors, such as work sites, churches, stores, and community organizations where rules, regulations, and policies influence behaviors. Community factors make up the fourth level. Community is defined in terms of (a) mediating structures or face-to-face primary groups in which an individual belongs (e.g., families, personal friendship networks, neighborhoods), (b) relationships among organizations and groups within a defined area (e.g., local government health providers, local schools), and (c) having the community attached through geographical and political boundaries. Public policy at the
local, state, or federal level and the legislation that regulates or supports healthy practices/actions, is the fifth level in the model (McLeroy et al., 1988).

Emmons (2000) expanded upon McLeroy et al.’s (1988) model by elaborating on the upstream social-structural conditions that influence down-stream health behaviors (Berkman & Glass, 2000). Upstream social-structural conditions are social networks and social-structural conditions such as social networks are size, range, density, proximity, homogeneity, and reachability (Berkman & Glass, 2000). Characteristics of network ties are frequency of face-to-face contact, frequency of nonvisual contact, frequency of participation, reciprocity of ties, duration and intimacy (Berkman & Glass, 2000). Factors of social structural conditions are culture (e.g., norms and values, social cohesion, racism and sexism), socioeconomic factors (e.g., relations to production, inequality, discrimination, conflict, poverty, labor market structure), politics (e.g., laws, public policy, differential political participation/enfranchisement, political culture) and social change (e.g., urbanization, war/civil unrest, economic depression) (Berkman & Glass, 2000). Down-stream health behaviors are psychosocial mechanisms and pathways (Berkman & Glass, 2000). Examples of psychosocial mechanisms are social support (e.g., instrumental and financial, informational, appraisal, emotional), social influence (e.g., constraining/enabling influences in health behaviors, norms toward help-seeking/adherence, peer pressure, social comparison processes), social engagement (e.g., physical/cognitive exercise, reinforcement of meaning social roles, bonding/interpersonal attachment, handling effects [children], grooming effects [adults]), person-to-person contact (e.g., close personal contact, intimate contact), and access to resources and material goods (e.g., jobs/economic opportunity, access to health care, housing, human
Examples of pathways are health behavioral pathways (e.g., smoking, alcohol consumption, diet, exercise, adherence to medical treatments, help-seeking behavior), psychological pathways (e.g., self-efficacy, self-esteem, coping effectiveness, depression/distress, sense of well-being) and physiological pathways (e.g., allostatic load, immune system function, cardiovascular reactivity, cardiopulmonary fitness, transmission of infectious disease) (Berkman & Glass, 2000).

In Emmons’ (2000) model, the institutional level focuses on organizations, such as schools, as the intervention targets (Langille, & Rodgers, 2010). These organizations are influenced by internal and external social and physical factors (Langille, & Rodgers, 2010). For example, according to the ODPHP (2015), social factors are the availability of resources to meet daily needs, such as educational and job opportunities, living wages, or healthful foods; social norms and attitudes, such as discrimination; exposure to crime, violence, and social disorder, such as the presence of trash; social support and social interactions; exposure to mass media and emerging technologies, such as the Internet or cell phones; socioeconomic conditions, such as concentrated poverty; quality schools; transportation options; and residential segregation. Physical factors are the natural environment, such as plants, weather, or climate change; built environment, such as buildings or transportation; worksites, schools, and recreational settings; housing, homes, and neighborhoods; exposure to toxic substances and other physical hazards; physical barriers, especially for people with disabilities; and aesthetic elements, such as good lighting, trees, or benches (Langille, & Rodgers, 2010).
The community level of Emmons’ (2000) SEM focuses on relationships among applicable groups and organizations such as social service advocacy, networking with community resources, and groups for mediation within the community for structural and environmental needs (Langille, & Rodgers, 2010). It is through policies, procedures and laws at the governing level that we see influencing at the public policy level (Emmons, 2000; McLeroy et al., 1988). Emmon’s model should be considered when looking into the social-contextual factors that could influence the interactions of the policy, community, and organizational levels for health behaviors in a meaningful way in organizational settings (Langille, & Rodgers, 2010).

Daniel Stokols’s Social Ecology Model of Health Promotion (1992, 2003) identified four core assumptions, which underpin the social-ecological model (Glanz, Rimer, & Viswanath, 2008). The first assumption is that physical environments, social environments and personal attributes can be influenced by health behavior. The second assumption looks at analyzing of health and health promotion; it is believed they should address both the multidimensional and complex nature of human environments. Third, it is assumed that within environments, individuals can be studied by adjusting the levels from individuals to small groups to organizations and finally, larger populations. The final assumption is that the social-ecological perspective integrates concepts derived from systems theory (e.g., interdependence, homeostasis, negative feedback, deviation amplification) to understand the dynamic interrelations between people and their environments. Mutual influences are known as the transactions between the people and the environment (Stokols, 1992). For example, the physical and social characteristics of a setting are directly influenced by the health of the participants (Stokols, 1992). To adjust
the healthfulness of their surroundings the individual and collective settings can be changed (Stokols, 1992).

**SEM Research in Schools**

SEM’s have been used in research to promote school-based programs and interventions focusing on a wide range of issues. Swearer and Doll (2001) used SEM in a study on bullying in schools. From a social-ecological perspective, bullying interactions occur from individual characteristics of the bully but also from the actions of others (e.g., peers, teachers and other adult caretakers at school, physical characteristics of the school grounds, family factors, cultural characteristics, and community factors). Families who allow and/or show signs of bullying behaviors contribute to the characteristics of the children who bully. These behaviors may be damaging to a child’s mental suffering. A more direct social learning influence of bullying behavior comes from peer contribution. For example, a peer’s immediate and cumulative respect for bullying will reinforce the child that bullies and continue to lower the self-esteem of the victim. When locations are left unsupervised, teachers are mistakenly allowing for bullying to occur. Administration can also contribute to bullying by not providing the appropriate supervision and polices that discourage fast and swift responses. At the conclusion of the study, it was believed that bullying can be thought of as an exchange between an individual and their peer group, school, family, and community. It is the internal factors in the individual that interact with the social environment, which reinforces the behaviors of the bully or the victim (Swearer & Doll, 2001).

Comer and Hayes (1991) used SEM to demonstrate how a school’s planning and management team promoted and increased parent involvement at their school. The school
created three different levels of involvement. Level Three was general participation, Level Two was helping in the classrooms or sponsoring/supporting school events, and Level One was being elected to the parent group to join the school planning and management team. Level One was projected to be the most critical for parent involvement. It is at this level that parents will serve alongside the teachers, professional and nonprofessional support staff representatives, and the principal. Parents at Level One will also work as a group to develop activities in support of the comprehensive school plan. Level Two sees parents participating in day-to-day classroom and school activities and joining whatever parent organization exists. Level Three focuses on parents attending general activities at the school (e.g., holiday programs, awards assemblies). The study found that when parents participate in Level Three they develop a sense of pride and satisfaction from seeing their children perform while students experience approval and appreciation from their parents and the staff during these activities. When parents participate in Level Two they develop a strong, positive attachment to the school. Moreover, a positive attachment of students to the staff and program of the school is more likely. When parents participate at Level Three we see ownership of the school’s plan and its implementation, giving them a stake in the outcome of school activities. By getting parents and school personnel involved and working, there was a more motivating and desirable effect on the academic and social performance of the students at the school (Comer & Hayes, 1991).

In another study, Gregson et al. (2001) used SEM to examine nutrition education. In this model the social world is conceptualized in five spheres, or levels, of influence: (a) social structure, policy, and systems; (b) community; (c) institutional/organizational;
(d) interpersonal; and (e) individual (Gregson et al., 2001). In Level One – social structure, policy, and systems – local, state, and federal policies that regulate organizational or individual behavior are included. The Food Guide Pyramid and U.S. Department of Agriculture (USDA) guidelines for nutrition education in the Food Stamp Program are part of this level, and, these influence entire systems of service delivery and consumer communications. Level Two targets the community and includes social networks, norms, and standards that exist formally or informally among individuals, groups, partnerships, and organizations. Broad community support for nutrition education creates a more positive environment for behavior change and a shared commitment to improving the nutritional status of members of the local. Institutional and organizational factors are at the third level of the model. Examples of institutions/organizations include businesses, schools, churches, public agencies, service organizations, and professional or trade associations. The fourth level is the interpersonal level, which includes primary groups (e.g., peers, family, and friends) that provide social identity, support, role delineation, and interaction for the individual. Finally, the individual level is the most direct level of influence, as it focuses on expressed behavior choices and psychological and cognitive factors such as the individual’s knowledge, attitudes, beliefs, and personality traits (Gregson et al., 2001).

**SEMs Applied to School-Based PA Promotion**

In the last several years, a number of studies also have approached the issue of school-based PA promotion from social-ecological perspectives. Based on Emmons’ (2000) SEM, Langille and Rodgers (2010) interviewed numerous stakeholders (government officials, the school board, principals, and teachers) to qualitatively...
investigate how PA is promoted in schools within a school district in Canada. Policy can come from the provincial level down or start at the school level and go up. The results from this study showed that top-down policy change was looked at in higher regards by school board members, principals and teachers but that buy in and the local level (e.g. the community) are also needed for success. This study also showed that other factors, such as the priority placed on math or literacy or even the presence of a champion of PA, also could influence the success of the policy. School culture was also influenced by societal norms. Further, the study provided evidence that principals are key in providing leadership and directing priorities/policies at the school level in regard to PA implementation at their schools.

Webster et al. (2013) drew upon McLeroy et al.’s (1988) SEM and diffusion of innovations theory to explore elementary classroom teacher’s adoption of PA promotion in the context of South Carolina state policy. Specifically, the researchers examined relationships among the intrapersonal, institutional, and policy levels of McLeroy et al.’s (1988) model to understand the teachers’ self-reported use of classroom-based PA promotion. Using structural equation modeling, the results showed that policy awareness directly predicted teachers’ perceived school support for classroom-based PA promotion and that perceived school support directly predicted teachers’ perceived attributes (compatibility, simplicity, and observability) of classroom-based PA promotion. In turn, perceived attributes directly predicted teachers’ self-reported frequency of using strategies to promote children’s PA in their classrooms.

Webster and Suzuki (2014) conducted a qualitative study using multiple SEM perspectives and inductive techniques to examine PA opportunities and the factors that
influence these opportunities in five school districts in Japan. The researchers found that Japanese schools provided many more PA opportunities for children than most American schools and that these opportunities derived from top-level (i.e., federal government) support via the national course of study for schools and reinforcement for the curriculum by district leaders, principals, and teachers. A distinct leverage point that emerged from the study was the uniform buy-in for children’s PA in schools and lack of a need for external accountability to implement PA opportunities. This was due to a philosophical orientation toward ubiquitous respect for, and unquestioning duty to, one’s superiors, which is firmly embedded within Japanese culture.

Carson, Castelli, Beighle & Erwin (2014) proposed a SEM to apply in research specific to CSPAP implementation. Variables at four levels—micro, meso, exo, and macro—must function synergistically to positively influence daily PA behavior. In brief, microsystem-level variables include the five CSPAP components, which theoretically should have the most direct and proximal influence on PA outcomes. The mesosystem level includes key facilitators (knowledge, skills, dispositions, resources, and safety) needed to effectively implement the CSPAP components. These facilitators derive from school PA program leaders at the exosystem level, including the CSPAP champion, a supportive school administration, and a CSPAP committee. The fourth level is the macrosystem level, which includes relevant policies for increasing PA and normative beliefs and behaviors of the school community (e.g., local media portrayal and overall public visibility of school PA. Macrosystem variables directly influence the actions of the PA program leaders at the exosystem level, while the program leaders are directly tied to
the key facilitators at the mesosystem level, which directly impacts CSPAP implementation at the microsystem level of the model (Carson et al., 2014).

**The Importance of a Person-Centered Perspective in Theoretically-Driven Research**

In J. Block's (1971) seminal study on personality development he used for the first time the terms "variable-centered" and "person-centered" to contrast his person-centered approach from the earlier variable-centered longitudinal studies (J. Block, 1971, p.12-13). More recently, physical education researchers have adopted person-centered analyses to understand distinct learning profiles of students from various motivational perspectives (e.g., Haerens, Kirk, Cardon, De Bourdeaudhuij & Vansteenkiste, 2010; Webster, Mindrilă, & Weaver, 2013). Webster et al. (2013) stated, “Whereas the primary aim of a variable-centered approach is to investigate the effect of the different motivational dimensions on outcomes, the aim of the person-centered approach is to examine how different motivational dimensions get combined with different groups of individuals, each characterized by a different motivational profile” (p. 120). A person-centered approach describes differences among individuals in how variables are related to each other: “the identification of groups of individuals who function in a similar way at the organism level and in a different way relative to other individuals at the same level” (Magnusson, 2003, p. 16). In other words, this approach identifies groups or types of individuals who share particular attributes or relations among attributes (Laursen, & Hoff, 2006).

Explaining the perceptions and behavior of people can be done by sorting them into groups by their shared common characteristics (Wang, Sinclair, Zhou, & Sears, 2013). By using individual characteristics, researchers can study configurations or
patterns of characteristics that a group of people may share in common (Wang, Sinclair, Zhou, & Sears, 2013). Person-centered research identifies a set of groups that best represent the patterns of covariation among the variables of interest and then investigate differences between these groups on other measures (Wang, Sinclair, Zhou, & Sears, 2013). Research aimed at classifying subgroups of administrators would help to offer differentiated professional development to school leaders in regard to CSPAP (Webster, Mîndrilă, & Weaver, 2013).

**Survey Research and Design**

Surveys have become a fundamental tool to an evaluator (Greenlaw & Brown-Welty, 2009). The term survey is used in a many ways, but generally refers to selecting a sample population and collecting data from that sample (Kelley, Clark, Brown & Sitzia, 2003). The information is then used to make inferences about the wider population (Kelley, Clark, Brown & Sitzia, 2003). Surveys allow for the collection of opinions, demographics, or feedback in a direct and potentially inexpensive manner (Greenlaw & Brown-Welty, 2009). Several advantages to survey design are it (a) produces data based on real-world observations, (b) allows for a wide breadth of coverage of many people or events, which increases the likelihood of obtaining data that are generalizable to a population, and (c) can produce large amounts of data in a short time at fairly low cost (Kelley et al., 2003). Disadvantages include (a) the significance of the data can become negated if the range of focus is to broad so that there will not be enough detail to sufficiently apply to relevant issues, problem, or theories; (b) the data that are produced are likely to lack details or depth on the topic being investigated; (c) procuring high response rates to a survey can be difficult to achieve (Kelley et al., 2003).
Survey research is being conducted via the internet, more and more (Davidson, 2015). According to the International Telecommunication Union, the number of internet users has increased from 738 million in 2000 to 3.2 billion in 2015, (Davidson, 2015). With the widespread acceptance of communicating through online means, the internet has given survey research an expansive push; there are multiple ways to collect data and participants can complete surveys when it is convenient for them (Daley, McDermott, McCromack Broen & Kittleson, 2003). Internet, or web-based, surveys have been used as a means of collecting data from large sample groups quickly and with minimal cost (Schonlau, Fricker, & Elliott 2002). Web-based surveys have become easier and more convenient for public use in their construction and distribution with numerous options available (e.g., Zoomerang.com, SurveyMonkey.com and Google Docs; Greenlaw & Brown-Welty, 2009). Web-based surveys are able to be self-administered, removing the need to pay people to administer a survey. Researchers can now create, disseminate, and interpret results from their surveys in a quicker and more precise manner eliminating the need for mass mailings or personnel to conduct the interviews (Couper, 2000). Studies also suggest that surveys taken via the Web may be more likely to get completed; this indicates that participants find Web-based surveys more appealing (Bälter, Bälter, Fondell, & Lagerros, 2005).

Other advantages to Web-based surveys include being able to reach people in distant locations and the convenience of having data collection provided for you (Wright, 2005). Online surveys provide convenience in multiple ways: (a) respondents can answer at a convenient time for themselves; (b) respondents may take as much time as they need to
answer individual questions; and (c) some online surveys let respondents start and then return later to the question where they left off earlier (Evans & Mathur, 2005). You can conduct web-based surveys multiple ways, such as e-mail with embedded survey, e-mail with a link to a survey URL or a visit to a web site by an internet surfer who is then invited to participate in a survey (Evans & Mathur, 2005). Surveys can be in plain text or html and they can easily be adjusted to customer demographics and language (Evans & Mathur, 2005). Online surveys are capable of including layered questions; multiple-choice questions; scales; questions in a multimedia format; single-response and multiple-response questions; and open-ended questions (Evans & Mathur, 2005). Due to the cost being low and ease of doing web-based surveys, the follow up on these surveys is more likely to increase the survey response rate (Evans & Mathur, 2005).

There are multiple disadvantages to online surveys as well. One disadvantage is self-selection bias (Thompson, Surface, Martin & Sanders, 2003). In on-line communities, there will be people who will be more likely than others to complete the survey (Thompson, et al., 2003). The target audience may have different levels of computer expertise; this lack of expertise can cause the participants to not respond (Gunn, 2002). The survey may be perceived as junk mail or spam (unsolicited junk mail) (Evans & Mathur, 2005). Privacy issues may also be a problem (Evans & Mathur, 2005). Two concerns with privacy are the security of transmissions (e.g., standard e-mail surveys do not have a high level of security, messages can be intercepted) and how data will be used (e.g., participants wonder if their answers will be treated confidentially) (Evans & Mathur, 2005). Misrepresentation is another disadvantage to online surveys (Wright, 2005). For example, participants can misrepresent their age, gender, or level of education.
Even when the precise characteristics of a sample are known by the researcher, people can still respond in socially desirable ways or misrepresent their identity or their true feelings about the content of the survey (Wright, 2005).

Coverage and sampling errors are other disadvantages of online surveys. Coverage error is a function of the mismatch between the target population and the frame population (Couper, 2000). The target population is the set of persons one wishes to study or the population to which one wants to make inference (Couper, 2000). The frame population is the group of potential subjects from which the target population is obtained (Couper, 2000). Sampling error arises when not all members of the frame population are measured (Couper, 2000). Sampling issues inhibit researchers' ability to make generalizations about study findings. This limits the researcher’s ability to estimate population parameters and is the biggest threat to conducting probability research (Wright, 2005).

**Designing Surveys**

Surveys are created to give a snapshot of how things are at a specific time in history (Kelley et al., 2003). Data are collected in a standardized form with no attempt to control conditions or manipulate variables; participants are put into groups and they receive no treatments (Kelley et al., 2003). When designing a survey, a coherent objective is crucial. When refining the initial research objectives, it is necessary to look at the specification of the topic, participants, and the primary, as well as the, secondary research questions to be addressed (Burns et al., 2008). The researcher should also determine the sampling frame (Burns et al., 2008). The sample frame is the method by which the sample is selected and is integral to the external validity of a survey: the
sample has to be representative of the larger population to obtain all the elements of that population (Kelley et al., 2003).

After defining the objectives and identifying the sampling frame, researchers can begin to develop their survey by generating items (Burns et al., 2008). With item generation, the researcher needs to consider all potential items (ideas, concepts) for inclusion in the survey, with the goal of concentrating on important themes or categories suggested by the research question (Kirshner & Guyatt, 1985). Items may be generated through literature reviews, in-depth interviews, focus-group sessions, or a combination of these methods with potential participants or experts (Burns et al., 2008). The Delphi method can be used to develop items by achieving consensus through experts rating the items (Burns et al., 2008).

Surveys typically have 25 questions, with five items per category (Fox, 1994). When developing a survey, the questionnaire formatting is a crucial part to the process. The question stem, which is the statement or question to which a response is sought, should focus on a single construct (Burns et al., 2008). Question stems should contain twenty words or less, and be understandable and easy to interpret (Stone, 1993). Their needs to be a concise format for the answering of the questions asked in the survey (Passmore, 2002). As with question stems, researchers should develop succinct and impartial response formats, either open/free text or closed/structured; closed response formats include binary (yes/no), nominal (e.g., a list of mutually exclusive, but unordered, names or labels, i.e., administrators, physicians, nurses), ordinal (e.g., Likert scales, i.e., strongly disagree to strongly agree), and interval and ratio measurements (Burns et al., 2008).
The survey content starts with a cover letter (Burns et al., 2008). The cover letter establishes the first impression for the survey, should state the objective of the survey and highlight why potential participants were selected (Dillman, 2000). Presenting demographic questions first may ease participants into completing the survey. If the questions asked in the survey are sensitive in nature, researchers may choose to ask demographic questions at the end of the survey (Burns et al., 2008). The font style and size should be easy to read, the use of bold type, shading and broad lines can help direct respondents’ attention and enhance visual appeal (Burns et al., 2008). For Internet-based surveys, questions are presented in a single scrolling page or on a series of linked pages that often provide electronic instructions and links to facilitate the flow of the survey (Burns et al., 2008). The questions should be numbered and organized with every question stem including a clear request for either single or multiple responses and indicate the desired notation (e.g., check, circle), response options should appear on separate lines (Burns et al., 2008).

The first stage survey of design is pilot testing or pretesting; this will help determine the quality of your survey. The quality of survey data depends on how well the participants understand the questions (Burns et al., 2008). The participants’ understanding of the survey may be affected by language skills, education and culture (Passmore, 2002). Pre-testing begins the process of reviewing and revising questions; the purpose at this stage is to evaluate whether participants interpret questions in a consistent manner, as the researcher intended and allows the researcher to judge the appropriateness of each question included in the survey (Collins, 2003). Researchers ask people who are similar to prospective participants to evaluate each question through interviews.
(individual or group) or written feedback (Woodward, 1998). Researchers also ask if the original question and meaning should be kept, if one (question or meaning) should be changed, or if the question should be eliminated or replaced (Bowden et al., 2002).

In the second phase of pilot testing the participants are asked to examine the survey with regard to its flow, accuracy, acceptability, and administrative ease (Collins, 2003). The second phase of pilot testing is also to identify poorly worded question stems and items (Collins, 2003). In order to find out the length of time needed to complete the survey, participants may be asked to record the time required to complete the survey (Burns et al., 2008). Pilot testing minimizes the chance that participants will misinterpret questions, fail to recall what is requested or misrepresent their true feelings (Collins, 2003). The information obtained through pilot testing is used to improve the survey before sending it out to the intended audience (Burns et al., 2008).

Using reliability assessment helps with the evaluation of a new survey (Carmines & Zeller, 1979). Questions discriminate among participants such that participants who think similarly about a question choose similar responses, while those who think differently choose diverse responses (Passmore, 2002). With test–retest reliability, researchers assess whether the same question posed to the same individuals generates consistent results at different times (usually spanning 2–4 weeks; Burns et al., 2008). With interrater reliability, researchers assess whether different participants provide similar responses where expected (Burns et al., 2008). Internal consistency is where researchers determine whether different items intended to measure the same construct are correlated (Aday & Cornelius, 2006).
There are several types of validity that can be assessed in surveys: face, content, construct and criterion validity. Face validity is the most subjective aspect of validity testing (Turocy, 2002). With face validity, experts and sample participants evaluate whether the survey measures what it says it is supposed to measure during pretesting or pilot testing (Turocy, 2002). Content validity is the assessment best performed by experts who evaluate whether survey content accurately assesses all aspects of the topic from the survey (Burns et al., 2008). Construct validity is the most abstract type of validity assessment: it is used if specific criteria cannot be identified that adequately define the construct being measured (Burns et al., 2008). Researchers may engage in one or more assessments of instrument validity depending on current and anticipated uses of the survey; at a minimum, they should assess the survey’s face validity (Burns et al., 2008).

How to administer the survey to participants depends on the amount and type of information desired, the target sample size, investigator time, financial constraints and whether test properties were established (Burns et al., 2008). Self-administered questionnaires can be distributed by mail or electronically via email (Burns et al., 2008). Before choosing an administration technique, researchers need to make sure they are able to have support of skilled information technologists and the required server space (Burns et al., 2008). Researchers must also establish that potential participants have access to electronic mail (email) or the internet (Burns et al., 2008). Electronic software is needed for questionnaire development and analysis; otherwise commercial electronic survey services can be used (e.g., SurveyMonkey, QuestionPro) (Burns et al., 2008).

Complete and transparent reporting is essential for a survey to provide meaningful information for clinicians and researchers (Burns et al., 2008). Higher response rates will
increase the precision of parameter estimates, reduce the risk of selection bias and enhance validity (Leece et al., 2004). The lower the response rate, the higher the likelihood that participants will differ from those of non-participants, which can then cast doubt on whether the results of the survey reflect those of the target population (Passmore, 2002). Researchers may report the actual response rate – this reflects the sampling element or the analyzable response rate, which reflects information, obtained from partially or fully completed surveys as a proportion of the sampling frame (Burns et al., 2008). Reminders also have a powerful and positive influence on response rates; Dillman (1978) proposed the use of three follow-up reminders: an initial reminder sent one week after the survey was sent out, with two more follow-up reminders to the participants that have not responded.

In summary, CSPAPs are an integral part of the school community. Through CSPAPs, a healthy and active atmosphere can be developed at schools within the K-12 setting. Using a social ecological model to examine principals’ involvement in, and perceptions of, a CSPAP can help determine what needs to be done to foster administrator support for such programs.
Regular physical activity (PA) in children and adolescents promotes health and fitness (Office of Disease Prevention and Health Promotion [ODPHP], 2015). When youth meet the nationally recommended 60 minutes of PA every day, health benefits accrue, such as healthy bones and muscles, improved muscular strength and endurance, reduced development of chronic disease risk factors, improved self-esteem, and reduced stress and anxiety (Physical Activity Guidelines Advisory Committee, 2008).

Unfortunately, almost half of United States youth do not meet PA guidelines (Institute of Medicine [IOM], 2013; Troiano, Berrigan, Dodd, Masse, Tilert, & McDowell, 2008). Children also spend 80-93% of their waking hours in sedentary time (Turner, Johnson, & Slater, 2014). National organizations (e.g., Centers for Disease Control and Prevention [CDC]; National Academies of Science) suggest that schools should be the key focus of intervention efforts when attempting to increase youth PA, given the number of waking hours children and adolescents spend in schools (Cooper et al. 2016). Schools directly reach approximately 25% of the US population. From this perspective, education settings can play a major role in public health initiatives related to PA (National Physical Activity Plan Alliance, 2016).

In 2008, the National Association for Sport and Physical Education (now the Society for Health and Physical Educators [SHAPE] America) published a position
A statement (updated in 2015) called Comprehensive School Physical Activity Programs (CSPAP). A CSPAP is described as a five-component approach to promoting increased PA among school communities. The five components include (a) Physical Education, (b) PA before and after school, (c) PA during school, (d) staff involvement, and (e) family and community engagement (SHAPE America, 2015). The CSPAP model provides a complete conceptual framework for providing children and adolescents with PA support and opportunities before, during, and after school as a means to achieving the recommended 60 minutes a day of PA. 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. However, a survey conducted by SHAPE America (2011, then called the American Alliance for Health, Physical Education, Recreation and Dance [AAHPERD]), found that CSPAPs existed in only 16% of elementary schools, 13% of middle schools, and 6% of high schools. In a more recent survey by the CDC (2016), a mere 3% of secondary schools were found to have implemented a CSPAP. The apparent low prevalence of CSPAPs in the U.S. underscores the need to investigate the factors that are associated with program implementation.

One factor that has consistently been cited as critical in school reform efforts and in creating and maintaining an effective school is the principal and his or her leadership (Dow & Oakley, 1992; Fullan, 2001). Next to a mission and vision statement for the school, an important driver toward the creation of any kind of school culture is the school leadership (Bryk, Sebring, Allensworth, Easton & Luppescu, 2010). If a principal supports a school program by actively assisting in its development and taking part in its
promotion, teachers will believe that they are supported and will show more commitment to the initiative (Leithwood & Jantzi, 1999). The principal is the main reason programs are or are not successful in schools; they hold the most influence for implementation of programs and policies (Datnow & Castellano, 2001). Functioning as leaders, principals can serve either to transform or to maintain school cultures (Leithwood & Jantzi, 1999).

The success of a school-based health promoting program depends on an administration that is supportive in the creation, implementation and maintenance phases of the program. (Greaney et. al., 2007; Weiler, Pigg & McDermott, 2003). Van den Berg et al. (2017) found that principals had a positive perception of PA, citing reasons such as academic benefits, physical health benefits, and social and emotional benefits. However, the barriers for PA in schools were stronger; these included time, priority, space constraints, and financial issues. There is a gap in the research literature specific to principals’ perceptions of CSPAPs. It is important to measure these perceptions to understand key factors of influence that should be taken into consideration with respect to initiatives that include principals’ involvement in CSPAP implementation and/or sustainability.

In the health promotion field, ecological models have been used to understand and identify targets for both general and specific health behavior interventions (McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis, Owen, & Fisher, 2008; Stokols, 1996). Social-ecological models (SEMs) are used to show the dynamic relationships among individuals, groups, and their environments (Golden, et al., 2015). Bronfenbrenner (1976) created a model explaining how the environment and a person’s development are connected and how the influence from that connection lasts throughout their lifetime (Hess & Schultz,
Social-ecological models (SEMs) are used to show the dynamic relationships among individuals, groups, and their environments (Golden, et al., 2015). SEMs also have been used in previous studies on school-based programs and interventions on multiple topics, including PA promotion (Carson, Castelli, Beighle & Erwin, 2014; Comer and Hayes, 1991; Gregson et al., 2001; Langille and Rodgers, 2010; Swearer and Doll, 2001; Webster et al., 2013; Webster and Suzuki, 2014).

There are currently no measures available to assess principals’ involvement in CSPAPs or the factors that may be associated with such involvement from a social-ecological perspective. The purpose of this study, therefore, was to develop and examine the psychometric properties of a survey measure for the assessment of (a) principal involvement in CSPAPs and (b) factors that might influence CSPAP involvement at multiple levels of influence within a social-ecological framework. A secondary purpose of this study was to examine associations between a school’s CSPAP implementation, principal involvement, and social-ecological factors. The results of this study will help to advance research focused on the role of principals in CSPAP implementation and may inform future directions in professional development for school administrators.

Methods

Participants

Participants in this study included a total of 358 individuals who participated in different phases of the study (see Procedures).

Instrumentation

We developed an online survey as part of a larger investigation of principals’ perceptions of CSPAPs. The final version of the survey, specifically, the parts of the
survey used in the present study and as administered to the main study sample, is described in this section. The development of the survey is described in the Procedures section that follows.

The final survey was organized into six sections: (a) informed consent, (b) introduction, (c) CSPAP implementation, (d) CSPAP involvement, (e) social-ecological factors, (f) professional/context biography, and (g) participant demographics. Participants provided their consent by continuing with the survey. In the subsequent introduction section, participants were provided with a definition of a CSPAP and the purpose of the survey. The CSPAP implementation section of the survey listed possible CSPAP components (e.g. physical education, PA during school, PA before and after school) with examples and included a single dichotomous response question (“yes/no”), asking participants if their school has a CSPAP, which was conceptualized as follows:

[your school provides] opportunities, **through any combination or variety of CSPAP components** – for all students at your school to: (a) receive standards-based physical education experiences designed to prepare individuals for a lifetime of participation in physical activity, and (b) meet the national guideline for school-aged youth to accumulate at least 60 minutes of mostly moderate-to-vigorous physical activity each day (including lunch time activities, and before and after school activities).

A logic mechanism was built into the survey so that “Yes” respondents proceeded to the following two sections (involvement and social-ecological factors) with items written in the past/present tense (e.g., “I am involved with supporting my school staff in their efforts to promote physical activity”). “No” respondents proceeded to two identical
sections except that items were written in the future tense (e.g., “I would be involved with supporting my school staff in their efforts to promote physical activity”). Involvement items assessed the dependent variable (principal involvement in a CSPAP), while social-ecological items assessed the independent variables (factors at multiple levels of influence – intrapersonal, interpersonal, organizational, community, and public policy) that could be associated with principal involvement from a social-ecological perspective. The final two sections on professional context/biography and participant demographics included items that focused on participants’ school context (e.g., geographic location, total student enrollment), educational background (e.g., highest degree earned, licensure obtained) and experience (e.g., years serving as a principal, years serving as a teacher).

A 6-point Likert-type response scale (“strongly agree,” “agree,” “somewhat agree,” “somewhat disagree,” “disagree,” and “strongly disagree”) was used for all involvement and social-ecological items. Respondents were also able to choose a “don’t know” option for these items (Johnson & Morgan, 2016).

**Procedures**

This study consisted of three phases: (a) item construction, (b) pilot testing, and (c) administration of the survey to the main study sample.

**Item Construction.** A comprehensive literature search was completed to find published records (e.g., peer-reviewed articles, books, doctoral dissertations, public policies) in the areas of CSPAP (e.g., Carson, Castelli, Beighle, & Erwin, 2014; Rink, Hall, & Williams, 2010; SHAPE America, 2015; Webster et al., 2015), health promotion in schools (e.g., Cooper et al. 2016; Hillman, Buck, Themanson, Pontifex, & Castelli, 2009; Kohl III, & Cook, 2013; USDHHS, 2010), principals’ perceptions of health-related
school programming (e.g., physical education, recess, fitness, wellness) (e.g., Carson, 2012, 2003; Greaney et al., 2007; Van den Berg et al., 2017; Weiler, Pigg & McDermott, 2003) and survey item design (e.g., Davis, 2012; Hunt, 2017; Morrison, 2006; Park, 2003). A total of 165 draft items were constructed to measure CSPAP implementation (one item), principal involvement in CSPAPs (32 items), social ecological factors that could be associated with principal involvement (107 items), professional context/biography (22 items), and participant demographics (three items). Based on a “yes” or “no” response to the CSPAP implementation item, the sections assessing principal involvement and social-ecological factors were divided into two equivalent sections except for word tense.

The aforementioned six-point Likert-type response scale (see the Instrumentation section of this manuscript) was selected based on recommendations for scale development (Fink, 2003; Johnson & Morgan, 2016; Krosnick & Fabrigar, 1997) and the treatment of categorical variables (Finney & DiStefano, 2006). The preliminary sections of the survey (e.g., instructions, definition and examples of a CSPAP) were also developed during this phase of survey development. Survey Monkey was used as a platform for survey design and to administer the survey to the pilot and main study samples (see next two sections).

**Pilot Testing.** Before data collection started, approval was obtained by the university institutional review board (IRB) to conduct the study. There were two rounds of pilot testing. For the first round, the survey was sent out to CSPAP authors ($n=41$), university faculty in the area of educational leadership ($n=89$), and authors who have published research using social-ecological theory ($n=51$). This first round of pilot testing
was conducted to determine the content validity of the survey and obtain general feedback about the formatting and clarity of the survey.

CSPAP authors were identified from a list of contributing authors to a book about CSPAP research and practice (Carson & Webster, 2019). For each section of the survey, we instructed participants to rate the appropriateness of the items (completely inappropriate, mostly inappropriate, somewhat inappropriate, mostly appropriate and completely appropriate) and provide feedback about the content on each page. The survey remained open for two weeks, during which time follow-up emails were sent to maximize participation. A total of 24 CSPAP authors (59% response rate) provided responses. Using their comments, no items were removed but several revisions were made. Items that included the term “parents” were changed to read “parents/guardians”. Additionally, six items were added to the survey: “I believe schools have a responsibility to promote physical activity for all students throughout the school day,” “My school partners/would partner with a local university to promote CSPAP at our school,” “I am familiar with national-level policies support school physical activity,” “I am familiar with state-level policies that support school physical activity,” “Our state should develop more and better-quality policies that support students' physical activity”. Several of the CSPAP authors believed adding these items would better capture principals’ knowledge of PA and the polices that may affect the behavior of school age children.

SEM authors were identified from peer-reviewed articles on the topic of, or framed by, social-ecological perspectives (e.g., Devis-Devis, 2015; Golden, McLeroy, Green, Earp, & Lieberman, 2015; McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis, Owen, & Fisher, 2015; Stokols, 1992). These authors were asked to match each of the
105 social-ecological items to the level of influence (intrapersonal, interpersonal, community, organizational, or public policy) they perceived to be most relevant. Participants were also asked to provide feedback on the quality and appropriateness of specific items and/or the items in general. The survey remained open for two weeks, during which time follow-up emails were sent to increase the response rate. A total of six SEM authors provided responses (12% response rate). Based on their feedback, items were found to match their intended SEM categories, so no changes were made to the survey.

University faculty who work in the area of educational leadership and policy were identified using convenience sampling (Glesne, 2011; Yin, 2011). The fourth author of this study contacted individuals with whom she was familiar using connections and experiences within the professional organization, the University Council for Educational Administration (UCEA). UCEA “is a consortium of higher education institutions committed to advancing the preparation and practice of educational leaders for the benefit of schools and children” (UCEA, n.d.). In efforts to receive rich and diverse feedback from experienced researchers, the list of individuals was compiled from 58 institutions and with representation of all levels of academic rank / seniority from assistant professor to retired professor. Many of those on the list had served as former school- and district-level administrators and thus had a dual-perspective of practicing school leader as well as a researcher and instructor in the field of educational leadership or educational policy. For each section of the survey, participants were instructed to rate the appropriateness of the items (completely inappropriate, mostly inappropriate, somewhat inappropriate, mostly appropriate and completely appropriate), considering the roles and responsibilities
of a school principal, and provide feedback about the content on each page. The survey remained open for two weeks, during which time follow-up emails were sent to remind faculty to participate in the survey. A total of 16 educational leadership faculty provided responses (17% response rate), which informed several changes to the survey. Two items were removed (“Others in my school environment notice/would notice the impact of promoting physical activity” and “I have a good relationship with the teachers at my school”). Educational Leadership faculty believed these two items would not receive a fair answer from the respondent. The first comment was deemed to be something school principals wouldn’t worry about. For the second item it was believed that; most principals would either believe they have a good relationship with their staff or would not admit to having a bad relationship with their staff. The introduction to the survey was revised to use less academic jargon.

Following all changes to the survey in the first round of pilot testing, the survey contained 168 items: CSPAP implementation (one item), principal involvement in CSPAPs (32 items), social ecological factors that could be associated with principal involvement (110 items), professional context/biography (22 items), and participant demographics (three items),

For the second round of pilot testing, the survey was sent to a convenience sample of 42 K-12 school principals to obtain data for an initial statistical analysis of the items. Twenty-one principals responded (16 indicated they had a CSPAP at their school) for a 50% response rate. After receiving feedback from principals, one item was removed from the survey: “Compared to what my school is currently / was previously doing to promote physical activity, a CSPAP has given / would give my school greater control
over promoting physical activity.” Directions for taking the survey and an explanation of what a CSPAP is were revised again based on two comments: “It's very wordy and I honestly just skimmed it” and “This page looks good, but too lengthy.” Accordingly, the directions and explanations were revised for brevity and concision using more practitioner-friendly (versus academic) language, although the intended meanings were retained.

Bayes exploratory factor analysis (BEFA) was used to individually examine each survey scale. Recent studies showed that EFA can provide accurate results with small samples as small as 20 or 10 observations when the data are well conditioned (i.e., high ω, low f, high p) (de Winter, Dodou, & Wieringa, 2009; Preacher & MacCallum, 2002). Further, the Bayesian estimation method does not rely on a large-sample theory and, therefore, can provide accurate results with very small sample sizes (Heerwegh, 2014; Muthén & Asparouhov, 2012). The survey items with the highest loadings under the corresponding factor were selected for further data collection. A total of 21 items were removed due to not loading with any factor or having very low / non-significant loadings. Thus, 51 items were included in the final survey.

We also asked the respondents from the convenience sample to retake the survey one week after their survey closed, to assess test-retest reliability. One week was allowed to retake the survey. There were thirteen respondents (11 indicated they had a CSPAP at their school) for an 62% response rate. Thirteen items were removed from the survey due to having a Kappa value lower than .2

**Main study.** Respondents for the main study were 291 K-12 school principals (see Table 3.1 for demographic information). A federal website listing all public schools
in the United States was used to choose principals for the study. A stratified random sampling was applied to select 60 schools (20 elementary, 20 middle/junior high, and 20 high) from each state (total of 3,000 schools), school websites were examined to find email addresses (where available) for all K-12 school principals at each school, and compiled a list of 2,941 email addresses. With these addresses, we sent a blanket email, via Survey Monkey, to K-12 school principals inviting them to participate in the study. The link to the final survey was included in the email.

Table 3.1

Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age-band</strong></td>
<td></td>
</tr>
<tr>
<td>31-35</td>
<td>3%</td>
</tr>
<tr>
<td>36-40</td>
<td>14%</td>
</tr>
<tr>
<td>41-45</td>
<td>19%</td>
</tr>
<tr>
<td>46-50</td>
<td>22%</td>
</tr>
<tr>
<td>51-55</td>
<td>14%</td>
</tr>
<tr>
<td>56-60</td>
<td>18%</td>
</tr>
<tr>
<td>61-65</td>
<td>9%</td>
</tr>
<tr>
<td>70+</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>58%</td>
</tr>
<tr>
<td>Female</td>
<td>42%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
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</tr>
<tr>
<td>Asian</td>
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</tr>
<tr>
<td>African-American/Black</td>
<td>11%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>3%</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>84%</td>
</tr>
<tr>
<td>No Response</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>27%</td>
</tr>
<tr>
<td>Masters +30</td>
<td>44%</td>
</tr>
<tr>
<td>Ed.D.</td>
<td>21%</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>29%</td>
</tr>
<tr>
<td>6-10</td>
<td>23%</td>
</tr>
<tr>
<td>11-15</td>
<td>24%</td>
</tr>
</tbody>
</table>
### Data Analysis

Before conducting statistical analyses, survey variables were screened to examine the prevalence of “don’t know” responses as well as the distribution of missing values. The “don’t know” response option was included to prevent item non-response, forced responses, or guessing, but were not included in statistical analysis because they indicate insufficient information to provide an informed opinion. To avoid losing data, “don’t know” responses were recoded as missing values. Cases with less than 15% valid responses were listwise deleted. The proportion of missing values ranged between 0.0% and 2.7% per item. Little’s MCAR test showed that missing values were distributed completely at random ($\chi^2_{(1825)} = 1800.867, p=.652$); therefore, missing values were imputed using the expectation-maximization algorithm. The resulting sample included 260 respondents. Descriptive statistics such as the mean, standard deviation, skewness, and kurtosis were computed for all survey items to examine the distribution of valid responses and identify the items with the highest ratings.

### Exploratory Structural Equation Modeling

Although the SEM is a well-established framework, no studies were conducted using school principals. The identification of the factor structure was, therefore the initial step of our investigation. Exploratory structural equation modeling (ESEM) was
employed to identify the latent variables underlying the data. ESEM was chosen because it allows the estimation of an exploratory model with rotations and estimation of cross-loadings, thus yielding a more realistic representation of the data and reducing estimation bias. Additionally, ESEM allows the inclusion of covariates and estimation of structural coefficients and goodness of fit indices. (Marsh, Morin, Parker, & Kaur, 2014; Morin & Maiano, 2011; Morin, Marsh, & Nagengast, 2013). This analysis was based on the assumption of measurement invariance across CSPAP adopters and potential adopters.

A group of 51 observed indicators were used to estimate latent variables. We used the mean and variance adjusted weighted least squares (WLSMV) estimation method and Geomin rotation with the Mplus 8.2 software. This estimation method is recommended for small sample sizes and data that are ordinal or non-normally distributed (Finney & DiStefano, 2006). The Geomin rotation is an oblique procedure; oblique rotation methods are employed when factors are expected to correlate (Browne, 2001).

The optimal number of factors was determined after examining the scree plot, the number of eigenvalues larger than one, the interpretability of the factor structure, and goodness of fit indices. The indices used to assess model fit were: (a) \( \chi^2 \) and corresponding \( p \)-value, (b) \( \chi^2/df \), (c) the comparative fit index (CFI), (d) the Tucker-Lewis index (TLI), (e) the weighted root mean residual (WRMR), (f) the root mean square error of approximation (RMSEA) and 90% confidence interval (CI), and (g) the standardized root mean square residual (SRMR).

The \( \chi^2 \) test is an overall measure of model fit; a non-significant \( \chi^2 \) statistic indicates good fit (Barrett, 2007); however, this statistic is sensitive to sample size and model size. Therefore, the \( \chi^2/df \) is often used, where values lower than 3 show good
model fit (Finney & DiStefano, 2006). CFI and TLI values above .95 indicate excellent model fit, while values larger than .90 indicate good fit. WRMR values lower than 1 indicate very good fit (DiStefano, Liu, Jiang, & Shi, 2018; Yu & Muthén, 2002). For SRMR and RMSEA, values larger than .10 show poor model fit, values between .08 and .10 indicate acceptable fit, values .05 and .08 indicate good fit, whereas values lower than .05 indicate excellent fit (Hu & Bentler, 1999). The final factor solution (Model 1) included survey items with loadings that were statistically significant (alpha=.05) and larger than .320 (Costello & Osborne, 2005).

Survey respondents were asked whether a CSPAP is currently implemented at their school. Their responses were coded as \( \text{impl}=1 \) for "Yes" (\( N=198 \)) and \( \text{impl}=0 \) for "No" (\( N=62 \)). The factor model was then estimated by including the \( \text{impl} \) variable as a covariate on the identified factors (Model 2). This multiple indicator multiple cause model (MIMIC), helped determine whether scores on the identified factors differed significantly across the two groups.

**Results**

Descriptive analyses showed that most respondents provided high ratings on the majority of the survey items. As indicated in Table 3.2, the item with the highest average response was “A CSPAP would enhance students' physical development” (\( M=5.28, SD=.766 \)), followed closely by the item “I would be involved with supporting my school staff in their efforts to promote physical activity” (\( M=5.23, SD=.843 \)). The item with the lowest average was “It is mostly up to me whether we have a CSPAP at my school” (\( M=3.17, SD=1.410 \)).
Table 3.2

**Descriptive Statistics**

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Skew</th>
<th>Kurt</th>
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<tbody>
<tr>
<td>A CSPAP would enhance students' physical development</td>
<td>5.28</td>
<td>.766</td>
<td>-2.074</td>
<td>9.417</td>
</tr>
<tr>
<td>I would be involved with supporting my school staff in their efforts to promote physical activity</td>
<td>5.23</td>
<td>.843</td>
<td>-1.822</td>
<td>5.794</td>
</tr>
<tr>
<td>A CSPAP would promote a whole-child learning approach</td>
<td>5.16</td>
<td>.816</td>
<td>-1.887</td>
<td>7.182</td>
</tr>
<tr>
<td>A CSPAP would be an ideal program for our students to pursue a healthy lifestyle</td>
<td>5.15</td>
<td>.797</td>
<td>-1.561</td>
<td>5.467</td>
</tr>
<tr>
<td>A CSPAP would promote students' social development</td>
<td>5.15</td>
<td>.776</td>
<td>-1.574</td>
<td>6.045</td>
</tr>
<tr>
<td>A CSPAP would facilitate student learning</td>
<td>5.13</td>
<td>.792</td>
<td>-1.798</td>
<td>7.318</td>
</tr>
<tr>
<td>A CSPAP would help our students pursue physically active lifestyles</td>
<td>5.08</td>
<td>.759</td>
<td>-1.310</td>
<td>5.250</td>
</tr>
<tr>
<td>I would be involved with allocating resources for our school's CSPAP</td>
<td>5.00</td>
<td>1.053</td>
<td>-1.393</td>
<td>2.116</td>
</tr>
<tr>
<td>A CSPAP would improve cognitive performance</td>
<td>5.00</td>
<td>.722</td>
<td>-1.433</td>
<td>6.465</td>
</tr>
<tr>
<td>Policies in my school district support school physical activity</td>
<td>4.99</td>
<td>.717</td>
<td>-.554</td>
<td>.540</td>
</tr>
<tr>
<td>I would be involved with establishing physical activity opportunities at my school</td>
<td>4.96</td>
<td>.997</td>
<td>-1.546</td>
<td>3.543</td>
</tr>
<tr>
<td>A CSPAP would foster students’ attention to academics</td>
<td>4.94</td>
<td>.911</td>
<td>-1.483</td>
<td>3.823</td>
</tr>
<tr>
<td>Policies in my school support physical activity</td>
<td>4.94</td>
<td>.806</td>
<td>-.877</td>
<td>2.089</td>
</tr>
<tr>
<td>A CSPAP would promote improved classroom behavior</td>
<td>4.89</td>
<td>.803</td>
<td>-1.201</td>
<td>3.862</td>
</tr>
<tr>
<td>Policies in my state support school physical activity</td>
<td>4.86</td>
<td>.841</td>
<td>-1.502</td>
<td>5.352</td>
</tr>
<tr>
<td>A CSPAP would promote our students' academic achievement</td>
<td>4.85</td>
<td>.786</td>
<td>-1.118</td>
<td>3.661</td>
</tr>
<tr>
<td>I would be involved with advocating for our school's CSPAP</td>
<td>4.80</td>
<td>1.054</td>
<td>-1.328</td>
<td>1.942</td>
</tr>
<tr>
<td>I feel capable of helping to create opportunities within my school's CSPAP</td>
<td>4.77</td>
<td>.905</td>
<td>-1.322</td>
<td>3.378</td>
</tr>
<tr>
<td>Statements</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------</td>
<td>-----------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Policies in my school support the promotion of students' physical activity during school hours every school day</td>
<td>4.75</td>
<td>.985</td>
<td>-1.232</td>
<td>2.234</td>
</tr>
<tr>
<td>A CSPAP would fit well with the way my school community likes to promote physical activity</td>
<td>4.68</td>
<td>.943</td>
<td>-1.380</td>
<td>3.177</td>
</tr>
<tr>
<td>Our district superintendent supports CSPAPs</td>
<td>4.68</td>
<td>.943</td>
<td>-.880</td>
<td>1.111</td>
</tr>
<tr>
<td>I would be involved with evaluating my school's CSPAP</td>
<td>4.65</td>
<td>1.161</td>
<td>-1.211</td>
<td>1.406</td>
</tr>
<tr>
<td>I would be involved with being a physically active role model for others in my school</td>
<td>4.61</td>
<td>1.152</td>
<td>-.975</td>
<td>.617</td>
</tr>
<tr>
<td>Parents/Guardians at my school would support our CSPAP</td>
<td>4.61</td>
<td>.938</td>
<td>-9.52</td>
<td>1.608</td>
</tr>
<tr>
<td>A CSPAP would promote increased school attendance</td>
<td>4.60</td>
<td>.918</td>
<td>-.883</td>
<td>1.558</td>
</tr>
<tr>
<td>The facilities at my school are adequate to implement a CSPAP</td>
<td>4.60</td>
<td>1.149</td>
<td>-1.210</td>
<td>1.914</td>
</tr>
<tr>
<td>Policies at my school support the promotion of faculty/staff wellness (e.g., health, fitness, physical activity)</td>
<td>4.46</td>
<td>1.015</td>
<td>-.755</td>
<td>1.110</td>
</tr>
<tr>
<td>Our school schedule can accommodate a CSPAP</td>
<td>4.45</td>
<td>1.166</td>
<td>-.943</td>
<td>1.065</td>
</tr>
<tr>
<td>The teachers at my school believe it is important that our school has a CSPAP</td>
<td>4.44</td>
<td>1.094</td>
<td>-.795</td>
<td>.623</td>
</tr>
<tr>
<td>A CSPAP can be easily applied to fit my school's specific context</td>
<td>4.43</td>
<td>1.054</td>
<td>-.793</td>
<td>.646</td>
</tr>
<tr>
<td>I would be involved with CSPAP planning at my school</td>
<td>4.41</td>
<td>1.203</td>
<td>-.742</td>
<td>.247</td>
</tr>
<tr>
<td>I would be involved with organizing physical activity opportunities at my school</td>
<td>4.33</td>
<td>1.178</td>
<td>-.681</td>
<td>.187</td>
</tr>
<tr>
<td>The majority of teachers at my school would be capable of contributing to the developing and implementing of a CSPAP</td>
<td>4.26</td>
<td>1.002</td>
<td>-.405</td>
<td>.315</td>
</tr>
<tr>
<td>I would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP</td>
<td>4.25</td>
<td>1.255</td>
<td>-.781</td>
<td>.085</td>
</tr>
<tr>
<td>Classroom teachers at my school are able to integrate physical activity into academic</td>
<td>4.21</td>
<td>1.089</td>
<td>-.483</td>
<td>.533</td>
</tr>
<tr>
<td>Statement</td>
<td>Mean</td>
<td>SD</td>
<td>Cronbach's Alpha</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------</td>
<td>-----</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Having a CSPAP at my school is something that is within my control as a principal</td>
<td>4.20</td>
<td>1.301</td>
<td>-.766 .240</td>
<td></td>
</tr>
<tr>
<td>Adequate CSPAP resources are available for my school faculty/staff</td>
<td>4.17</td>
<td>1.091</td>
<td>-.664 .788</td>
<td></td>
</tr>
<tr>
<td>My school has sufficient funds to support a CSPAP</td>
<td>4.05</td>
<td>1.183</td>
<td>-.379 -.068</td>
<td></td>
</tr>
<tr>
<td>Parents/Guardians at my school would be interested and willing to help our school toward our CSPAP goals</td>
<td>4.04</td>
<td>1.128</td>
<td>-.401 .512</td>
<td></td>
</tr>
<tr>
<td>I would be involved with staying up-to-date on best practices for school physical activity programming</td>
<td>4.03</td>
<td>1.167</td>
<td>-.478 -.325</td>
<td></td>
</tr>
<tr>
<td>I would be involved with providing CSPAP professional development opportunities at my school</td>
<td>3.96</td>
<td>1.412</td>
<td>-.555 -.615</td>
<td></td>
</tr>
<tr>
<td>I would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force</td>
<td>3.96</td>
<td>1.529</td>
<td>-.509 -.936</td>
<td></td>
</tr>
<tr>
<td>There are safe routes for active transportation (e.g., walking, biking) to/from our school</td>
<td>3.91</td>
<td>1.343</td>
<td>-.445 -.350</td>
<td></td>
</tr>
<tr>
<td>Our school's vision/mission includes the promotion of physical activity</td>
<td>3.87</td>
<td>1.256</td>
<td>-.394 -.283</td>
<td></td>
</tr>
<tr>
<td>Parents/Guardians would be engaged in helping our school work toward our CSPAP goals</td>
<td>3.82</td>
<td>1.125</td>
<td>-.368 .129</td>
<td></td>
</tr>
<tr>
<td>Our school has a strong relationship with one or more other organizations/agencies that help to support a CSPAP</td>
<td>3.76</td>
<td>1.329</td>
<td>-.351 -.335</td>
<td></td>
</tr>
<tr>
<td>Sufficient professional development for CSPAP is available for my school staff</td>
<td>3.67</td>
<td>1.198</td>
<td>-.212 -.256</td>
<td></td>
</tr>
<tr>
<td>A CSPAP would increase students’ off-task behavior in class</td>
<td>3.65</td>
<td>1.598</td>
<td>-.158 1.161</td>
<td></td>
</tr>
<tr>
<td>I would be involved with setting performance standards for my school’s CSPAP</td>
<td>3.61</td>
<td>1.312</td>
<td>-.226 -.868</td>
<td></td>
</tr>
<tr>
<td>Our school has a facility joint use agreement with one or more community</td>
<td>3.58</td>
<td>1.488</td>
<td>-.183 -.926</td>
<td></td>
</tr>
</tbody>
</table>
organizations for CSPAP programming
It is mostly up to me whether we have a CSPAP at my school

The initial EFA run yielded six eigenvalues larger than one, while the scree plot indicated solutions with 3-5 factors as optimal (Figure 3.1). We estimated factor solutions with 3-6 factors. Based on goodness of fit indices and the interpretability of the factor solutions, we considered the four-factor solution optimal (Model 1). Goodness of fit indices for Model 1 show that this factor structure had a relatively good fit to the data (Table 3.3). Nevertheless, the inclusion of a covariate further improved the model fit. As indicated in Table 3.3, Model 2 had a slightly better fit to the data than Model 1. Further, Model 2 provided information on the relationship between the CPAP adoption covariate and the identified factors. Therefore, Model 2, the MIMIC model, was selected as optimal.

All items in the final factor solution had statistically significant loadings, well above the cutoff of .320 (Costello & Osborne, 2005). Items with lower loadings and items that were cross-loading were sequentially removed; the final solution retained 38 items.

Figure 3.1 Scree plot
Table 3.3

Goodness of Fit Indices for Model 1 and Model 2

<table>
<thead>
<tr>
<th>Fit Index</th>
<th>Model 1 (five factors)</th>
<th>Model 2 (five factors with a covariate - MIMIC model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>1590.355</td>
<td>1555.512</td>
</tr>
<tr>
<td>df</td>
<td>557</td>
<td>591</td>
</tr>
<tr>
<td>p-value</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\chi^2$/df</td>
<td>2.855</td>
<td>2.632</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.084</td>
<td>0.079</td>
</tr>
<tr>
<td>(90% CI)</td>
<td>(0.080 – 0.089)</td>
<td>(0.074 – 0.084)</td>
</tr>
<tr>
<td>CFI</td>
<td>0.929</td>
<td>0.935</td>
</tr>
<tr>
<td>TLI</td>
<td>0.911</td>
<td>0.919</td>
</tr>
<tr>
<td>WRMR</td>
<td>0.983</td>
<td>0.962</td>
</tr>
</tbody>
</table>

Table 3.4 lists the items included in each factor along with their factor loadings, standard errors, corresponding $t$ statistics and $p$ values. The strongest factor was labeled F1 and included 12 items referring mostly to the implementation of CSPAPs. Item loadings ranged between .519 and .854, and the item with the highest loading was “I would be involved with CSPAP planning at my school”. Cronbach’s alpha index of internal consistency for this factor was .908. The second factor, F2, included nine items referring to the intrapersonal benefits of CSPAP adoption. Item loadings ranged between .625 and .991 and the item with the highest loading was “A CSPAP would facilitate student learning”. Cronbach’s alpha index of internal consistency for this factor was .947. The third factor, F3, included 12 items referring to environmental aspects that may facilitate CSPAP implementation. Loadings on this factor ranged between .358 and .897, and item with the highest loading was “Policies in my school support physical activity”. The internal consistency of this factor was alpha=.902. The fourth factor, F4, included five items, which referred to interpersonal aspects of CSPAP implementation. Loadings
on this factor ranged between .619 and .893 and the item with the highest loading was “Parents/Guardians at my school would be interested and willing to help our school toward our CSPAP goals”. The internal consistency of this factor was alpha=.850.

Table 3.4
Factor Loadings

<table>
<thead>
<tr>
<th>Items</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1 (Involvement)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be involved with CSPAP planning at my school</td>
<td>0.854</td>
<td>0.028</td>
<td>30.527</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with providing CSPAP professional development opportunities at my school</td>
<td>0.776</td>
<td>0.038</td>
<td>20.668</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with evaluating my school's CSPAP</td>
<td>0.753</td>
<td>0.036</td>
<td>21.151</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with setting performance standards for my school’s CSPAP</td>
<td>0.703</td>
<td>0.04</td>
<td>17.621</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force</td>
<td>0.695</td>
<td>0.041</td>
<td>17.145</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with establishing physical activity opportunities at my school</td>
<td>0.683</td>
<td>0.039</td>
<td>17.751</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with allocating resources for our school's CSPAP</td>
<td>0.677</td>
<td>0.038</td>
<td>17.878</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with organizing physical activity opportunities at my school</td>
<td>0.66</td>
<td>0.042</td>
<td>15.884</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with staying up-to-date on best practices for school physical activity programming</td>
<td>0.654</td>
<td>0.041</td>
<td>15.842</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP</td>
<td>0.612</td>
<td>0.045</td>
<td>13.599</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with advocating for our school's CSPAP</td>
<td>0.574</td>
<td>0.041</td>
<td>13.971</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with being a physically active role model for others in my school</td>
<td>0.519</td>
<td>0.051</td>
<td>10.211</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>F2 (Intrapersonal)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A CSPAP would facilitate student learning</td>
<td>0.991</td>
<td>0.022</td>
<td>45.63</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would promote a whole-child learning approach</td>
<td>0.909</td>
<td>0.026</td>
<td>35.553</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would improve cognitive performance</td>
<td>0.87</td>
<td>0.049</td>
<td>17.861</td>
<td>0.00</td>
</tr>
</tbody>
</table>
A CSPAP would promote students’ social development & 0.861 & 0.031 & 27.359 & 0.00
A CSPAP would enhance students' physical development & 0.860 & 0.031 & 27.694 & 0.00
A CSPAP would be an ideal program for our students to pursue a healthy lifestyle & 0.823 & 0.034 & 24.265 & 0.00
A CSPAP would foster students’ attention to academics & 0.814 & 0.031 & 26.271 & 0.00
A CSPAP would promote increased school attendance & 0.666 & 0.053 & 12.683 & 0.00
A CSPAP would help our students pursue physically active lifestyles & 0.625 & 0.045 & 13.874 & 0.00

**F3 (Environmental)**
Policies in my school support physical activity & 0.897 & 0.028 & 32.564 & 0.00
Policies in my state support school physical activity & 0.849 & 0.032 & 26.158 & 0.00
Adequate CSPAP resources are available for my school faculty/staff & 0.748 & 0.033 & 22.996 & 0.00
Policies in my school support the promotion of students' physical activity during school hours every school day & 0.739 & 0.033 & 22.424 & 0.00
My school has sufficient funds to support a CSPAP & 0.735 & 0.037 & 20.084 & 0.00
Our school schedule can accommodate a CSPAP & 0.638 & 0.043 & 14.967 & 0.00
The facilities at my school are adequate to implement a CSPAP & 0.615 & 0.042 & 14.596 & 0.00
Our district superintendent supports CSPAPs & 0.601 & 0.039 & 15.241 & 0.00
Sufficient professional development for CSPAP is available for my school staff & 0.56 & 0.04 & 14.004 & 0.00
There are safe routes for active transportation (e.g., walking, biking) to/from our school & 0.419 & 0.054 & 7.834 & 0.00
Our school's vision/mission includes the promotion of physical activity & 0.384 & 0.046 & 8.369 & 0.00
Policies at my school support the promotion of faculty/staff wellness (e.g., health, fitness, physical activity) & 0.358 & 0.047 & 7.621 & 0.00

**F4 (Interpersonal)**
Parents/Guardians at my school would be interested and willing to help our school toward our CSPAP goals & 0.893 & 0.023 & 39.203 & 0.00
Parents/Guardians would be engaged in helping our school work toward our CSPAP & 0.771 & 0.026 & 29.344 & 0.00
goals

Classroom teachers at my school are able to integrate physical activity into academic instruction/learning.

The majority of teachers at my school would be capable of contributing to the developing and implementing of a CSPAP.

Parents/Guardians at my school would support our CSPAP.

As indicated in Table 3.5, all factor covariance’s were statistically significant. The strongest relationships were F2-F1 and F2-F3, whereas the weakest relationships were F4-F1 and F3-F1. The impl covariate had a statistically significant path coefficient on F3 and F2 (Table 3.6), indicating that CSPAP adopters had significantly higher factor scores on these two factors (Figure 3.2).

Table 3.5

<table>
<thead>
<tr>
<th>Factor Covariances</th>
<th>Estimate</th>
<th>S.E.</th>
<th>Est./S.E.</th>
<th>Two-tailed p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2-F1</td>
<td>0.529</td>
<td>0.044</td>
<td>12.125</td>
<td>0.000</td>
</tr>
<tr>
<td>F2-F3</td>
<td>0.398</td>
<td>0.046</td>
<td>8.738</td>
<td>0.000</td>
</tr>
<tr>
<td>F4-F2</td>
<td>0.308</td>
<td>0.046</td>
<td>6.685</td>
<td>0.000</td>
</tr>
<tr>
<td>F4-F3</td>
<td>0.306</td>
<td>0.045</td>
<td>6.764</td>
<td>0.000</td>
</tr>
<tr>
<td>F3-F1</td>
<td>0.233</td>
<td>0.054</td>
<td>4.354</td>
<td>0.000</td>
</tr>
<tr>
<td>F4-F1</td>
<td>0.191</td>
<td>0.048</td>
<td>3.982</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3.6

<table>
<thead>
<tr>
<th>Parameter Estimates for the Relationship Between the IMPL and the Four Factors</th>
<th>Estimate</th>
<th>S.E.</th>
<th>Est./S.E.</th>
<th>Two-tailed p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>impl-&gt;F1</td>
<td>0.182</td>
<td>0.170</td>
<td>1.072</td>
<td>0.284</td>
</tr>
<tr>
<td>impl-&gt;F2</td>
<td>0.447</td>
<td>0.165</td>
<td>2.709</td>
<td>0.007</td>
</tr>
<tr>
<td>impl-&gt;F3</td>
<td>1.426</td>
<td>0.169</td>
<td>8.434</td>
<td>0.000</td>
</tr>
<tr>
<td>impl-&gt;F4</td>
<td>0.230</td>
<td>0.165</td>
<td>1.388</td>
<td>0.165</td>
</tr>
</tbody>
</table>
Discussion

Using a SEM framework, this study’s primary purpose was to develop and psychometrically assess a survey designed to measure principals’ involvement in CSPAP implementation. The results provide initial evidence of instrument validity and reliability. Following an extensive literature search and two rounds of pilot testing, EFA with data from the main study sample indicated that the most robust and parsimonious model, following our a priori theoretical framework, was a four-factor solution containing a total of 38 items. This solution supports three distinct levels of influence in relation to principals’ CSPAP involvement: intrapersonal, interpersonal, and “environmental,” which encompassed items focusing on organizational, community, and public policy variables. While the original SEM model structure is composed of five levels, it is not uncommon for researchers to collapse levels into groupings that are similar to the factors retained in the present study. Fisher et al. (2018) examined the relationship between the personal, social, and environmental factors regarding PA in community-dwelling older
adults, whereas Wilk and colleagues (2018) researched the PA levels of grade 5 children by focusing on individual, interpersonal, and environmental levels of influence. Other examples include studies in which individual, social, and environmental factors were used to investigate young womens’ participation in PA at transitional life stages (Craike, Symons, and Zimmermann, 2009) and PA participation of adolescents in Spain (Devis-Devis, Beltrán-Carrillo & Peiró-Velert, 2015).

A secondary purpose of this study was to examine associations between CSPAP implementation, principal involvement, and SEM-based variables. When principals indicated their school did not have a CSPAP, they scored significantly lower on measures that assessed intrapersonal and environmental levels of influence. The items that loaded onto the intrapersonal factor focused on expected outcomes of a CSPAP (e.g., positive academic and developmental outcomes for students), whereas the items that loaded onto the environmental factor focused on support for the program at the organizational, community, and public policy levels of the SEM. Thus, principals’ outcome expectancies and perceived school-based, community-based, and state policy support in relation to a CSPAP appear to be important factors in whether a school implements such a program. Previous research using a SEM perspective to examine the involvement of classroom teachers in CSPAP implementation also supports the significant role of factors at the intrapersonal (i.e., domain-specific innovativeness), organizational (i.e., perceived school support) and public policy (i.e., awareness of a state policy specific to school PA) levels.

Significant associations were found between principals’ CSPAP involvement and all SEM-based factors (intrapersonal, interpersonal, and environmental) assessed in this study. From this perspective, variables across the full scope of the SEM appear to be
important in the extent to which principals are involved with CSPAPs. Furthermore, the strength of the relationships between factors supports the postulate within social ecology theory that the intrapersonal level of influence is most strongly related to the target behavior (i.e., principal involvement in a CSPAP). According to SEM, physical and social environments influence a person’s actions it is the diversity of intrapersonal factors including genetic heritage, personality dispositions, and health practices that can attribute and influence well-being either directly or in conjunction with a variety of environmental circumstances (Stokols, 1996). While initiatives (e.g., professional development, interventions) focused on principals’ CSPAP involvement should include strategies that target all levels of influence, special attention should be given to ensuring principals recognize the many positive outcomes (e.g., increased physical activity before and after school, decreased off task behaviors, increased academic performance; Egan et al., 2019; Erwin, Fedeewa & Ahn, 2017; Mahar et al., 2006) that a CSPAP can help to facilitate.

Social ecology theory and research also suggests that beyond the intrapersonal level of influence, subsequent levels of influence indirectly impact the target behavior (Langille & Rogers, 2010; Webster & Suzuki, 2014; Webster et al., 2013). Most pertinent to the current study, other CSPAP research focusing on staff involvement found that the relationship between the target behavior (i.e., classroom-based PA promotion) and intrapersonal factors (i.e., domain-specific innovativeness and perceived attributes of PA promotion) was mediated by the organizational level of influence (i.e., perceived school support for PA promotion) in a sample of elementary classroom teachers in South Carolina (Webster et al., 2013). Although the present study did not specifically examine direct and indirect relationships between variables, both the interpersonal and
environmental levels of influence significantly correlated with principals’ CSPAP involvement. Of these two higher levels of influence, the strongest association with involvement was found for the environmental level. This could be due to the nature of the principal’s job, which requires oversight of the entire school and may often include an external-facing role as the school’s primary representative. While initiatives (e.g., professional development, interventions) focused on principals’ CSPAP involvement should include strategies that target all levels of influence, special attention should be given to ensuring principals recognize the many positive outcomes (e.g., increased physical activity before and after school, decreased off task behaviors, increased academic performance; Egan et al., 2019; Erwin, Fedeewa & Ahn, 2017; Mahar et al., 2006) that a CSPAP can help to facilitate.

This study is one of the first to examine principals’ CSPAP involvement. Notable strengths of the study are its theoretical grounding within a social-ecological perspective, systematic development of an appropriate survey measure with sound psychometric properties, and use of stratified random national sample. However, this study is limited by the low response rate to the survey, potential response bias, and reliance solely on principals’ perceptions. Future survey studies of principals’ CSPAP involvement should aim to recruit proportionately representative (e.g., by state) samples and use incentives to increase the response rate. It is also worth exploring whether there are times during the year that principals may be more inclined to participate in a survey. For this study, data from the main study sample were collected in the mid-to-late spring, which coincides with end-of-year testing for many schools and may be a more hectic time for principals than the beginning or middle parts of the school year. Finally, examining others’ (e.g.,
teachers, parents) perceptions of principals’ CSPAP involvement and conducting studies
that use different methods (e.g., observation) and designs (e.g., qualitative) will also help
to build upon the results of the present study.
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CHAPTER 4

STUDY TWO: A PERSON-CENTERED ANALYSIS OF PRINCIPALS’ INVOLVEMENT IN COMPREHENSIVE SCHOOL PHYSICAL ACTIVITY PROGRAMS: SOCIAL-ECOLOGICAL AND BIOGRAPHICAL PERSPECTIVES

Schools are charged with caring for the whole child, and in order for this to occur, the academic education as well as the health of the child needs to be addressed (Greaney et al., 2007; Weiler, Pigg & McDermott, 2003). It is recommended that children receive 60 minutes of moderate-to-vigorous physical activity (MVPA) daily, but nearly half of America’s youth are not meeting this recommendation (Institute of Medicine [IOM], 2013; Troiano et al., 2008). Schools reach approximately 25% of the US population (National Physical Activity Plan, 2008). From this perspective, education settings can play a major role in public health initiatives related to physical activity (PA; National Physical Activity Plan, 2008). National organizations (e.g., Centers for Disease Control and Prevention [CDC]; National Academies of Science) promote school settings as ideal for PA interventions (Cooper et al., 2016).

A leading model for school-based PA promotion is the comprehensive school physical activity program (CSPAP), originally introduced in 2008 by the National Association for Sport and Physical Education (now the Society for Health and Physical Educators [SHAPE] America). A CSPAP is described as a multicomponent and coordinated approach to promoting physical education and PA. The components of the model include (a) physical education (PE), (b) PA during school, (c) PA before and after school, (d) staff involvement, and (e) family and community engagement (SHAPE
America, 2015). A key aspect of the model is its focus on the involvement of not just physical education teachers, but all school staff in the support needed to help all children and adolescents achieve the accepted guidelines for daily PA as well as develop the skills, knowledge, confidence and dispositions to pursue a physically active lifestyle. In alignment with this perspective, numerous studies have endeavored to understand how best to support classroom teachers as PA promoters. One of the consistent findings from these studies is that teachers perceive the support of their school principal as an important factor in their choices concerning how and whether to promote PA during regularly scheduled classroom time. However, comparatively little research has addressed the role of principals with respect to their involvement in CSPAPs.

Principals hold the most influence over the success or failure of programs and polices implemented at their school (Datnow & Castellano, 2001). As a leader of their school, principals can serve to either transform or maintain school cultures (Leithwood & Jantzi, 1999). Teachers’ belief in the success of the implementation of new programs, according to Lochman (2003) were related to both perceived school environment and perceived support from school administrators. Environments where teachers feel they can take risks, experiment with new ideas and practices and exercise creativity are established by the principal (Bredeson, 2000). If teachers are aware that they have the professional, psychological, and emotional support of their principal they will be more willing to try new skills in order to grow as teachers (Bredeson, 2000). Principals may play leading roles in supporting the school’s professional learning community; making teachers aware of changes in school law and legislative mandates; supporting teachers seeking to improve professional practice; overseeing school change efforts; facilitating
group development processes; and promoting technology integration (Bredeson, 2000). When principals establish a trusting environment for all school members (e.g., parents, teachers, students, community) they can drive programs to succeed at their schools (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010).

Specific to the focus of the present study, principals can play a pivotal role in the success of school-based health programs (Greaney et al., 2007; Weiler et al., 2003). Previous research found that principals believed PA has academic, physical health, and social/emotional benefits for students; yet, they also perceived barriers to school-based PA promotion, such as time, competing priorities, space constraints, and financial costs (Van den Berg et al., 2017). In a recent survey administered to a national sample of principals in the U.S. (Orendorff et al., in preparation), participants’ CSPAP involvement was explored within a social-ecological framework that identified three potential levels of influence (i.e., intrapersonal, interpersonal, and environmental). Results indicated that involvement was significantly associated with all three levels.

While it is helpful to obtain an understanding of the variables that may influence the extent of principals’ CSPAP involvement, it is also necessary to identify distinct profiles of principals that highlight departures from the general trends suggested by variable-centered research. Moreover, even though a social-ecological perspective captures a broad range of variables that may influence behavior, other perspectives may also help to uncover unique attributes that further distinguish different groups of principals. Previous CSPAP-related research focusing on integrating movement in general education classrooms demonstrated that social-ecological as well as biographical frameworks should be considered when attempting to understand predictors of classroom
teachers’ involvement in PA promotion (Webster et al., 2015; Webster et al., 2013).

Therefore, to build on the results of the Orendorff et al. (in preparation) study, the present investigation adopted a person-centered view of principals’ CSPAP involvement drawing from both social-ecological and biographical perspectives.

**Person-Centered Research**

A person-centered approach in research describes differences among individuals in how variables are related to each other and serves to “[identify] groups of individuals who function in a similar way at the organism level and in a different way relative to other individuals at the same level” (Magnusson, 2003, p. 16). In other words, this approach classifies groups or types of individuals who share particular attributes or relations among attributes (Laursen, & Hoff, 2006). Explaining the perceptions and behavior of people can be done by sorting them into groups by their shared common characteristics (Wang, Sinclair, Zhou, & Sears, 2013). By using individual characteristics, researchers can study configurations or patterns of characteristics that a group of people may share in common (Wang, et al., 2013). Person-centered research identifies a set of groups that best represent the patterns of covariation among the variables of interest and then investigates differences between these groups on other measures (Wang, et al., 2013).

Research with students in physical education has used a person-centered approach to distill distinct profiles of learners from various theoretical and biographical perspectives (Haerens, Kirk, Cardon, De Bourdeaudhuij, & Vansteenkiste, 2010; Webster, Mîndrilă, & Weaver, 2013). The benefit of this research is that it can directly inform professional practice by guiding teachers in their efforts to differentiate
instruction. Similarly, research aimed at classifying subgroups of principals would be helpful to offer differentiated professional development to school leaders in regard to CSPAP implementation.

**Social Ecology Theory**

Bronfenbrenner (1976) created a social ecological model (SEM) explaining how a person’s development and their environment are connected and how the influence from that connection can last a lifetime (Hess & Schultz, 2008). SEMs acknowledge the relationships between personal and environmental factors and the assumptions that behavior is shaped by multiple levels of influence (Sallis, Owen, & Fisher, 2015). Hess and Schultz (2008) use the example of a stone dropping into water and the rings that surround the stone to show how interconnected rings can influence the development of a person. SEMs can provide the groundwork for factors (e.g., intrapersonal, social and physical environment, policy) that should be taken into consideration when trying to establish comprehensive approaches to examining and intervening on health behaviors (Sallis, Owen, & Fisher, 2015). In the health field a SEM was first introduced by McLeroy, Bibeau, Steckler, & Glanz (1988) to better understand the relationships between lifestyle and chronic disease. McLeroy, Bibeau, Steckler and Glanz (1988) provided a SEM that has five levels (e.g., intrapersonal, interpersonal, organizational, community and public policy).

Using SEMs is not new to health-based research in schools. In 2015, Swearer and Hymel did a study on school bullying using a social-ecological perspective. Webster et al. (2013) used SEM and diffusion of innovations theory to explore elementary classroom teacher’s adoption of PA promotion in the context of South Carolina state policy. Results
showed that policy awareness directly predicted teachers’ perceived school support for classroom-based PA promotion and that perceived school support directly predicted teachers’ perceived attributes (compatibility, simplicity, and observability) of classroom-based PA promotion. Webster and Suzuki (2014) conducted a qualitative study using multiple SEM perspectives and inductive techniques to examine PA opportunities and the factors that influence these opportunities in five school districts in Japan. The researchers found that Japanese schools provided many more PA opportunities for children than most American schools and that these opportunities derived from top-level (i.e., federal government) support via the national course of study for schools and reinforcement for the curriculum by district leaders, principals, and teachers. Langille and Rodgers (2010) interviewed numerous stakeholders (government officials, the school board, principals, and teachers) to qualitatively investigate how PA is promoted in schools within a school district in Canada. The results from this study showed that top-down policy change was looked at in higher regards by school board members, principals and teachers but that buy in and the local level (e.g. the community) are also needed for success. This study provided evidence that principals play key roles in providing leadership and directing priorities/policies at the school level in regard to PA implementation at their schools.

Biographical Perspective of Educator Behavior

Following previous CSPAP-related research examining classroom teachers’ PA promotion (Webster, 2011; Webster et al., 2015; Webster, Monsma, & Erwin, 2010), a biographical perspective of PA promotion behavior, encompassing aspects of teacher socialization theory (Lortie, 1975; Lawson, 1983a, 1983b, 1986) and social learning theory (Bandura, 1977, 1986), was adopted for this study. This perspective highlights the
importance of personal biography in teachers’ school-based PA promotion behaviors (Egan & Webster, 2018) and is informed by numerous studies (e.g., Allison et al., 1990; Callea et al., 2008; Cothran, Kulinna, & Garn, 2010; Karteroliotis, 2008; Morgan et al., 2001). The present investigation focused on two biographical variables that have been identified as significant factors in classroom teachers’ involvement in school-based PA promotion: (a) personal competence in PA, and (b) satisfaction with K-12 PE experiences. PA competence captures self-perceptions related to PA interest, enjoyment, and ability, while PE satisfaction measures the degree of satisfaction with one’s own experiences in elementary, middle and high school PE. In studies with preservice classroom teachers, both variables were found to positively correlate with participants’ attitudes toward promoting PA and perceived competence to promote PA (Webster, 2011; Webster et al., 2010). Moreover, PE satisfaction indirectly predicted inservice classroom teachers’ self-reported PA promotion (Webster et al., 2015), underscoring the impact of early life PA-related experiences on the PA promotion behaviors of school professionals.

Overall, research focusing on the staff involvement component of a CSPAP has mainly focused on classroom teachers, even though other school staffs, and particularly principals, play prominent roles in the support and uptake of educational initiatives. The study by Orendorff et al. (in preparation), which was one of the first to investigate principals’ involvement in CSPAPs, identified variables from a social-ecological perspective that were associated with principals’ CSPAP involvement. However, research has yet to address principals’ CSPAP involvement using person-centered analyses, or to consider both social-ecological and biographical perspectives as they relate to such
involvement. The purpose of this study, therefore, was to examine distinct profiles of school principals in terms of their CSPAP involvement, SEM-based perceptions of CSPAPs, PA competence, and PE satisfaction. Additional information pertaining to educator demographics (e.g., age), background (e.g., years serving as a principal), and professional context (e.g., school setting) was also explored in an attempt to provide further insight into the unique characteristics of each profile.

Method

Participants

K-12 school principals (N=265) from a national sample of public schools in the U.S. participated in this study, we had respondents from 49 of the 50 United States, see Table 4.1.

Table 4.1

Demographics

<table>
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<th>Variable</th>
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<tr>
<td>31-35</td>
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<td>36-40</td>
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<td>14%</td>
</tr>
<tr>
<td>56-60</td>
<td>18%</td>
</tr>
<tr>
<td>61-65</td>
<td>9%</td>
</tr>
<tr>
<td>70+</td>
<td>1%</td>
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<tr>
<td><strong>Sex</strong></td>
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<tr>
<td>Male</td>
<td>58%</td>
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<tr>
<td>Female</td>
<td>42%</td>
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<tr>
<td><strong>Race</strong></td>
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<tr>
<td>Asian</td>
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<tr>
<td>African-American/Black</td>
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</tr>
<tr>
<td>Hispanic or Latino</td>
<td>3%</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>84%</td>
</tr>
</tbody>
</table>
No Response 1%

Education
Masters 27%
Masters +30 44%
Ed.D. 21%
Ph.D. 8%

Experience
0-5 29%
6-10 23%
11-15 24%
16-20 11%
20+ 14%

Grade level
Elementary 29%
Jr. High/Middle School 32%
High School 25%
Grades K-8 5%
Grades 7-12 9%

Instrumentation

An electronic survey was used to measure school principals’ (a) perceived CSPAP implementation at their schools, (b) self-reported CSPAP involvement, (c) SEM-based perceptions related to CSPAPs, (d) personal biography (i.e., PA competence and PE satisfaction, and (e) demographic, background, and contextual information.

CSPAP implementation. In line with previous studies examining physical education teachers’ perceptions of CSPAP implementation (Webster et al., in press) and principals’ CSPAP involvement (Orendorff et al., in preparation), participants were provided with the following definition of a CSPAP:

[the school provides] opportunities, through any combination or variety of CSPAP components – for all students at [the] school to: (a) receive standards-based physical education experiences designed to prepare individuals for a lifetime of participation in physical activity, and (b) meet the national guideline
for school-aged youth to accumulate at least 60 minutes of mostly moderate-to-vigorous physical activity each day (including lunch time activities, and before and after school activities).

The five CSPAP components were listed with examples. Participants were asked to respond “yes” or “no” if their school has a CSPAP.

**CSPAP involvement.** A total of 12 items assessed principals’ CSPAP involvement. Example items include “I would be involved with supporting my school staff in their efforts to promote physical activity” and “I would be involved with organizing physical activity opportunities at my school.” A six-point Likert-type response scale was used (“strongly agree” to “strongly disagree”) with no neutral option. Respondents were also able to choose a “don’t know” option (Johnson & Morgan, 2016).

**SEM-based perceptions.** A total of 52 items (26 items written in present tense for respondents who indicated their school has a CSPAP and 26 equivalent items written in future tense for respondents who indicated their school does not have a CSPAP) assessed principals’ SEM-based perceptions of CSPAPs. Example items for each level of influence included, “A CSPAP promotes / would promote a whole-child learning approach” (intrapersonal, 9 items), “Parents/guardians are engaged in helping our school work toward our CSPAP goals” (interpersonal, 5 items), and “There are safe routes for active transportation (e.g., walking, biking) to/from our school” (environmental, 12 items). The same six-point response scale (with the additional “don’t know” option) used for the CSPAP Involvement measure was used to assess SEM-based perceptions.

**Personal biography.** Items from a previously validated measure (Webster, Monsma & Erwin, 2010) were used to assess PA competence (five items – e.g., “I like
being physically active”) and PE satisfaction (four items – e.g., “My elementary physical education experiences were positive”). To be consistent with the response options for other items in the survey, the original four-point response scale (“strongly agree” to “strongly disagree”) was expanded to the previously described six-point scale with the additional “don’t know” option.

Demographic, background, and contextual information. Demographic information that was collected included participants’ age, gender, and race/ethnicity. Background items focused on teaching experience, years serving as a principal, and highest level of education. Two items assessed professional context: education level where currently employment (e.g., elementary, middle, high) and school setting (e.g., urban, suburban, rural).

Procedures

Stratified random sampling was used to identify 20 elementary schools, 20 middle schools, and 20 high schools from each state using a list of all public schools in the U.S., which was available on a federal website (https://nces.ed.gov/). Email addresses of principals at these schools were obtained from the school websites, where available, resulting in a total of 2985 contacts. An email via Survey Monkey was sent to all contacts inviting principals to complete the survey. The link to the survey was embedded in the email. By clicking on the link, principals first were presented with an informed consent form. Continuing with the survey was considered participant consent. The survey remained open for four weeks, during which time several follow-up emails were sent in an effort to maximize the response rate.
Data Analysis

Data screening and descriptive analysis. Before conducting statistical analyses, data were screened to examine the distribution of survey responses. Responses of “Don’t know” were coded as missing values. Missing values ranged between 0.0% and 2.6% per variable. They were distributed completely at random ($\chi^2_{(2223)}=2110.476, p=.956$) and were, therefore, imputed using the expectation-maximization algorithm. The distribution of survey responses was further examined by computing descriptive statistics such as the item mean, standard deviation, skewness, and kurtosis. Indices of kurtosis larger than 3 and skewness coefficients larger than 2 were considered non-normal (Bentler & Wu, 2002; Chou & Bentler, 1995).

Exploratory factor analysis. To identify the latent variables underlying the data, the authors employed exploratory factor analysis (EFA) within the exploratory structural equation modeling framework (Marsh, Morin, Parker, & Kaur, 2014). They used the mean and variance adjusted weighted least squares (WLSMV) estimation method and the Mplus 8.2 statistical software.

The ESEM approach allows the computation of a set goodness of fit indices: (a) the $\chi^2$ statistic and its $p$ value, (b) the $\chi^2/df$ index, (c) the root mean square error of approximation index (RMSEA) and its 95% confidence interval (CI), (d) the comparative fit index (CFI), (e) Tucker-Lewis index (TLI), and (f) the weighted root mean residual (WRMR). The $\chi^2$ test is an overall measure of model fit, where a non-significant $\chi^2$ indicates good fit to the data (Barrett, 2007); however, because the $\chi^2$ statistic is sensitive to sample size, model size, and non-normality, $\chi^2/df$ is also used as a measure of
fit. For the $\chi^2/df$, values lower than 3 indicate good fit (Finney & DiStefano, 2006). For RMSEA, smaller values indicate better model fit. Specifically, RMSEA values lower than .05 show excellent fit, values between .05 and .08 indicate good fit, values between .08 and .10 indicate acceptable fit, whereas valued above .10 indicate poor fit. Similarly, smaller WRMR values indicate better fit, where a WRMR value lower than 1 indicates good fit (Yu & Muthén, 2002; DiStefano, Liu, Jiang & Shi, 2017). For TLI and CFI, larger values show better fit. TLI and CFI values lower than .90 indicate poor fit, values between .90 and .95 indicate good fit, whereas values above .95 indicate excellent model fit. To improve the factor structure, items with lower or non-significant loadings and cross-loading items were sequentially removed until the model reached an optimal fit. After obtaining a simple structure with an optimal fit, factors scores were computed to estimate the location of each individual on the identified factors.

EFA was also used as a data reduction procedure for two groups of items measuring physical activity competence (PAC) and physical education experience (PEX) respectively. The PAC scale included five items, whereas the PEX scale included four items. The EFA procedure was conducted independently with each scale and was followed by the computation of factor scores. These estimates were then used for further analysis.

**Latent profile analysis.** Factor scores were used as input for latent profile analysis (LPA). This procedure estimates a latent categorical variable using a set of continuous observed indicators (Collins & Lanza, 2010). In the current study, LPA was used to differentiate groups of respondents based on some of their CSPAP factor scores. Models with two (Model 2), three (Model 3), four (Model 4), and five (Model 5) latent
profiles were estimated. The optimal model was selected based on the interpretability of the results, as well as a set of indices of classification precision and goodness of fit indices.

The goodness of fit indices used to assess model fit were (a) the Bayesian Information Criteria (BIC), and (b) the Akaike Information Criteria (AIC). These estimates are frequently used to compare the fit to the data across models with different specifications or with different numbers of latent categories (DiStefano, 2012); models with lower AIC and BIC values are considered more parsimonious and have a better fit to the data (Muthén, 2004; Vermunt & Magidson, 2002).

The measures of classification precision were (a) the average latent profile probabilities for the most likely profile membership, and (b) classification probabilities for the most likely latent profile membership. These probabilities represent the proportion of correctly cases in each latent category (DiStefano, 2012). An overall measure of classification precision is entropy, which ranges from 0 to 1 and values closer to 1 indicate that a model has higher levels of classification precision, with clearly distinguished groups (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993; Vermunt & Magdison, 2002). Latent profiles were further described by aggregating factor scores by group and by cross-tabulating demographic information by group. The $\chi^2$ test was used to determine whether demographic characteristics varied significantly across groups.

**Latent profile analysis with a covariate and a distal outcome.** The relationship between the categorical latent variable $C$ and a dependent variable measuring CSPAP implementation was estimated by including a distal outcome in the latent profile model.
Further, the PAC and PEX factor scores were included in the latent profile model as covariates.

This mixture model was estimated using the 3-step approach proposed by Asparouhov and Muthén (2012). The traditional 1-step approach may induce bias because the inclusion of a distal outcome may lead to changes in profile memberships, whereas the 3-step approach aims to correct for classification error by (a) estimating the LPA model first, (b) creating a nominal most likely profile variable $N$, and (c) estimating the mixture model with covariates and a distal outcome where $N$ is an indicator of $C$ with measurement error at the misclassification rate estimated at step one (Asparouhov & Muthén, 2012).

**Results**

**Descriptive Analysis**

As indicated in Table 4.2, most participants provided high ratings on the majority of the survey items. The items with the highest ratings were “A CSPAP would enhance students' physical development” ($M=5.26$, $SD=.736$), and “I would be involved with supporting my school staff in their efforts to promote physical activity” ($M=5.23$, $SD=.838$). The item with the lowest average response was “It is mostly up to me whether we have a CSPAP at my school” ($M=3.16$, $SD=1.381$).

Table 4.2

**Descriptive Statistics**

<table>
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<tr>
<th>Item</th>
<th>$M$</th>
<th>$SD$</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
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<tr>
<td>A CSPAP would enhance students' physical development</td>
<td>5.26</td>
<td>.736</td>
<td>-2.176</td>
<td>10.938</td>
</tr>
</tbody>
</table>
I would be involved with supporting my school staff in their efforts to promote physical activity

A CSPAP would promote students’ social development

A CSPAP would promote a whole-child learning approach

A CSPAP would be an ideal program for our students to pursue a healthy lifestyle

A CSPAP would facilitate student learning

A CSPAP would help our students pursue physically active lifestyles

A CSPAP would improve cognitive performance

Policies in my school district support school physical activity

I would be involved with allocating resources for our school's CSPAP

A CSPAP would foster students’ attention to academics

Policies in my school support physical activity

I would be involved with establishing physical activity opportunities at my school

A CSPAP would promote improved classroom behavior

Our district superintendent supports CSPAPs

Policies in my state support school physical activity

A CSPAP would promote our students’ academic achievement

I feel capable of helping to create opportunities within my school's CSPAP

I would be involved with advocating for our school's CSPAP

Policies in my school support the promotion of students' physical activity during school hours every school day

A CSPAP would fit well with the way my school community likes to promote physical activity
<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>SD</th>
<th>Lower CI</th>
<th>Upper CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>The facilities at my school are adequate to implement a CSPAP</td>
<td>4.72</td>
<td>1.083</td>
<td>-1.453</td>
<td>2.382</td>
</tr>
<tr>
<td>Parents/Guardians at my school would support our CSPAP</td>
<td>4.71</td>
<td>.884</td>
<td>-1.296</td>
<td>2.832</td>
</tr>
<tr>
<td>Our school schedule can accommodate a CSPAP</td>
<td>4.71</td>
<td>1.109</td>
<td>-1.673</td>
<td>2.999</td>
</tr>
<tr>
<td>A CSPAP would promote increased school attendance</td>
<td>4.68</td>
<td>.904</td>
<td>-1.119</td>
<td>2.101</td>
</tr>
<tr>
<td>The teachers at my school believe it is important that our school has a CSPAP</td>
<td>4.68</td>
<td>1.037</td>
<td>-1.389</td>
<td>1.858</td>
</tr>
<tr>
<td>A CSPAP can be easily applied to fit my school's specific context</td>
<td>4.68</td>
<td>1.000</td>
<td>-1.464</td>
<td>2.201</td>
</tr>
<tr>
<td>I would be involved with evaluating my school's CSPAP</td>
<td>4.66</td>
<td>1.143</td>
<td>-1.290</td>
<td>1.644</td>
</tr>
<tr>
<td>Policies at my school support the promotion of faculty/staff wellness (e.g., health, fitness, physical activity)</td>
<td>4.65</td>
<td>.997</td>
<td>-1.284</td>
<td>2.102</td>
</tr>
<tr>
<td>I would be involved with being a physically active role model for others in my school</td>
<td>4.63</td>
<td>1.134</td>
<td>-1.055</td>
<td>.838</td>
</tr>
<tr>
<td>I would be involved with CSPAP planning at my school</td>
<td>4.42</td>
<td>1.185</td>
<td>-.776</td>
<td>.383</td>
</tr>
<tr>
<td>I would be involved with organizing physical activity opportunities at my school</td>
<td>4.29</td>
<td>1.173</td>
<td>-.604</td>
<td>.170</td>
</tr>
<tr>
<td>I would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP</td>
<td>4.25</td>
<td>1.258</td>
<td>-.786</td>
<td>.069</td>
</tr>
<tr>
<td>The majority of teachers at my school would be capable of contributing to the developing and implementing of a CSPAP</td>
<td>4.22</td>
<td>.969</td>
<td>-.283</td>
<td>.529</td>
</tr>
<tr>
<td>Having a CSPAP at my school is something that is within my control as a principal</td>
<td>4.20</td>
<td>1.258</td>
<td>-.732</td>
<td>.448</td>
</tr>
<tr>
<td>Classroom teachers at my school are able to integrate physical activity into academic instruction/learning</td>
<td>4.19</td>
<td>1.060</td>
<td>-.460</td>
<td>.769</td>
</tr>
<tr>
<td>Adequate CSPAP resources are available for my school faculty/staff</td>
<td>4.18</td>
<td>1.049</td>
<td>-.698</td>
<td>1.254</td>
</tr>
<tr>
<td>My school has sufficient funds to support a CSPAP</td>
<td>4.09</td>
<td>1.128</td>
<td>-.483</td>
<td>.393</td>
</tr>
</tbody>
</table>
Parents/Guardians at my school would be interested and willing to help our school toward our CSPAP goals
I would be involved with staying up-to-date on best practices for school physical activity programming
I would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force
I would be involved with providing CSPAP professional development opportunities at my school
Our school's vision/mission includes the promotion of physical activity
There are safe routes for active transportation (e.g., walking, biking) to/from our school
Our school has a strong relationship with one or more other organizations/agencies that help to support a CSPAP
Parents/Guardians would be engaged in helping our school work toward our CSPAP goals
Sufficient professional development for CSPAP is available for my school staff
A CSPAP would increase students' off-task behavior in class
Our school has a facility joint use agreement with one or more community organizations for CSPAP programming
I would be involved with setting performance standards for my school’s CSPAP
It is mostly up to me whether we have a CSPAP at my school

*Physical Activity Competence*

I like being physically active
I like to exercise
I am physically active
I have a good level of muscular strength 4.34 .8589 -.551 1.733
I have a good level of muscular endurance 4.33 .9172 -.472 1.060

Physical Education Experience
I was good at physical education 4.79 1.048 -1.345 2.515
My elementary school PE experiences were positive 4.70 1.011 -1.616 3.870
My high PE experiences were positive 4.63 1.104 -1.426 2.751
My middle school PE experiences were positive 4.47 1.195 -1.241 1.805

Exploratory Factor Analysis
EFA of the survey items referring to CSPAP implementation yielded a four-factor solution, which had a good fit to the data ($\chi^2_{(557)}=1430.144$, $\chi^2/df =2.567$, RMSEA=0.077, CI=(0.072-0.082); CFI=0.935 ; TLI=0.918). Table 4.3 lists the items included in each factor, along with their loadings and corresponding standard errors, $t$ statistics, and $p$ values. The first factor, F1, included 12 items referring mostly to the implementation of CSPAPs. Cronbach’s alpha index of internal consistency for this factor was .907. The second factor, F2, included nine items referring to the intrapersonal benefits of CSPAP adoption. Cronbach’s alpha index of internal consistency for this factor was .947. The third factor, F3, included 12 items referring to environmental aspects that may facilitate CSPAP implementation. The internal consistency of this factor was alpha=.902. The fourth factor, F4, included five items, which referred to interpersonal aspects of CSPAP implementation. The internal consistency of this factor was alpha=.850. As indicated in Table 4.4 and Table 4.5, items in the PAC and PEX scales had very high loading values and high indices of internal consistency.
Table 4.3

Factor Loadings

<table>
<thead>
<tr>
<th>Items</th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F1 (Implementation)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be involved with CSPAP planning at my school</td>
<td>0.832</td>
<td>0.027</td>
<td>30.866</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with evaluating my school's CSPAP</td>
<td>0.761</td>
<td>0.034</td>
<td>22.563</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with providing CSPAP professional development opportunities at my school</td>
<td>0.754</td>
<td>0.037</td>
<td>20.487</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with setting performance standards for my school's CSPAP</td>
<td>0.726</td>
<td>0.037</td>
<td>19.453</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force</td>
<td>0.716</td>
<td>0.04</td>
<td>18.021</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP</td>
<td>0.655</td>
<td>0.039</td>
<td>16.709</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with allocating resources for our school's CSPAP</td>
<td>0.647</td>
<td>0.038</td>
<td>17.216</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with establishing physical activity opportunities at my school</td>
<td>0.641</td>
<td>0.039</td>
<td>16.289</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with staying up-to-date on best practices for school physical activity programming</td>
<td>0.641</td>
<td>0.042</td>
<td>15.275</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with organizing physical activity opportunities at my school</td>
<td>0.627</td>
<td>0.039</td>
<td>15.899</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with advocating for our school's CSPAP</td>
<td>0.594</td>
<td>0.037</td>
<td>15.938</td>
<td>0.00</td>
</tr>
<tr>
<td>I would be involved with being a physically active role model for others in my school</td>
<td>0.516</td>
<td>0.049</td>
<td>10.564</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>F2 (Intrapersonal)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A CSPAP would facilitate student learning</td>
<td>0.976</td>
<td>0.021</td>
<td>46.927</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would promote a whole-child learning approach</td>
<td>0.877</td>
<td>0.026</td>
<td>33.202</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would promote students’ social development</td>
<td>0.874</td>
<td>0.028</td>
<td>30.924</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would improve cognitive performance</td>
<td>0.866</td>
<td>0.043</td>
<td>19.977</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would enhance students' physical development</td>
<td>0.863</td>
<td>0.029</td>
<td>30.099</td>
<td>0.00</td>
</tr>
<tr>
<td>Statement</td>
<td>p-value</td>
<td>a-value</td>
<td>1 - b-value</td>
<td>p - c-value</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>A CSPAP would be an ideal program for our students to pursue a healthy lifestyle</td>
<td>0.857</td>
<td>0.028</td>
<td>30.863</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would foster students’ attention to academics</td>
<td>0.83</td>
<td>0.028</td>
<td>29.917</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would promote increased school attendance</td>
<td>0.631</td>
<td>0.049</td>
<td>12.763</td>
<td>0.00</td>
</tr>
<tr>
<td>A CSPAP would help our students pursue physically active lifestyles</td>
<td>0.598</td>
<td>0.044</td>
<td>13.659</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>F3 (Environmental)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policies in my school support physical activity</td>
<td>0.938</td>
<td>0.026</td>
<td>36.48</td>
<td>0.00</td>
</tr>
<tr>
<td>Policies in my state support school physical activity</td>
<td>0.931</td>
<td>0.028</td>
<td>33.35</td>
<td>0.00</td>
</tr>
<tr>
<td>Policies in my school support the promotion of students’ physical activity during school</td>
<td>0.787</td>
<td>0.031</td>
<td>24.973</td>
<td>0.00</td>
</tr>
<tr>
<td>hours every school day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My school has sufficient funds to support a CSPAP</td>
<td>0.735</td>
<td>0.036</td>
<td>20.597</td>
<td>0.00</td>
</tr>
<tr>
<td>Adequate CSPAP resources are available for my school faculty/staff</td>
<td>0.734</td>
<td>0.033</td>
<td>22.178</td>
<td>0.00</td>
</tr>
<tr>
<td>Our school schedule can accommodate a CSPAP</td>
<td>0.731</td>
<td>0.034</td>
<td>21.265</td>
<td>0.00</td>
</tr>
<tr>
<td>The facilities at my school are adequate to implement a CSPAP</td>
<td>0.667</td>
<td>0.04</td>
<td>16.698</td>
<td>0.00</td>
</tr>
<tr>
<td>Sufficient professional development for CSPAP is available for my school staff</td>
<td>0.601</td>
<td>0.04</td>
<td>14.934</td>
<td>0.00</td>
</tr>
<tr>
<td>Our district superintendent supports CSPAPs</td>
<td>0.499</td>
<td>0.047</td>
<td>10.696</td>
<td>0.00</td>
</tr>
<tr>
<td>Policies at my school support the promotion of faculty/staff wellness (e.g., health,</td>
<td>0.468</td>
<td>0.047</td>
<td>9.981</td>
<td>0.00</td>
</tr>
<tr>
<td>fitness, physical activity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are safe routes for active transportation (e.g., walking, biking) to/from our school</td>
<td>0.468</td>
<td>0.055</td>
<td>8.454</td>
<td>0.00</td>
</tr>
<tr>
<td>Our school's vision/mission includes the promotion of physical activity</td>
<td>0.432</td>
<td>0.046</td>
<td>9.341</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>F4 (Interpersonal)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/Guardians at my school would be interested and willing to help our school toward</td>
<td>0.839</td>
<td>0.026</td>
<td>31.775</td>
<td>0.00</td>
</tr>
<tr>
<td>our CSPAP goals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/Guardians would be engaged in helping our school work toward our CSPAP goals</td>
<td>0.758</td>
<td>0.028</td>
<td>26.991</td>
<td>0.00</td>
</tr>
<tr>
<td>Classroom teachers at my school are able to integrate physical activity into academic</td>
<td>0.687</td>
<td>0.034</td>
<td>19.93</td>
<td>0.00</td>
</tr>
<tr>
<td>instruction/learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The majority of teachers at my school would be capable of contributing to the developing and implementing of a CSPAP. Parents/Guardians at my school would support our CSPAP.

Table 4.4

Factor loadings on the PAC scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to exercise</td>
<td>.888</td>
</tr>
<tr>
<td>I am physically active</td>
<td>.881</td>
</tr>
<tr>
<td>I like being physically active</td>
<td>.888</td>
</tr>
<tr>
<td>I have a good level of muscular endurance</td>
<td>.925</td>
</tr>
<tr>
<td>I have a good level of muscular strength</td>
<td>.875</td>
</tr>
</tbody>
</table>

**Cronbach’s alpha**  .934

Table 4.5

Factor Loadings on the PEX Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>My elementary school PE experiences were positive</td>
<td>.895</td>
</tr>
<tr>
<td>My middle school PE experiences were positive</td>
<td>.966</td>
</tr>
<tr>
<td>My high PE experiences were positive</td>
<td>.926</td>
</tr>
<tr>
<td>I was good at physical education</td>
<td>.860</td>
</tr>
</tbody>
</table>

**Cronbach’s alpha**  .932

Latent Profile Analysis

Factor scores on F2, F3, and F4 were used as observed indicators for latent profile analysis, whereas F4 factor scores were specified as the distal outcome of C. As indicated
in Table 4.6, Model 2 and Model 4 had the highest entropy values. However, Model 4 had lower BIC and AIC indices and provided more information by including two additional latent profiles. Model 5 also had high entropy and lower AIC and BIC values, but the identified groups were relatively small indicating over-clustering. Model 4 was, therefore selected as the optimal model. The average latent profile probabilities for this model ranged between 91.8% and 99.5%, whereas the classification probabilities for most likely latent profile membership ranged between 93.2% and 98.5% (Table 4.7).

Table 4.6

<table>
<thead>
<tr>
<th>Goodness of Fit and Classification Precision by Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 2</td>
</tr>
<tr>
<td>Entropy:</td>
</tr>
<tr>
<td>AIC:</td>
</tr>
<tr>
<td>BIC:</td>
</tr>
<tr>
<td>Sample Adjusted BIC:</td>
</tr>
<tr>
<td>BIC:</td>
</tr>
</tbody>
</table>

Table 4.7

Model 2 Average Latent Profile Probabilities and Classification Probabilities for Most Likely Latent Profile Membership by Group

<table>
<thead>
<tr>
<th>LP1</th>
<th>LP2</th>
<th>LP3</th>
<th>LP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP1</td>
<td>Average Latent Profile Probabilities for Most Likely Latent Profile Membership Classification Probabilities</td>
<td>0.918</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.972</td>
<td>0.000</td>
</tr>
<tr>
<td>LP2</td>
<td>Average Latent Profile Probabilities for Most Likely Latent Profile Membership Classification Probabilities</td>
<td>0.000</td>
<td>0.921</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.000</td>
<td>0.932</td>
</tr>
<tr>
<td>LP3</td>
<td>Average Latent Profile Probabilities for Most Likely Latent Profile Membership Classification Probabilities</td>
<td>0.002</td>
<td>0.058</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.002</td>
<td>0.051</td>
</tr>
<tr>
<td>LP4</td>
<td>Average Latent Profile Probabilities for Most Likely Latent Profile Membership Classification Probabilities</td>
<td>0.001</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.005</td>
<td>0.008</td>
</tr>
</tbody>
</table>
The latent categorical variable $C$ included four groups of individuals. These groups were labeled LP1-LP4. Mean factor scores for each latent profile are represented in Figure 4.1. The largest group, LP4 (N=173) had average factor scores close to average or slightly above average on F2, F3, and F4. The second largest group, LP2 (N=42) had close to average factor scores on F2, and below average factor scores on F3 and F4. The LP3 group (N=38) had close to average factor scores on F3, but lower factor scores on F2 and F4. Finally, the smallest group, LP1 (N=12), had higher factor scores on F3, and close to average factor scores on F2 and F4. The four groups did not differ significantly on characteristics such as age ($\chi^2(21)=20.309, p=.502$), racial distribution ($\chi^2(9)=7.240, p=.612$), educational level ($\chi^2(9)=10.705, p=.296$), organizational level of the school ($\chi^2(12)=4.502, p=.973$), years of experience as a principal ($\chi^2(12)=8.622, p=.735$), years of experience at the current school ($\chi^2(18)=12.542, p=.818$), school location ($\chi^2(6)=11.165, p=.083$), school size ($\chi^2(15)=12.234, p=.661$), or proportion of students receiving free or reduced-price lunch ($\chi^2(12)=19.196, p=.084$).

![Figure 4.1. Mean factor scores by latent profile](image)

**Figure 4.1.** Mean factor scores by latent profile
**Relationship between C and the Covariates.**

Results showed that one of the covariates had a statistically significant relationship with one of the categories of the latent variable C. Specifically, in reference to the LP4 profile, there was a negative, statistically significant relationship between PEX factor scores and the probability of membership to the LP3 group (estimate=-0.922, SE=0.209, t=-4.416, p<=.000). In other words, as PEX factor scores increased by one unit, the probability of membership to the LP3 profile, which had some of the lowest factor scores, decreased by 39.8%. The other relationships between the two covariates and latent profile memberships were not statistically significant (Table 4.8).

Table 4.8

Relationships between C and the PAC and PEX covariates and between C and the F1 distal outcome

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Estimate</th>
<th>S.E.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates (reference LP4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAC-&gt;LP1</td>
<td>0.775</td>
<td>0.471</td>
<td>1.646</td>
<td>0.100</td>
</tr>
<tr>
<td>PEX-&gt;LP1</td>
<td>0.435</td>
<td>0.355</td>
<td>1.227</td>
<td>0.220</td>
</tr>
<tr>
<td>PAC-&gt;LP2</td>
<td>0.502</td>
<td>0.289</td>
<td>1.739</td>
<td>0.082</td>
</tr>
<tr>
<td>PEX-&gt;LP2</td>
<td>0.149</td>
<td>0.312</td>
<td>0.478</td>
<td>0.633</td>
</tr>
<tr>
<td>PAC-&gt;LP3</td>
<td>0.198</td>
<td>0.253</td>
<td>0.782</td>
<td>0.434</td>
</tr>
<tr>
<td>PEX-&gt;LP3</td>
<td>0.922</td>
<td>0.209</td>
<td>4.416</td>
<td>0.000</td>
</tr>
<tr>
<td>F1 Distal Outcome (Reference LP4)</td>
<td></td>
<td></td>
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<tr>
<td>LP1-&gt;F1</td>
<td>0.981</td>
<td>0.364</td>
<td>2.698</td>
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<td>0.731</td>
<td>0.244</td>
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<td>LP3-&gt;F1</td>
<td>1.797</td>
<td>0.308</td>
<td>5.835</td>
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</table>

**Relationship between C and the Distal Outcome**

The relationship between C and the distal outcome (CSPAP Adoption) was significant for all latent profiles. As indicated in Table 4.8, in reference to LP4, which
had above average mean factor scores on all factors, membership to the other groups, which had lower factor scores on some or all of the factors, was associated with lower factor scores on F1. As illustrated in Figure 4.2, LP4 had higher average factor scores on F1 than all the other three groups.

![Figure 4.2 F1 factor scores by latent profile](image)

**Discussion**

This study’s purpose was to examine distinct profiles of school principals in terms of their CSPAP involvement, SEM-based perceptions of CSPAPs, PA competence, and PE satisfaction. As a slightly higher number of participants were included in this study compared to the first study reported in this dissertation, EFA was conducted with items from the involvement and SEM scales. Consistent with the first study, the optimum solution consisted of four factors: (a) involvement, (b) intrapersonal level of influence, (c) interpersonal level of influence, and (d) environmental level of influence. Internal consistencies were good to excellent. Additionally, significant associations were found among these four factors, as also found in the first study.
With respect to this study’s main objective, the latent profile analysis included the three SEM factors. The model with the best fit included four profiles with the fourth group demonstrating the most positive overall profile (relatively high scores on all SEM factors). It is encouraging that the majority of participants had membership in the fourth group, as this suggests that most principals may perceive a CSPAP positively in terms of its expected outcomes, interpersonal support, and environmental support. Furthermore, when using this profile as our referent group, the other latent profiles were significantly lower on CSPAP involvement. Realizing this, those who lead preservice and inservice trainings focused on CSPAP implementation can expect that, in many cases, teachers will have the support and engagement of their principals with respect to CSPAP implementation efforts. When principal support may be questionable or lacking, it would be important to proactively develop professional development that focuses on all three SEM levels of influence.

In relation to the fourth latent profile group, when PE satisfaction scores increased, the probability of membership to the third latent profile group (i.e., arguably the least positive overall profile) significantly decreased. Thus, if principals had a positive experience in their K-12 PE programs, they would be more likely to support PA at their schools. This holds true in previous research with PE teachers (Webster et. al., in press), classroom teachers (Morgan & Hansen, 2008; Webster et al., 2015) and preservice classroom teachers (Webster, 2011; Webster, et. al., 2010), strengthening the assertion that experience satisfaction as a student in PE plays a powerful socializing role in educators’ professional behaviors related to PA promotion. Socialization involves a lifelong process in which individuals learn the norms, customs, and ideologies important
to the culture in which they live through interactions with one another and social institutions (Templin & Richards, 2014). Experiences in K-12 PE programs appear to have a long-term influence on the decisions of those who enter the education profession, including both teachers and administrators.

Although shown to be an important variable in preservice classroom teachers’ learning with respect to school-based PA promotion (Webster, 2011; Webster et al., 2010), PA competence was not a significant covariate in principals’ CSPAP-related perceptions in the present study. Despite demonstrating excellent internal consistency in the current study, the PA competence scale assesses broad dimensions of PA-related self-perceptions (e.g., PA enjoyment, PA engagement, personal fitness), some of which may be more relevant to PA promotion than others. In a study conducted by Parks, Solmon and Lee (2017), principals perceived themselves as having good fitness levels but did not believe they were highly active. Overall, however, they understood and valued the importance of PA for children. Thus, different aspects of PA competence may influence principals’ CSPAP involvement in varying degrees.

None of the demographic variables (e.g., age, gender, race/ethnicity, school level) showed significant differences across the four latent profiles. In literature related to technology integration in schools, demographics variables were found not to have an influence on the integration of technology. Dawson and Rakes (2003) found that age influenced the integration of technology, but school level and school size did not. Handal, Cavanagh, Wood and Petocz (2011) conducted a study on the adoption of graphics calculators; their study also revealed that demographics including gender, educational
qualifications geographical location and availability of technology did not play an important role in increasing adoption of graphic calculators.

As with all research, this study has both strengths and limitations. This is one of the first studies to examine principals’ CSPAP involvement. Moreover, few CSPAP studies have been conducted with national samples; the data from the current study were collected from participants across nearly all of the states in the U.S. The use of stratified random sampling is another strength of this study, as this helped to ensure that there was representation across all school levels and diversity of schools (e.g., geography, professional context). A limitation of this study is that data were collected only from school principals. Although previous research has also investigated physical education teachers’ perceptions of CSPAPs (Webster et. al., in press), a CSPAP is conceptualized as a coordinated and collaborative effort (SHAPE America, 2015). Future studies should attempt to concurrently assess the perceptions of various CSPAP participants/stakeholders to better understand both intersecting and deviating perspectives. Additionally, this study is limited to self-report data. Increased research employing direct observation of CSPAPs is needed to build a more robust evidence base that can advance intervention design, professional training, and school practices aligned with goals in education and public health that serve to nurture and sustain more physically educated and active Americans.

In conclusion, the majority of principals in this study supported PA promotion in their schools. As a key protagonist for the successful adoption, promotion and sustaining of new programs, principals are essential participants in the collaboration needed to enact CSPAPs. When developing CSPAP-related professional learning experiences for both
in service and preservice principals, it is important to attend to differences in participants’ SEM-based perceptions about CSPAPs, as these perceptions appear to play a role in principals’ CSPAP involvement. This study also underscores the importance of supporting quality PE programs in schools. The results build on a growing line of staff involvement research that consistently suggests experience satisfaction in one’s own formative K-12 PE is a significant factor in the extent to which he/she promotes PA with students under his/her charge.
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CHAPTER 5

DISCUSSION

The purpose of this dissertation was to examine principals’ CSPAP involvement in the U.S. In the first study, a new survey assessing principals’ CSPAP involvement and potentially relevant social-ecological variables was developed. The psychometric properties of the instrument were sound and a four-factor solution was found to be optimum. All four factors were significantly associated, suggesting that intrapersonal, interpersonal, and environmental levels of influence play important roles in principals’ CSPAP involvement. The second study uncovered four distinct groups of survey respondents, based on principals’ different social-ecological-based perceptions related to CSPAPs. Having more positive social-ecological perceptions appeared to promote principals’ CSPAP involvement. Furthermore, positive personal experiences in K-12 physical education made it less likely that principals would have relatively negative social-ecological perceptions.

This dissertation demonstrates that many principals in the U.S. may be at schools that have CSPAPs and may be involved with these programs. Based on the results of this dissertation, supporting principal involvement can be achieved through professional learning opportunities and interventions that integrate a focus on all levels of influence from a social-ecological perspective. Moreover, this dissertation underscores the importance of differentiated support in efforts to increase principals’ CSPAP involvement. Those who lead CSPAP professional learning experiences for principals
should expect there to be differences in principals’ outcome expectations and perceived support for a CSPAP. Study 2 indicates there could be as many as four different groups of principals, based on their social-ecological perceptions, in any given professional development session related to CSPAPs.

Incorporating a biographical perspective in Study 2 reaffirmed the powerful role of K-12 personal physical education experiences in educators’ professional actions. While those who advocate for physical education often do so from the perspective of the subject’s importance to promoting a physically active lifestyle, this dissertation adds to previous studies that suggest there is a “reciprocal effect” of positive physical education programs. That is, educators who enjoyed their childhood physical education programs may, in essence, give back to these programs by supporting relevant initiatives in their schools.

The principal is consistently cited as critical in school reform efforts and in creating and maintaining an effective school (Dow & Oakley, 1992; Fullan, 2001). If a principal supports a school program by actively assisting in its development and taking part in its promotion, teachers will believe that they are supported and will show more commitment to the initiative (Leithwood & Jantzi, 1999). The principal is the main reason programs are or are not successful in schools; they hold the most influence for implementation of programs and policies (Datnow & Castellano, 2001). The success of a school-based health promoting program, such as CSPAP, depends on an administration that is supportive in the creation, implementation and maintenance phases of the program (Greaney et al., 2007; Weiler, Pigg & McDermott, 2003). As CSPAPs move into their
next iteration of research and practice, continued focus on the school principal and other educational leaders is imperative to the success of these programs.
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## Preliminary Survey Items

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<tr>
<th>Item</th>
<th>Response Scale</th>
<th>Variable</th>
<th>Theoretical Link</th>
<th>Is the item derived from literature (e.g., an instrument/measure) that focuses on the identified theoretical link? If not, indicate which variable the item was originally intended to measure (if any).</th>
<th>Citation (if applicable)</th>
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<td>I am/would be involved with setting performance standards for my school’s CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Involvement (Dependent Variable: Study 1 and 2)</td>
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<td>US Dept of Ed, National Center for Education Statistics, Principal Questionnaire, National Teacher and Principal Survey 2015-2016 School Year; Webster et al. (in</td>
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<td>I am/would be involved with being a physically active role model for others in my school</td>
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<td>N/A</td>
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<td>I am/would be involved with organizing physical activity opportunities at my school</td>
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<td>Involvement (Dependent Variable: Study 1 and 2)</td>
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<td>Yes</td>
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<td>I am/would be involved with evaluating my school's CSPAP</td>
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<td>I am/would be involved with staying up-to-date on best practices for school physical activity programming</td>
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<td>Involvement (Dependent Variable: Study 1 and 2)</td>
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<td>Involvement (Dependent Variable: Study 1 and 2)</td>
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<td>I am/would be involved with maintaining a high level of communication about the CSPAP with all constituents (e.g., faculty, staff, students, families, the community)</td>
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<td>Yes</td>
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<td>I am/would be involved with providing CSPAP professional development opportunities at my school</td>
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<td>Involvement (Dependent Variable: Study 1 and 2)</td>
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<td>I am/would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force</td>
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<td>I am/would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP</td>
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<td>I am/would be involved with allocating resources for our school's CSPAP</td>
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<td>Involvement (Dependent Variable: Study 1 and 2)</td>
<td>None</td>
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<td>A CSPAP promotes / would promote a whole-child learning approach</td>
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<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
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<td>A CSPAP is / would be an ideal program for our students to pursue a healthy lifestyle</td>
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<td>Process Evaluation Studies</td>
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<td>A CSPAP facilitates / would facilitate student learning</td>
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<td>Process Evaluation Studies</td>
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<td>A CSPAP increases / would increase the likelihood of school site injuries</td>
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<td>Morrison (2006)</td>
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<td>A CSPAP fosters / would foster students’ attention to academics</td>
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<td>Van den Berg et al (2017)</td>
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<td>A CSPAP enhances / would enhance students’ physical development</td>
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<td>A CSPAP increases / would increase students’ off-task behavior in class</td>
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<td>A CSPAP leads / would lead to a chaotic school environment</td>
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<td>SEM; Outcome expectations (Social Cognitive Theory)</td>
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<td>A CSPAP promotes / would promote improved student test scores at my school</td>
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<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Outcome expectations (Social Cognitive Theory)</td>
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<td>Promote increased school attendance</td>
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<td>A CSPAP improves / would improve cognitive performance</td>
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<td>SEM; Outcome expectancies (Social Cognitive Theory)</td>
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<td>A CSPAP is / would be an essential component of the total education experience for our students</td>
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<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Attitude (Theory of Planned Behavior)</td>
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<td>A CSPAP is / would be an important part of the school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Intrapersonal (Independent Variable)</td>
<td>SEM; Attitude (Theory of Knowledge)</td>
<td>No</td>
<td>Theories of Perception (Theory of Knowledge)</td>
</tr>
<tr>
<td>Principal's Role</td>
<td>Level of Agreement</td>
<td>Variable</td>
<td>Planned Behavior</td>
<td>Coordinated School Health Program Model</td>
<td>Reference</td>
</tr>
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</tr>
<tr>
<td>Principals should play a major role in a school's CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Attitude (Theory of Planned Behavior)</td>
<td>No</td>
<td>Davis (2012); Webster et al. (2010)</td>
</tr>
<tr>
<td>Principals can make a significance difference in helping children adopt lifelong PA habits</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Attitude (Theory of Planned Behavior)</td>
<td>No</td>
<td>Davis (2012)</td>
</tr>
<tr>
<td>Principals should help to ensure all students meet the national physical activity guideline of at least 60 minutes of physical activity each day</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Attitude (Theory of Planned Behavior)</td>
<td>No</td>
<td>Parks (2003); Parks &amp; Solmon (2007); Hunt (2017)</td>
</tr>
<tr>
<td>The CSPAP is / would be an important component of my school culture</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Attitude (Theory of Planned Behavior)</td>
<td>Yes</td>
<td>SEM</td>
</tr>
<tr>
<td>It is mostly up to me whether we have a CSPAP at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Perceived Behavioral Control (Theory of Planned Behavior)</td>
<td>Yes</td>
<td>Perceived Behavioral Control (Theory of Planned Behavior)</td>
</tr>
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</tr>
<tr>
<td>Having a CSPAP at my school is something that is within my control as a principal</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Perceived Behavioral Control (Theory of Planned Behavior)</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>The students at my school believe it is important that our school has a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Subjective Norm (Theory of Planned Behavior)</td>
<td>Yes</td>
<td>Subjective Norm (Theory of Planned Behavior)</td>
</tr>
<tr>
<td>The teachers at my school believe it is important that our school has a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>Subjective Norm (Theory of Planned Behavior)</td>
<td>Yes</td>
<td>Subjective Norm (Theory of Planned Behavior)</td>
</tr>
<tr>
<td>Statement</td>
<td>Agree</td>
<td>Somewhat Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
<td>Subjective Norm (Theory of Planned Behavior)</td>
</tr>
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</tr>
<tr>
<td>The parents at my school believe it is important that our school has a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>Yes</td>
<td>N/A</td>
<td>Martin &amp; Kulinna (2004)</td>
</tr>
<tr>
<td>Promoting physical activity is the norm at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>I know more about new educational ideas/practices before other principals I know</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>Yes</td>
<td>Domain-Specific Innovativeness (Diffusion of Innovations)</td>
<td>Webster et al. (in review)</td>
</tr>
<tr>
<td>I don't see any good reasons for me to be involved with implementing a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>Yes</td>
<td>Amotivation (Self-Determination Theory)</td>
<td>Vazou &amp; Vlachopoulos (2014)</td>
</tr>
<tr>
<td>Implementing a CSPAP is something I am required to do</td>
<td>Disagree</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Externally Regulated (Self-Determination Theory)</td>
<td>Yes</td>
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<tr>
<td>I would feel bad about myself if I did not help to implement our school's CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Introjected Regulation (Self-Determination Theory)</td>
<td>Yes</td>
<td>Introjected Regulation (Self-Determination Theory)</td>
</tr>
<tr>
<td>Being involved with implementing a CSPAP is / would be a good thing to do</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Identified Regulation (Self-Determination Theory)</td>
<td>Yes</td>
<td>Identified Regulation (Self-Determination Theory)</td>
</tr>
<tr>
<td>I enjoy / would enjoy the work involved with implementing a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Intrinsic Motivation (Self-Determination Theory)</td>
<td>Yes</td>
<td>Intrinsic Motivation (Self-Determination Theory)</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Perceived Competence (Social Learning Theory)</td>
<td>Yes</td>
<td>Perceived Competence (Social Learning Theory)</td>
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<tr>
<td>I feel capable of helping to create opportunities within my school's CSPAP</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>A CSPAP is / can be easily applied to fit my school's specific context</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SEM</td>
</tr>
<tr>
<td>Others in my school environment notice / would notice the impact of promoting physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Observability (Diffusion of Innovations Theory)</td>
</tr>
<tr>
<td>Compared to what my school is currently / was previously doing to promote physical activity, a CSPAP has given / would give my school greater control over promoting physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Relative advantage (Diffusion of Innovations)</td>
</tr>
<tr>
<td>My school was / would be able to implement a CSPAP on a trial basis</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Trialability (Diffusion of Innovations)</td>
<td>Yes</td>
<td>Trialability (Diffusion of Innovations)</td>
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</tr>
<tr>
<td>A CSPAP fits / would fit well with the way my school community likes to promote physical activity</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Compatibility (Diffusion of Innovations)</td>
<td>Yes</td>
<td>Compatibility (Diffusion of Innovations)</td>
</tr>
<tr>
<td>A CSPAP is not very complicated</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Complexity/Simplicity (Diffusion of Innovations)</td>
<td>Yes</td>
<td>Complexity/Simplicity (Diffusion of Innovations)</td>
</tr>
<tr>
<td>I have had sufficient professional training to be involved with a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Social Learning Theory</td>
<td>Yes</td>
<td>Social Learning Theory</td>
</tr>
<tr>
<td>The majority of teachers at my school are helping / would help with the implementation of our CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Diffusion of Innovations/Social Learning Theory</td>
<td>Yes</td>
<td>Diffusion of Innovations/Social Learning Theory</td>
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</tr>
<tr>
<td>I have received sufficient professional training to help implement a CSPAP at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Intrapersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Social Learning Theory</td>
<td>Yes</td>
<td>Social Learning Theory</td>
</tr>
<tr>
<td>I can successfully overcome obstacles to implementing our school's CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Self-efficacy (Social Cognitive Theory)</td>
<td>Yes</td>
<td>Self-efficacy (Social Cognitive Theory)</td>
</tr>
<tr>
<td>Classroom teachers at my school are able to increase the activity levels of students in their classroom</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Collective efficacy (Social Cognitive Theory)</td>
<td>Yes</td>
<td>Collective efficacy (Social Cognitive Theory)</td>
</tr>
<tr>
<td>Classroom teachers at my school are able to integrate physical activity into academic instruction/learning</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Collective efficacy (Social Cognitive Theory)</td>
<td>Yes</td>
<td>Collective efficacy (Social Cognitive Theory)</td>
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</tr>
<tr>
<td>The majority of the teachers at my school support our school’s CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Collective efficacy (Social Cognitive Theory)</td>
<td>Yes</td>
<td>Collective efficacy (Social Cognitive Theory)</td>
</tr>
<tr>
<td>The majority of teachers at my school are / would be capable of implementing a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM; Collective efficacy (Social Cognitive Theory)</td>
<td>Yes</td>
<td>Collective efficacy (Social Cognitive Theory)</td>
</tr>
<tr>
<td>Parents are engaged in helping our school work toward our CSPAP goals</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>Theories of Perception (Theory of Knowledge)</td>
</tr>
<tr>
<td>Parents at my school support our</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Interpersonal</td>
<td>SEM</td>
<td>No</td>
<td>Theories of Perception</td>
</tr>
<tr>
<td>Item</td>
<td>Agreement Options</td>
<td>Interpersonal Variables</td>
<td>SEM</td>
<td>Collective Efficacy</td>
<td>Source(s)</td>
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</tr>
<tr>
<td>CSPAP</td>
<td>Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>(Independent Variable: Study 1 and 2)</td>
<td></td>
<td>Collective efficacy (Social Cognitive Theory)</td>
<td>Parks, 2003; Parks &amp; Solmon (2007)</td>
</tr>
<tr>
<td>I have a good relationship with the teachers at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>The people who work at our school collaborate well together</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Faculty at my school have received adequate professional development to implement a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Interpersonal (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>Collective efficacy (Social Cognitive Theory)</td>
</tr>
<tr>
<td>Our school's physical education staff is / would be capable of playing</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Organizational (Independent Variable: Study 1 and 2)</td>
<td>SEM; Collective efficacy</td>
<td>No</td>
<td>Collective efficacy (Social Cognitive)</td>
</tr>
<tr>
<td>Statement</td>
<td>Agreement Levels</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>a key role in implementing our school's CSPAP</td>
<td>at Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>There is at least one person at my school who is / would be a champion or lead advocate for our CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Policies in my school support the promotion of students' physical activity during school hours every school day</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Policies at my school support the promotion of faculty/staff wellness (e.g., health, fitness, physical activity)</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Sufficient professional development for CSPAP is available for my school staff</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat</td>
<td>(Social Cognitive Theory)</td>
<td>SEM</td>
<td>Yes</td>
<td>SEM</td>
</tr>
<tr>
<td>Statement</td>
<td>Agreement Levels</td>
<td>Measure</td>
<td>Method</td>
<td>SEM</td>
<td>Yes</td>
</tr>
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</tr>
<tr>
<td>Adequate CSPAP resources are available for my school faculty/staff</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The facilities at my school are adequate to implement a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our school schedule can accommodate a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is possible to align a CSPAP with other priorities at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>Agreement Levels</td>
<td>Organizational Values</td>
<td>Process Evaluation Studies</td>
<td>References</td>
<td></td>
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</tr>
<tr>
<td>My school has sufficient funds to support a CSPAP</td>
<td>Disagree; Strongly Disagree</td>
<td></td>
<td>SEM Yes</td>
<td>Hunt (2017)</td>
<td></td>
</tr>
<tr>
<td>Our school's vision/mission includes the promotion of physical activity</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Organization</td>
<td>SEM No</td>
<td>Van den Berg et al (2017)</td>
<td></td>
</tr>
<tr>
<td>There are safe routes for active transportation</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community</td>
<td>SEM Yes</td>
<td>Hunt (2017)</td>
<td></td>
</tr>
<tr>
<td>There is sufficient community support to implement a CSPAP at my school</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community</td>
<td>SEM Yes</td>
<td>Egan &amp; Miller (2019); Hunt (2017)</td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>Disagree</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
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</tr>
<tr>
<td>My school district provides our teachers with sufficient professional development to support CSPAP implementation</td>
<td></td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
</tr>
<tr>
<td>Our school has a facility joint use agreement with one or more community organizations for CSPAP programming</td>
<td></td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>Yes</td>
</tr>
<tr>
<td>Our district superintendent supports CSPAPs</td>
<td></td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
</tr>
<tr>
<td>Our school has a strong relationship with one or more other organizations/agencies that help to support a CSPAP</td>
<td></td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Community (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
</tr>
<tr>
<td>National policies support school physical activity</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Policy (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>Policies in my state support school physical activity</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Policy (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Policies in my school district support school physical activity</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Policy (Independent Variable: Study 1 and 2)</td>
<td>SEM</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Before taking this survey, I was familiar with the notion of a CSPAP</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Knowledge (Diffusion of Innovations)</td>
<td>Yes</td>
<td>Knowledge (Diffusion of Innovations)</td>
</tr>
<tr>
<td>Question</td>
<td>Response Choices</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Communication channels (Diffusion of Innovations)</td>
<td>Webster et al., in review</td>
<td></td>
</tr>
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<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td>Where did you first learn about a CSPAP?</td>
<td>List of response choices provided</td>
<td>None</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you or have you ever been a licensed/certified physical education teacher?</td>
<td>Yes/No</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>What is your highest level of education?</td>
<td>List of response choices provided</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>At which educational level are you currently employed?</td>
<td>Elementary School; Middle School; High School</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>In which state are you currently employed?</td>
<td>Drop down menu of all states</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Variable: Study 2</td>
<td>Overall, my experiences being involved with CSPAP have been positive</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Strongly Disagree</td>
<td>Personali Biography (Independent Variable: Study 2)</td>
<td>Social Learning Theory</td>
<td>No</td>
</tr>
<tr>
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<td>-----</td>
</tr>
<tr>
<td>Which sources of communication about CSPAPs were most important to your decision to become involved with implementing a CSPAP at your school?</td>
<td>List of response choices provided</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Communication channels (Diffusion of Innovations)</td>
<td>No</td>
<td>Communication channels (Diffusion of Innovations)</td>
</tr>
<tr>
<td>After first learning about what a CSPAP is, about how long did it take for you to become involved with implementing a CSPAP?</td>
<td>List of response choices provided</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Rate of Adoption (Diffusion of Innovations)</td>
<td>No</td>
<td>Rate of Adoption (Diffusion of Innovations)</td>
</tr>
<tr>
<td>How many years’ experience do you have working as a principal?</td>
<td>Enter number of years</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>How many years did you spend as a teacher before you became a principal?</td>
<td>Enter number of years</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
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</tbody>
</table>

Canada, Canada

US Dept of Ed, National Center for Education Statistics, Principal Questionnaire, National Teacher and Principal Survey 2015-2016 School Year
<p>| How many years’ experience do you have working as a principal at this school? | Enter number of years | Personal Biography (Independent Variable: Study 2) | None | No | No | OECD Teaching and Learning International Survey (TALIS)Principal Questionnaire: Main Study Version (MS-11-01)[International English, UK Spelling]International Project Consortium: International Association for the Evaluation of Educational Achievement (IEA), The Netherlands; IEA Data Processing and Research Center (IEA DPC), Germany; Statistics Canada, Canada |</p>
<table>
<thead>
<tr>
<th>I like to exercise</th>
<th>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</th>
<th>Personal Biography (Independent Variable: Study 2)</th>
<th>Personal Competence in PA (Social Learning Theory)</th>
<th>Yes</th>
<th>Personal Competence in PA (Social Learning Theory)</th>
<th>Webster, Monsma, &amp; Erwin (2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am physically active</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Yes</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>I like being physically active</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Yes</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>I have a good level of muscular endurance</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Yes</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>I have a good level of muscular strength</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Yes</td>
<td>Personal Competence in PA (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
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<td>---------------------------------</td>
</tr>
<tr>
<td>My elementary school PE experiences were positive</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Yes</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>My middle school PE experiences were positive</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Yes</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>My high PE experiences were positive</td>
<td>Strongly Agree; Agree; Somewhat Agree; Somewhat Disagree; Disagree; Strongly Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Yes</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
</tr>
<tr>
<td>I was good at physical education</td>
<td>Strongly Agree; Agree; Somewhat Agree; Disagree; Somewhat Disagree</td>
<td>Personal Biography (Independent Variable: Study 2)</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Yes</td>
<td>PE Satisfaction (Social Learning Theory)</td>
<td>Webster, Monsma, &amp; Erwin (2010)</td>
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</tr>
<tr>
<td>For the CSPAP component, physical education</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>School Policy and Environment School Questionnaire - CDC, 2008</td>
</tr>
<tr>
<td>For the CSPAP component, physical activity during school</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
<tr>
<td>For the CSPAP component, physical activity before/after school</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
<tr>
<td>For the CSPAP component, staff involvement, identify physical activity promotion</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
<tr>
<td>Question</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>For the CSPAP component, family and community engagement, identify physical activity promotion strategies currently utilized at your school.</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
<tr>
<td>Is there a committee in place at your school that is responsible for the overall goals related to a CSPAP?</td>
<td>Yes/No</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>(Webster et al., in review)</td>
</tr>
<tr>
<td>On average, how many minutes each day do students spend in recess/nutrition break?</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>School Policy and Environment School Questionnaire - CDC, 2008</td>
</tr>
</tbody>
</table>
Which of the following best describes the setting in which this school is located?

- Urban; Suburban
- Rural

Professional Context

Study 2

None

No

No

OECD Teaching and Learning International Survey (TALIS)
Principal Questionnaire
Main Study Version (MS-11-01)
[International English, UK Spelling]
International Project Consortium: International Association for the Evaluation of Educational Achievement (IEA), The Netherlands
IEA Data Processing and Research Center (IEA DPC), Germany
Statistics Canada, Canada
<table>
<thead>
<tr>
<th>Question</th>
<th>List of response choices provided</th>
<th>Profesional Context (Independent Variable: Study 2)</th>
<th>None</th>
<th>No</th>
<th>No</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students in your school</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>Davis (2012)</td>
</tr>
<tr>
<td>Percentage of your students that participate in the free or reduced lunch program</td>
<td>List of response choices provided</td>
<td>Professional Context (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>Morrison (2006)</td>
</tr>
<tr>
<td>What is your age?</td>
<td>Enter age</td>
<td>Demographics (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>Webster et al., in review</td>
</tr>
<tr>
<td>Please indicate which gender you identify with:</td>
<td>Male; Female</td>
<td>Demographics (Independent Variable: Study 2)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>Webster et al., in review</td>
</tr>
<tr>
<td>What is your race/ethnicity?</td>
<td>List of response choices provided</td>
<td>Demographics (Independent Variable: Study)</td>
<td>None</td>
<td>No</td>
<td>No</td>
<td>Webster et al., in review</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Who should be involved in supporting the CSPAP? (Select all that apply)</td>
<td>List of response choices provided</td>
<td>Perceived Role appropriateness (possible additional item)</td>
<td>None</td>
<td>No</td>
<td>Process Evaluation Studies</td>
<td>Van den Berg et al (2017)</td>
</tr>
<tr>
<td>Who is the most suitable person at your school to lead the CSPAP?</td>
<td>List of response choices provided</td>
<td>Perceived Role appropriateness (possible additional item)</td>
<td>None</td>
<td>No</td>
<td>Process Evaluation Studies</td>
<td>Van den Berg et al (2017)</td>
</tr>
</tbody>
</table>
APPENDIX B

Invitation Email

Dear Principal,

Greetings from the University of South Carolina! For my dissertation I am conducting a nationwide study to learn about principals’ perceptions of comprehensive school physical activity programming (CSPAP). I need you to participate in this important research, to establish a much needed knowledge base.

It may be easier to complete the survey using a computer as opposed to a smartphone. You can take the survey anytime from now until Friday, May 10th, at which time the survey will close. This survey is expected to take 12 minutes or less.

Thank you so much for your participation, and please do not hesitate to reach out to me with any questions or concerns at karie@email.sc.edu.

Karie Orendorff, M.A.
Doctoral Candidate
Department of Physical Education
University of South Carolina

E: karie@email.sc.edu
P: 626-399-7827
O: Blatt Physical Education Center
1300 Wheat St, Room 210
Columbia, SC 29208

You can discover more about a person in one hour of play than a lifetime of conversation.
~Plato
APPENDIX C

Informed Consent

PRINCIPAL INVESTIGATOR: Karie Lee Orendorff

DESCRIPTION OF STUDY PROCEDURES: Complete the online survey. Completion of the online survey will be taken as your consent to participate in the study.

RISKS OF PARTICIPATION: There are no known risks associated with participating in this research except a slight risk of breach of confidentiality, which remains despite steps that will be taken to protect your privacy. In order to minimize the risk of this occurring, your survey will be stored in a password protected database on a computer in the PI’s locked office at the University of South Carolina and will not be shared with anyone other than other members of the research team. Your name and your school's name will not be used in any reports of the study.

BENEFITS OF PARTICIPATION: Taking part in this study is not likely to benefit you personally. However, this research may help us understand the extent and nature of school principals' involvement in implementing CSPAPs.

CONFIDENTIALITY OF RECORDS: All information gathered will remain confidential. Study information will be stored in the PI’s locked office and in password protected computer files at the University of South Carolina. The results of the study may be published or presented at meetings, but your identity will not be revealed. While we will make every effort to protect your privacy, it cannot be absolutely guaranteed. In rare cases, a research study may be evaluated by an oversight agency, such as the USC Institutional Review Board or the U.S. Office for Human Research Protections. If this occurs, the consent form signed by you may be inspected so that they may evaluate whether the study is properly conducted and the rights of participants were adequately protected.

CONTACT PERSONS: For more information concerning this research, you should contact Karie Lee Orendorff at (626) 399-7827 or email karie@email.sc.edu. If you have any questions about your rights as a research participant, you may contact: Thomas Coggins, Director, Office of Research Compliance, University of South Carolina, Columbia, SC 29208, Phone - (803) 777-7095, Fax - (803) 576-5589, E-Mail - tcoggins@mailbox.sc.edu

VOLUNTARY PARTICIPATION: Participation in this study is voluntary. You are
free not to participate or to withdraw at any time, for whatever reason, without negative consequences. In the event that you do withdraw from this study, the information you have already provided will be kept confidential.
APPENDIX D

Survey

Dear Principal,

Thank you for participating in this important research! Please carefully read the information below before starting this survey.

A Comprehensive School Physical Activity Program (CSPAP) seeks to take advantage of and/or create opportunities for students to meet national physical activity guidelines, while also helping students to develop the knowledge, skills and confidence that they need to remain physically active throughout their lifetime. A CSPAP can achieve these goals using one or more of the following components, examples of these components are included on the next page of this survey:

- physical education,
- physical activity during school,
- physical activity before and after school,
- staff involvement,
- family and community engagement.

For this survey, only programs that provide education related to physical activity (e.g., physical education) AND physical activity opportunities (e.g., daily opportunities to be active in/out of school) will be considered CSPAPs.

This survey aims to capture principals’ perceptions about their involvement in, and the factors associated with, the implementation of a CSPAP in their school/community. You will be asked questions to:

- determine the ways in which you are, or could be, involved with a CSPAP
- determine the facilitators and barriers related to implementing a CSPAP to provide additional information about yourself and your school context

CSPAP Implementation:

Is a Comprehensive School Physical Activity Program (CSPAP) currently being implemented at your school?
Note: For this survey, only respond "yes" if your school provides opportunities, **through any combination or variety of CSPAP components** - **all** students at your school:

- receive standards based physical educational experiences designed to prepare individuals for a lifetime of participation in physical activity, **and**
- meet the national guideline for school-aged youth to accumulate at least 60 minutes of mostly moderate to vigorous physical activity each day (including lunch time activities, and before and after school activities).

**EXAMPLE CSPAP COMPONENTS:**

- **Physical Education** (e.g., standards based instruction, assessment of student learning, opportunities for moderate to vigorous physical activity during physical education lessons)

- **Physical Activity During School** (e.g., physical activity during regular classroom time, at recess, or during lunch)

- **Physical Activity Before, After School** (e.g., active transportation options to/from school, intramural sports, physical activity clubs)

- **Staff Involvement** (e.g., staff wellness programming, staff training for physical activity promotion, staff/administrator support for physical activity promotion)

- **Family and Community Engagement** (e.g., facility joint use agreements with outside organizations, physical activity events for families, active homework)

Place Yes and No buttons after the examples:

**YES**

**NO**

**Your Involvement in a CSPAP: Pages 4 (NO) and 14 (YES)**

**INVOLVEMENT**: The degree to which you are involved with the implementation, support, and/or sustainability of a Comprehensive School Physical Activity Program (CSPAP).

**Page 4 and 14**

I am/would be involved with supporting my school staff in their efforts to promote physical activity
I am/would be involved with establishing physical activity opportunities at my school

I am/would be involved with CSPAP planning at my school

I am/would be involved with providing CSPAP professional development opportunities at my school

I am/would be involved with serving on my school's CSPAP committee or other related (e.g., school wellness) board/task force

I am/would be involved with building/maintaining partnerships with community constituents to implement/sustain our school's CSPAP

**Page 5 and 15**
I am/would be involved with setting performance standards for my school’s CSPAP

I am/would be involved with being a physically active role model for others in my school

I am/would be involved with organizing physical activity opportunities at my school

I am/would be involved with evaluating my school's CSPAP

I am/would be involved with staying up-to-date on best practices for school physical activity programming

I am/would be involved with advocating for our school's CSPAP

I am/would be involved with allocating resources for our school's CSPAP

**Intrapersonal Facilitators/Barriers to CSPAP Involvement: Pages 6 (NO) and 16 (YES)**

This section of the survey focuses on intrapersonal facilitators/barriers to CSPAP involvement, which include characteristics of the individual (e.g., knowledge, skills, beliefs) that may influence his/her behavior.

**Page 6 and 16**
A CSPAP promotes / would promote a whole-child learning approach

A CSPAP is / would be an ideal program for our students to pursue a healthy lifestyle

A CSPAP facilitates / would facilitate student learning

A CSPAP fosters / would foster students’ attention to academics
A CSPAP enhances / would enhance students’ physical development

A CSPAP increases / would increase students’ off-task behavior in class

A CSPAP promotes / would promote students’ social development

**Page 7 and 17**
A CSPAP helps / would help our students pursue physically active lifestyles

A CSPAP helps / would help to improve our students’ physical skills

A CSPAP promotes / would promote improved classroom behavior

A CSPAP promotes / would promote increased school attendance

A CSPAP improves / would improve cognitive performance

A CSPAP promotes / would promote our students' academic achievement

A CSPAP is / would be an essential component of the total education experience for our students

**Page 8 and 18**
A CSPAP is / would be an important part of the school curriculum

The CSPAP is / would be an important component of my school culture

It is mostly up to me whether we have a CSPAP at my school

Having a CSPAP at my school is something that is within my control as a principal

The students at my school believe it is important that our school has a CSPAP

The teachers at my school believe it is important that our school has a CSPAP

Implementing a CSPAP is something I am required to do

**Page 9 and 19**
I would feel bad about myself if I did not help to implement our school's CSPAP

Being involved with implementing a CSPAP is / would be a good thing to do

I feel capable of helping to create opportunities within my school's CSPAP

A CSPAP is / can be easily applied to fit my school's specific context
My school was / would be able to implement a CSPAP on a trial basis

A CSPAP fits / would fit well with the way my school community likes to promote physical activity

A CSPAP is not very complicated

I believe schools have a responsibility to promote physical activity for all students throughout the school day

**Interpersonal Facilitators/Barriers to CSPAP Involvement: Pages 10 (NO) and 20 (YES)**

This section of the survey focuses on interpersonal facilitators/barriers to CSPAP involvement, which include aspects of the social environment (e.g., relationships with others) that may influence an individual's behavior.

Classroom teachers at my school are able to integrate physical activity into academic instruction/learning

The majority of teachers at my school are / would be capable of contributing to the developing and the implementing of a CSPAP

Parents/guardians are engaged in helping our school work toward our CSPAP goals

Parents/guardians at my school support our CSPAP

Parents/guardians at my school are/would be interested and willing to help our school toward our CSPAP goals

**Organizational Facilitators/Barriers to CSPAP Involvement: Pages 11 (NO) and 21 (YES)**

This section of the survey focuses on organizational facilitators/barriers to CSPAP involvement, which include the resources and support structure of an institution (e.g., a school) that may influence an individual's behavior.

Our school's vision/mission includes the promotion of physical activity

Policies in my school support the promotion of students' physical activity during school hours every school day

Policies at my school support the promotion of faculty/staff wellness (e.g., health, fitness, physical activity)
Our school’s physical education staff is / would be capable of playing a key role in implementing our school's CSPAP

Sufficient professional development for CSPAP is available for my school staff

Adequate CSPAP resources are available for my school faculty/staff

The facilities at my school are adequate to implement a CSPAP

Our school schedule can accommodate a CSPAP

My school has sufficient funds to support a CSPAP

Community Facilitators/Barriers to CSPAP Involvement: Pages 12 (NO) and 22 (YES)

This section of the survey focuses on community facilitators/barriers to CSPAP involvement, which include aspects of the community surrounding an institution (e.g., school) that may influence an individual's behavior.

There are safe routes for active transportation (e.g., walking, biking) to/from our school

Our school has a facility joint use agreement(s) with one or more community organizations for CSPAP programming

Our district superintendent supports CSPAPs

Our school has a strong relationship with one or more other organizations/agencies that help to support a CSPAP

My school partners/would partner with a local university to promote CSPAP at our school.

Public Policy Facilitators/Barriers to CSPAP Involvement: Pages 13 (NO) and 23 (YES)

This section of the survey focuses on public policy facilitators/barriers to CSPAP involvement, which include regulations, standards, and accountability measures at local, state, and/or national levels that may influence an individual's behavior.

Policies in my state support school physical activity

Policies in my school district support school physical activity
Policies in my school support physical activity

I am familiar with state level policies that support physical activity

**Response Scale in Official Survey will be:**

- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree
- Don’t Know

**Professional Context Questions: Page 24**

This section of the survey focuses on your school context and the characteristics of your CSPAP, if your school has one.

Before taking this survey, I was familiar with the notion of a CSPAP

- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Where did you **first** learn about a CSPAP? (Select only one response)

- National conference
- Regional conference
- State conference
- Website
- Physical Education teacher at your school
- Physical Education teacher not at your school
- Classroom teacher at your school who is not a Physical Education teacher
- A principal from another school
- Assistant principals
- Instructional coaches
- Someone who holds a position in district-level leadership
- Formal learning experiences in your pre-service teacher education program
- Formal learning experiences in an in-service professional development workshop/training
- Informal learning experiences (e.g., reading professional literature on your own)
- This survey
Which sources of communication about CSPAPs were/would be most important to your decision to become involved with implementing a CSPAP at your school? ALLOW FOR MULTIPLE ANSWERS

- National conference
- Regional conference
- State conference
- Website
- Physical Education teacher at your school
- Physical Education teacher not at your school
- Classroom teacher at your school who is not a Physical Education teacher
- A principal from another school
- Assistant principals
- Instructional coaches
- Someone who holds a position in district-level leadership
- Formal learning experiences in your pre-service teacher education program
- Formal learning experiences in an in-service professional development workshop/training
- Informal learning experiences (e.g., reading professional literature on your own)
- This survey

For the CSPAP component, physical education, identify physical activity promotion strategies currently utilized at your school. ALLOW FOR MULTIPLE ANSWERS

- Standards Based Instruction
- Assessment of Student Learning
- Opportunities to Learn
- Opportunities for Moderate to Vigorous Activity
- Meaningful Content
  - None. As it relates to physical education, no physically activity promotion strategies are currently utilized at my other school
  - Other (please specify)

For the CSPAP component, physical activity during school, identify physical activity promotion strategies currently utilized at your school. ALLOW FOR MULTIPLE ANSWERS

- Classroom Based Physical Activity
- Recess
- Physical Activity Assemblies
- Physical Activity Drop-In Opportunities (e.g., keeping the gym open during lunch)
  - None. As it relates to physical activity during school, no physically activity promotion strategies are currently utilized at my other school
  - Other (please specify)
For the CSPAP component, **physical activity before/after school**, identify physical activity promotion strategies currently utilized at your school. **ALLOW FOR MULTIPLE ANSWERS**

- Active Transportation Programs/Options
- Intramurals
- Interscholastic Sports
- Physical Activity Clubs
- None. As it relates to physical activity before/after school, no physically activity promotion strategies are currently utilized at my other school
- Other (please specify)

For the CSPAP component, **staff involvement**, identify physical activity promotion strategies currently utilized at your school. **ALLOW FOR MULTIPLE ANSWERS**

- Staff Wellness Programming (e.g., fitness programs/events for teachers, health screening for teachers)
- Staff Training for Physical Activity Promotion
- Administrators Involved in Promoting Physical Activity
- Classroom Teachers Involved in Promoting Physical Activity
- None. As it relates to staff involvement, no physical activity promotion strategies are currently utilized at my school.
- Other (please specify)

For the CSPAP component, **family and community engagement**, identify physical activity promotion strategies currently utilized at your school. **ALLOW FOR MULTIPLE ANSWERS**

- Facility Joint Use Agreements with Outside Organizations
- Physical Activity Programs/Events for Families
- Parents/guardians Involved in Physical Activity Promotion
- Community Members/Organizations (e.g., Universities, YMCAs, Church Groups) Involved in Physical Activity Promotion
- Active Homework for Students
- None. As it relates to family and community engagement, no physical activity promotion strategies are currently utilized at my school.
- Other (please specify)

Is there a committee in place at your school that is responsible for the overall goals related to a CSPAP? **YES**

Who should be involved in implementing, supporting and/or sustaining your school’s CSPAP? **ALLOW FOR MULTIPLE ANSWERS**

- Principal
- Assistant Principal

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• Other School Administrator
• Classroom Teachers
• Physical Education Teachers
• School Nurse
• Parents/guardians
• Other Community Members/Organizations
• Students

Who is the most suitable person/group in your school community to lead your school’s CSPAP? (Select only one response)
• Principal
• Assistant Principal
• Other School Administrator
• Classroom Teachers
• Physical Education Teachers
• School Nurse
• Parents/guardians
• Other Community Members/Organizations
• Students

Overall, my experiences being involved with CSPAP have been positive
• Strongly Agree
• Agree
• Somewhat Agree
• Somewhat Disagree
• Disagree
• Strongly Disagree
• Have Not Been Involved

After first learning about what a CSPAP is, about how long did it take for you to become involved with implementing a CSPAP?
• A matter of days
• A matter of weeks
• A matter of months
• A year or more
• Have not been involved

Personal and Professional Biography Page 25

This section of the survey focuses on your personal and professional biography.

Are you currently the lead/head principal at your school?
• Yes
• No
Are you or have you ever been a licensed/certified physical education teacher?
- YES
- NO

What is your highest level of education?
- Associate
- Bachelors
- Masters
- Masters +30
- EdD
- PhD

Which educational level fits the closest to where you are currently employed?
- Elementary School
- Jr. High/Middle School
- High School
- K-8
- 7-12

In which state are you currently employed?
- Drop Down of States

How many years’ experience do you have working as a principal?
- 0-5
- 6-10
- 11-15
- 16-20
- over 20

How many years did you spend as a teacher before you became a principal?
None
Less than 3 years
3-5 years
6-10 years
11-15 years
16-20 years
More than 20 years

How many years’ experience do you have working as a principal at this school?
- This is my first year
- 1-2 years
- 3-5 years
- 6-10 years
- 11-15 years
- 16-20 years
• More than 20 years

On average, how many minutes each day do students spend in recess/nutrition break
• 0
• 1-15 minutes
• 16-30 minutes
• 31-45 minutes
• 46-60 minutes

Which of the following best describes the setting in which this school is located?
• Suburban
• Metro urban
• Rural

What is the total number of students in your school?
• 400 or less
• 401-600
• 601-800
• 801-1,000
• 1,001-1,200
• 1,201 or above

What percentage of your students participate in the free or reduced lunch program?
• 0-20%
• 20-40%
• 40-60%
• 60-80%
• 80-100%

I am a member of one or more school administrator associations (e.g., American Association of School Administrators)
• Yes
• No

School Principal’s Physical Activity Promotion Attitudes Page 26

This section of the survey focuses on biographical characteristics in school principal’s physical activity promotion attitudes
I like to exercise
• Strongly Agree
• Agree
• Somewhat Agree
• Somewhat Disagree
• Disagree
• Strongly Disagree
I am physically active
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I like being physically active
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I have a good level of muscular endurance
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I have a good level of muscular strength
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

My elementary school PE experiences were positive
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree

My middle school PE experiences were positive
- Strongly Agree
- Agree
• Somewhat Agree
• Somewhat Disagree
• Disagree
• Strongly Disagree

My high PE experiences were positive
• Strongly Agree
• Agree
• Somewhat Agree
• Somewhat Disagree
• Disagree
• Strongly Disagree

I was good at physical education
• Strongly Agree
• Agree
• Somewhat Agree
• Somewhat Disagree
• Disagree
• Strongly Disagree

Demographic Questions: Page 27

This section of the survey focuses on your demographic characteristics.

What is your age?
• 25-30
• 31-35
• 36-40
• 41-45
• 46-50
• 51-55
• 56-60
• 61-65
• 60 +

Please indicate which gender you identify with:
• Male
• Female
• Prefer to self-describe
• Prefer not to say

What is your race/ethnicity?
• American Indian or Alaska Native
• Asian
• Black or African American
• Hispanic or Latino
• Native Hawaiian or Other Pacific Islander
• White
• Other (please specify)