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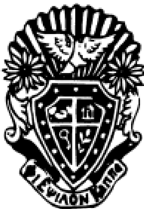

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COACHING EDUCATION

Tools for a Formal Mentoring Program: A Guide Every Mentee in Coaching Can Use

Vincent Lyons and Donna Pastore

Abstract

Mentoring is crucial for the development of competent coaches (Jones, Harris, & Miles, 2009), and athletic departments and sport organizations are encouraged to use this process that links an inexperienced coach with a veteran mentor coach (Megginson & Clutterbuck, 1995). Mentored coaches benefit from gaining insight and wisdom into their profession and from building important relationships with significant others in the department or organization (Pastore, 2003). In this paper, we provide an overview of mentoring and give practical tools for implementing or strengthening a formal mentoring program. As such, relative worksheets for use by mentee and mentor coaches have been included in the appendices of this paper.

Much has been written about the mentoring process that occurs in educational settings (Burden, Harrison, & Hodge, 2005; Dodds, 2005; Jones, Harris, & Miles, 2009; Sambunjak, Straus, & Marusic, 2010), including the sport and athletic context (Cardone, 2010; Pastore, 2003; Weaver & Chelladurai, 2002). In most of these published articles, the focus has been on defining what mentoring is and what roles are common for the people involved and on articulating attributes, characteristics, and expectations of the mentor teacher

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or coach (Dawson, 2014; D'Abate, 2009; Kram, 1983, 1988; Kram & Isabella, 1985; Ragins, 1997). The purpose of this paper is to provide further insight into the perspective of the mentee in coaching, including a description of assessing his or her basic competencies and future goals. Finally, we provide useful templates that can be used as how-to guides for those newly or actively engaged in the process of formal mentoring in their current athletic coaching location and situation.

Within the realm of sports coaching, the practice of mentoring has been commonly used to enhance mentee coaches' expertise and knowledge base (Bloom, Durand-Bush, Schinke, & Salmela, 1998) as part of the integral process of "developing high-quality practitioners" (Jones et al., 2009, p. 268). This mentoring of coaches is only possible because of the experience and perspicacity of expert coaches who were mentored themselves in areas ranging from tactical and physical skills to coaching philosophies and values that govern the mentee coach's relationship with other people (Bloom et al., 1998; Jones et al., 2009). In the most rudimentary sense, then, mentee coaches receive on-the-job training from mentor coaches who provide regular conversational interactions as well as modeled actions indicating how various responsibilities and tasks ought to be handled.

At least one group of scholars has noted that beginning athletic coaches, who are often inexperienced teachers in an unfamiliar school, regularly "encounter challenges and demands," especially as they pertain to navigating the many new relationships with students, parents, and school administrators (Rikard & Banville, 2010). The novice coaches who are also academic teachers have previously had at a minimum a mentor teacher who helped them develop their organizational and technical skills in a relatively controlled student teaching classroom setting. However, the first-time coach who is not a classroom teacher may never have had a coaching mentor before, let alone a controlled context in which to practice skill development germane to the art and science of coaching. Therefore, it is essential that new coaches have the opportunity to be formally mentored by experienced coaches who have walked in the shoes of the mentees early in their own careers.

Theoretical Framework

The process of mentoring is grounded in Bandura's (1977) social learning theory, which argues that individuals learn through observing the actions and behaviors of influential role models. Social learning theory can also be a powerful tool for shaping desired behavior through positive or negative reinforcement that is given to mentees from people who are more experienced. To this end, Megginson and Clutterbuck (1995) noted that mentoring is usually understood as an intraorganizational social relationship in which a more experienced person serves as a role model and friend to another less experienced person. The mentee is a person who can learn from a knowledgeable mentor in a relationship that requires "trust, respect and a genuine interest in each other's lives" (MacLennan, 1995, p. 41), and a mentor helps the mentee avoid mistakes and gives the protégé the opportunity to meet and forge relationships with those in more powerful or influential positions (Pastore, 2003).

Appendix A illustrates the various ways in which the mentoring can occur formally or informally in almost any athletic department or sporting context. Regardless, though, of whether coaches are mentored in a formal or informal setting or program, the process can potentially lead to the procurement of personal fulfillment and professional evolution for both parties involved. In this mutually beneficial bidirectional relationship, scholars have noted that mentees have someone to invest in their total growth as professionals (Jones et al., 2009) and that mentors are rewarded with personal satisfaction that comes with helping another person in the vocation (Pastore, 2003). In support of this claim, in sport survey research, Weaver and Chelladurai (2002) indicated that male and female mentored athletic administrators are "more satisfied with their work than their non-mentored counterparts" (p. 96). It stands to reason, then, that mentored coaches at all levels of athletics may be more satisfied with their work, too, which can only help to influence positively the overall coaching experience and growth of the persons taking part in such an important relationship. In turn, the positive coaching experiences of mentored coaches will strengthen the overall success of the entire athletic department of the school. Hence, not only is mentoring potentially beneficial for the mentor and mentee directly involved in this social learning process, but the entire school

and its sport organization may also be strengthened and improved (Flannery & Swank, 1999).

Pilot Program

Once a person is hired as an athletic coach, he or she is suddenly confronted with various aspects of the job that must be learned to perform the duties of the specific appointment well. According to Bandura's (1977) social learning theory and his subsequent theory of self-efficacy, people often learn how to act in certain social situations through observing the actions and role modeling of others. He also noted that these same people are capable of developing a sense of their own abilities to control courses of action that lead to the successful attainment of goal and performance outcomes (Bandura, 1977). With this perspective in mind, it is certainly possible to assert that many novice coaches will quickly adapt to their new position and acquire essential job functional knowledge by witnessing the behavior of and asking questions to the other coaches in their school and sport-specific school context. The formal mentoring program presented in this paper is intended to assure the mentee coach that there will be at least one primary mentor coach who can be counted on as a role model for demonstrating appropriate coaching behaviors and for answering inquiries (Flannery & Swank, 1999).

To help guide the process of learning and the advancement of self-efficacy for the new coach, three forms appear in appendices that can be used to help govern the overall process of formal sport coach mentoring in any school setting. The "Mentee Coach Skill Assessment Sheet " (see Appendix B) is intended to be an initial self-assessment for the mentee coach that ought to be filled out prior to performing any job-related duties. This form is guided by the foundational work of Zachary (2000) and MacLennan (1995), who noted that an initial assessment can be useful in helping mentees state specific goals and objectives that they would like to accomplish with the assistance of their mentor. The use of the skill assessment sheet here is not intended to report or establish a level of self-efficacy for the mentee coach, but rather it is geared toward ultimately helping the coach determine the best possible ways to use successfully the skills that the mentee already possesses (Bandura, 1986) through an enumeration of strengths and weaknesses in a wide range of skill ar-

eas associated with coaching job functions. Mentor coaches should be prepared to share the results of this preliminary assessment with their assigned mentor coach at one of their first scheduled mentoring meetings.

The "Mentee Coach Open Observation Sheet" (see Appendix C) should be used at least two to three times by the mentor coach during the sport season for which the mentee is an inexperienced coach (2 years of coaching or less for that specific sport). The mentor coach needs to make every effort to share observations and reflections with the mentee coach in a timely fashion, during which the two coaches can gather without distraction for at least 15–30 min to discuss and ask questions regarding the particulars of the recorded observation. This observation form and the conversation that follows are not intended to be an evaluation tool of the mentor's performance of particular skills, but they are intended to serve as a tool for reflection based on the observation of a more experienced coach in the same sport. Because coaches often serve a role in influencing someone's interpretation of the sport experience (Duda & Balaguer, 1979), it can be assumed that a mentor coach can help guide the learning of a mentee coach as each person shares and responds to the written notes from the observed coaching experience.

The "Mentee Coach Summative Evaluation Tool Sheet" (see Appendix D) is grounded in the work of Zachary (2005), who noted that the process of mentoring should primarily be oriented toward the learning process and stated improvement needs of the mentee. This mentoring form was also constructed in part to serve as a reflection tool for those involved in the mentee coach's work progress. To this end, Rhodes, Stokes, and Hampton (2004) wrote that open reflection is an essential component to furthering professional development. As such, this form is recommended to be used at the completion of the sport season specific to the mentee coach (i.e., if the mentee is a ninth grade basketball coach and his or her season ends a month before the mentor varsity coach's season ends, both coaches should make every effort to meet with the athletic director in a timely fashion to meet and fill out this form together). A form that is filled out too long after the season or by only two members of the recommended triad of professionals is likely to seem stale or unhelpful, especially if the mentee coach has moved on to coaching

another sport. Thoughts, ideas, and reactions that are soon after the season has ended give the coaches and athletic director the opportunity to recall more easily instances and examples of situations that were or were not appropriately or positively handled during the season, which allows for healthy discussion on the mentee coach's skills in various stages of development.

SWOT Analysis of Pilot Program

The useful tools set forth in this article for helping to establish a mentoring program for coaches have shown promise in serving as useful guides for schools and coaches who want to introduce or formalize their athletic coaching mentor–mentee program. During the 2013–2014 school year, this program received administrator approval for use by a Midwestern K–12 school. Therefore, following a consultation with the authors of this work, an introductory meeting was held at this school in the summer of 2013 between the school's athletic director and its coaches. At this meeting, coaches received an outline to the mentoring program and those who wanted to participate immediately were guided through the early stages of engagement with the materials presented in the appendices of this paper. It was noted that most coaches preferred to select their mentor coach to work with as opposed to having one assigned to them, and several more veteran coaches offered to try and mentor more than one inexperienced coach. In the end, though, all mentees had a mentor coach (even if this was an administrator who also coached), and at a minimum, each less experienced coach had the chance to articulate initial areas of strength and weakness. Furthermore, mentee coaches expressed well-defined goals for their increase in coaching aptitude, including their desire to receive more frequent feedback from their athletic director or other school administrators.

The most positive reported benefit of the mentoring program for this school appears to be the establishment of a postseason meeting between coaches and school administrators. In this pilot case, mentee coaches noted that they were thankful they now had a chance to sit down and talk with a school administrator about their sport season and overall coaching growth and effectiveness. We believe that this type of big-picture, positive consequence is the result of a more natural line of communication between coaches and administrators that results from de-emphasizing a vertical hierarchical structure

that often exists among school personnel. Further use of these mentoring tools at other schools and in other athletic settings is needed to confirm whether this is most often the case.

The pilot testing of this program was not without its challenges either. For example, the school experienced coaching resignations and dismissals during and immediately after the fall and winter sport seasons, which led to difficulties following through on mentoring program commitments for those directly involved. This unanticipated challenge may have been amplified further at this school because of its relatively small size and lack of paid assistant coaches for use by a Midwestern 7–12 school. Thus, it is recommended that schools or community athletic organizations wishing to adopt a mentoring program similar to this consider their overall coaching stability before beginning a formal mentoring process.

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Appendix A

Comparison of Features for Formal & Informal Mentoring Approaches

Key features	Informal	Formal
Common Descriptors	Casual, serendipitous, spontaneous, natural, idiosyncratic	Organized, structured, facilitated, strategic, planned
Finding a Mentoring Partner	No eligibility requirements Self-initiated Voluntary Chemistry and accessibility valued Individual asks for or offers advice or guidance	Eligibility requirements established Facilitated selection process Voluntary Learning fit and compatibility Person who makes first contact is stipulated
Accountability	Lack of expectation No formal agreement Commitment not required Accountability harder to maintain Self-managed	Roles and responsibilities predefined Structured or negotiated mentoring agreements Commitment required Mechanism for accountability built in Program-managed
Relationship	Personal Unstructured Evolves naturally over time Lack of formal commitment Communication is sporadic	Partnership Structured Milestones defined for each phase of relationship Commitment to each other Communication is ongoing

Key features	Informal	Formal
Learning Goals	Broad goals Goals tend to change or evolve over time Just-in-time goals	Broad, generalized goals become more specific and focused Goals are evaluated regularly Development goals
Training	No training required	May be training sessions for mentors or mentees individually as groups or combined sessions
Duration	No expectation as to relationship time frame Relationship organized around immediacy of need Relationships can go on indefinitely or be purely situational	Relationship finite; has a beginning and an ending point Relationship organized around time frame or completion of learning goals Relationships renegotiated
Evaluation	No formal mechanism Goal achievement ad hoc No required reporting to a third party	Formal mechanism Relationship progress toward goal achievement is measured regularly Required reporting on a programmatic basis

Appendix B
Mentee Coach Skill Assessment Sheet

Mentee Name:
Sport(s) Coached:
Years of Experience:
Mentor Name:

Instructions: Review each skill and indicate how comfortable you are in using it by checking one of the three boxes: V = very comfortable, M = moderately comfortable, U = uncomfortable. Then identify an example that illustrates a concrete situation in which you were either comfortable or uncomfortable using that skill. Check each skill that you feel you must improve to develop a level of comfort. Once you have completed the skill inventory, rank your overall comfort level with all eight skills on a scale of 1 to 5.

Skill	V M U	Examples	Needs work
1. Asking for feedback			
2. Brainstorming			
3. Communicating			
4. Fostering accountability			
5. Managing conflict			
6. Problem identification			
7. Problem solving			
8. Building positive relationships			

Overall rating: 1 2 3 4 5
Not very comfortable to *very comfortable*

Source: Adapted from *The Mentor's Guide*, by L. Zachary, 2000, San Francisco, CA: Jossey-Bass.

Appendix C
Mentee Coach Open Observation Sheet

Mentee Name: Date & Time:
Mentor Name: Sport:

Context of Coaching Observation (location, age and skill level, practice or game, before/during/after practice or game, etc.):

Primary Areas of Focus for Coaching Observation:

Comments:

Important Issues to Pay Attention to:

Observable Aspects of Coaching Performance:

Practice/Game Planning and Preparation ___
Teaching Techniques ___
Coaching Knowledge and Application ___
Management and Control ___

Appendix D
Mentee Coach Summative Evaluation Tool Sheet

Mentee Name: Sport:
Mentor Name:

1 = Effective
2 = Needs improvement
3 = Unsatisfactory
4 = Unable to observe

Skill	1	2	3	4
Commitment to the team				
Communication with players and parents				
Knowledge of sport				
Teaching ability				
Ability to motivate players				
Energy and passion for coaching players				
Managerial ability				
Ability to establish rapport with other coaches				
Accepts responsibility for actions				

Overall evaluation of mentee coach:

Other comments:

Mentee coach's signature: ________________ Date: __________
Mentor coach's signature: ________________ Date: __________
Athletic director's signature:_______________ Date: __________

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FITNESS

A Comparison of the Fitness, Obesity, and Physical Activity Levels of High School Physical Education Students Across Race and Gender

Kathryn L. Davis, Janet R. Wojcik, Christi S. DeWaele

Abstract

Introduction: *Little is known about the physical fitness, obesity, and physical activity (PA) levels of high school students in physical education classes when comparing racial and gender groups.* ***Purpose:*** *To compare the fitness, obesity, and PA levels of female and male students of different racial groups in 6 high schools in the southeastern United States.* ***Methods:*** *Three fitness measures (PACER, Modified Curl-Ups, and the Back-Saver Sit and Reach), as well as BMI, body fat percentage, and PA data, were obtained from 413 youth (216 females, 197 males, 14.8 ± .84 years). Additionally, fitness levels, prevalence of obesity, and PA patterns of genders and races were compared between groups.* ***Results:*** *Fitness, body fat, and PA data were significantly better for males than for females other than back-saver sit and reach, for which females performed higher. There were no gender differences in BMI. White students scored significantly better than Black students on fitness, body fat, PA, and BMI except back-saver sit and reach right side.* ***Conclusions:*** *The study suggests a strong need for more active*

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physical education programs that are appropriate for developing the fitness and PA levels of high school students, especially females and Black students, and for programs that motivate students to improve their fitness and PA levels beyond and outside of high school.

The need to improve physical fitness in school-aged children in the United States has received considerable attention ever since Kraus and Hirschland (1954) indicated that American children were less fit than European children. Concern for the health-related physical fitness of all children in American schools has recently increased because of the current childhood obesity epidemic. The benefits of physical fitness are universal for all children and can potentially improve students' academic performance, including academic achievement and grades, time on task, concentration, and attentiveness (Centers for Disease Control and Prevention [CDC], 2013).

Children and adolescents who are obese are more likely to be obese as adults (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001). The rate of obesity in adolescents has nearly quadrupled (from 5% to 21%) over the past 30 years (CDC, 2012). The rise in overweight and obesity in adolescents has also given rise to the likelihood of having major health problems, such as type 2 diabetes, cancer, and greater risk for bone and joint problems (U.S. Department of Health and Human Services [USDHHS], 2010). Many adolescents also exhibit early signs of cardiovascular risk factors, such as physical inactivity, excess weight, and higher blood cholesterol levels (Beets & Pitetti, 2004). In contrast to these physical risk factors, obesity also exerts a social and psychological burden on adolescents—the likelihood of a low quality of life for obese adolescents is 5.5 times greater than for their healthy weight counterparts (Schwimmer, Burwinkle, & Varni, 2003).

The school physical education (PE) curriculum is the primary source of physical activity (PA) and fitness instruction for adolescents (USDHHS, 2001). It has been suggested that the quantity and, in particular, the quality of school PE have a significant positive effect on the health-related fitness of adolescents by increasing their participation in moderate to vigorous physical activities (McKenzie et al., 1996). High quality PE gives adolescents the opportunity to learn the fundamental movement skills needed to establish and maintain physically active lifestyles throughout their lives. States

and local school districts determine the amount of required PE that children and adolescents receive daily. In 2006, few schools provided daily PE or its equivalent for the entire school year to all students (Lee, Burgeson, Fulton, & Spain, 2007). Across the nation in 2007, only 30% of high school students attended PE classes for 5 days in an average school week compared with 42% in 1991 (CDC, 2008). To promote PA and its resulting benefits, school systems should require at least 225 min/week of required daily PE in all secondary schools. Sedentary behavior in adolescents may be influenced by insufficient motor or physical fitness because competence in movement is crucial to activity participation (Okely, Booth, & Chey, 2004). Because having higher levels of physical fitness is important to the functional health needed for everyday living and for preventing disease and obesity, attempts should be made to evaluate the physical fitness of high school students.

It has been consistently reported that adolescent males participate in PA more than adolescent females do (Fakhouri et al., 2014). Wenthe, Janz, and Levy (2009) in a study of 205 adolescents found that male adolescents spent a greater percentage of their day engaged in moderate to vigorous physical activity (MVPA), performed a higher number of 5-min bouts of MVPA, and reported more MVPA than did their female counterparts. In a study of 5,863 students over 5 years, Brodersen, Steptoe, Boniface, and Wardle (2007) found that, on average, adolescent males exercised approximately one day per week more than females ($p < .001$).

There have been numerous efforts to study the differences in fitness, obesity, and PA between male and female adolescents (Hannon & Ratliffe, 2005), but few researchers have compared these physical components between students of different ethnicities. Kimm et al. (2002) examined longitudinal changes in PA in a large cohort of over 2,000 Black and White adolescent females over 10 years. Throughout the study, Black females had significantly higher BMI values, with Black females having a decline in PA twice that of White females. Brodersen et al. (2007) also found that sedentary behavior was more common in Black students than in White students and that Black females engaged in less PA than did White females, with these differences persisting over several years. Both groups decreased PA over time.

The primary goals of this study were to assess the fitness, obesity, and PA levels of adolescents in high school PE classes and to determine any relationship between these levels across race and gender. We sought to answer the following two questions: (a) What are the differences in fitness, obesity, and PA levels of a selected group of male and female high school students, aged 14–16? (b) What are the differences in these levels of the same group according to racial group identification?

Method

Participants

A total of 413 high school students (197 males, 216 females, 14.8 ± .84 years) from six southeastern high schools participated in this study. Of the students, 171 were Black, 186 were White, 29 were Hispanic, and 27 were multiracial or from other ethnic groups. Students were allowed to self-identify their ethnicity, which is a common practice in obtaining census data (U.S. Census Bureau, 2013) and for school demographics (Fahlman, Hall, & Lock, 2006). The 413 participants in this study were representative of the population in any high school PE class in the school district. Participants were enrolled in one of 21 required ninth grade PE classes throughout the six schools. Informed parental consent, along with district and school administration approval, was obtained before participation in the study. The study was approved by the university institutional review board.

The 21 high school classes were randomly selected from the available PE classes in all high schools of the district. Participants were from six high schools (Grades 9–12) of approximately 1,500 students each. The sample design was purposive in that the participants had to be enrolled in a ninth grade PE class and they could not have any limiting physical condition that would hinder their ability to engage in routine PA. The 21 PE classes contained an average of 19 students (range = 10–27 students) in each class. When parental consent was not granted (*N* = 4, or .01%), those students were given an alternative assignment during the class.

In all six settings, students received PE from a licensed physical educator 5 days per week, all having block periods of 90 min. During class instructional activities in PE, the curriculum involved

games, fitness, and physical activities that were focused on continuous activity and skill improvement.

Data Collection

Data collection was conducted during a 12-week period during the second semester of the school year. One of the physical educators at each school assisted the research team with data collection. The research team consisted of one senior researcher and six graduate students who were trained in the assessment protocols. Testing was conducted in a gymnasium in all six schools, and school visits for testing occurred over 14 weeks.

There are numerous tests and test batteries to measure the five components of physical fitness, but FitnessGram is used most often in PE classes (Meredith & Welk, 2010). The five testing items used in this study were selected because of their roles as important indicators of health-related fitness. The measures included (a) BMI to indicate the prevalence of obesity, (b) percentage of body fat as measured by a bioelectrical impedance scale, (c) the 20-m Progressive Aerobic Cardiovascular Endurance Run (PACER) to measure cardiovascular endurance, (d) the modified curl-up test of abdominal strength and endurance, and (e) the back-saver sit-and-reach (BSSR) test to measure flexibility. The use of FitnessGram as a fitness assessment in schools is supported by the FitnessGram Scientific Advisory Board (Meredith & Welk, 2010).

In addition to the fitness testing and obesity measures, the PA patterns during PE classes were determined through the use of pedometers to measure step counts. A pedometer is an objective measure of step counts to determine individual PA levels, and it is considered one of the most widely used practical PA measures in exercise and PA interventions (Tudor-Locke, Hatano, Pangrazi, & Kang, 2008). An Omron pedometer (model HJ-112) with a 7-day memory function was given to each student at the beginning of each PE class to assess the students' PA levels during their PE classes. The pedometer was placed on the waistband of their required PE uniforms on the right side of the body. The pedometers were immediately retrieved when the PE class period was completed, and the step count was immediately recorded for each student by one of the researchers. The students' average pedometer step count per day was used for the analysis of the PA component. The pedometer testing was recorded

for 5 consecutive days, but the middle 3 days of step counts were used to determine the average number of steps per student.

BMI. BMI provides an indication of the appropriateness of a child's weight relative to height. BMI is usually calculated from height and weight data and is derived from the following equation:

$$BMI = \text{body weight (kg)}/\text{height}^2\ \text{(m)}$$

Estimates of obesity level based on height and weight (BMI) result in an acceptable level of 5% to 6% error because body weight reflects muscle and bone mass as well as fat mass (Lohman, 1981). Standing height (cm) was measured without shoes to the nearest 0.1 cm using a portable stadiometer (Model 214, range: 20–200 cm; Seca, Hamburg, Germany). Body weight (kg) was measured to the nearest 0.1 kg using a digital weight scale (Model DG-66, maximum: 150 kg; Seca, Hamburg, Germany). Participants' ages were calculated by subtracting their date of birth from the date of assessment using the Weill Medical College of Cornell University age calculator for pediatric medicine (Pon, 2009). Age-specific BMI values were calculated using the CDC's BMI Calculator for Child and Teen (National Center for Health Statistics, 2010). "The reliability of BMI is very high because the measurement of height and weight is very precise when following a standardized protocol" (Lohman, 1994, p. 59).

Body composition. The percentage of body fat for each student was measured using the Omron (model HBF-400) leg-to-leg bioelectrical impedance scale. It has often been theorized that these segmental devices for measuring body fat percentage are not reliable instruments. However, in a study on the accuracy of consumer grade bioelectrical impedance analysis (BIA) devices, the leg-to-leg BIA devices were found to provide an acceptable significant correlation with weight changes over time, but they may not be accurate enough to give reliable individual body composition measures (Peterson, Repovich, & Parascand, 2011). In other studies, it has been suggested that segmental BIA provides a relatively accurate estimate of body composition in high school students (Kriemler et al., 2009; Lintsi, Kaarma, & Kull, 2004).

PACER. The 20-m PACER test (Meredith & Welk, 2010) is a multistage aerobic capacity fitness test adapted from the 20-m

shuttle-run test. For this study, eight to 10 students were tested during each round of PACER testing, and each student being assessed had an assigned partner to record the number of laps. Cones were set at a starting line and at a distance of 20 m from the starting line for each student. One lap was counted for every 20-m distance covered. The test was concluded when the participant could no longer complete a 20-m lap. According to Meredith and Welk (2010), the PACER test has demonstrated reliability and validity measured against maximal oxygen uptake (VO_2 max), which is generally considered the best measure of aerobic capacity.

Modified curl-up. The modified curl-up was used to measure abdominal strength and endurance. The modified curl-up was performed with the participants' knees flexed and their feet unanchored. The students were instructed to place their hands at the top of a 4-in. rubber strip taped to the mat underneath them and to slide their fingers to the other side of the rubber strip, which counted as one modified curl-up. This test was selected for use in this study because of its high reliability and validity. The intraclass coefficients (*R*) for the modified curl-up range from .93 to .97 (Robertson & Magnusdottir, 1987).

Back-saver sit and reach (BSSR). Flexibility and range of motion are measures that describe attributes of motion within the body. The BSSR was included in the FitnessGram battery in response to the health-related concern of low back pain. The BSSR is similar to the traditional sit-and-reach test, except that the measurement is performed on one side at a time. In this study, BSSR was tested three times on the left side and three times on the right side. The highest score on each side was used in the data analysis because it likely best represents a student's true flexibility and range of motion. The advantage of the BSSR is that by testing one leg at a time, any asymmetry in hamstring flexibility can be identified with acceptable accuracy (Meredith & Welk, 2010). An intraclass reliability of .99 was reported for the BSSR (Patterson, Wiksten, Ray, Flanders, & Sanphy, 1996). A student was considered as having met the minimum FitnessGram standards if he or she reached the standard on either the left side or the right side or on both sides.

Data Analysis

Data were analyzed using IBM SPSS 19 (IBM Corporation, Armonk, NY) to compare high school students by gender and race regarding their performance on each of the five fitness/obesity measures and the pedometer step counts. To investigate if the observed differences between groups were statistically significant, an independent t test was conducted and the alpha level was set at $p < .05$. For the differences by gender, all 413 students were included in the analysis. For the analysis by race/ethnicity, only White (n = 186) and Black students (n = 171) were included, for a total of 357 students. Students who classified themselves as Hispanic (n = 29) or Multiracial/Other (n = 27) were not included because of a very small sample size for each group. Including these groups would have violated the mathematical assumptions for parametric statistics as well as reduced internal validity.

Results

The main concerns by gender for this population of ninth grade students were in the areas of body composition for females and the lack of cardiovascular fitness for males and females. The average BMI of the male students was 23.46, and the average BMI of the female students was 24.23; both values are closer to the heavier end of the Healthy Fitness Zone, based on the FitnessGram standards (Cooper Institute, 2013). The average body composition value for the ninth grade males was 16.17 and for the females was 31.24. This body composition mean for the males was considered Very Lean by FitnessGram standards and for the females was considered in the Needs Improvement-Health Risk category for this age group. The average number of PACER laps for the males was 39.25 and for the females was 20.49, and both values are clearly below the Needs Improvement zone of FitnessGram. These data show an overall lack of cardiovascular endurance among all participants in the study. The mean number of modified curl-ups for males was 49.47 and for females was 41.20, both clearly exceeding the minimum modified curl-up standards for FitnessGram. The mean BSSR (right and left side) values for the males and females exceeded the minimum standards for FitnessGram. The step count means for males and females fell well below the expected step counts for MVPA during a 90-min

period, especially for young adults. The low step counts reflected a large amount of wait time and disorganized lessons on the part of the physical educators in the 21 PE classes studied. A positive result of these findings is the exceptional flexibility and abdominal strength shown by both genders.

Student data were compared to test for differences by gender and by race in fitness, PA, body composition, and prevalence of obesity. The results for the comparison between males (n = 197) and females (n = 216) are reported in Table 1. As found in most other research, the males ran more laps on the PACER test (M = 39.25, $p < .0001$), performed more curl-ups (M = 49.47, $p < .001$), had higher step counts in the PE classes (M = 2,409, $p < .0001$), and had lower body fat percentage (M = 16.17, $p < .0001$) than did the females. As expected, the females had higher flexibility on both the right side (M = 35.35, $p < .0001$) and the left side (M = 36.06, $p < .0001$). There was no significant difference between genders on BMI calculations, which is a valid indicator of the prevalence of obesity (Hannon, Ratliffe, & Williams, 2006). However, there was a significant difference between genders in their body composition data. The bioimpedance analysis device used to measure body composition for participants in this study has not been shown to be a valid measurement of body composition. The lack of difference between genders on the BMI measurement may indicate that the prevalence of obesity is similar between genders in this sample.

Table 1
Student Fitness, Obesity, Physical Activity Levels by Gender (n = 413)

Measure by gender	*M*	*SD*	*df*	*p*
PACER				
Male	39.25	20.63	411	.000***
Female	20.49	10.78		
Modified Curl-Up				
Male	49.47	25.22	411	.001**
Female	41.20	24.13		

Table 1 (cont.)

Measure by gender	*M*	*SD*	*df*	*p*
Sit & Reach (Right)				
Male	29.66	7.84	411	.000***
Female	35.35	7.35		
Sit & Reach (Left)				
Male	29.67	7.48	411	.000***
Female	36.06	7.08		
Pedometer Steps				
Male	2409.70	1095.40	411	.000***
Female	1852.11	903.73		
BMI				
Male	23.46	5.42	411	.153
Female	24.23	5.60		
Percent Body Fat				
Male	16.17	9.65	411	.000***
Female	31.24	10.39		

**$p < .01$. ***$p < .001$.

In regard to racial groups, data were only compared between Black students (n = 171) and White students (n = 186). The right side sit-and-reach results were the only nonsignificant finding, likely because the difference between groups was very small on this test. White students ran more laps on the PACER test (M = 31.31, $p <$ .04), performed more modified curl-ups (M = 49.28, $p < .006$), had higher step counts (M = 2,288, $p < .007$), and had a slightly lower BMI (M = 23.07, $p < .043$) and percentage of body fat (M = 22.06, $p < .036$). Black students had a significantly higher flexibility on the left side (M = 34.04, $p < .002$).

Table 2
Student Fitness, Obesity, and Physical Activity Levels Compared by Ethnicity (n = 357)

Measures by race	*M*	*SD*	*df*	*p*
PACER				
Black	28.16	.91	355	.04*
White	31.31	.76		
Modified Curl-Up				
Black	41.89	24.44	355	.006**
White	49.28	25.69		
Sit & Reach (Right)				
Black	33.34	7.25	355	.051
White	31.69	8.57		
Sit & Reach (Left)				
Black	34.04	7.14	355	.002**
White	31.55	8.19		
Pedometer Steps				
Black	1994.42	1014.32	355	.007**
White	2288.46	1027.36		
BMI				
Black	24.23	5.76	355	.043*
White	23.07	5.04		
Percent Body Fat				
Black	24.84	13.60	355	.036*
White	22.06	11.32		

*$p < .05$. **$p < .01$.

Discussion

The results of this study suggest that the adolescent students enrolled in required ninth grade PE classes in this district have a higher incidence of overweight/obesity and lower levels of cardio-vascular endurance. Male students performed significantly better in most areas of fitness than females, and White students performed

significantly better in most fitness areas and in step counts than did Black students. Unfortunately, the results of this study lack generalization to other locations. That is, schools that have different teacher-to-student ratios or less time in PE may experience different results for physical fitness levels in high school students of both genders and all races. Given the same amount of PE class time (90 min) for both races, the higher average step count for White students seems perplexing. The differences between races on these fitness, obesity, and PA levels may reflect the lack of opportunity or access to fitness facilities or to organized PA programs.

These findings support previous research on both gender and ethnic comparisons of fitness. Saab, Fitzpatrick, Lai, and McCalla (2011) found that White non-Hispanics had lower odds of obesity and elevated BMI than did Black and White Hispanic students. Black American adolescent females displayed higher odds of obesity and elevated BMI than did Black Hispanic adolescent females and higher odds of elevated BMI than did Black Caribbean adolescent females in this study's sample. Black American adolescent males showed higher odds of obesity and elevated BMI than did Black Caribbean adolescent males. Black Hispanic adolescent females had greater odds of obesity and elevated BMI than did White Hispanic adolescent females. In a study of 198 high school adolescents enrolled in PE courses at a high school in the southeastern United States, White and Black males had equal values for BMI, but White females had a 2.3% lower BMI than did Black females (Hannon et al., 2006). They followed up with skinfold caliper and bioelectrical impedance analysis, which confirmed the differences in body composition between White females and Black females.

One potential limiting factor of this study was the "dropout rate" (*N* = 4, or .01%) from the original pool of participants. The parents of several students at each school did not sign the informed consent because of their desire for their children "not to be studied" in the research project. These students participated in PE by engaging in alternative assignments. Even though the remaining sample was highly reflective of the overall population of high school students in this school system, this could have negatively affected the results. Another potential limiting factor was the difference in curriculum and instruction between the six high schools. At a few schools, the

curriculum could be described as "recreational team sports" in content as compared to a "lifetime activity" curriculum offered at the other high schools. There may have been differences in teachers' instructional styles between classes and between schools as some content and teaching styles elicit more or less PA than other teaching styles. These factors would affect the amount of PA that students experience in their PE classes.

The findings of this study point to an alarming reality that there is a need to promote fitness programs among high school students, especially White females and Black students. The first step in addressing the problem could be identifying the factors contributing to the low fitness levels among high school students. Researchers need to interrogate closely and critically the structures, processes, and practices involved that may obstruct adolescents' participation in programs that promote physical fitness and PA. Some of those probable contributing factors may be time availability, parents' involvement, students' motivation to participate, a lack of staff development, and the availability of PE and PA programs that are suitable, feasible, and sustainable for high school students (Beets & Pitetti, 2004; Fahlman et al., 2006; Felton et al., 2002; Hannon & Ratliffe, 2005). The findings from this study could also be useful as a basis for developing school-based fitness programs (or interventions) uniquely appropriate for meeting the physical needs, as well as the cognitive and social needs, of students in high school PE classes. Other PA factors, such as the built environment regarding access and availability of healthy foods and the availability of parks, bike routes, and walking paths or trails, could be examined in this population.

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METHODOLOGY

Teacher-Led Change in Secondary School Physical Education

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Abstract

How and why meaningful curriculum or program changes happen in physical education is important, but not well understood, especially at the secondary school level. In this longitudinal case study, we examined teacher-initiated changes in a high school physical education program. Data were collected through prolonged engagement over 5 years and included interviews with teachers and students, documents from the physical education department, field notes, survey responses, and presentation notes. A broad range of change forces, including a standards-based assessment program, was assessed using qualitative methods. Consistencies and inconsistencies between Fullan's theoretical framework on changes in education and what occurred in this physical education program are identified. Ways that change was aligned with Fullan's phases of change (Initiation, Implementation, and Institutionalization) were also considered. Results suggest that aspects of Fullan's framework are aligned with systematic changes in physical education. Teachers, as passionate, committed change agents, were essential for positive change. Elements of bottom-up and top-down educational reform were present in varying degrees. The effect of external change agents and funding, however, was noticeably absent.

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As a traditionally marginalized subject area, with little administrative attention, physical education has too often been allowed to languish behind other school reform efforts (Bechtel & O'Sullivan, 2007; Castelli & Rink, 2003; Rink & Mitchell, 2002). Documented positive changes in physical education, especially at the secondary level, have been scarce and often do not describe the long-lasting effects of change. A framework for successful change in schools has been developed by Fullan (2007). This framework has been used to assist and assess changes in many subject areas. Though Fullan's framework has been used to support change efforts within physical education, these studies seldom follow change over time (Rink & Williams, 2003; Wirszyla, 2002). The purpose of this study was to identify changes to a secondary physical education program over 5 years. We also sought to examine ways in which that change in physical education does and does not align with Fullan's theoretical framework for educational reforms.

Fullan's (2007) framework is a synthesis of lessons learned from decades of school-centered reform efforts, making it relevant for studying the complex issue of sustained development for a high school physical education (HSPE) program. Unlike national and state general education reforms that have not been designed to include physical education, and unlike teacher development, which is focused on changes in individual teacher's classroom practice, this study was focused on teacher-led program change at the school level. Our primary intent was to identify elements essential in developing improved HSPE program design, teaching and policies, and student learning and engagement that are sustained over time. Fullan's framework consists of three phases: (1) Initiation, (2) Implementation, and (3) Institutionalization, with a number of factors affecting each phase (Figure 1). Fullan posited that program development efforts acknowledging these phases and addressing related factors can lead to authentic changes in student outcomes and in the organizational capacity of the programs, which are both essential if changes are to be sustained. Studying a highly successful HSPE program through the lens of a framework derived from decades of school reform projects may help increase the practical and theoretical understanding of the improvement phases and processes. Reforms rarely succeed as intended, but understanding the details of the change process in

schools helps to focus efforts for innovation in ways that are sustainable (Fullan, 2007).

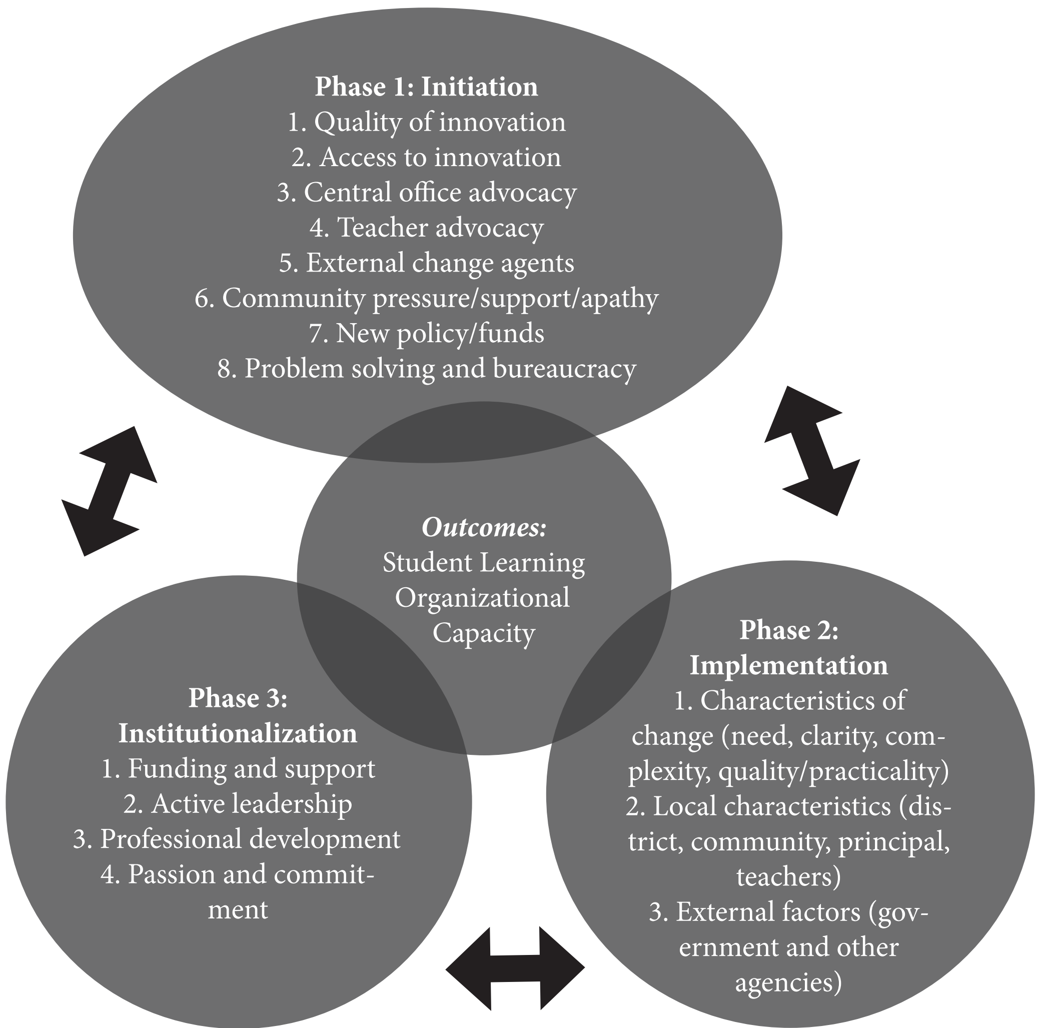

Figure 1. Visual representation of Fullan's framework.

Some reform efforts in physical education, including the National Curriculum implementation efforts in England and Wales as well as state-based efforts in Australia and the United States are examples of top-down innovations that were difficult to implement. Academics

have investigated secondary physical education program change projects to understand the curriculum change process at this level. Kirk and Macdonald (2001) found three dimensions of the local contexts that mediate secondary teachers' authentic implementation of the innovation: teachers' knowledge of their students and community, the human (skills and abilities) and material resources available to teachers, and the practical structures (including class sizes and time) of teachers' work. These factors affect teachers' attempts, or "authoritative voice," to introduce curriculum reforms into their classes (Kirk & Macdonald, 2001, p. 552). Kirk and Macdonald concluded that teachers' authority in program development cannot be overlooked, nor can the quality and presentation of the reform agenda.

Macdonald (2003) and Booker and Macdonald (1999) added another often overlooked factor to program development, student voice, which they described as "marginalized" and a particular problem in physical education. Even when secondary teachers decide to change their programs, working from bottom up may be problematic. As Kirk (1988) described nearly three decades ago, through a closely studied English secondary school PE curriculum reform, three factors—the source of the innovation, teachers' different roles in their collective effort, and "residual ideologies" of what is successful physical education teaching—contribute to conflict and may hinder even teacher-initiated processes of change.

In the last two decades, there have been three prominent lines of research on change in American HSPE programs: (1) the effect of state-mandated changes in accountability for student achievement as a result of standards-based assessment mandate (Castelli & Rink, 2003; Rink & Williams, 2003; Wirszyla, 2002); (2) change implemented through the infusion of substantial federal grant funding for equipment and teacher development (Centeio & Castelli, 2012; Martin, McCaughtry, Kulinna, & Cothran, 2008; McCaughtry, Martin, Kulinna, & Cothran, 2006a, 2006b; Panayiotis & Ward, 1999; Ward, Panayiotis, & Evans, 1999); and (3) the implementation of a health-related physical activity program, such as SPARK (McKenzie, Sallis, & Rosengard, 2009) and other models-based curricular interventions (Casey, 2012). In each of these research initiatives, the sustainability of change has been questioned.

In the standards-based assessment studies, there was evidence that school and teacher accountability for clearly identified and attainable state-mandated physical education outcomes, assessed through student achievement data and included on school report cards, have had a positive effect on HSPE, although without attendant funding, this progress was blunted (Rink & Stewart, 2003). In the various federal grant-funded studies of K–12 school district level change, the purchase of new equipment and staff development on new teaching practices in physical education programs were successful, but these studies often do not reveal what remains of the innovations when the funding ends and the external change agents/researchers have left the schools (McCaughtry et al., 2006b). The high school version of elementary and middle school SPARK projects indicates that modest student increases in moderate to vigorous physical activity and nutrition changes result from well-designed and well-supported staff and program development (Frank, McKenzie, Rosengard, & Smith, 2011). But little has been reported about the degree to which the models are institutionalized in high schools after the initiation or how these curricular models affect students or their teachers in the long term (McKenzie et al., 2009).

In this paper, we present a 5-year longitudinal study in which HSPE teachers were successful in institutionalizing and sustaining program change. Some stimuli for initiating change were the teachers' desire to address criticisms of their high school physical education program, including a poor perception of physical education in the eyes of other school staff, parents, and students; to improve a dysfunctional grading policy; and to address low levels of teacher and student accountability. Teachers in this HSPE program also decided to experiment with a state-supported physical education assessment program to address these concerns. Their assessment initiative evolved beyond a trial in one unit to implementing them in other instructional units, then to persuading other teachers to try using the assessments, and eventually to implementing a formal change in grading policy that included assessment results and the institutionalization of an elective physical education program incorporating student input. Student outcomes included increased student engagement and learning. For teachers, positive outcomes included their perceptions of better teaching and stronger professional

commitment and a sense of increased organizational capacity (i.e., improved problem-solving capacity or ability of the group to engage in continuous improvement; Fullan, 2007).

We analyzed the factors that led to this successful teacher-initiated change in an HSPE program. We studied data collected over a 5-year change process to understand what changes were made; how and why they were initiated, implemented, and institutionalized; and how the process compares with Fullan's (2007) concepts of phases and factors underpinning institutionalized school change (Figure 1). We purposefully assessed the fit of Fullan's framework for change in an HSPE program and identified particular factors to address when planning program development. What factors meaningfully affect initiation, implementation, and institutionalization of change in HSPE programs? Understanding this may be an important step in ameliorating physical education in the current environment of educational reform and may suggest why other HSPE program development efforts fall short.

Method

An interpretive qualitative research approach was taken to assist in identifying influences supporting and impeding sustained program development. This approach was taken to align with the nature of the research questions and with a single case study in a real-world setting. This study was designed to avoid some of the previously identified shortcomings of single case study research, such as insufficient time in the setting and inadequate data collection (Mayring, 2007; Yin, 2009). A longitudinal case study approach was taken to provide researchers with sustained immersion in the school context and sufficient collection of data. Results of longitudinal case studies can be generalized to existing theory but not to specific populations (Yin, 2009). IRB approval and school permissions were obtained before beginning data collection. The methods of this study are presented in three sections: (a) setting and participants, (b) data sources, and (c) data analysis.

Setting and Participants

The school is located in a moderately affluent suburban community in the New York City metropolitan area. The school and teachers selected for this study were known by the researchers and

were chosen because it was inferred that changes were occurring in physical education at this school. As a result, there may be elements of bias associated with the selection and the preexisting and ongoing relationships between the researchers and the teachers. Bias and reflexivity were controlled for as much as possible by using semistructured interviews, field notes, informal observations, and interviews with other personnel in the school.

Teacher participants (n = 5; three female, two male) were HSPE teachers who had taught physical education for 3–16 years at the start of the study. Student participants (n = 12; six female, six male) were selected from class rosters with numbers generated from a random numbers list. Seven students were seniors, two were juniors, and two were freshmen. Informed consent was obtained from students or their parents (for students under 18) and all teachers who participated. Permission was granted for researchers to observe, videotape, and interview during regular physical education classes. Students who participated were selected at random to minimize bias. At this school, ninth through 12th grade students were enrolled in state-mandated physical education courses every semester for 4 years of high school. Classes were 40 min in length with 30 min of activity time per class on alternating school days. Observed physical education content during the study included volleyball, fitness, softball, Ultimate Frisbee, personal wellness, and team handball.

We started the study by investigating how standards-based assessments were implemented in this HSPE program. Initially, two teachers decided to try a statewide assessment package primarily to strengthen the grading policy for required physical education. Data were collected on the teachers' use of assessments and on associated effects on teaching and students. Although assessment scores, video tapes, document collection, and interviews with students and teachers were focused on the effect of assessment at first, we expanded the study to examine broader changes in the physical education program. An ongoing relationship between the researchers and the school district allowed data to be collected to examine the outcomes of this change on the physical education program, the teachers, and the students. Thus, what began with an examination of the implementation of an assessment package evolved into a more comprehensive case study of the process of teacher-initiated curriculum/program and pedagogical changes.

Data Sources

Data were initially collected in 2008, 1 year after the release of the New York State Physical Education Profile (PE Profile; New York State Education Department, 2007), a standards-based high school level assessment tool distributed, but not mandated, by the state education department. The PE Profile consists of authentic rubric-based assessments for a wide range of secondary physical education content, an interactive CD-ROM for teachers to learn and practice how to assess, and guidelines and tips for administering assessments. PE Profile materials and trainings were rolled out statewide through conferences and teacher workshops conducted by turn-key trainers.

Records of de-identified student results on the assessments and digital and hard copy versions of program documents, such as lesson plans, unit plans, and teaching materials, were collected from teachers. Formal semistructured interviews were conducted with two teachers and five students in 2008. Interviews were digitally recorded and transcribed verbatim. Questions for the semistructured interviews were drawn from protocols previously used to investigate school change (Sarason, 2002). All interviews followed the same format to ensure consistency in the data collection. Interview participants were given time to "warm up" in a relaxed atmosphere, facilitated by beginning the interviews with a section of icebreaker questions. Methods of developing rapport, using probes, conversational repairs, and follow-up questions were considered and practiced prior to and during interviews (Patton, 2002; Rubin & Rubin, 1995). These initial interviews were focused on teachers' and students' experiences with assessments and grading policy change. Interviews with students lasted between 20 and 35 min. Interviews with the teachers were 40 min for one and 55 min for the other.

Researchers had access to teachers and students between 2008 and 2012 and interacted three to four times every semester. From 2009 to 2011, one teacher wrote a journal describing teaching and changes within the department and program. Throughout the study, researchers maintained engagement and continued to gather data including class observations, student assessment results, program documents, plan books, and informal interviews. Researchers also assisted with meetings and presentations to various PE professional groups on the implementation and effect of the state assessments

on this program (Cameron & Mercier, 2008; K. Mercier & Iacovelli, 2010).

In 2012, a second series of formal interviews was conducted with students (n = 7; four female, three male) during study halls and with teachers (n = 3; two female, one male) during preparation or supervision periods. A revised semistructured interview guide, built from the original used in 2008, was used to elicit perceptions of change in the physical education program from the students and teachers. Student interviews lasted for 20–40 min and teacher interviews ranged between 45 and 65 min. The interviews conducted were set up to bracket each end of the change processes to allow sufficient time for changes to happen and to allow for distinct data collection points (rather than interviewing throughout). To further document changes in 2012, artifacts, including grading policies, program plans, surveys, and class assignments, were also collected digitally and in hard copy.

Data Analysis

Data were entered into NVivo version 9 (QSR International, 2010) for organization, for coding purposes, to aid in analysis, and to provide a means to evaluate intercoder reliability. These data included transcripts from two rounds of teacher and student interviews (2008 and 2012), grading policies, field notes, teacher journals, professional presentation materials, and teacher documents (e.g., block plans, handouts). Data were analyzed following procedures outlined by Côté, Salmela, and Russell (1995). Two researchers independently analyzed all uploaded data. Initially, data were analyzed for single thoughts or statements and broken into chunks of varying sized phrases, sentences, or whole paragraphs called meaning units (MU; Tesch, 1990). Each researcher coded MU independently, giving tags that reflected content related to the research questions. Similar tags were consolidated into nodes through negotiation between coders. Resulting coded MUs were analyzed for interrater reliability. Both percent agreement and a Kappa coefficient were calculated on all overlapping coding (~80% of all coding). This exceeds Côté et al.'s recommendation of analyzing interrater reliability on 25% of common coding. Nodes were then grouped using NVivo tools. Nodes were initially clustered into eight subgroups that were then reduced to five distinct emergent themes by constant comparison.

Coding from the sets was collected in five documents that all three researchers independently reviewed and cut down to a list of 10 most representative quotes. The top 10 lists were based on selecting MUs that best represented each set according to each researcher. Top 10 lists were then examined for overlaps and commonality. These data analysis methods steps (organizing, abstracting, integrating, and synthesizing) are also in line with recommendations by Goetz and LeCompte (1984).

Trustworthiness was established by following recommendations that the data collected are applicable, consistent, and neutral (Thomas, Nelson, & Silverman, 2005). Data were collected as perceived indicators of change in one physical education program. The longitudinal nature and prolonged engagement of the researchers together with regulated data collection methods argue for consistency. Neutrality was maintained through anonymity of all participants and through researcher impartiality. Further moves toward trustworthiness included providing data to support broadly all emergent themes and triangulation of interviews, observations, and documents when possible. Member checks and peer review are additional steps taken toward trustworthiness. Triangulation was established by using multiple sources of data (multiple participants, collected documents, field notes) and by using more than one researcher to aid in reliability of data analysis (peer review confirming coding, properties, and categories).

Results

The results of this study are representative samples of each set that emerged from data analysis. The five sets describe what changes occurred and teachers' and students' perceptions on how and why changes to the physical education program happened. The sets were (a) aligned with teachers' perspectives (teachers' perspectives on change), (b) students' perspectives (students' view on change in physical education and students' perspectives on their physical education experiences), and (c) to both teachers and students (shared instructional change experiences and program and policy changes).

Intercoder reliabilities between the two researchers who handled the data were calculated across all common MUs. For 139 MUs, the average percent agreement was 86.48% and the Kappa average value was .37. The Kappa value is just below a desirable .40, but it is con-

sidered adequate based on the 80% coding overlap (beyond the 25% overlap recommended by Côté et al., 1995, for establishing reliability) on the interviews. The overlaps for all three researchers related to the top 10 lists were for between two and four quotes common to all three lists and seven and eight for two of the three researchers matching. The data displayed below are drawn largely from overlaps that matched with all three researchers by set. The emergence and refinement of five sets of related MUs was a useful way to consider what changes occurred in this school.

Shared Instructional Change Experience

This set is defined by nodes and MUs that represent ways teachers and/or students experienced changes in instruction. A major catalyst for changing instruction was the PE Profile assessment package. In particular, the teachers frequently referred to their decision to try the assessments as having a noticeable effect on their teaching. The following quote demonstrates not only that the teacher was concerned about student learning but also that assessments were a key to change:

> **Teacher 1:** . . . administrative support, teacher willingness to put in the time to assess and get feedback. To me the number one reason to assess is to give yourself feedback on whether or not you're getting through to the kids and to me that's the number one thing. . . . So that's a feedback I learned from my assessing and now going back to what I said, that's a feedback that helps change; assessing helps change.

Another important consideration for change related to instruction was raised by a teacher who described assessments as important tools to evaluate where students were and to adjust instruction accordingly. It was documented in two field note entries that teachers used the rubrics from the assessment program at the beginning of units to alert students to what was expected. It was indicated in field notes that rubrics were handed out to students and covered at the beginning of a unit and were also enlarged and posted on gym walls. Related to instruction, however, the students' scores on the commonly used authentic assessments, the data from the rubrics, were only used sporadically by teachers throughout the study.

Teachers and students described instructional changes related to assessments:

> **Teacher 2:** We were able to watch the kids in a 4v4 situation and see what types of things they didn't do well. I think my previous experiences and from watching a pre-assessment, showed that there were very few occurrences where students demonstrated any level of strategy. It was really just try to hit the ball back over the net using either a legal or illegal hit. So I think that was really something that guided our instruction and our planning.

The previous quote supports that teachers found the assessments useful in planning instruction, but that this usefulness was based on the process (doing the assessment and looking at specific areas, such as strategy, during game play) rather than on product (the students' scores on the assessments). In several field notes entries, students' use of the assessment rubrics to peer assess during volleyball, softball, and personal wellness classes was documented.

Another teacher credited technology, such as iPads and video use, as affecting instructional change. Teachers were observed videoing students with an iPad and showing footage to students during classes. This represents a departure from practice before the use of assessments for which the content was delivered in the same manner unit after unit and year after year. It is also a form of assessment that occurred outside the PE Profile and may indicate that instructional changes based on a wide form of assessment were welcomed in this physical education program. Changes in teaching required hard work by teachers; however, it was work that yielded perceived benefits—teachers who were willing to put in extra labor for planning and instruction that was instrumental to changing physical education in this case:

> **Teacher 1:** I think it was more of a change for us and I think it was more labor intensive because it wasn't what we always do. It was a nice change, but it was definitely more labor intensive.
>
> **Interviewer:** Can you tell me more about what kind of labor?

> **Teacher 1:** In terms of preparation and planning . . . it was more labor intensive and now that it's done and now we can do this here year after year. . . . So it's more labor intensive and it does require more planning, but if you do it right, there are results.

One teacher's journal matched this sentiment with entries about feeling capable of increasing the number of units in which assessments can be used. The idea of starting small with something you are strong in was also represented in the teacher's journal and in two workshops presented by the teachers at conferences.

Program and Policy Change

Two of the most often mentioned catalysts for change were students' choices of content and grading. Both are important in affecting students' motivation and ownership of their physical education experiences. In many school reforms, the program and policy changes may be imposed in a top-down manner by administrators, but the MUs in this set seem to highlight that these changes were teacher generated.

> **Interviewer:** What caused things to change in physical education here?
>
> **Teacher 1:** . . . We were a little under the gun when people started asking how did we get that grade? We had students who were trying to opt out of physical education and so . . . we saw these things happening and we decided to get ahead of it.

A grading policy handout and grade book entries both supported a change in grading based on an assessment rationale. After gaining administration approval, the grading change was presented to students and parents. The following excerpt is from a physical education grading policy handout:

> Assessment Points (30 per quarter)
> A student can earn up to 30 points in assessments each quarter. The teacher may assess students in a variety of ways,

> including but not limited to; skill, strategy, rules application, knowledge (written quizzes) and personal and social responsibility.

Teachers took the initiative and responsibility to adjust not only grading but also physical education content programming based on data collected from their students. Evidence for this was supported by an end-of-year survey given to students in June to ask about content-related changes they would like to see in the next school year. Based on students' responses to the survey, the teachers adjusted the content to be offered in the elective program next year. These teachers saw program change as a shared responsibility that included students' assessment results as well as their views and took it upon themselves to adjust physical education content after analyzing results of students' surveys.

> **Teacher 1:** This is also why we do the surveys at the end (of the school year)—which helps. You have to keep things current and interesting. It motivates. The change is up to the educators and with the help of the kids, because they give us the feedback.

Such seeking out of students' input on program content was far more common than asking for input on policies. No examples of soliciting students' input on physical education policies were found in the data.

Teachers' Perception of Change

This theme set did not have the largest amount of coding, but it did contain MUs that illustrated that these teachers believed they were essential to the change process. In addition, the quotes in this set also indicated that teachers could identify facilitators and impediments to change. Change agents were internal as it was the school's physical education department and their own expectations that fueled programmatic change. Teachers also believed that demonstrating that students are learning and that aligning content assessments and expectations with other high school subjects were important aspects of changing physical education.

> **Teacher 4:** If you focus on it and show the benefits of physical education that is when change will happen. I think it is a group effort and everyone is on the same front and we have assessments and will students complain about it? Of course they will. "Why am I writing in physical education?" You write in math, you write in history; I am not asking you to write every day; however, I need to see if you're learning something. . . . I think change happens when a department as a whole is willing to make these changes and stick to them. [That's when] I think change will happen in your classes.

There was also a perceived need for teachers to break out of the same old teaching habits. Even teachers who were highly experienced and had been working in the school for over a decade were able to change. It is apparently possible to have "veteran" teachers learn new tricks when there is a "perfect storm" of needing to change, wanting to change, having tools to change, and feeling supported to change:

> **Teacher 2:** I think that we spent more time in the planning process which is interesting because we're both established teachers with 10 years of experience. . . . So I think that in the past we relied on our previous experiences and did what we always did. Using the Profile caused us to think a little bit more about the planning and the activities and students who were at different skill levels.

Other indicators of the teachers' perceptions that the changes they were making were for the better were seen in two distinct types of data: in their presentations to state and local physical education groups and administrators and in the form of three physical education teachers in the same school receiving Teacher of the Year awards from professional organizations. It was documented in research field notes that physical educators from this school were invited to speak in physical education teacher education classes, in physical education administrator meetings, and at local and state conferences.

Even with a statewide assessment tool guiding the change, it appears to only work when teachers are genuinely concerned with student learning and have a passion or professional commitment to their work:

> **Interviewer:** Do you feel that it comes from above or do you feel that it is generated . . . how does it [change] happen?
>
> **Teacher 4:** I don't think it's so much from above. I think they expect it, but I think that we feel that as educators we would be doing an injustice if we didn't do it. Also, it gets boring if you just throw a ball out there. You know I am a teacher and became a teacher to teach. So it's not . . . if I wanted to be a rec specialist, I can just go work at a camp. I want the kids to learn and to enjoy themselves.

This idea that physical educators perceive their role in school to be teachers responsible for important content that students will learn and enjoy is at least equally important to change as receiving external accolades for being innovative.

Students' Views of Change in Physical Education

There were more than twice as many students interviewed compared to teachers, but the students' perspectives on change were less revealing in terms of how and why change happened. Although students are obviously affected by changes, they appear to go along with these changes without much questioning or, perhaps, understanding. Their views on change are important, but they may have less to do with how change happens or continues. There were surprisingly no observations of students resisting change (whining about it), and in fact, many cases of students' approval of new content were documented in field notes. Students noticed, enjoyed, and appreciated changes and seemed to demonstrate some understanding of why they were needed:

> **Interviewer:** Do you have any other questions related to teaching volleyball or changing the way that we're teaching stuff in physical education?
>
> **Student 0801:** No, not really. I'd say that I really like the way the PE system is changing and getting more people involved—I like the way they're doing that.

> **Interviewer:** Why do you think these things are changing or need to occur?
>
> **Student 1203:** I guess they need to occur because why would you want one specific gym class when there are so many different types of kids that want to do different things and would have more fun playing something different.

The following two quotes, from two high school seniors, demonstrate that they were able to reflect back on previous physical education experiences and see changes made to the program. The first MU indicates a wide range of changes that was picked up by this student including enjoyment, increased participation, targeted instruction, improved teacher awareness, and skill development. Field notes written during class observations indicate extremely high rates of participation with no notes on students sitting out, and many entries refer to high percentages of students showing on-task behaviors. In the following quotes, students identified specific changes in learning:

> **Student 0801:** I'd say the topic of volleyball this year is more fun because I know the gym teachers have been trying to change it up and have more people interact and kind of like have a better game play and to develop our skills better. . . . I think they paid attention more. . . . Compared to other years you'd do this serve and people would slap it around and wouldn't do it, but this year everyone did and they would participate more and they have a better understanding of what we were doing. So I would say the skills were emphasized a lot more in this volleyball unit.

> **Student 0804:** Well something that was different was that we looked at the diamond formation or the umbrella formations, and I didn't know that there were two kinds of formations. I thought it was just the square where the five people with one in the middle. So that was good.

The majority of students saw changes that they could perceive and explain in detail, but not all students were convinced that physical education was changing:

> **Interviewer:** Does physical education seem the same to you or is it changing?
>
> **Student 1205:** It's the same.
>
> **Interviewer:** Why do you say that?
>
> **Student 1205:** Because every year we pretty much do the same thing—soccer, volleyball, football, badminton, and tennis—but tennis is only in High School because they have the courts.

That physical education had evolved into an electives program appears not to have registered with this student. Teachers' documents for electives supported that roughly 80% of students were able to get their first choice of physical education content each semester. Field notes on a wellness class indicated that the class was largely selected by female students, but several male students also liked the change toward a chance to take a class they perceived as enjoyable and less competitive.

Students' Perspectives on Physical Education Experiences

Students interviewed in this study appeared to see physical education as an enjoyable part of their school day. They also appreciated that it was different from other school subjects and liked being able to interact more with their friends and peers. For the most part, students reported that physical education was not a subject on their parents' radar—none had been asked about physical education by parents or ever had a grading issue that required parental intervention. The most salient students' perspectives on their physical educa-

tion experiences that emerged in this set were related to their physical education teachers.

> **Student 1202:** They [physical education teachers] expect a lot from you. They always want you to try. They never want you to just sit around—which is good.
>
> **Student 1205:** They really do help because like Mrs. A definitely helps me actually swing, the proper way to swing, so I can actually hit the ball.
>
> **Interviewer:** When you say *help* describe what she does to help.
>
> **Student 1205:** She, like, tells me the way to move my hips and if I swing too early. So she is very supportive.
>
> **Student 1207:** Yeah, she gives us a rubric to see what the requirements are to get an A.

One important student perspective relates to understanding what is expected to earn a good grade. The familiar use of the word *rubric* by an HSPE student is noteworthy, and samples of grading policy handouts and rubrics posted on gym walls in different units are also evidence that teachers used assessments routinely to give students a clear picture of what was expected of them in physical education.

Discussion

Data from this study indicated that changes within all three Fullan phases were apparent: Program development was initiated, implemented, and institutionalized over 5 years beginning with the actions of two teachers who initially took the lead and continuing with all department teachers using assessments and a changed grading policy. This discussion is focused on highlighting how the results are and are not aligned with Fullan's (2007) factors for successful school change. A summary of these changes and their alignment to Fullan's factors within each phase are presented in Table 1.

Table 1
Data Alignment With Fullan's Phases and Factors

Year	Fullan phase	Factors represented in the data	Factors not represented in the data
2007–2008	Initiation	• Quality of the innovation • Access to the innovation • Teacher advocacy • Problem solving and bureaucracy • Community pressure/support/apathy • Central office advocacy	• External change agents • New policy/funds
2008–2011	Implementation	• Characteristics of change (need, clarity, complexity, quality/ practicality) • Local characteristics (district, community, principal, teachers)	• External factors (government and other agencies)
2011–2012	Institutionalization	• Active leadership • Professional development • Passion and commitment	• Funding and support

Changes made include the use of standards-based performance assessments to improve student learning, teaching, and changes in program offerings. These changes continued throughout this study, evolving to implement structural changes, such an assessment-based grading policy, and an elective program that was widely popular with students and teachers. Furthermore, teachers readily spoke of additional changes planned for the near future: changed emphases

in fitness/wellness courses and increased use of iPads and other electronic tools in their teaching. Thus, the data show evidence of both major outcomes identified by Fullan (2007) as indicators of successful change: increases in student learning and the increased organizational capacity of teachers and school administrators.

Results indicate that several factors identified by Fullan (2007) were instrumental in these institutionalized program changes. The quality of the innovation, the PE Profile assessment package provided by the state, and the access teachers had to learning about it through the state-provided materials and teacher workshops were important factors in the initiation phase. Although teachers identified the impetus to initiate change was in part due to community and central administrative pressure to make changes in physical education grades and clarify rationales requirements, teacher advocacy also played a part because some of the high school teachers had also identified the need for deeper program and pedagogical changes. Teachers suggested specific program changes and showed confidence in their professional capacity to decide how to proceed. The teachers' voice and ability to be involved in the change process have previously been identified as important considerations in reform efforts (Kirk & Macdonald, 2001). Teacher and student interviews, artifacts, and observations confirmed that students' learning and teachers' pedagogy were affected by the assessments, indicating that the characteristics of the chosen innovation were important in affecting both day-to-day practice and program change over time. This study suggests that the two lead teachers' "authoritative voice" in the selection and implementation of the assessment program contributed to its long-term sustainability. Though the source of the innovation has been shown to hinder teacher-initiated change (Kirk, 1988), it appears to have promoted change in this case.

It has been identified in previous research that student voice is an important, often overlooked factor in program development (Booker & Macdonald, 1999; Macdonald, 2003). In this case, the student survey and interviews of random students confirmed that either students were oblivious to teachers' changes in program or changes had improved students' HSPE experience. Students had varied perceptions of whether there were changes and what the specific changes were. Most of the students' comments were either neutral

or positive. Only a few were able to describe how these changes affected their physical education experiences. In general, students appeared to "go with the flow" without perceiving much in terms of program change. It was surprising to teachers that instead of resisting changes, students appeared to comply with a bare minimum of perceived disruption or unhappiness. Teachers also noticed a decrease in student failures and that fewer students sat out during their classes, further signs that student engagement increased. It could be that the new lessons were of more interest to the students than were the traditional lessons, and their increased engagement led to their acceptance of the increased accountability measures.

It is of note that the passion and commitment of teachers were instrumental in this case of program development. Teachers were able to make changes not only within their own classes, but also across the department, and to gain acceptance of the administration for a fundamental policy change despite the lack of external funding or specific administrative mandate. The need for school-based leaders for program change in physical education is supported in the literature (Castelli & Rink, 2003; R. Mercier, 1999; Wirszyla, 2002), but not often recommended as part of preservice or in-service teacher education in physical education. The lead teachers in this study recognized that their work ethic was an essential component to addressing problems and to ensuring continued support for their subject matter in the school curriculum. It will be interesting to see if this professional passion and commitment are present in other change efforts and how teachers learn to assume responsibility for finding, enacting, or adapting appropriate policy changes, whether they are imposed on programs or internally initiated.

External or additional funding for program development was also not necessary from the point of view of the teachers in this study. This may be explained as a district contextual factor—the school is relatively affluent and amenable to allowing teachers to take the time necessary for in-service workshops and school meetings. In addition, working in well-funded schools removes many of the difficulties and frustrations of teaching in underresourced schools. Teachers here could think about improvements because they were not routinely confronted with more immediate needs.

It is understood that each school is unique, and the results in this case may not transfer to other contexts and other populations. In

other school situations, for example, factors including the initiative for change, the school culture, or the presence of external change agents may be different. What is worthy of reporting, however, is how this study presents a clear picture of how one school initiated, implemented, and institutionalized change in HSPE. At the conclusion of 5 years of data collection, this school had institutionalized change as evidenced by an altered written grading policy, summative assessments for all students by all teachers in sport and physical activity units, an elective program for 10th–12th graders, an increase in teacher and student accountability, and the beginnings of iPads for instruction. Furthermore, evidence of a shared commitment among the physical education teachers to this and future program improvements is apparent.

Broad, systematic change within schools can be hard. Researchers have documented that some of the struggles of implementing and institutionalizing top-down change are difficult, especially in the complex context of American high schools (Rink & Williams, 2003; McKenzie et al., 2009). Becoming more cognizant of change factors may help increase the incidence of sustained change in HSPE programs. It could be that the factors needed for school change are local, as Kirk (1988) revealed, and depend on factors within the process, as Fullan (2007) described. This study indicates that state assessments or a national curriculum could be more efficacious if presented for flexible interpretation by stakeholders. Fullan reported repeatedly that rigid top-down reform efforts are usually unsuccessful or are so modified by teachers that they are unrecognizable to reformers. Though the assessment tools selected by teachers in this study were from a state-level reform innovation, it was not mandated and was offered as an option that the lead teachers in this case sought out.

In this study, it appears that successful implementation of an optional assessment package was largely due to teachers' passion and commitment. Their confidence in initiating these and other changes, such as new teaching practices and elective units, seems to be a chief factor for what became institutionalized change. It could be that the marginalized nature of physical education allowed for teacher autonomy in facilitating change. The importance of the role of physical education teachers is noted, but other components needed for change that align with the Fullan model are present in this study. Studying other successful change programs in HSPE could help identify a

physical education–specific model for change in physical education or confirm the phases and factors presented by Fullan (2007) and how they relate to physical education. In the current realm of educational reform, a model for successful change would tremendously benefit physical education teachers and their students.

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PEDAGOGY

Appropriate or Inappropriate Practice: Exercise as Punishment in Physical Education Class

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Abstract

There is an expectation that physical educators will provide games, activities, and interactions that will positively affect student attitudes toward being physically active throughout their lives. Unfortunately, certain pedagogical practices have been employed in physical education (PE) classes that negatively affect attitudes toward physical activity. Of those practices, incorporating student exercise as punishment (EAP) was the focus of this investigation. The purpose of this study was to explore individuals' (i.e., former students in PE) perspectives regarding their experiences of EAP. Findings suggest the use of EAP negatively affected the classroom environment as well as perceptions toward physical educators. Former PE students reported EAP did not teach valuable life lessons, with running and push-ups identified as the most common methods that physical educators used to punish students. Results of this study reveal that EAP may not be an appropriate practice and that physical educators should identify other methods of classroom management to create a more positive learning environment.

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Physical education (PE) has been identified as a primary component to aid in combating the obesity epidemic in the United States. It is the hope that when students participate in PE that they will not only learn applicable skills to be physically active throughout their lives, but also form positive attitudes toward physical activity (Himberg, 2000). Yet physical educators employ certain practices that may negatively affect student attitudes toward physical activity. One of the more common practices in PE classes that may negatively affect attitudes is the use of exercise as punishment (EAP). Rosenthal, Pagnano-Richardson, and Burak (2010) provided an example of EAP in a middle school PE class:

> Students line up in their squad to listen to Mr. Thomson's instructions about the warm-up activity. Caitlyn has already been asked once to "open her ears" yet she continues to talk with her friend while Mr. Thomson is addressing the class. When he can no longer ignore Caitlyn's disruptions, he stops what he is saying and orders Caitlyn and her friends to take a lap on the track and return to their squad when they are ready to listen, while the rest of the class waits for them. (p. 44)

Additionally, EAP has been highlighted as an inappropriate teaching practice in the Physical Education Hall of Shame (Williams, 1996). In other literature, researchers have gone as far as to label EAP as corporal punishment (Imbrogno, 2000). The National Coalition to Abolish Corporal Punishment in School (Gundersen National Child Protection Training Center, 2014) has defined corporal punishment as "physically punishing children and inflicting pain with the intent of controlling behavior" (p. 1) and "physical pain inflicted on the body of a child as a penalty for disapproved behavior" (p. 1). To define EAP, the question may be asked, why would physical educators use these classroom management tactics in their lessons? Richardson, Rosenthal, and Burak (2012) found that physical educators incorporate EAP "to teach students that there are consequences to their actions" (p. 363), and its use "establishes the physical educators' authority with the students" (p. 363). Reoccurring practice of EAP may therefore lend itself to the possibility of negatively affecting student attitudes toward being physically active later in life.

One tool at a physical educator's disposal to assist in positively affecting student attitudes toward PE and physical activity is the Appropriate Instructional Practices (AIP) in PE documents, created by the National Association for Sport and Physical Education (NASPE). The AIP guidelines were specifically written for elementary (NASPE, 2009a), middle school (NASPE, 2009c), and high school (NASPE, 2009b) PE. The purpose of these documents is to give

> specific guidelines for recognizing and implementing developmentally appropriate physical education activities and practices . . . practices that are in the best interests of children (appropriate) and those that are counterproductive or even harmful (inappropriate) need to be identified for the benefit of the students. (NASPE, 2009d, p. 7)

The AIP documents stress the importance of appropriate instructional practices in contributing to a healthy lifestyle and address the inappropriate use of activities/exercises to chastise misbehavior. Along these lines, NASPE developed a parallel position statement, voicing opposition of the use of EAP; citing specific examples, such as withholding PE class or recess for students to complete unfinished schoolwork or as a consequence for misbehavior; forcing students to run laps or perform push-ups because of behavioral infractions (e.g., showing up late, talking, and disruptive behavior); and making students run for losing a game or for not performing a skill properly (NASPE, 2009d).

In literature specific to EAP, researchers have investigated why physical educators and coaches use this tactic with their students and athletes. Richardson et al. (2012) examined physical educators' and coaches' intentions to use EAP. Richardson et al. reported that physical educators and coaches did not hold positive attitudes, intentions, or subjective norms about using EAP, yet a majority of study participants reported they had used EAP to manage their students and/or athletes. Additionally, they reported that participants with the dual role of physical educator and coach held more positive intentions, attitudes, and subjective norms and were more likely to use EAP compared to participants who identified only as physical educators (Richardson et al., 2012). Finally, study participants who

both coached and taught were more likely to implement EAP in both settings, for athletes and students alike (Richardson et al., 2012).

Another population identified with a propensity to practice EAP in PE was students. Barney and Christenson (2014) investigated elementary-aged (third, fourth, and fifth grade) students' knowledge of appropriate instructional practices in PE, in approximately 2,400 elementary-aged students. In this study, 57% of third graders, 51% of fourth graders, and 49% of fifth graders reported that misbehaving students should run for long periods or perform numerous push-ups or sit-ups as punishment.

EAP has also been glamorized in popular culture and motion picture. In the beginning of the movie *Mr. Woodcock* (Cooper, Dobkin, & Gillespie, 2007), Mr. Woodcock (PE teacher) lines up his middle school students to discuss the game of basketball. During his dialogue, he poses questions to students, and as a result of incorrectly answering or not knowing the answer, students have to run laps around the gymnasium as punishment. This particular inappropriate instructional practice has been glamorized and perpetuated, taking place on an all-too-daily occurrence, being passed from one PE teaching generation to another (Burak, Rosenthal, & Richardson, 2013).

As mentioned, subjecting students to EAP has the possibility of negatively affecting attitudes toward PE and physical activity throughout their lives. Another concern for physical educators using EAP is possible legal consequences. As reference, Sawyer (2003) discussed the court case of *Moore v. Willis Independent School District.* In this case, parents of Aaron Moore brought suit after their son sustained serious injuries as a result of EAP. On the day of the event, during roll call, Moore was observed speaking with another student, violating a class rule. Punishment for the infraction was 100 squat thrusts. After completing the 100 squat thrusts, Moore then participated in 20 to 25 min of lifting weights. In the days following the event, Moore was diagnosed with degenerative skeletal muscle disease and renal failure. The student was hospitalized, missing 3 weeks of school. When the case went to court, the student's parents submitted testimony that the PE teacher told them that the squat thrusts were a means of punishment necessary to control junior high school students, and "with junior high kids, you have to inflict pain or they

don't remember" (Sawyer, 2003, p. 12). Even though Moore's federal claim was dismissed, it is still important to note that EAP may have detrimental consequences for the student and the physical educator.

The majority of studies in which EAP is referenced take the perspective of current physical educators, preservice teachers (PETE majors), and coaches using EAP in their classes or with their athletes (Richardson et al., 2012). To further research in EAP and its effects on students, investigating past students' experiences with EAP may be beneficial for both PETE faculty and current physical educators. The purpose of this study was to understand better individuals' (i.e., former students in PE) perspectives regarding their thoughts and experiences of EAP during their time in school PE.

Method

Participants

Participants for this study were 180 college-aged students and young adults (104 males, 76 females) from a private university and local community located in the western United States. Participant ages ranged from 19 to 36 years.

Instrumentation

Through a review of literature, we could not identify an instrument specific to EAP in physical education. Therefore, for this study, we developed a 16-question survey instrument (see Table 1). The survey consisted of five yes/no questions, three open-ended questions, six yes/no with open-ended follow-up questions, and two demographic questions. To establish content validity, we had college-aged students, academic colleagues, and other professionals with a PE pedagogy knowledge base review survey questions for clarity and understanding. For reliability, the instrument was further pilot-tested on college-aged students who did not participate in the subsequent study.

Table 1
Exercise As Punishment (EAP) Survey

Gender: Male Female

Age: 18–25 ____ 26–30 ____ 31–35 ____ 36 and older ____

The following survey questions will ask you about experiences with exercise as punishment in physical education class. Some questions will ask you to circle your answer and other questions will ask you to write a brief explanation. Thank you for participating in this survey.

1. Was daily (or frequent) running/exercise a requirement in your PE classes?

   Yes No

2. Was running/exercise enjoyable in your PE class?

   Yes No

3. If you misbehaved in class, did you have to run or exercise as a form of punishment?

   Yes No

4. What kind of misbehavior would warrant a student to exercise as punishment? Give examples.

5. If you had to exercise because of bad behavior, did it impact your exercise (running, other exercising) today? Please explain your answer.

   Yes No

6. Do you run for your exercise program now?

   Yes No

7. Do you recall ever having to exercise as punishment in your PE class?

   Yes No

Table 1 (cont.)

8. If you answered YES to the previous question, please write about your experience exercising as punishment.

9. Do you feel it is appropriate to have students exercise as a form of punishment? Please explain your answer.

   Yes No

10. When you were in PE, did you witness your PE teacher have students exercise as punishment?

    Yes No

11. What forms of exercise did you witness students do for their punishment?

12. When a student is told to exercise as punishment by the PE teacher, do you think it affects the overall classroom (gymnasium) environment for the whole class? Please explain your answer.

    Yes No

13. Do you feel that having students exercise as punishment could affect their attitude toward exercise in the future? Please explain your answer.

    Yes No

14. To those who experienced exercise as punishment, do you feel there were valuable lessons learned in the process? Please explain your answer.

    Yes No

Procedures

We employed nonprobability sampling to collect study survey data. We placed ourselves in locations with heavy student traffic (e.g., student union building and dormitory cafeterias). We distributed

surveys in paper format, with instruction given prior to completion, to 180 subjects. Approximate completion time for each survey was 10 min. Prior to survey distribution and data collection, the university institutional review board (IRB) granted approval to conduct the study.

Data Analyses

Analyses were performed on student responses to the survey instrument. Quantitative data analysis consisted of chi-squares (χ^2) as well as measures of central tendency and dispersion. Chi-square was conducted to compare question responses between genders. Significance was established at $p < 0.05$. Means, standard deviations, chi-square, levels of significance, and Cohen's *d* effect sizes were reported for all significant effects. Responses to questions, defined by gender, were presented as percentages, with means and standard deviations. Descriptive statistics were calculated, and thematic content analysis was performed on open-ended responses. Referencing qualitative analysis, we read and reread the data until common themes became evident for each survey question (Mueller & Skamp, 2003).

Results

Participants for this study were 180 college-aged students and young adults ($M = 1.42$, $SD = .495$) from a private university and local community located in the western United States. Participant ages ranged from 19 to 36 years, with 104 males and 76 females.

Table 2
Participant Responses in Percentages by Gender

	Total population ($n = 180$)		Male ($n = 104$)				Female ($n = 76$)			
Question #	Yes %	No %	Yes %	No %	*M*	*SD*	Yes %	No %	*M*	*SD*
1	83	17	83	17	1.42	.496	83	17	1.42	.502
2	56	44	56	44	1.43	.497	57	43	1.42	.496
3	49	51	49	51	1.42	.496	49	51	1.42	.495
5	21	79	18	82	1.49	.507	24	76	1.41	.493
6	57	43	61	39	1.38	.488	51	49	1.47	.503
7	37	63	38	62	1.42	.497	37	63	1.42	.495

Table 2 (cont.)

Question #	Total population (n = 180) Yes %	No %	Male (n = 104) Yes %	No %	M	SD	Female (n = 76) Yes %	No %	M	SD
9	46	54	54	46	1.33	.471	35	65	1.42	.495
10	64	36	64	36	1.43	.497	66	34	1.41	.495
12	77	23	73	27	1.45	.500	83	17	1.32	.471
13	83	17	79	21	1.45	.499	87	13	1.31	.471
14	38	62	47	53	1.29	.457	26	74	1.50	.502

Note. Total population mean and standard deviation for question responses (1.42 ± .495).

Quantitative Analysis

Table 2 depicts participant responses in percentages by question response. Significant differences were reported for two (Questions 9 and 14) of the 11 scaling questions when comparing gender.

Responses to the question (yes or no), "Do you feel it is appropriate to have students exercise as a form of punishment?" (Question 9) indicated an association by gender, with males ($M = 1.46$, $SD = .501$) and females ($M = 1.64$, $SD = .482$), $\chi^2(1, N = 180) = 8.036$, $p > .01$. Cohen's d effect size for Question 9 computed to $d = -0.37$, representing a small to moderate effect. Responses to the question (yes or no), "To those who experienced exercise as punishment, do you feel there were valuable lessons learned in the process?" (Question 14) indicated an association by gender, with males ($M = 1.53$, $SD = .502$) and females ($M = 1.74$, $SD = .443$), $\chi^2(1, N = 180) = 8.036$, $p > .01$. Cohen's d effect size for Question 14 computed to $d = -0.44$, representing a small to moderate effect.

Follow-Up Questions Analyses

Additional data results comprised short-answer responses from respondents. The thematic analysis and findings reported below comprise nine questions.

In nine questions, participants were asked to explain and expound their responses from the quantitative portion of the survey. The following outlines the qualitative responses from the participants in this study. Participants were asked (Question 4) what kind of misbehavior warranted EAP. Parallel responses to Question 4 were a student talking, talking during teacher instruction, and talking back to the teacher in a disrespectful manner. One student stated, "Talking when you're not supposed to." Another student stated, "Talking while the teacher was teaching." In reference to "talking," participants' comments were specific to talking disrespectfully to the teacher: "when a student cusses or swears at the teacher" or "just talking back." Another common theme specific to Question 4 was being late for class. One student said, "The typical punishment for being late to class was push-ups." One final theme from this question was in reference to the losing team and EAP, during team play in PE class. Students stated, "Losing the game, the teacher made losers run" and "The losing team for games generally had to do push-ups."

The participants were asked (Question 9) if they felt EAP was an appropriate form of punishment. The following themes came forward, such as "cruel and unusual punishment," "sends a bad message," and "not a motivator." Yet some of the participants felt that such a technique "strengthened them," "promotes toughness," and "healthy way to be punished." Participants were asked (Question 12) if the overall classroom (gymnasium) environment was affected when the teacher used EAP on a student. The following statements were made: "The atmosphere usually becomes tense," "It's awkward to watch," "It scares the group or makes them feel uneasy," and "It made us fear the teacher." The participants were also asked (Question 13) if EAP could affect attitudes toward exercising in the future. Students stated, "When you are forced to do stuff, sometimes you end up hating it more," "Why choose to do something that you've learned is a punishment," "They might have a negative attitude toward it," and "I hate running now." Finally, the participants were asked (Question 14) if they had experienced EAP, and if they had, did they feel they learned valuable lessons from their experience. Statements such as the following were given: "It didn't accomplish anything," "Taught me not to misbehave again," "Valuable lessons? Probably not. Just burn off some energy so they'll be less disruptive," and "Could've

learned the same thing without physical punishment." In Question 11, participants were asked what forms of exercise they witnessed their classmates participate in when used as punishment. As punishment, they identified running and push-ups.

Discussion

The purpose of this study was to understand better individuals' perspectives regarding their thoughts and experiences of EAP when they were in PE. Results indicate that participants generally did not enjoy EAP while in PE. However, gender differences were identified in reference to Question 9, with males more in support of the use of EAP compared to females. Burak et al. (2013) studied PETE majors' attitudes, beliefs, and intentions regarding the use of EAP in PE and sports. They found that 62% of male PETE majors used EAP during their teaching. For female PETE majors, 52% also used EAP during their teaching. Results from our study concur with results from Burak et al. (2013) that the male participants were more likely to use EAP. Other survey responses were homogenous when compared between genders. With a fairly equal amount of participant responses to survey Question 9, one may ascertain that a mind-set has been established early on that EAP may be considered standard practice in PE (Burak et al., 2013; Rico, 2002).

Another point of discussion is specific to the effects of EAP on the overall classroom (gymnasium) environment (Question 12). Data revealed that both males (73%) and females (83%) felt that EAP affected the classroom environment. The question may be asked, "In which direction was it affected, positively or negatively?" To help clarify the data, the participants responses ranged from "it's awkward to watch" or "it is humiliating" to "it changes the mood." One participant stated how "embarrassed" she was when she had to run in front of the whole class, which included friends. These types of responses may lead to negative feelings toward physical activity, which in turn may affect student attitudes toward being physically active throughout their lives. Along this line, in Question 13, participants were asked if EAP could affect attitudes toward exercise in the future. To note, a majority of males (82%) and females (76%) reported that they were not negatively affected when they encountered EAP. Yet other participant responses shed additional insight in reference to Question 13: "Why choose to do something that you've learned

is a punishment" and "It can traumatize a student." Literature has implied that EAP could negatively affect student attitudes toward exercise throughout a person's life (Burak et al., 2013; Himberg, 2000; Rosenthal et al., 2010). Student responses from this study help bring some clarity to the negative effects that EAP can have on future physical activity in a person's life.

A final point of discussion deals with valuable lessons learned (Question 14) by participating in EAP. In Rico's (2002) study of law reviews of EAP, she concluded that when students participate in EAP, they are not going to change behavior, not going to be taught discipline, and are likely to become physically aggressive. Participants in our study found EAP "did not accomplish anything" and "pain is not a good form of punishment." Prusak and Vincent (2005) implored physical educators to do what is best for their students. For physical educators who are using EAP in their daily lessons, it is hoped that they will discontinue this inappropriate practice. Findings from our study concur with the NASPE (2009a, 2009b, 2009c) documents in that PE should promote exercise for its contribution to a healthy lifestyle and not as a form of punishment.

Implications

After analysis of the data and a review of participants' responses, it does not come as a revelation that EAP is not appropriate for physical educators to use in their daily lessons. First, it is important that physical educators make their students' PE experiences positive. If physical educators use EAP with their students, they run the risk of creating a learning environment that makes students afraid or uncomfortable. Students will be required to come to class, yet participation may not be a fun or enjoyable experience. Furthermore, a learning environment that is tense or filled with uncertainty may affect a student's ability to learn and appreciate PE (Pangrazi, 2004). Graham (1995) stated that physical educators have the potential to positively affect multitudes of students. These students will grow up to be adults, parents, teachers, school board members, and voters. As such, their PE experiences may have an effect on PE in future children's schools and school districts (Aicinena, 1991).

Another study implication is to start a discussion to get physical educators to think of other classroom management methods to implement instead of EAP. The NASPE position statement on

Physical Activity as Punishment and/or Behavior Management has suggestions for physical educators. The following were documented as suitable alternatives to using EAP: (1) include students in establishing expectations and outcomes early in the school year, and review those expectations and outcomes frequently; (2) be consistent with enforcing behavioral expectations within the learning environment; (4) practice and reward compliance with rules and outcomes; (5) offer positive feedback and catch students doing things right; (6) include students in meaningful discussions about goals and how to reach them; (7) do not reinforce negative behavior by drawing attention to it; (8) hold students accountable for misbehavior; and (9) develop efficient routines that keep students involved in learning tasks. Richardson et al. (2012) suggested more work still needs to be done to encourage and educate physical educators, coaches, and preservice teachers about the potentially negative consequences of EAP. It is hoped that implications from this study will provide physical educators, coaches, and preservice teachers with plenty of alternatives to EAP and strategies with a focus on students' best interests as well as their future health and well-being.

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PEDAGOGY

Influence of Acculturation and Professional Socialization on Preservice Teachers' Interpretation and Implementation of the Teaching Games for Understanding Model

Catherine E. Vollmer and Matthew D. Curtner-Smith

Abstract

Research on how preservice teachers (PTs) learn to employ the teaching games for understanding (TGfU) model is in its infancy. The purpose of this study was to examine the combined effects of a package of university-based methods and the employment of the model during an early field experience (EFE) on PTs' delivery of TGfU during the teaching internship. The theoretical framework employed was occupational socialization. Participants were 2 PTs. Data were collected with 7 qualitative techniques and analyzed using analytic induction and constant comparison. Although the PTs understood elements of TGfU, a combination of their pedagogical struggles with and misconceptions of TGfU and their prior and concurrent socialization served to mediate and reduce the effects of their initial training. Consequently, neither PT was able to deliver the full version of TGfU during the internship. We suggest that faculty

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who are training PTs focus on a number of areas including recruiting teaching-oriented PTs, emphasizing the origins of the model in sport, contrasting TGfU and traditional pedagogies, debunking the idea that TGfU and foundational pedagogies are oppositional, providing a graded series of EFEs, teaching within small-sided games, and identifying tactical problems.

The teaching games for understanding (TGfU) model (Bunker & Thorpe, 1982; Mitchell, Oslin, & Griffin, 2006; Thorpe, Bunker, & Almond, 1984) is aimed at enabling students to understand and execute tactics and strategies in games and sports as well as acquire technical competence. Students are asked to explore the tactical and strategic decisions they make as they participate in games. Bunker and Thorpe (1982) described a six-stage process by which this could be achieved and in which the focus shifted from modified game playing, game appreciation, tactical awareness, decision making, and skill execution to performance. Within these stages, teachers select or sample a variety of games and emphasize their tactical complexity. These games are modified so they represent the adult version but exaggerate specific tactical issues (Thorpe et al., 1984). A simplified version of the model involves students playing small-sided conditioned games, answering tactical questions about those games, and solving tactical problems (Mitchell et al., 2006).

The relatively small amount of work in which researchers have examined how physical education teacher education (PETE) faculty have attempted to prepare their preservice teachers (PTs) to use the TGfU model indicates that packages of various methods have been employed. These methods have included reading articles about and discussing the model (McNeill et al., 2004; Peters & Shuck, 2009), teaching PTs content courses using the model, peer teaching within methods classes (McNeill et al., 2004), mentoring by experts (Wang & Ha, 2012), requiring PTs to design games and plan TGfU units, and providing PTs with a TGfU lesson plan template (Curtner-Smith et al., 2007; McNeill et al., 2004).

The aforementioned research, however, indicates that although PTs are often positive about and can gain confidence from using TGfU (Casey, 2014; Li & Cruz, 2008; Roberts, 2007; Wang & Ha, 2009), they have struggled to master the model. Specifically, PTs have had difficulty with the relative fluidity and flexibility of TGfU

pedagogy (Curtner-Smith et al., 2007; McNeill et al., 2004; Peters & Shuck, 2009), planning (McNeill et al., 2004; Randall, 2003), using indirect teaching styles (Curtner-Smith et al., 2007; McNeill, Fry, Wright, Tan, & Rossi, 2008; McNeill et al., 2004; Peters & Shuck, 2009), and teaching within small-sided and conditioned games (Curtner-Smith et al., 2007; Peters & Shuck, 2009). Furthermore, they have worried about students' skill levels and prioritized them over understanding how to play games (Curtner-Smith et al., 2007; McNeill et al., 2004; Randall, 2003). In addition, they have been concerned about students' abilities to understand tactics and strategies and create games (Curtner-Smith et al., 2007). Moreover, PTs have been concerned about their own mastery of foundational instructional skills (i.e., effective teaching and managerial behaviors) while trying to use and learn more advanced TGfU pedagogies (Curtner-Smith et al., 2007; McNeill et al., 2004; Wang & Ha, 2009).

Factors contributing to these difficulties have included an inadequate amount and depth of training (McNeill et al., 2008; Peters & Shuck, 2009; Wright, McNeill, & Fry, 2009) and PTs' lack of pedagogical, content, and pedagogical content knowledge (McNeill et al., 2004; Peters & Shuck, 2009). During the culminating teaching internship, the lack of time, facilities, and equipment (McNeill et al., 2004; Peters & Shuck, 2009); the low level of cooperating teacher (CT) knowledge and support (McNeill et al., 2004; Nash, 2009; Wang & Ha, 2012); and marginalization of the subject, large class sizes, and unpredictable class scheduling (McNeill et al., 2004; Peters & Shuck, 2009) have also proven to be significant constraints on PTs learning the TGfU model. In addition, PTs have been hindered by the resistance of students used to being taught through traditional skill practice-to-game and direct pedagogies focused on skill or fitness development or not being "taught" at all (Curtner-Smith et al., 2007; McNeill et al., 2004; Peters & Shuck, 2009).

PTs' prior experiences of more traditional and direct physical education (PE) teaching and curricula during their own schooling and PETE also appear to have made it difficult for them to learn TGfU (Casey, 2014; Light & Tan, 2006; McNeill et al., 2004; Peters & Shuck, 2009) and have led to faulty conceptions of the model. Specifically, they appear to have misconceived the model in three broad ways (McNeill et al., 2004). First, PTs believe that they are doing TGfU

correctly if they follow and stick rigidly with the stages outlined by academics regardless of whether students learn. Second, they continue to value technical skill development over learning how to play and consequently adapt the TGfU pedagogy to realize this goal or abandon it altogether. Third, they merely see the TGfU approach as a good way to keep students engaged and well behaved without emphasizing learning. Additionally, and as yet, the fears of Chandler and Mitchell (1990) that teachers may misconceive the model and mistakenly reduce it to an explanation of strategies and tactics followed by unsupervised game playing have not been observed among PTs.

The purpose of this study was to examine the combined effects of a package of university-based methods and employing the model during an earlier early field experience (EFE) on PTs' delivery of TGfU during the culminating teaching internship. This combination included many methods that researchers have suggested can lead to positive gains and was specifically designed to address, confront, and rectify the problems and issues that plague previously documented attempts to teach PTs to use the TGfU model. The specific questions we attempted to answer during the study were as follows: (a) How did PTs interpret and implement TGfU? and (b) How did PTs' acculturation and professional socialization influence this interpretation and implementation?

Theoretical Framework

Previous studies (Curtner-Smith, Hastie, & Kinchin, 2008; Li & Cruz, 2008; McNeill et al., 2004; Sofo & Curtner-Smith, 2010) have revealed that PTs "read" curricula in different ways and that this reading heavily influences how they interpret and deliver a given model of instruction. In turn, PTs' reading of curricula is heavily influenced by their occupational socialization (e.g., see Curtner-Smith et al., 2008; Lawson, 1983a, 1983b; Stran & Curtner-Smith, 2009). Therefore, data collection and analysis in this study were also guided by this theoretical framework.

Before they begin PETE, PTs hone their conceptions of the subject by the contexts and cultures in which they exist and by persons in positions of influence. This process of acculturation and PTs' initial interest in PE are often triggered by a strong interest in sport and physically active parents. Key influences on prospective PTs'

beliefs about teaching are their own experiences of PE, extracurricular school sport, and sport outside school as well as their relationships with PE teachers and coaches (Curtner-Smith et al., 2008). Prospective PTs learn what it is to be a teacher through an "apprenticeship of observation" (Lortie, 1975). If this apprenticeship involves participating in noncompetitive physical activity or less traditional competitive sport and working with teachers and coaches who give priority to good quality PE over producing high-level extracurricular sports teams, PTs are likely to enter PETE with "teaching orientations" and view coaching as a "career contingency." In contrast, if the apprenticeship involves participating in a relatively high standard of traditional sport and working with teachers and coaches who emphasize extracurricular sport over PE, PTs are likely to enter PETE with a "coaching orientation" and view teaching PE as a career contingency (Lawson, 1983a, 1983b).

The effects of professional socialization (PETE) on PTs are often minimal and fail to change the conceptions of PE with which PTs enter their programs (Stran & Curtner-Smith, 2009). PTs who enter PETE with strong coaching orientations are especially resistant to professional socialization (Sofo & Curtner-Smith, 2010). Moreover, weak PETE can serve to strengthen the faulty conceptions of some PTs (Doolittle, Dodds, & Placek, 1993). Conversely, strong PETE has been shown to have a positive influence on all but the most hardened coaching-oriented PTs (Sofo & Curtner-Smith, 2010). This type of PETE includes faculty with specialist training in sport pedagogy who are viewed as credible by PTs. These faculty supervise EFEs closely, agree on a "shared technical culture" (i.e., the skills and knowledge required for teaching effectively; Lortie, 1975), and tackle PTs' faulty beliefs about the subject head-on.

In line with occupational socialization theory, previous research (Curtner-Smith et al., 2008) has also indicated that when PTs with teaching orientations graduate, they are more likely to deliver the "full version" of another innovative and constructivist curriculum model: sport education (SE). Conversely, PTs with coaching orientations are more likely to misconceive SE and "water it down" or to take a "cafeteria approach" by selecting aspects of the model to employ within traditional instruction. Given these results and the finding that American PTs with strong coaching orientations had

more difficulty teaching through TGfU during an EFE than those with teaching orientations (Curtner-Smith et al., 2007), PTs with coaching orientations likely will also struggle with TGfU to a greater extent than those with teaching orientations during the teaching internship. Contradicting this suggestion was the finding of McNeill et al. (2004) that Singaporean student teachers with a higher level of games playing experience did better with TGfU than those who were relatively inexperienced sportsmen and women.

Method

Participants

Two PTs, to whom we gave the fictitious names of Emily and Kenny, were the participants in this study. Emily and Kenny were aged 22 years and Caucasian, and they were enrolled in their culminating teaching internship at a university in the Southeastern United States. They were selected because they had been successful in previous coursework but had different orientations to teaching and coaching. In congruence with the university's institutional review board policy on human subjects, both PTs signed consent forms before the study began.

PTs' Prior Training in TGfU

Both PTs were introduced to TGfU during their secondary methods course through class discussion, participation in 12 TGfU lessons as "students," and peer teaching four lessons. Further discussion and peer teaching (six lessons) of the model occurred during the PTs' elementary methods class. In addition, during the elementary methods course, the PTs read a leading text (Mitchell et al., 2006) in which the model was described, designed small-sided and conditioned games, and planned an 18-lesson TGfU unit. PTs were required to write individual lesson plans from this unit plan. Finally, the PTs taught the 18-lesson unit to second and third grade students within classes of eight to 12 students during their elementary EFE.

Setting

The PTs taught at different elementary schools for 7 weeks. Emily's school catered to children in prekindergarten to fifth grade aged 5 to 11 years. Most were African American and from lower

socioeconomic status backgrounds. Emily taught nine-lesson speedball and six-lesson ultimate frisbee TGfU units to one third grade (8 and 9 years old), one fourth grade (9 and 10 years old), and one fifth grade (10 and 11 years old) class for a total of 45 TGfU lessons. Her class sizes ranged from 61 to 73 students, although she had the support of a teaching aide and the CT.

Kenny completed his elementary teaching internship at a predominantly lower to middle class school that catered to Caucasian (69%) and African American (31%) children in third through fifth grades. He taught TGfU units to three third grade (60 lessons) and three fourth grade (60 lessons) classes. Both units comprised a series of mini-units on ultimate frisbee (four lessons), lascoop (an invasion game using scoops and a ball; four lessons), rounders (four lessons), cricket (four lessons), and soccer (four lessons). His class sizes ranged from 40 to 50 students. Kenny also had assistance from his CT.

Data Collection

Seven techniques were used to collect data with the goals of describing how the PTs interpreted and implemented TGfU and explaining how their acculturation and professional socialization influenced this interpretation and implementation. Nonparticipant observation involved extensive field notes being written on the pedagogies employed by Emily (during 19 lessons) and Kenny (during 19 lessons) during the TGfU model. Document analyses of PTs' teaching portfolios were conducted during and at the end of the internship. During these analyses, the focus was on PTs' TGfU unit and lesson plans, evaluations of students, and other materials they had developed during the teaching of their TGfU units. PTs were also asked to provide at least one entry per week in a reflective journal in which they discussed anything they deemed pertinent about their teaching of TGfU. Similarly, they were asked to complete at least one critical incident report per week in which they described a specific and significant event that had occurred during their TGfU teaching. Three types of interviews were used during the study. First, formal semistructured interviews were conducted with each PT at the beginning, middle, and end of the internship. In the initial interview, PTs were asked about their acculturation, professional socialization, and general understanding of the TGfU model. In the second and

third interviews, the focus was on their use of the TGfU model. All six interviews were audiotaped and transcribed verbatim. Second, whenever an opportunity was available, PTs were informally interviewed. Detailed written notes on the contents of these interviews were made as soon after informal interviews as possible. Finally, one stimulated recall interview was conducted with each PT. This involved PTs viewing a filmed lesson from one of their units. These films were paused periodically so the PTs could describe the thought processes that resulted in particular actions.

Data Analysis

Data indicating how the PTs interpreted and implemented TGfU and how their acculturation and professional socialization influenced this interpretation and implementation were identified. The two sets of data were then coded into categories, subcategories, and themes by employing analytic induction and constant comparison (Goetz & LeCompte, 1984). This process involved multiple readings of both data sets while data collection was being carried out and after it was completed. During the initial reading, data from all sources were placed in tentative categories and subcategories. In subsequent readings, categories and subcategories were refined, modified, expanded, or collapsed, and data were recoded and moved accordingly. In addition, new categories and subcategories were developed. Toward the end of the process, the categories and subcategories were grouped within emerging themes consistent with the questions we were aiming to answer and the theoretical framework that we employed. The final categories, subcategories, and themes are the basis for the Findings and Discussion section. Trustworthiness and credibility were established by periodic member checking, triangulating findings from the data sources, and searching for negative and discrepant cases (Goetz & LeCompte, 1984).

Findings and Discussion

Reading About and Teaching TGfU

Comprehension of the model. Although both PTs revealed that they understood elements of the TGfU model, data indicated that in general and in congruence with participants in previous studies (e.g., Curtner-Smith et al., 2007; McNeill et al., 2004; Peters & Shuck,

2009; Randall, 2003), they misunderstood and misconceived it. As illustrated by the following data extract, their ideas on how to implement the model were vague at best:

> I would introduce the sport real quickly and just go over a few rules and then we would just basically have them . . . divide up in teams to go out and play for like 10 to 15 minutes. And then you would come back and you would basically have a practice . . . go back to game play and continually just doing that and eventually having a full game. But your first time, it's modified and you do skills modified and keep adding more skills along the game, and eventually, you would want a full-sized game. (Emily, Formal Interview 1)

In terms of the stages of the model advocated by Bunker and Thorpe (1982), and during their methods courses, both PTs frequently mentioned tactical awareness, skill execution, and performance:

> I probably should have done a better job with the strategies and tactics. . . . I spent a lot of time the first couple weeks on kicking, throwing, and passing, where it was pretty easy to do. . . . I could have spent a little more time and been like, "OK in this situation when this person is guarding you, what should you do?" (Emily, Formal Interview 2)

They did not, however, significantly emphasize game appreciation or students making decisions within games. Moreover, both PTs continued to prioritize technical competence over tactical and strategic understanding:

> Emily stops the students to explain the practice. The students gather behind their team cones. . . . She refers to the practice from the previous day on throwing and catching a frisbee. . . . She asks, "What finger is on top?" . . . "What on the bottom?" . . . "Remember to step with the same foot toward your partner." . . . "How do we catch?" . . . "Like an alligator." . . . She then sends students to practice with a partner with the

> option of using a foam or hard frisbee. (Emily, Field Notes, Lesson 2, Ultimate Frisbee Unit, Grade 4)

Similarly, and in line with the thoughts of Thorpe et al. (1984) and Mitchell et al. (2006) on pedagogical principles and the curricular scaffolding of the model, the PTs made plenty of references to "modified" and "small-sided" games and the sampling of "different" games:

> The most significant incident was when I had to modify the ball/frisbee to make the students more successful. . . . I had to modify the goals of lascoop and make them bigger so they could score more frequently. . . . I modified the game of cricket by letting them hit off a tee because they could not throw [i.e., bowl] the ball. (Kenny, Critical Incident Reports, Week 2–4)

> They played some games they had never played before so it kind of took them a day or two to finally get the rules and how everything works. . . . I did a variety . . . two invasion games and then two fielding games. . . . I was going to do a target game, but . . . I swapped it back to soccer. (Kenny, Formal Interview 2)

Conversely, the PTs did not mention modifying or conditioning games for the purpose of emphasizing specific tactical problems, questioning students with the goal of helping them become more tactically aware, or setting tactical problems for students to solve. In short, both PTs appeared to have a rudimentary and limited understanding of the more basic pedagogies associated with TGfU and no understanding of pedagogies that are more complex.

Structure of the model. Not surprisingly, their limited and shallow understanding of the model led to Emily and Kenny delivering units of instruction that, in Curtner-Smith et al.'s (2008) parlance, fell short of the full version of TGfU. Specifically, Kenny took a cafeteria approach to the model and Emily watered it down.

Kenny's version of TGfU essentially involved taking a fairly traditional skill practice-to-game approach with a few more small-sided

games included on the path to the full game than normal. Emily was more likely to teach through small-sided and conditioned games, less likely to include isolated skill drills, and occasionally attempted to teach skills within game contexts. Like Kenny, however, she was still traditional in her focus. Both emphases are portrayed in the following data extracts:

> Emily assigns students to their fields. . . . While students are playing she provides motivational and performance feedback. . . . She blows the whistle to stop class play. . . . She says, "I just saw a team do an awesome play!" . . . Students re-enact what they had just done (three passes among teammates to score). . . . Emily then asks the students, "Where were the players and their teammates?" . . . "What type of passes were they?" . . . She then reemphasizes moving to an open space on offense and executing short, quick passes by asking students, "Why do these strategies work so well?" . . . Emily then blows the whistle to restart game play. (Emily, Field Notes, Lesson 8, Speedball Unit, Grade 5)

> Kenny has students get behind a designated coned area with their team color . . . Students are assigned to designated areas to play one another. . . . Teams start playing. . . . There are 6–7 players per team all playing at the same time on a quarter of the gym space. . . . Kenny organizes two teams on the last court in their straight lines (9 players on each side). They are to practice tossing back and forth and rotating to the end of the line. . . . He then organizes the teams to play again. (Kenny, Field Notes, Lesson 4, Lascoop Unit, Grade 3)

Pedagogies employed within the model. Despite a considerable emphasis in their methods courses on using indirect teaching styles within TGfU units, both PTs' pedagogies were predominantly direct and featured practice-style teaching:

> Kenny has students get behind a designated coned area with their team color. . . . Students are then assigned to designated areas to play one another. . . . He approaches a student and

> says, "This is how you want to bat." . . . He then shows the proper stance and fixes the student's feet. . . . He then says, "You want to hit it away from her, and you hit it right to her." . . . He then shouts to the rest of the children, "Hit away from the pitcher." (Kenny, Field Notes, Lesson 1, Cricket Unit, Grade 3)

Informal and stimulated recall interviews also revealed that PTs were focused on using a repertoire of effective teaching behaviors with particular emphasis on "establishing rules, routines, and expectations"; creating momentum and flow; and providing optimal levels of "engaged skill learning time" and adequate "performance" and "motivational feedback." Furthermore, Kenny was keen that his students were well "organized" and Emily put a premium on students "really listening" to her.

In direct contrast to the requirements of the model, both PTs also revealed a lack of flexibility in their teaching. Again, Kenny was the worst offender in this regard. Observations indicated that both PTs usually followed their original lesson plans faithfully and were not willing or able to make alterations based on students' needs. The rigidity in their thinking was also apparent in their stimulated recall interviews:

> I spent a lot of time on my lesson plans to make sure I was as organized and as prepared as possible, so I pretty much just stuck to those. I tried to make sure I didn't stray from them too much. (Emily, Stimulated Recall Interview)

Finally, PTs also found it "difficult" to "identify tactical issues" on which to focus, to ask questions about tactics and strategies, and to teach within game play. Lesson plans were for the most part devoid of tactical problems to be examined and example lead questions on tactics and strategies to be asked. Because both PTs were excessively plan dependent and inflexible, they rarely focused on major tactical issues within their classes. Emily admitted in her stimulated recall interview that she "should have done a better job with the strategies and tactics" because the focus on skills was essentially "pretty easy to do." For the majority of the PTs' internships, most questions includ-

ed in lesson plans or asked during lessons were either skill- ("When you kick, should you use the inside or outside part of your foot?") or rule-focused ("What does every game start off with?"). Toward the end of her internship, however, Emily started to plan and ask tactical questions ("What do you think you are supposed to do with more players in this situation?"). Unfortunately, if students were unable to answer her initial question, Emily did not possess the ability to ask a follow-up question that was simplified or modified.

Both PTs were also relatively quiet during the game play segments of their lessons compared to the isolated skill practices they organized, during which they provided liberal amounts of performance and motivational feedback. Emily was the more engaged of the two PTs within game play segments, but her interaction with the students was usually aimed at motivating them ("Nice pass, [Dameon]! Did you all notice how he looked for the open player?"), and during her stimulated recall interview, she relayed that she "felt that [she] spent more time correcting the rules than [providing] actual feedback about the performance and decisions made." Kenny's level of interaction with his students during game play segments was low at the beginning of his internship and "tailed off" to the point that it was virtually nonexistent. The rationale for this pattern of behavior, provided in his stimulated recall interview, was that he had come to realize that his students "just needed to play so they would figure it out."

Factors Influencing PTs' Reading About and Teaching TGfU

Acculturation. Two key elements of the PTs' acculturation appeared to be partially responsible for the orientations with which they entered PETE and the ways in which they read about and taught TGfU units during their teaching internships. These were their involvement in conservative forms of sport and their own schooling.

Involvement in conservative forms of sport. In congruence with many other PTs (Curtner-Smith et al., 2008; Stran & Curtner-Smith, 2009), Emily and Kenny were initially attracted to careers in PE based on their "love" of children and their early, continued, and for the most part, positive involvement in physical activity and sport inside and outside the school setting:

> I played lots of sports growing up. . . . I just like working with kids and I felt that PE was my strong suit . . . since I can't play anymore. PE was a way to still keep up with my love of sports. (Kenny, Formal Interview 1)

Having played a "variety" of organized youth sports in her early childhood, during high school, Emily specialized in soccer, which she "had played [her] whole life," and basketball. When he was a child, Kenny participated in organized sports within "recreation leagues." During his early adolescence, he played traditional team games, but in high school, he "just did baseball." This focus and Kenny's athletic ability led to him "playing baseball for two years" at a local community college.

Emily and Kenny spent their childhood and youth participating mainly in "traditional" sports that were "coach controlled," which guaranteed that they made few decisions about tactics or strategies. To the contrary, they learned that coaches made decisions and players played. Because Kenny had participated in a major male American team sport at a higher level than Emily, his experiences, in this sense, were more extreme. It was, then, not surprising that he and Emily found it difficult to let their students make tactical and strategic decisions in PE.

PTs' own schooling. The PTs' apprenticeship of observation also influenced their future career and pedagogical choices. Although their elementary PE teachers used "direct styles of teaching" and were "very traditional," Emily and Kenny rated them as "great" and "good" because they "kept children active the whole time and always taught different games" (Emily), "didn't have free play" (Kenny), and "had certain things [they] had to do," including a "fitness unit each year [for] which [students] got rewarded for reaching fitness goals" (Kenny). Moreover, both PTs decided to train to be PE teachers partly based on the modeling that these elementary teachers provided:

> It was all because of my elementary teacher. . . . She was so great. She kept us active the whole time, we never sat down, and we were always playing. She always taught us different games. . . . I just loved her and just loved PE. . . . From elementary on, I just wanted to be a PE teacher. (Emily, Formal Interview 1)

The pedagogies modeled by their elementary teachers had a positive effect on Emily and Kenny despite running counter to the requirements within TGfU, but those of their middle and high school PE teachers had a neutral or negative effect. This was because both PTs experienced nonteaching middle school PE teachers who "rolled out the ball" and would "help [students] with basketball because that's all she cared about" (Emily) and "pretty much [supervised] free play every day" (Kenny). In addition, their high school teachers had strong coaching orientations and allowed Emily and Kenny to bypass their (admittedly weak) PE programs and, ironically, use the time to train for their extracurricular sports instead with a specific focus on honing their "techniques and strategies."

Orientations to teaching and coaching. Both PTs' acculturation was conservative and similar. However, because Emily's elementary PE teacher had such a big effect on her, Emily entered PETE with a teaching orientation and clearly viewed coaching as a career contingency, and because Kenny was relatively successful in a traditional form of sport, Kenny entered the same program with a "moderate coaching orientation" (Curtner-Smith et al., 2008), meaning he was still open to teaching curricular PE "properly" even if it was not his priority. These two perspectives were still intact at the time of the study:

> I feel like I have a strong voice and strong opinion about teaching. . . . I am very organized and I feel that a teacher needs to have a plan and follow through with that plan every day. . . . I want students to understand what they are doing, why they are doing it, and how to do it the correct way. (Emily, Formal Interview 1)

> My first career choice is to be a teacher . . . and I know a lot of schools around here . . . need help because . . . I've talked to a lot of people. . . . They have said . . . if you ever get this job, in an interview, say you would be able to help out and coach . . . and that's when I would step in. (Kenny, Formal Interview 2)

Crucially, these teaching and coaching perspectives had served to filter the messages the two PTs had received about TGfU during

their PETE and continued to influence their teaching of it during their internships.

Professional socialization. The PTs' TGfU-PETE contradicted and competed with their prior socialization. Because of his more conservative acculturation, and because he entered the program with a coaching orientation, the contradiction and competition of the TGfU model with what Kenny considered to be "good" PE pedagogy was much greater than it was for Emily with her teaching orientation.

Influence of PTs' TGfU-PETE prior to the teaching internship. Both PTs were generally complimentary about the package of strategies, methods, and experiences the faculty had put together for TGfU-PETE prior to their teaching internships. Emily was particularly positive about the "book [Mitchell et al., 2006] that gave you a bunch of ideas for games for understanding." Kenny noted that he often referred to "sample" games in the textbook, "but [that] a lot of time [he had] used the Internet trying to find interesting games that kids [had never] played before." By contrast, Emily lamented that only one EFE was focused on TGfU and Kenny explained that it was difficult trying to teach large classes using TGfU during his internship because he had only taught relatively small classes during the TGfU EFE:

> I would have liked better to actually teach more because I feel like for one of the classes we were in there for so long just learning all these games, which was helpful, but it was too long of a time to spend in a classroom. We could have quickly gone over it . . . and sent us off. So, I feel like I didn't have enough time to incorporate all those games I learned into my teaching. (Emily, Formal Interview 1)

> I think it [the TGfU EFE] is mainly focused on the small classes . . . When I'm teaching 10 kids and there is enough equipment for . . . 10 kids . . . but when I have 50 you start to think about . . . am I going to have enough [equipment] and trying to keep as many people as I can active for most of the period of time. (Kenny, Formal Interview 1)

Both PTs also indicated that they saw a contradiction and contrast between the direct nature, control, and safety of the foundational pedagogies (i.e., behaviors based on the research on effective instruction and management) they were being taught and the indirect nature, relative lack of control, and risk involved with employing TGfU:

> I'm a little hesitant about teaching TGfU. . . . I mean we have only done it with about 10 kids, and now I'm going to be teaching 70 or so. . . . It might be kind of chaotic at first, and I might be more comfortable with skill themes. (Emily, Formal Interview 1)

Teaching internship. Several elements of the teaching internship had a pronounced effect on the degree of success the PTs achieved when implementing their TGfU units. In line with previous socialization research (Curtner-Smith et al., 2008; Curtner-Smith et al., 2007; Stran & Curtner-Smith, 2009), these were facilities and equipment, CTs, students, and class size. In general, these elements had a positive effect on Emily's teaching and a negative effect on Kenny's instruction.

Facilities and equipment. Emily had access to "a good-sized gym" and "a lot of field space." Moreover, she often noted that she had "plenty of equipment for students . . . especially during the practice." In contrast, Kenny taught on the outfield of a baseball field and "struggled" when he taught "inside on half of the gym for 50 kids." Moreover, Kenny was hampered by a lack of equipment. Despite these issues, Kenny optimistically noted that he had "always said, 'ya know, you can make do with what you have, even if you don't have a lot.' . . . I try to keep as many students as I can physically active."

CTs. The CTs who supervised Emily (Leslie) and Kenny (Vaughn) had been through the same PETE program as the PTs and were in the same cohort 19 years prior to the study. At this stage in their careers, however, Leslie possessed a strong teaching orientation and Vaughn, who was also the head football coach at the local high school, was coaching oriented. This meant that Emily received more support for her teaching than Kenny, particularly in "helpful ways of going about teaching a large group of students . . . making sure lessons [were]

safe and that students [were] constantly being active." Vaughn was not nearly as structured as Leslie, and consequently, conditions for Kenny's teaching were less favorable. In addition, Vaughn seemed more interested in helping Kenny move into an extracurricular coaching role than in improving his teaching and was quick to voice his approval of Kenny coaching baseball at a local middle school while he was completing his internship as it would help him "get his foot in the door." Vaughn also noted that during his training, TGfU "was different than what it is now . . . this play, practice, play stuff. What's that?"

Students. The children in Emily's and Kenny's classes also had a profound effect on the PTs' ability to employ the TGfU model. Although her class sizes were larger than Kenny's, Emily's students were relatively well behaved and enthusiastic, allowing her to experiment with the model with confidence:

> Students are very attentive while Emily tells them which team will be playing one another. . . . Students are anxious to begin playing the game. . . . When a ball is hit too high through the goal (a rule Emily established for safety purposes), students look around to see if she saw because it was "accidental" and don't want to sit out . . . Students who are substitutes are highly engaged and cheer for their teammates as they wait their turn. (Emily, Field Notes, Lesson 6, Speedball Unit, Grade 5)

In contrast, Kenny's students were often poorly behaved, and understandably, this made him wary of using the indirect teaching styles called for when working within TGfU. Moreover, they frequently resisted his attempts at using the model:

> Kenny assigns students to their designated fields. Teams consist of 6 to 8 students. . . . He asks certain teams to begin playing, but they are unorganized. . . . Exasperated, Kenny says, "Y'all are trying to stop them from scoring. . . . I told you several times . . . you have to pass it. . . ." Two girls on the first field get bored because no one is passing them the ball and choose to sit down by the fence. . . . Other students

> are arguing with Kenny about who has possession of the ball. (Kenny, Field Notes, Lesson 2, Ultimate Frisbee Unit, Grade 3)

Both PTs also expressed their concern about their students' relative lack of skill and experience in the activities they were teaching. They were also skeptical about their ability to comprehend and use anything more than the most straightforward tactics and strategies:

> The students don't have the skill level I thought they would coming in to this. . . . I have broken down the practices into basic stuff, especially for the third graders. . . . I would normally just do skill themes with these kids, but I see this as a challenge for myself to stick with the games for understanding. (Kenny, Informal Interview, Ultimate Frisbee Unit)

Conclusions

Assuming the results of this study transfer to other PTs and programs, its implications for TGfU-PETE can be divided into (a) recruitment and selection of PTs and (b) training PTs to use TGfU during methods courses, EFEs, and the culminating teaching internship. In line with previous research and commentary (Curtner-Smith, 2012), this study implies that PETE faculty have more chance of "selling" TGfU to PTs with teaching orientations than to those with coaching orientations. Given the relatively small potential pool of teaching-oriented recruits in the United States, in addition to identifying PTs with this background, PETE faculty also need to consider strategies that may help them sell the model to PTs with moderate coaching orientations, who can be turned. The most obvious of these may be emphasizing the origins and connections of TGfU in and with "real" sport and the potential to decrease managerial issues by increasing the ratio of instructional game play to skill practice. Overtly contrasting the effectiveness of the pedagogies employed in TGfU and traditional teaching in terms of instruction, relevance, and management, as has been done with some success by those training PTs to use the SE curriculum model (Curtner-Smith, 2012), may also be of use.

This study also indicates that PETE faculty should consider giving priority to a number of issues when designing their TGfU-PETE packages and seeking internship placements. The first of these is debunking the idea that foundational and TGfU pedagogies are oppositional and incompatible. The second is asking PTs to examine the current obsession with keeping students "active" and "moving" for health-related purposes when such actions, taken to an extreme, may inhibit learning. The key concept here is that gaining more complex tactical and strategic knowledge may necessitate pauses in game play for explanation and reflection. The third is the search for decent school environments in which interns can practice the model, which may necessitate vetting potential CTs and training them to use the TGfU model during in-service sessions.

As the PTs in the study noted, and as has been suggested for other curricular models (Curtner-Smith, 2012), PETE faculty also need to include a series of graded EFEs so PTs can begin teaching the model using familiar content in relatively controlled, simple, and safe environments (e.g., peer teaching, teaching small classes of students) and gradually progress to teaching less familiar content in contexts that are more complex and realistic. In this study, it appeared that too little time was spent on practicing the model prior to the internship and that the jump from teaching TGfU in one EFE to teaching the model to large classes within the internship was too great.

The study also highlights the need to prioritize helping PTs to acquire the skills to teach within small-sided games, particularly asking questions about tactics and strategies. This may involve PETE faculty attempting to socialize PTs into using TGfU, focusing much of their initial effort on deconstructing the way PTs think about games and games teaching. Subsequently, faculty can then reconstruct this knowledge by employing a games-centered constructivist approach. Strategies that could be employed to achieve this goal include faculty modeling and requiring PTs to study expert TGfU teachers (live and on film), participate in TGfU units as students, reflect on film of their teaching using a modified stimulated recall protocol, code film of their teaching with relevant systematic observation instruments, and engage in specific practice with feedback. In addition, the study indicates that faculty focus on aiding PTs to identify tactical problems and issues that students have within game play. This

may also be achieved through modeling and practice. Conversely, an increase in the number of courses aimed at improving PTs' content and pedagogical content knowledge may be necessary. Finally, faculty may have a relatively narrow focus and modest expectations when PTs first attempt to use the model, perhaps only holding them accountable for designing a series of small-sided and conditioned games without having to react to students. Once PTs are comfortable with this process, other aspects of TGfU pedagogy could be layered on this foundation. These include focusing on one tactical problem at a time, asking progressively more complex questions in game play, and conditioning and modifying games in reaction to students' responses. Further research to examine the effectiveness of these pedagogical strategies, in terms of socializing PTs to employ TGfU effectively, would be useful. As well as conducting case studies, those who engage in this research may gain by employing an action research model.

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PEDAGOGY

Preparing Adapted Physical Educators to Teach Students With Autism: Current Practices and Future Directions

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Abstract

For many students with autism spectrum disorder, physical education is the responsibility of an adapted physical education specialist. In this study, we examined the training focused on teaching students with autism spectrum disorder received by a sample of 106 adapted physical education specialists. Competencies necessary on a course to train adapted physical education specialists to work with students with autism spectrum disorder were also defined using a two-step process. First, a group of physical education and special education experts generated a provisional list of competencies that they saw as necessary. Participants in this study then provided their opinions on the validity of this list. Additional suggestions for future training were also sought from participants.

Certified adapted physical education specialists (CAPEs) are a select group of teachers who have specific training in physical education (PE) for students with disabilities. The competencies necessary to be a CAPE have been outlined (Lytle, Lavay, & Rizzo, 2010); they

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include general PE content knowledge, safety, disability studies, assessment methods, knowledge of laws and individualized education programs (IEPs), individual teaching and learning styles, adaptations and modifications, collaboration and consultation, advocacy and inclusion practices, community and family resources, and professional leadership.

Such specialized skills and knowledge are essential when teaching students with unique, complex needs. Students with autism spectrum disorders (from here on referred to as autism) are one such population. Autism is the most prevalent developmental disability, affecting 1 in 68 children in the United States (Centers for Disease Control and Prevention, 2014). With its definition recently amended (American Psychiatric Association, 2013), it is now defined by symptoms present in two categories (as opposed to the previous three categories): social and communication deficits and repetitive and restrictive behaviors. A recent meta-analysis also demonstrates the prevalence of motor deficits in children with autism, and the researchers concluded that motor coordination deficits, including movement planning, upper extremity motor functioning, and gait and balance, are cardinal features of autism (Fournier, Hass, Naik, Lodha, & Cauraugh, 2010).

As PE environments can be highly physical, social, dynamic, competitive, and sensory stimulating, the symptoms associated with autism may conflict with the demands of PE. Researchers have recently highlighted many concerns that general physical educators have when including students with autism into their programs including inattentive and hyperactive behaviors, social isolation, emotional difficulties, problems understanding and performing tasks, and a narrow focus and inflexible adherence to routines (Obrusnikova & Dillon, 2011). However, overcoming these challenges is imperative because physical activity may have great benefits for children with autism. For example, Pan (2014) documented that physical activity interventions improve motor skills and fitness levels in children with autism. Therefore, a focus on motor skills and fitness levels is warranted and of utmost necessity so individuals with autism may attain and enjoy a more active lifestyle.

For many students with autism, PE is the responsibility of CAPEs. It is assumed that CAPEs receive specialized training and

experiences needed to provide an appropriate, safe, and successful PE program for students with autism. However, little is known about the method of preparing CAPEs to teach students with autism. The purpose of this study was to (a) survey practicing CAPEs to understand their training experiences in their APE teacher education program specific to teaching students with autism and (b) define the specific content and information needed in APE teacher preparation programs to prepare future APE specialists effectively to teach students with autism.

Method

Participants

To achieve the purposes of the research, 400 randomly selected CAPEs were e-mailed an invitation to participate in the study; contact details were obtained from the database of CAPEs housed in the Adapted Physical Education National Standards (APENS) office. Sixty-six e-mails were incorrect, resulting in 344 CAPEs receiving the e-mail invitation to participate. One-hundred six CAPEs, representing 22 states (see Table 1 for the distribution of participants per state), completed the survey for a 31% response rate. Age range of participants was 22 to 67 with a mean age of 42 years. Seventy-two percent of respondents were female. To achieve the second purpose, in addition to the CAPEs, a group of experts in APE and autism (N = 11) was also involved. This group consisted of professors of APE, professors specializing in autism, and other experts with practical experience in teaching students with autism and in preparing CAPEs. They were responsible for creating the provisional list of competencies deemed necessary on a course focused on APE and autism.

Table 1
Participants per State

State	No. of participants	State	No. of participants
AK	2	CA	1
AL	1	DE	2
AZ	1	FL	2

Table 1 (cont.)

State	No. of participants	State	No. of participants
GA	5	NM	1
IL	5	NY	6
IM	1	NC	3
MA	1	ND	1
MD	11	OH	8
MI	2	OR	1
MT	1	PA	1
NH	1	RETIRED	3
NJ	1	MX	1

Procedures

A survey methodology was used to fulfill both research purposes. First, to understand teaching and training experiences of the CAPEs, participants were asked to provide information pertaining to the number of years of experience they had in teaching students with autism as well as the nature of and their satisfaction with the training received focused on teaching students with autism.

To fulfill the second aim, defining content for a course on APE and autism, a two-step process was followed. First, the expert group generated a preliminary list of competencies deemed necessary for CAPEs to instruct students with autism effectively. Together, experts generated a final list of 17 competencies that they believed were important for CAPEs to know with regard to teaching PE to students with autism. Second, an online survey was used to assess the CAPEs' opinions on the 17 competencies defined by the experts. Participants were specifically asked, "Please provide your feedback on whether a particular content/competency regarding autism should be included in an APE preparation program." Participants responded to the necessity of each content/competency using a 1–5 Likert scale with 1 = *definitely yes* and 5 = *definitely no.* Finally, participants were asked if they had suggestions as to how APE teacher preparation programs could most effectively prepare future CAPEs to teach students with autism. This ensured the final list of competencies most reflected the demands experienced by practicing CAPEs.

Data Analysis

To address the first research question, quantitative and qualitative methods were used. Basic descriptive statistics were computed for quantitative items. For open-ended questions, including how "teacher preparation programs could most effectively prepare physical educators to work with students with autism" and identification of what "content areas (if any), related to teaching students with autism, do you feel you require additional training in," the researchers independently coded the answers and grouped them into themes using the method suggested by Braun and Clarke (2006).

To address the second research question, defining the content necessary in APE teacher preparation programs focused on students with autism, quantitative and qualitative methods were used. To evaluate the CAPEs' opinions on the validity of the experts' provisional list of competencies, descriptive statistics were computed. To analyze the CAPEs' suggestions of additional competencies that they deemed necessary for future APE teacher training programs, thematic analysis was again used (Braun & Clarke, 2006).

Results

Education

Sixty-eight percent (n = 72) of respondents held a master's degree as their highest level of education, 17% (n = 18) completed a bachelor's degree, and 15% (n = 16) completed a doctorate degree. The majority of respondents completed a bachelor's degree in health and PE (n = 70), followed by kinesiology (n = 9), with some students studying subjects including special education (n = 2), exercise sports science (n = 4), and movement (n = 1).

The specific major for the 72 who completed a master's degree varied. Of these participants, more than half (n = 39) majored in APE, 14% in special education (n = 10), and 13% in PE (n = 9). The remaining 19% majored in subjects such as administration and curriculum (n = 6), exercise and sport science (n = 2), health (n = 4), psychology (n = 1), and kinesiology (n = 1).

In regard to preparation to teach students with autism, 83% of participants did not take a specific course in teaching students with autism in PE, and 61% did not take a specific course in special edu-

cation related to autism. Only 48% of respondents stated that they were satisfied with how their graduate program in APE prepared them to work with students with autism, leaving 14% dissatisfied, 5% very dissatisfied, and 33% neutral. On average, the participants had 12.9 years of experience teaching students with autism.

Training Needs

Participants were asked to identify areas in which they felt they required additional training related to teaching students with autism. Forty-eight participants responded to this question, identifying 11 areas (Table 2). The most prevalent area highlighted was behavior management, which 25% of participants identified as being an area in which they required further training. This was followed by communication (6%) and curriculum development (6%).

Table 2
Areas in Which APE Specialists Expressed a Need for Further Training

Content area	No. of participants
1. Behavior management	12
2. Communication strategies	3
3. Curriculum development	3
4. Technology/assistive devices	1
5. Individualized education programs	1
6. Interaction with paraprofessionals	1
7. Professional collaboration with other APE specialists	1
8. Assessments	1
9. Inclusion	1
10. Visual supports	1
11. Teaching a self-contained class of students with ASD	1

Suggestions for Future Teacher Preparation

The majority (over 93%) of CAPEs agreed (yes or definitely yes) with the expert-generated list of competencies necessary for teaching students with autism. As a result, 17 items were agreed upon as being the recommended content requisites for a course on au-

tism for preservice CAPEs (see Table 3). When asked for additional suggestions on how to prepare CAPEs most effectively to teach students with autism, participants identified no additional competencies. However, many of the respondents noted the following as being particularly important for the training of preservice CAPEs to teach students with autism: practical experience (42%), observation of students with autism (9%), and training in behavioral support strategies (13%).

Table 3
Participant Agreement With the Expert-Generated List of Competencies Deemed Necessary on a Course for Preparing APE Specialists to Teach Students With Autism

Content areas	APE specialist agreement
1. Knowledge of sensory impairments associated with ASD	97%
2. Knowledge of motor impairments associated with ASD	97%
3. Knowledge of social impairments associated with ASD	95%
4. Strategies for communicating with students with ASD	97%
5. Developing social skills related to physical activity (turn taking, choosing partners, etc.)	98%
6. Knowledge of behavioral characteristics associated with ASD	97%
7. Positive behavioral support strategies	97%
8. Knowledge of the effect of common medical conditions for individuals with ASD	84%
9. Motivational strategies	93%
10. Methods for adapting activities/games for students with ASD	96%
11. How to modify assessments for students with ASD	93%
12. Awareness of potential safety concerns related to students with ASD	97%
13. How to create a safe and supportive learning environment	96%
14. Curriculum planning and goal and objective setting for students with ASD	89%
15. Knowledge of specific models and strategies to teach students with ASD (e.g., TEACCH model, social stores, modeling, and prompting)	94%
16. Experience through observing a student with ASD	88%
17. Practical experience of working with a student with ASD	98%

Discussion

Defining Course Content

According to this study, it is suggested that current APE teacher training programs take a closer look at how training related to teaching students with autism is provided. Only 48% of the respondents were satisfied with how their graduate program in APE prepared them to work with students with autism. It is suggested that the competencies identified in this study (Table 3), as agreed upon by experts and CAPEs, be incorporated as objectives in APE course syllabi. This would aid in the development of comprehensive teacher training programs and ensure that future CAPEs have the knowledge and insight necessary to teach PE to students with autism.

For preservice CAPEs, it appears that a specific course (or at a minimum more information in existing coursework) on autism is warranted. One issue with creating new courses or strengthening existing courses is the limited knowledge about autism of faculty in many universities. Piletic and Davis (2010) found that only 60% of professors teaching an introduction to APE course had terminal degrees in APE. In addition, autism is still a relatively new area such that special education and PE departments may not have professors with specialization on this topic. One solution is to provide distance education supplements via e-learning on issues related to autism to university faculty who are responsible for teaching APE coursework (Scott & Scott, 2010). Such e-learning supplements, created by experts in autism, could be posted on the Web and then used by faculty with limited expertise on teaching students with autism. In addition, e-learning allows course instructors to present videos for the student to see the use of specialized techniques, such as visual supports, video modeling, and peer tutoring. E-learning is still a relatively new teaching tool in APE, but it appears to have tremendous potential for providing new information and support to preservice and in-service physical educators.

The participants in this study also revealed that in-service CAPEs are in need of training to teach students with autism better; most prominently they reported a need for increased training in behavior management, communication strategies, and curriculum development. Professional development focused on these needs should be

offered to in-service CAPEs, whether through traditional professional development workshops or online courses.

Practical Experiences

Participants of this study noted that the practical experience of working with students with autism is a key component in CAPEs' preparation. Indeed, practical experiences have long been identified as an integral component of teacher preparation programs (Van Laarhoven, Munk, Lynch, Bosma, & Rouse, 2007) and have been touted as the most influential educational experience preservice teachers will have (Stowitschek, Cheney, & Schwartz, 2000). Although researchers have not yet examined the effect of the practical experience on CAPEs, they have revealed improvements in attitude and competence toward teaching students with disabilities in preservice general PE teachers after completing a practical experience (Ellis, Lepore, & Lieberman, 2012; Hodge, Tannehill, & Kluge, 2003). It is clear that the practicum experience for CAPEs could provide such benefits, allowing for the knowledge and skills learned in class to be applied and a positive attitude and disposition to teaching students with autism to be fostered. The preservice teacher should be fully supported through the teaching practicum and feedback provided on their teaching from experts. In addition, opportunities should be provided for the teacher to work with diverse student populations. The experience gained from teaching a student with autism is not comparable to the time spent with another student population; the diversity of students in schools should be reflected in a preservice teacher's placement setting. Research by Hodge, Davis, Woodard, and Sherrill (2002) showed that the practicum type (off campus and on campus) was not significantly different in the effects on the preservice teacher. Therefore, educators of CAPEs should consider both options as viable in their efforts to prepare their students.

Increased Training in Behavioral Support Strategies

Reschly and Holdheide (2008) found that teachers who are skilled in evidence-based instruction, classroom organization, and behavior management had the competencies to establish effective learning environments. However, novice teachers have expressed a lack of preparedness and readiness to deal with problematic behaviors (Cooper, Kurtts, Baber, & Vallecorsa, 2008), especially among

students with special needs in inclusive settings (Billingsley, Israel, & Smith, 2011; Regan & Michaud, 2011). Research with general PE teachers and CAPEs has revealed several behavioral challenges associated with teaching students with autism (Lavay, Guthrie, & Henderson, 2014; Obrusnikova & Dillon, 2011). Similarly, participants in this study expressed a need for increased training in behavioral management strategies. Future CAPE training programs should address these needs by providing evidence-based practices to their students, for example, use of visual schedules and visual cues, use of alternative forms of communication (i.e., pictures, sign language), positive reinforcement, and establishing routine (Groft-Jones & Block, 2006). In addition, preservice CAPEs should be given the opportunity to implement these newly learned strategies in practical settings. In-service teachers must also be given the opportunity to acquire these strategies through professional development workshops. This recommendation is reflected in research in which researchers have called for increased quality in in-service training in behavior management for CAPEs (Lavay et al., 2014). Increased competence in behavioral support strategies would result in more effective CAPEs and more success for students with autism in PE.

Conclusions

The CAPEs in this study provided insights into their readiness to teach students with autism and gave their perspective of how teacher education programs can best prepare future CAPEs. Results reveal a high level of dissatisfaction with teacher preparation in this area. Recommendations have been made as to how teacher training can be improved, including increased practical experiences, training in behavior management strategies and the provision of a course specific to teaching PE to students with autism. The participants also provided their opinions on a list of content areas that experts deemed necessary on a course to teach CAPEs to work with students with autism; 17 content areas were suggested for inclusion in future courses to train APE specialists. Future research should further explore training needs of CAPEs in teaching students with autism as well as students with other disabilities.

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PEDAGOGY

Teachers' Perceptions of Using Movement in the Classroom

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Abstract

A mixed-methods design was employed to explore classroom teachers' perceptions of using movement in the classroom. Questions on a written survey and in interviews were focused on gaining understandings of teachers' knowledge of the connections between movement and learning, their perceptions about movement as a teaching strategy, and the role of schools in addressing physical inactivity. Teachers reported a lack of knowledge related to movement in the classroom but were willing to learn more and add movement to their "teaching toolbox" with support and training. They also believe that schools should have a role in increasing physical activity opportunities in youth.

Children throughout the world are facing an unprecedented obesity epidemic. Obesity is one of the most significant public health issues facing the international community in this century (World Health Organization [WHO], 2014). According to Onis, Blossner, and Borghi (2010), 43 million preschool children worldwide are estimated to be overweight or obese and 92 million are at risk for overweight (p. 1259). Despite that obesity data can be challenging to compile, the International Association for the Study of Obesity (IASO, n.d.) provides statistics for various countries. Selected sta-

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tistics from the international community include 21.1% of girls and 23.1% of boys are overweight or obese in Brazil, 24.0% of girls and 22.0% of boys are overweight or obese in Australia, and 34.7% of girls and 32.7% of boys are overweight or obese in Italy (IASO, n.d.). Obesity is a problem affecting significant numbers of children around the world.

Obesity is a condition mediated by genetic, behavioral, and environmental factors (Daniels et al., 2005). Data from the National Health and Nutrition Examination Surveys (NHANES) collected in 1976–1980 and 2009–2010 show the prevalence of obesity in the United States has more than tripled for those aged 2 to 19 years (5.0% to 17%; Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). The potential health effects of obesity on the well-being of youth are devastating. Excess body fat is associated with high blood pressure, type 2 diabetes, high cholesterol, stroke, several cancers, and some forms of arthritis (Dietz, 1998; Singh, Mulder, Twisk, Van Mechelen, & Chinapaw, 2008). Health risks are not the only concerns; in several large-scale studies, BMI has been shown to have a significant negative correlation with academic performance in children (Castelli, Hillman, Buck, & Erwin, 2007; Datar, Sturm, & Magnabosco, 2004). Recent progress has been made in the fight against obesity, but more work still needs to be done, especially in light of the significant effects overweight and obesity can have on children and the adults they become.

A major factor contributing to childhood obesity is a lack of physical activity. It is recommended that children and adolescents participate in daily physical activity for at least 60 min; however, the physical activity patterns of youth have been on a steady decline nationwide. Results from the Centers for Disease Control and Prevention (CDC, 2012) Youth Risk Behavior Survey, which collects data from students in Grades 9–12 in the United States, indicate that 13.8% of students had not participated in physical activity on any day in the past 7 days and only 49.5% reported that they were physically active 5 or more days in the past 7 days. Only 28.7% reported meeting the recommended amount of physical activity in the past week. Clearly, adolescents are not meeting the recommended amounts of physical activity.

Schools have been identified as ideal settings to help young people improve and maintain healthy eating and physical activity behaviors

to prevent or reverse obesity (Institute of Medicine of the National Academies [IOM], 2013; Lagarde et al., 2008; Pate et al., 2006). After the family, school is one of the most influential institutions in children's social, emotional, and cognitive development. Schools are also a place where students are physically inactive, with up to potentially 6 hr a day of sedentary behavior (Donnelly et al., 2009). The WHO and more recently the IOM and the White House Task Force have called upon schools to adopt policies and implement strategies to increase the physical activity levels of students (IOM, 2013; Lagarde et al., 2008; White House Task Force on Childhood Obesity, 2010). Selected recommendations from these documents include conducting needs assessment, implementing schoolwide policies, supporting quality physical education, engaging all stakeholders within the school environment, and increasing opportunities for physical activity in the classroom. Schools have one of the most promising opportunities to address the global issue of physical inactivity in youth directly.

Schools should be considered as one of the main institutions for addressing physical inactivity not only because of the amount of time spent at school and the influence schools can have on student development, but also because of the increased amounts of research that suggest that physical activity can have positive benefits on academic outcomes. Evidence from multiple studies and research reviews suggests that physical activity improves many academic outcomes, including overall academic success, cognitive performance, reading and math skills, increased on-task classroom behavior, creation of positive learning experiences for students, and improved levels of concentration (CDC, 2010; Fredericks, Kokot, & Krog, 2006; Lowden, Powney, Davidson, & James, 2001; Mellecker, Witherspoon, & Watterson, 2013; Robert Wood Johnson Foundation, 2009).

Regardless of the method to increase physical activity in schools, classroom teachers are critical stakeholders (Lagarde et al., 2008). Bringing teachers on board with movement initiatives is essential, but can be difficult (Lagarde et al., 2008). Given the significant opportunity schools have to affect physical inactivity and the obesity epidemic, it is critical to understand teachers' perceptions about movement to increase movement in schools. To date, there have been recommendations about the need for movement in schools,

studies in which specific movement curricula and/or programs (some of which include teacher perceptions) are examined, but limited research on broader teacher perceptions about using movement in the classroom. Therefore, the purpose of this study was to examine classroom teachers' perceptions about integrating movement in the classroom to gain a better understanding of the extent to which physical activity is being used in classrooms, teachers' understanding and opinions of using movement in the classroom, and potential resources necessary to assist teachers in increasing the use of movement in the classroom.

Method

Methodological Design

A mixed-methods research design with an emphasis on qualitative methods was implemented to examine classroom teachers' perceptions about integrating movement in the classroom. The researchers used an exploratory approach, based on grounded theory methodology and principles, for the qualitative portion of the study to gain a deeper understanding of the perceptions and needs of a particular group, in this case classroom teachers (Creswell, 1998; Strauss & Corbin, 1990). The quantitative portion of the design (Movement Survey described below) was used to support the main qualitative methodology.

After participants submitted the Movement Survey, one researcher conducted individual semistructured interviews with participants, allowing for the researchers to gain an in-depth understanding of classroom teachers' perceptions about using movement in the classroom. The semistructured interview format afforded the researchers the opportunity to probe more deeply into participants' responses and ask follow-up questions, leading to richer, more robust data. Having one researcher conduct all the interviews allowed for consistency in the data collection process and enhanced the quality of the data. This also provided an opportunity for independent analysis of the data by each researcher, which minimized bias.

Participants

Seventeen participants enrolled in the study (15 females, two males). After data analysis was completed, the researchers deter-

mined that data saturation had been reached, and no additional participants were recruited. The average age of the participants was 39.7 (± 10.7) years, and the teachers had an average of 11.3 (± 6.8) years of teaching experience. Selected demographic data of participants are provided in Table 1.

Table 1
Subject Demographics

Gender (Female)	88%
Age	39.7 (± 10.7)
Number of Years Teaching	11.3 (± 6.8)
Grade Level	47% High School 24% Middle 29% Elementary
Subject Area	24% Science 18% Health Education 17% Health Education and Physical Education[a] 24% History/Social Studies 6% Mathematics 6% Foreign Language
Level of Education (Master's Degree)	77%
Previous Professional Development	82%

[a]These participants were included because they taught health education in a traditional classroom setting in addition to physical education.

Data Collection Procedures

The researchers obtained institutional review board approval from Boston University. Merrimack College entered into an authorization agreement with Boston University. The researchers implemented convenience, purposeful sampling to recruit classroom teachers currently practicing in the field. The researchers directly contacted teachers known to them and requested participants to recommend colleagues (snowball sampling). Teachers interested in the study returned informed consents to one of the researchers

and enrolled in the study. Upon enrollment, teachers completed a Movement Survey, which included demographic information, a series of Likert scale questions related to movement in the classroom, and an open-ended question for further comments. The interviews lasted 15–30 min, were conducted over the phone or in person, and were recorded for data transcription.

Instruments

The researchers designed the Movement Survey to help support the data collected during the interviews as a means of data triangulation. The survey included basic demographic information (age, years teaching, grade level taught, etc.) as well as a series of statements. In the first six questions, participants were asked to rate their knowledge about movement and physical activity (responses ranging from 1 = *no knowledge* to 5 = *very knowledgeable*), and in the next 10 questions, they were asked to rate their feelings and attitudes about using movement in the classroom (responses ranging from 1 = *strongly disagree* to 5 = *strongly agree*). Likert scale questions are included in a table in the Results section. Space was provided for participants to include additional comments. Responses for this section were limited, so data are included with the interview data.

The researchers designed the interview guide using a semistructured format because they wanted to maintain consistency throughout the interviews to enhance the integrity of the data without losing the opportunity to follow up with questions and/or delve more deeply into responses. One researcher conducted all interviews to further support the quality of the data. The researchers developed the interview guide specifically for this study. Teachers answered open-ended questions regarding their use of movement, their understanding of connections between movement and learning, and the role of schools in addressing students' lack of physical activity. Selected questions from the interview guide are presented in Table 2.

Table 2
Questions From the Interview Guide

Questions related to movement in the classroom
What do you think of when you hear the phrase "movement in the classroom" or "classroom-based physical activity"?
Do you use movement in your classroom?
What is your understanding of the connections between movement and learning?
What do you think are the benefits of using movement in the classroom?
What do you think are the barriers and/or challenges of using movement in the classroom?
Do you think that teachers should integrate movement into the classroom? Why or why not?
What types of supports or resources would you want and/or need in order to incorporate movement into your classroom?
Questions related to movement in schools
Do you believe that lack of movement and physical activity in schools is a problem? Why or why not?
Do you think that schools should have a role in increasing students' physical activity levels outside of physical education and recess? Why or why not?
What practices does your school currently use to get children active during the school day?

Data Analysis

For the quantitative data, basic descriptive statistics—mean and standard deviation—were calculated for the Likert scale question. In addition, the total score of knowledge of movement and attitude

toward movement was calculated by adding the score for each item together (i.e., the range for the knowledge score was 6–30 and for the attitude score was 10–50). Internal consistency for each scale was calculated. To explore which demographic factors were related to knowledge and attitude scores, ANOVA and correlations analyses were performed using SPSS 21.0, with alpha set at $p < .05$.

The qualitative data were analyzed using the general inductive process, as described by Thomas (2006), which allowed the researchers to uncover the most dominant themes from the data as they related to the purpose. Initially, both researchers read the transcripts independently and in their entirety to gain a sense of the data and to evaluate the data without bias. The researchers continued this holistic evaluation of the data multiple times, and during the second and third "read-throughs," the researchers assigned labels for emerging themes that they then organized into the major themes. Upon completion of the independent reviews by the lead authors, the researchers reviewed the themes and supporting data via phone and e-mail. Both researchers discovered the same themes in the data, so minimal discussion was needed to come to consensus. The researchers shared the results with the third author, who was not a researcher on the project, but served as an independent reviewer with knowledge of the subject matter of the study. The third author confirmed the themes.

Data Credibility

A minimum of two strategies should be implemented during a qualitative investigation (Creswell, 1998). Four were used in this study: peer review, multiple analyst, member checks, and the survey. The third author, who reviewed all transcripts, final themes, and conclusions, conducted the peer review. The multiple analyst triangulation was completed by the two lead authors when they independently completed data analysis. Participants reviewed the final transcripts before analysis, serving as the member check. Finally, the survey, which was a second form of data collected in the study, served as triangulation for the interview data.

Results

Quantitative Data

Quantitative data were used primarily as a method of triangulation to support the qualitative data. A summary of the knowledge and attitude scales is presented in Table 3. Table 4 shows the means and standard deviations of both scales by demographic factors. Internal consistency was calculated for both scales. Alpha for the knowledge scale was .76 and for the attitude scale was .84.

Table 3
Likert Scale Question Results

Question	*M*	*SD*
Teacher Perceptions of Knowledge of Movement in the Classroom Response choices were 1 = *no knowledge,* 2 = *little knowledge,* 3 = *neutral,* 4 = *some knowledge,* 5 = *very knowledgeable.*		
The health benefits of physical activity.	4.7	0.5
The relationship between movement and learning.	3.8	0.8
The benefits of integrating movement into the classroom.	3.7	0.8
The relationship between movement and student behavior in the classroom.	3.6	0.6
Student attitudes toward movement in the classroom.	3.1	1.0
Methods for integrating movement into the classroom.	3.1	1.2
Teacher Attitudes (Feelings) Toward Movement in the Classroom Response choices were 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral,* 4 = *agree*, 5 = *strongly agree.*		
I believe that students would benefit from movement in my classroom.	4.7	0.6
In the future, I would like to integrate movement into the curriculum.	4.6	0.6
I believe that my administration would support integrating movement into the classroom.	4.5	0.6

Table 3 (cont.)

Question	*M*	*SD*
I think that integrating movement into my classroom would be a positive experience for both my students and me.	4.5	0.6
I believe that my students would enjoy if I integrated movement into my classroom.	4.4	0.9
I think that with training and support, I would integrate movement into my classroom.	4.4	0.7
I would like training or professional development about integrating movement into the classroom.	4.2	0.7
I am comfortable integrating movement into the curriculum.	3.6	1.1
I currently utilize movement to help teach concepts in the classroom.	2.8	1.3
I think that integrating movement into my classroom would cause class management issues and would be disruptive.	2.5	0.9

Table 4
Teacher Perceptions of Knowledge of and Attitudes Toward Movement in the Classroom

Demographic information	Knowledge *M* (*SD*)	Attitude *M* (*SD*)
Gender		
Male	20.00 (7.07)	37.50 (14.85)
Female	22.33 (2.97)	40.53 (4.05)
Grade level		
Elementary school	22.75 (4.50)	40.75 (2.87)
Middle school	22.00 (2.83)	43.00 (0.00)
High school	21.82 (3.34)	39.45 (6.47)
Subject taught		
Health/PE	22.67 (2.52)	42.33 (1.51)
Health	24.67 (.58)	42.67 (1.53)
Other	21.18 (3.74)	39.00 (6.42)

Table 4 (cont.)

Demographic information	Knowledge *M* (*SD*)	Attitude *M* (*SD*)
Level of education		
Bachelor	21.25 (4.79)	39.75 (9.00)
Master	22.31 (3.03)	40.31 (4.31)
Professional Development		
Yes	23.00 (2.83)	42.50 (3.87)
No	21.77 (3.59)	39.46 (5.72)

The descriptive statistics showed that teachers were knowledgeable about the health benefits of physical activity but reported limited knowledge related to movement and learning in the classroom. The teachers were the least knowledgeable in the statements about student attitudes toward movement in the classroom and methods for integrating movement into the classroom. In terms of teacher attitudes, they expressed a strong interest in integrating movement even though most were not currently using it. ANOVA analysis showed no differences of knowledge and attitude scores in terms of gender, grade level, subject taught, level of education, and professional development opportunities. Teachers with previous professional development opportunities also showed a higher trend of scores on both scales.

Correlation analysis showed that teacher age was negatively correlated to the knowledge score, $r = -0.52$, $p < .05$, indicating that the younger the teacher is, the more knowledge of movement in classroom the teacher has. In addition, years of teaching was negatively correlated to the attitude score, $r = -.59$, $p < .05$. This indicates that teachers with less teaching experience tend to have better attitudes toward movement in classroom.

Qualitative Data

An overview of the major themes and subthemes is provided in Figure 1. In-depth descriptions with data from the interviews are presented next.

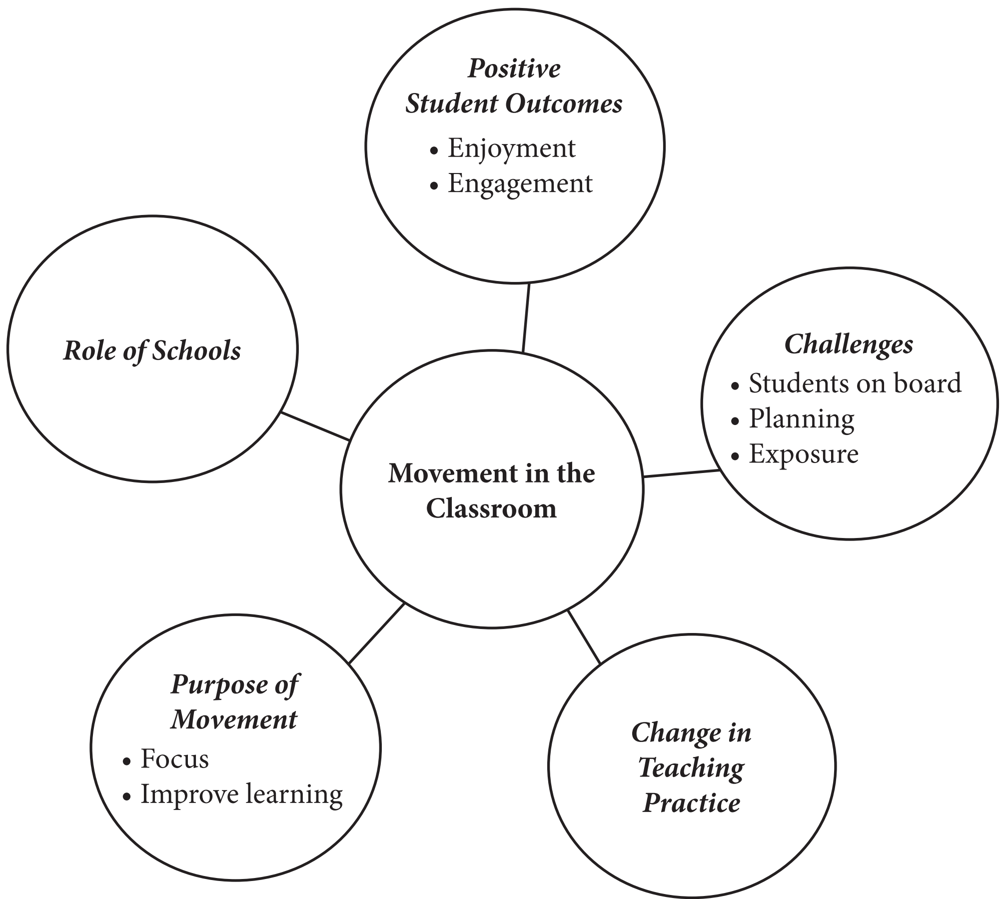

Figure 1. Themes and subthemes.

Positive student outcomes. Many teachers discussed that students enjoy moving in the classroom and that movement increases students' engagement with their academic content. Teachers reported that they use movement to give the students a break before returning to academic content. They also felt that movement helps refocus students. Finally, teachers also felt that the students enjoy using movement in the classroom.

Participants felt that students enjoy the use of movement in the classroom. Tennis Girl explained,

> Movement helps learning for a lot of different reasons, because I think kids are excited to move and they feel good

> about moving and because their brains are stimulated and that helps their learning and just that they have positive attitudes towards doing anything besides just sitting in their desks.

Tracy supported this: "I saw the kids getting excited about what they were doing on a different level than it would be before." Many participants discussed that students find movement fun and that it provides a unique element to the class that students and teachers find enjoyable.

Teachers in this study who use movement shared that they believe that physical activity increases student engagement. Kelly explained, "I would say the biggest thing is engagement, because the kids can't just sit there and disengage if their main goal is to move around and to engage with each other and with the content." Tracy expressed a similar view: "I think of kids being engaged in what they are doing . . . And I see them, basically engaged would be the word that comes to my mind."

Purpose of movement. Participants in this study described that they use movement primarily to focus students and to improve learning. Most participants reported that they use movement in their classrooms, but most do not use it on a regular basis. However, all explained that they use movement when they feel students need to refocus or when they need to reinforce or improve learning outcomes.

Carol explained that movement "makes them a little alert, I think, if they have to get up and move around." Veronica said, "If I don't give them a break, then they check out, they get antsy; I notice more behavioral problems." Veronica further explained, "It's mostly for relief from the academics. I use it as rewards, too." In her survey, Carol wrote,

> I teach double period science classes (100 min) to sixth grade students. (I see students for a double period, every other day.) They NEED to move during that time period. Having them sit for this much time is not a good option. . . . especially in the afternoons.

Marcie summarized this theme: “The attention, like I said, is the number one thing.” Participants in this study felt that a primary purpose of movement in the classroom is to help students focus and/or to increase attention.

Many participants also discussed a connection between the use of movement and student learning outcomes. Emma and Gabriella discussed using movement to help with retention: “Certain movements can be associated with certain vocabulary words or training, like its reminders, associations” and “The word with a movement to help them remember things, and it’s especially good for kinesthetic learners, but it’s really, I think, good for everybody.” Patricia mentioned a similar example with her elementary school students:

> Last week, the word was sprang, and we tried to talk about what that sprang meant, so acting out what does that mean and having them actually act out to move quickly. I think it just makes them remember it more.

Kate explained that she feels that movement helps student learn because “they can sort of replay it in their mind because they made a more meaningful memory about it versus just kind of studying the flash card.” Overall, teachers explained that they believe that using movement can help students retain the information and increase their ability to learn and remember material.

Change in teaching practice. Teachers described that to integrate movement into their classrooms in a meaningful way would require a change in the way they think about teaching or in the way they teach. For example, Tracy mentioned that after using movement in her classroom, “I see that I am losing kids now. I’m much more aware of it than I used to be.” Emma discussed a similar thought: “I think it lets me see students in a different light that maybe I hadn’t seen before that are successful.”

Many participants also discussed that using movement requires a shift in the way teaching and learning is viewed. Elizabeth explained, “I’m always up for some new way of thinking about teaching and learning, so I’m always happy to hear about some new way to think about learning a complicated idea through physical activity.” However, she also felt, “It hasn’t sort of fully integrated itself into the way I think about my classroom,” which again suggests the need for

a change in teaching practice. Tennis Girl discussed a slightly different angle to this idea when she explained why people may not use movement:

> Probably just because it's too much work to think of ways and maybe they're just old school and they don't want to take kids out of the classrooms; they want to be able to control them more easily in their desks.

Kate described a similar thought:

> I'm just going to pour my information into you, you're an empty vessel and I'm pouring the information into you, I think that those people, if they were to walk past my classroom, they might look in and say, "What . . . is going on there? There's nothing but chaos going on in there. You can't possibly tell me that those kids are learning." But they are.

Teachers discussed this theme from different angles (their own teaching, teaching practice, teaching and learning), but all discussed that integrating movement into their classrooms, or into classrooms in general, takes a significant shift in the way teachers think about teaching and learning and/or their own teaching practice.

Challenges. Participants discussed challenges to using movement in the classroom. Three major challenges were discussed: getting students on board with movement in the classroom, planning for movement, and a lack of exposure on how to use movement in the classroom.

Teachers who use movement described that it can be challenging to get students to "buy into" using movement during class. Nicole explained, "As a teacher, you want to build relationships and trust with your students, not having them think your activities are stupid, as if you're a loser." Marcus shared a similar sentiment: "I think for me it would be more of how can I convince my students to take this seriously." Gabriella brought up another point:

> When kids aren't used to it, then they can be reticent, resistant; if they feel uncomfortable about their bodies, maybe they don't want to do it. If they are very particular

> about their clothes or their hair depending on how active the movement, it depends on how much jumping around you are doing, I guess.

Helping students understand the importance of movement and finding ways to integrate movement that can reach all students are two components of getting students on board.

Participants in the study felt that planning for movement is a significant challenge. They felt that teachers have many demands placed on them and that integrating movement is another "thing" that they would have to try and "fit into" their curriculum. They also mentioned the barrier of "logistics," including classroom management and space. In her written survey, Veronica explained that she teaches in a school with an "open-classroom" concept where she cannot "do the physical activity movements with my student because it disturbs other classrooms." In terms of movement as an addition to the curriculum, Marcus explained, "That with my academic discipline, it is hard to think of that in a planned way." Gabriella explained, "It can be hard to think of how to incorporate it curricularly so it's not just a break." Emma also discussed, "There is so much curriculum to cover, and there are so many things I am supposed to be doing with the kids, I need to make sure that I can double up." A number of participants also mentioned that physical space can be a problem: "You have to be able to control the kids and you've got to be able to control just where you were able to do movement . . . or just kind of the logistics of it can be an issue" (Tennis Girl) and "I think the biggest thing is just behavior management and then refocusing them after" (Kelly).

Participants in this study described a lack of exposure on how to integrate movement into the classroom. One participant wrote in the survey,

> Little research has been passed around to the "people who matter" for it to become a norm. I believe that if articles from well-respected educational magazines/websites/research were presented to administration, it could be passed down the appropriate chain and become a norm in the classroom.

Samantha stated, “So, I just would love to see them move more, but I don’t have a lot of ideas as to what I can do as part of my class to do that.” Stacy explained that she does not regularly include movement “probably because I don’t have more training and more ideas and more activities in what to do.” Marcus explained, “I don’t have a good sense of how it would make my class better or what I could do to make it productive.” In her written survey, Nicole stated, “I am very excited about learning more about how to add this into my classroom routine and help my students ‘engage’ in the classroom materials.” It seems that many teachers identified not only a need for further information and examples of how to increase the amount of movement in the classroom, but also that they are willing to learn more about how to integrate movement effectively.

Role of movement. Participants felt that schools should have a role in addressing the movement needs of students. Marcus said,

> I think the short answer is yes . . . I don’t think we find enough avenues for kids to do things physical in general . . . I think it would be better for them to have more active outlets, and therefore if the school can provide them, that [would] be good.

Gabriella believes that “if you can incorporate physical activity in small ways throughout the day, it’s probably helpful because every little bit counts and helps you.” Finally, Kelly stated,

> Why not? I mean . . . I think it’s that important. Like I said, there [are] the obvious benefits of it in a classroom, and I think that we’re teaching these kids in general how to succeed in life. And I think that it’s important at least to have small movement things and to have conversations about it, just teaching these kids how to live a healthy life and be successful. Because if we’re not doing it in school, there is a chance that these kids aren’t hearing it . . . but yeah I think it’s really important.

Discussion

We examined classroom teachers’ perceptions about integrating movement in the classroom to gain a better understanding of the ex-

tent to which physical activity is being used in classrooms, teachers' understanding and opinions of using movement in the classroom, and potential resources necessary to assist teachers in increasing the use of movement in the classroom. Despite a lack of using movement in the classroom, teachers reported positive associations with movement in the classroom and a desire to learn more about movement as a strategy in the classroom. Significantly, teachers in the study believe that schools should have a role in addressing physical inactivity in youth.

Teachers who were younger had higher knowledge and more positive attitudes toward movement in the classroom. This may be due to younger teachers feeling that physical activity is important for health and educational outcomes in children and perhaps due to preservice program faculty beginning to address physical activity and to increasing awareness (Goh et al., 2013; Webster, 2011; Webster, Monsma, & Erwin, 2010). In addition, teachers who had professional development opportunities showed the trend of higher scores on both scales compared to those who did not have those opportunities. This is supported by recent research in which teachers who received increased facilitator support and a social marketing campaign reported increased exposure and self-efficacy in regard to movement breaks and more frequent regular use of physical activity breaks (Delk, Springer, Kelder, & Grayless, 2014). Support, in the form of professional development or more direct support, increases the likelihood of increasing movement in the classroom. Together, these findings suggest that an increase in preservice training as well as professional development opportunities about using movement in the classroom may help prepare them to be more knowledgeable and confident to implement movement in the classroom.

No difference was found in the knowledge or attitude scales for health and physical education teachers. This finding is surprising because PE and health teachers' coursework and professional training include a focus on physical activity and being physically active (Dyson, 2014). In turn, teachers in these fields seem more likely to use movement in their classrooms; however, our results do not support this idea. Perhaps this provides further support of the paradigm shift that many participants discussed as necessary to use movement in the classroom. Even teachers with more knowledge about physi-

cal activity may find it challenging to transfer that into the classroom and/or may not have the skills or confidence to apply their knowledge from the gym into the classroom in the specific context of movement and learning. This area should be explored further as health and physical educators, because of the training they receive, are poised to be leaders for increasing physical activity in schools.

Participants in this study overwhelmingly reported either experiencing positive benefits from using movement in their classroom or believing that using movement can lead to positive outcomes. Teachers also identified outcomes such as enjoyment in the classroom and engagement, which supports previous research (Ahamed et al., 2007; Fredericks et al., 2006; Lowden et al., 2001). Teachers also reported that movement improves learning through improved retention; however, at this point, researchers have not provided strong evidence to support this specific connection of understandings related to procedural knowledge and implicit learning (Jensen, 2000). Teachers appear to have mainly anecdotal evidence for using movement in the classroom and may not realize or have been exposed to current research in the field.

Implementing movement in the classroom is a behavior change for many teachers. Social cognitive theory (Bandura, 2004) suggests that knowledge is one determinant of behavior change, along with variables such as self-efficacy, outcome expectations, and facilitators and impediments. The data imply that the current level of awareness of benefits of movement is not enough to change behaviors. Teachers do not have knowledge of current research related to outcomes such as improvements in reading and math, cognitive behaviors, academic achievement, and meeting the needs of multiple learners, and they do not appear to be able to articulate the neurological connections between movement and learning (CDC, 2010; Donnelly & Lambourne, 2011; Fredericks et al., 2006; IOM, 2013; Lowden et al., 2001; Robert Wood Johnson Foundation, 2009). This is similar to previous research conducted by Cothran, Kulinna, and Garn (2010), who found that teachers were "rarely able to articulate a direct connection between physical activity and learning and rarely spoke about the specifics of academic integration" (p. 1385). To support global recommendations for movement in schools, teachers, especially those who are not using movement, should receive infor-

mation related to movement and learning as one way of facilitating behavior change.

A few participants in the study use movement and have received information about physical activity in schools. Teachers who use movement reported using it mainly for focus and to improve learning. Many participants discussed the use of movement to provide students a break during class and/or before returning to academic content. This is in agreement with research showing improved on-task behavior/concentration during academic instruction through incorporating movement in the classroom (Barros, Silver, & Stein, 2009; Fredericks et al., 2006; Lowden et al., 2001; Mahar, 2011; Mahar et al., 2006). However, this is a limited view of the outcomes and benefits to movement in the classroom. Teachers who use and teachers who do not use movement do not appear to have an in-depth understanding of the potential of movement when it is meaningfully integrated into the school day and only use movement on a limited basis for limited outcomes.

Even teachers who use movement are not taking advantage of the potential benefits. Some participants discussed that they are dealing with pressures related to curriculum and planning as barriers to movement. These findings support Cothran et al. (2010), who found that scheduling and feeling that movement is an "extra," along with the pressures of standardized testing, were "negative presses" for implementing movement. This may, in part, be due to many teachers implementing movement on their own; it was not part of a schoolwide initiative as suggested in recent reports (IOM, 2013; Lagarde et al., 2008; White House Task Force on Childhood Obesity, 2010). Lack of administrative support and lack of an environment conducive to physical activity could serve as barriers to using movement in the classroom. As suggested in the WHO *School Policy Framework*, schools should work toward sustainable strategies and policy development that engage stakeholders and support implementation through training, support from administration, and motivational strategies (Lagarde et al., 2008).

Not only did teachers in the study express an interest in learning more about movement in the classroom, every participant also felt that schools should have a role in increasing students' physical activity levels. Similarly, Cox, Schofield, and Kolt (2010) found that

adults (teachers and parents) believe that schools have a responsibility to act as a "backstop" or "fallback" if parents fail to take responsibility for children's physical activity (p. 50). Cox et al.'s study is different from this study because the findings suggest that teachers view schools as a primary party responsible for addressing physical activity levels of students. Therefore, the finding in this study is unique and potentially significant; teachers are essential stakeholders who can influence what happens in schools and in classrooms. If the belief is that schools should have a role in addressing physical inactivity, it could lead to advocacy efforts among stakeholders who are able to make direct changes in the levels of physical activity for their students. However, until research, materials, and professional development are available, meaningful change will not likely occur.

This study has several limitations. Although participants represented teachers from a diverse range of grade levels, almost half of the participants were high school teachers, which may have influenced their experience with movement in the classroom. Also, the teachers who participated in the study were not representative of all subject areas that are taught in school. Furthermore, participants only represented school districts in Massachusetts and New Hampshire. The generalizability of the study is limited to the teachers in the states and content areas represented. This study was also not gender balanced (15 women, two men), which may have altered results. Convenience, purposeful sampling was implemented to recruit classroom teachers currently practicing in the field. Because many of the participants were directly known to the researchers, this may have affected the results as compared to a random sampling of teachers. Nevertheless, this study is a first step in gaining an in-depth analysis of physical activity and movement in the classroom among teachers.

In summary, we found that work still needs to be done to make movement a regular practice in schools. Teachers in this study understand that movement can be helpful in the classroom, but cannot explain in detail the connections between movement and learning. Most explain that to use movement effectively, they would need training and support and recognize that it would involve a change in their teaching practice. Finally, teachers in this study believe that schools should have a role in addressing physical inactivity in youth.

Stakeholders, including current school staff including physical educators, should begin the process of providing the training and support necessary to make movement a meaningful part of the educational system.

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PEDAGOGY

Which Lifelong Activities Are Held in Highest Regard by Physical Education Stakeholders in Michigan: Can Stakeholders Agree? A Delphi Study

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Abstract

The purpose of this study was to identify what lifelong activities stakeholders agree upon as most important to include in physical education programs. Little research has been conducted regarding which lifelong activities are most important to include in the curriculum and if there is consensus in priorities across program stakeholders. Consensus among stakeholders at the local level would contribute to program support and guide program planning. Three hundred fifty subjects were drawn from 15 school districts across Michigan and five professional organizations with a stake in physical education programming. Subjects completed three rounds of a Delphi study, in which they shared opinions and rated the relative importance of lifelong activities. Swimming, jogging/power walking, and strength training were the highest rated of the 64 activities that received a rating in the final round. The mean dispersion of ratings by stakeholders decreased on 82 of the 86 activities, demonstrating an increase in agreement as a result of the Delphi study.

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The rank order of activities based on mean ratings also changed during the study. The decrease in the dispersion in ratings and the change in rank order based on ratings support the use of the Delphi as a consensus-building tool.

The purpose of this study was to identify the priorities held by stakeholders concerning which lifelong activities should be included in K–12 physical education (PE) programs in Michigan. A component of the National Association for Sport and Physical Education's definition of a physically literate person is the demonstration of skills necessary to participate in a variety of physical activities (American Alliance for Health, Physical Education, Recreation, and Dance, 2013). These combinations of activities serve graduates in part with a foundation of experiences that they can use to engage in health-related physical activity and/or apply in learning new activities as their life circumstances change.

Little research has been conducted regarding which lifelong activities are most important to include in the core curriculum and if there is consensus regarding the relative importance that specific activities hold in the eyes of program stakeholders. Which lifelong activities are taught in the local curriculum is most times left to the discretion of the local physical educators. However, there is little evidence that physical educators agree which activities, or which combination of activities, best match the needs, values, and interests of their local constituency.

Reaching a consensus across PE stakeholder groups would contribute to improving the status of PE programs within schools. Curriculum construction is as much a sociopolitical process as it is a result of empirical science (Goodlad, 2004; Goodson, 2005; Kirst & Walker, 1971; Levin, 2008). In a subject such as PE, program resources depend on stakeholder support. Some authors (Doolittle, 2007; Fairclough, Stratton, & Baldwin, 2002; Griffey, 1987; Siedentop, 1987) contend that one problem with which PE programs struggle is stakeholders failing to see what is taught, especially at the secondary level, as relevant in the lives of students outside of school. A major purpose of schooling is to prepare students for life as an adult. Clearly, it is important to provide students with healthy bouts of physical activity, and it is also important to engage students in activities they currently enjoy as tools to achieve learning objectives

(Brophy & Alleman, 1991). At the same time, it is important to equip students to participate successfully in healthy physical activities after they leave school and as their circumstances and interests change.

In this study, we engaged stakeholders across the state of Michigan in a modified Delphi study in an attempt to build consensus regarding which lifelong activities are most important to learn as part of a PE program. The study was framed by two research questions: (1) What is the relative importance assigned by stakeholders to lifelong activities suitable for inclusion in K–12 PE programs, and (2) did the procedure result in a greater consensus on content priorities among stakeholders?

The Delphi technique is a consensus-building process (Helmer, 1994; Hsu & Sandford, 2007; Lundberg & Glassman, 1983; Spinelli, 1983) and has been used to establish priorities in the PE curriculum construction process on a number of occasions (Bulger, 2004; Fazio, 1985; Sager, 2012; Uhl, 1983; Weaver, 1988). The final rankings of lifelong activities that resulted from this study and the process used to derive the rankings are valid only to the degree that it resulted in a greater consensus within and across stakeholder groups and if the final rank order changed as a result of the process.

The combination of the first 12 lifelong activities is varied enough to meet a wide range of criteria (e.g., cost, indoor/outdoor, climatic, large/small group, variable intensity). Providing learners with a varied set of experiences is critical on two counts. First, because different people engage in physical activity for different reasons, providing learners with a diverse set of experiences contributes to meeting the needs of a diverse audience. Second, providing learners with proficiency in a battery of diverse activities enables them to transition into different activities as they migrate through phases and circumstances of their lives.

Method

Description of the Sample

The sample for this study was drawn from a population of stakeholders residing in Michigan. In education, the term *stakeholder* typically refers to anyone invested in the welfare and success of a school and its students, including administrators, teachers, staff members, students, parents, families, community members, local business leaders, and elected officials such as school board members, city councillors, and state representatives ("Stakeholder," 2014). School-

related stakeholder groups were identified by synthesizing the literature addressing those who influence or are influenced by what is taught in schools ("Stakeholder," 2014). Participants were drawn from 15 school districts and specified agencies across the state relative to this definition.

The state was divided into four regions, and a purposeful sampling procedure was implemented to acquire representative schools from each region. The intent was to obtain combinations of public–private, large–small, urban–rural, poor–affluent school districts from each region to represent these differences in subpopulations. Stakeholders were then solicited within each district to represent local demographics. The number of participants varied according to the size of the school (e.g., a large school with multiple buildings was often represented by numerous building administrators, and a small school where administrators have more diverse roles typically had fewer participants). The participants by region of the state, school size, and stakeholder type are summarized in Table 1. Invitations were also extended to the following:

- individuals who teach PE curriculum and/or pedagogy courses at Michigan colleges/universities with teacher preparation programs in PE;
- all officers in Michigan's Association for Health, Physical Education, Recreation, and Dance (MAHPERD) with a primary focus on PE;
- state senators and representatives serving on education and appropriations committees and representing school districts;
- members of the Departments of Education and Community Health who are responsible for educational programming; and
- a random sample of members of the Michigan Recreation and Park Association.

Three hundred fifty of the 412 (85.0%) stakeholders who agreed to participate completed all three rounds of the study. The composition of the stakeholder groups appears in Table 2. The attrition rate was similar across stakeholder groups, with the exception of students and representatives from the Departments of Education and Community Health. The response rates for the remaining groups ranged from 97.8% (classroom teachers) to 72.7% (MAHPERD representatives).

Table 1

Distribution of Participants by Region, School Size, and Stakeholder Type

			Stakeholder type									
Region	**Size**[a]	**School**	**cad**	**bad**	**sbm**	**crt**	**pet**	**pnt**	**std**	**rec**	**undesignated**	**Total**
North	A	A	2	1	2	3	13	2	0	1	1	25
	D	B	2	1	0	4	2	3	2	0	1	15
	C	C	0	3	0	3	3	2	2	0	3	16
West	B	D	0	3	1	3	8	4	0	1	0	20
	C	E	0	3	2	4	3	3	1	0	2	18
	D	F	1	0	1	1	2	8	1	0	0	14
	A	G	1	2	0	5	12	10	1	3	1	35
Central	D	H	0	2	1	2	3	3	0	0	2	13
	D	I	1	1	1	3	1	4	0	1	3	15
	B	J	1	3	3	3	8	4	1	3	2	28
	C	K	0	1	0	2	2	5	2	0	0	12
East	A	L	2	1	0	1	11	2	0	0	1	18
	B	M	1	3	1	4	2	3	0	1	4	19
	A	N	0	4	0	3	5	4	0	0	6	22
	A	O	1	3	2	2	13	8	0	2	3	34
Total		15	12	31	14	43	88	65	10	12	29	304

Note. cad = central administrator; bad = building administrator; sbm = school board member; crt = classroom teacher; pet = physical education teacher; pnt = parent; std = student; rec = community recreation director.

[a]Schools in Michigan are divided into quartiles by the Michigan High School Athletic Association to equalize competition between like-sized schools. Class A schools represent the 25% of schools with the largest student population.

Table 2
Characteristics of Stakeholders

No.	% Completion	Stakeholder groups
12	75.0	Central School Administrator
31	83.8	Building School Administrator
14	73.7	School Board of Education
43	97.8	Classroom Teacher
88	87.1	Physical Education Teacher
65	92.9	Parent
10	45.5	Student (current or former)
16	85.7	Community Recreation Director
6	75.0	Intermediate School District
2	28.6	Legislature
8	72.7	MAHPERD Representative
17	94.0	University Physical Education
0	0.0	Department of Education
0	0.0	Department of Health
38		Undesignated
350	85.0%	Total[1]

No.	Gender
144	Male
132	Female
276	Total[1]

No.	Household income
1	Less than $15,000
10	$15,000–$29,999
38	$30,000–$44,999
79	$45,000–$69,999
135	$70,000 or more
262	Total[1]

The nature of the participating school districts is summarized in Table 3. Data are presented concerning the sample size representing each school district; the region of the state where the district is located; each district's student enrollment; whether the school is public or private, urban or rural; and the district's general economic status. Dashes appear where data were not available. Definitions for urban, urban areas, and rural were extracted from the U.S. Census Bureau (2000). The terms *inside* and *outside* refer to whether the district's population resides inside or outside an urban area. The data from Table 3 suggest that the demographic data were reasonably balanced in every category.

Table 3
School District Demographic Data

School	No. of subjects	Region	No. of students	Type	% urban	% poverty	Median family income
A	25	North	11,085	public	25 outside	7.8	$29,561
B	15	North	1,002	public	0	18.4	$18.280
C	16	North	1,897	public	0	22.3	$20,092
D	20	West	3,342	public	96.2 inside	1.8	$38,180
E	18	West	1,395	private	43.6 inside	4.22	$35,475
F	14	West	955	private	45 inside	—	—
G	35	West	6,554	public	71.4 inside	3.6	$39,031
H	13	Central	1,087	public	0	12.4	$25,102
I	15	Central	1,010	public	0	9.3	$31,907
J	28	Central	3,354	public	41.9 outside	6.8	$33,499
K	12	Central	1,324	private	98 inside	—	—
L	18	East	24,600	public	100 inside	32	$18,742
M	19	East	2,105	private	92 inside	0	—
N	22	East	12,825	public	99.2 inside	3.7	$44,004
O	34	East	15,800	public	98.5 inside	3.5	$49,047
State average	304	2,664		63 inside 8 outside		12.8	$31,020

[a]Outside refers to populations defined as urban, but located outside urbanized areas. Inside refers to populations defined as urban and located inside urbanized areas.

Description of the Survey Instrument

The initial survey instrument was designed to represent discrete leisure activities in the form of games, sports, and activities commonly included in PE programs. The instrument is an aggregation of activities proposed for inclusion by stakeholders in over 35 curriculum construction projects across Michigan prior to this study. For the instrument, 89 games, sports, and activities were listed in alphabetical order, with space to insert other activities that participants wanted to include. Demographic data were collected as part of the Consent to Participate form. Participants were asked (not required) to provide the school district with which they were associated (if appropriate), the primary stakeholder group they were representing, their gender, and the category that contained their household income. Because of the difficulty in defining and measuring socioeconomic status, household incomes were used as a general indicator. Income brackets were determined by identifying the median household income for the state of Michigan as identified in the U.S. Census data. Cut points were then estimated by identifying income levels that would subdivide the state's household incomes into quintiles.

Data Collection Procedures

The study consisted of three rounds of surveys. In the case of school districts, participants convened at a site within the district to complete each round. The instruments were mailed to all other participants in all three rounds.

Participants were first asked to peruse the instrument thoroughly and then assign priorities to what they considered to be the most important lifelong activities to teach in a K–12 PE program. They were asked to rate 15 of the 96 lifelong activities by assigning a 5 rating to the three activities they felt were most important for students to master as a result of participation in a K–12 PE program, then a 4 rating to the three next most important lifelong activities, then three 3 ratings, three 2 ratings, and three 1 ratings in a similar fashion. This forced-choice method of rating was adopted on the assumption that a limited amount of time was available to teach PE content in most Michigan school districts. It was used to avoid the risk inherent in absolute rating, which is the assignment of equally high or peak

values to a large number of lifelong activities, thus failing to discriminate between activities. Each participant was then asked to provide a statement of rationale supporting their three highest choices.

Mean values were calculated for each lifelong activity. Dispersions in ratings were represented by interquartile ranges. A committee of content experts reviewed the rationales provided for each lifelong activity. Their charge was to review the rationales for each item; eliminate arguments that conflicted with the professional literature; categorize like rationales; and then represent each unique, discrete rationale in a concise statement to be included for consideration by participants in the subsequent round. This information was incorporated into the second round instrument. The lifelong activities appeared in rank order according to mean ratings and were accompanied with their overall rank, mean rating, interquartile range, and statements of rationales constructed by the project committee.

In the second round, participants were asked to review each item's rank order and mean rating and to read and consider rationales provided from the first round for selecting an activity as a high priority. They were then asked to re-rate the activities using the same procedure as the first round. When participants rated an item outside the interquartile range from the previous round (thus assigning either more or less relative importance to the lifelong activity/program objective than at least half of the participants of the prior round), they were asked to provide a statement of rationale for why their rating was appropriate.

The data were processed in the same manner used for the first round. The rationales were sorted into those supporting higher ratings and those supporting lower ratings on each item. The project committee represented each unique rationale statement as a discrete statement for participants to read and consider in the third and final round.

For the third round instrument, the lifelong activities were presented in rank order based on data obtained in the second round. Each item was accompanied by its mean rating and interquartile range and by the rationales for rating the item higher and/or lower. Participants were asked to consider the rank order, mean ratings, and arguments for rating the item higher or lower and then to re-rate each objective in the same manner used in the second round. The

data obtained in this round were used to compile the final prioritized list of program objectives.

Data Analysis

Determining overall priorities. Mean ratings were calculated for each item at the conclusion of each survey round. Items were ranked according to mean ratings in descending order. Results from the first round represent priorities held at the onset of the study, and results from the third and final round represent the priorities established as a result of the Delphi process. The data were also separated according to subgroups specified in the design and prioritized in the same fashion.

Measuring convergence/divergence in ratings within and across groups. The dispersion in ratings for each item was calculated by averaging the absolute difference between each participant's rating and the item's median rating. Changes in dispersion from the first to the final round were represented by computing the difference in mean absolute differences from the first and third rounds on each item. The binomial test was administered to test the probability that the observed number of items with a decrease in rating dispersion would occur by chance. The procedure was used to identify a significant convergence or divergence in ratings for each item. It was applied to all participants together and then for each stakeholder group, school district, household income, gender, and region of the state.

Measuring changes in relative priorities across rounds. Rank orders for items from the first and final rounds were compared for all participants together and then by stakeholder group, school district, gender, household income, and region of the state. Wilcoxon's matched-pairs signed-ranks test was used to determine if statistically significant changes in rank order occurred. The test assesses the degree to which the distribution of objectives around their median was significantly different from the first to the third round. The Wilcoxon test accounts for the degree of change that occurs on each item.

Results

Relative Priorities of Lifelong Activities

Mean ratings of relative importance for lifelong activities were calculated by assigning zeros to lifelong activities that were unrated by the 350 participants. Ratings were averaged across each activity. The lifelong activities were then ranked according to their mean ratings in descending order. Data from the lifelong activities appear in Table 4, listed according to their final rank order by all participants. Dispersions of ratings were calculated by averaging the absolute value of the difference between each participant's rating and the item's median rating.

Table 4
Rankings, Mean Ratings, and Rating Dispersions of Lifelong Activities by Stakeholders for the First and Final Rounds

	Final round			First round			Changes		
Activity	**Rank**	***M***	**Disp.**	**Rank**	***M***	**Disp.**	**Rank**	***M***	**Disp.**
swimming	1	4.64	0.36	1	4.20	0.80	0	0.44	−0.44
jogging/power walking	2	4.32	0.68	2	3.06	1.81	0	1.26	−1.13
strength training	3	3.64	1.22	5	2.35	1.85	−2	1.29	−0.63
basketball	4	3.15	1.23	3	2.61	1.59	1	0.55	−0.36
tennis	5	3.06	1.14	4	2.40	1.48	1	0.66	−0.34
volleyball	6	2.85	1.10	8	1.90	1.50	−2	0.95	−0.40
golf	7	2.52	1.38	6	2.33	1.50	1	0.18	−0.12
cycling	8	2.33	1.46	9	1.76	1.68	−1	0.57	−0.22
softball	9	2.32	1.27	7	2.02	1.51	2	0.30	−0.24
dance: aerobic	10	2.11	1.43	10	1.73	1.72	0	0.37	−0.29
soccer	11	2.02	1.24	11	1.72	1.61	0	0.30	−0.37
walking	12	1.55	1.41						
skiing: cross-country	13	1.33	1.22	13	1.22	1.22	0	0.11	0.00
track: running	14	1.00	1.00	16	1.00	1.00	−2	0.01	0.01
hiking	15	0.99	0.99	12	1.30	1.30	3	−0.31	−0.31
skating: in-line	16	0.82	0.82	15	1.00	1.00	1	−0.18	−0.18
dance: social	17	0.70	0.70	17	0.86	0.86	0	−0.16	−0.16
bowling	18	0.70	0.70	14	1.04	1.04	4	−0.34	−0.34
rope jumping	19	0.69	0.69	18	0.81	0.81	1	−0.12	−0.12
swimming: life saving	20	0.68	0.68	20	0.73	0.73	0	−0.05	−0.05
gymnastics: tumble/floor	21	0.47	0.47	23	0.61	0.61	−2	−0.14	−0.14

Table 4 (cont.)

Activity	Final round			First round			Changes		
	Rank	*M*	Disp.	Rank	*M*	Disp.	Rank	*M*	Disp.
badminton	22	0.38	0.38	26	0.39	0.39	−4	−0.01	−0.01
step aerobics	23	0.32	0.32						
racquetball	24	0.31	0.31	24	0.59	0.59	0	−0.28	−0.28
football: flag/touch	25	0.29	0.29	19	0.80	0.80	6	−0.51	−0.51
track: field	26	0.19	0.19	30	0.35	0.35	−4	−0.16	−0.16
camping	27	0.19	0.19	21	0.66	0.66	6	−0.47	−0.47
hockey: ice/in-line/floor	28	0.17	0.17	27	0.39	0.39	1	−0.22	−0.22
backpacking	29	0.15	0.15	31	0.34	0.34	−2	−0.20	−0.20
dance: line	30	0.12	0.12	41	0.17	0.17	−11	−0.05	−0.05
skating: ice	31	0.12	0.12	28	0.38	0.38	3	−0.26	−0.26
dance: square	32	0.11	0.11	43	0.14	0.14	−11	−0.03	−0.03
table tennis	33	0.10	0.10	33	0.25	0.25	0	−0.15	−0.15
skiing: downhill	34	0.09	0.09	29	0.37	0.37	5	−0.28	−0.28
swim: WSI	35	0.09	0.09	40	0.17	0.17	−5	−0.08	−0.08
self-defense	36	0.07	0.07						
tai chi	37	0.06	0.06	44	0.13	0.13	−7	−0.08	−0.08
fishing: bait casting	38	0.05	0.05	32	0.26	0.26	6	−0.20	−0.20
Frisbee: skills/games	39	0.05	0.05	36	0.21	0.21	3	−0.16	−0.16
martial arts: karate	40	0.05	0.05	37	0.20	0.20	3	−0.14	−0.14
canoeing	41	0.05	0.05	25	0.41	0.41	16	−0.36	−0.36
archery	42	0.04	0.04	34	0.24	0.24	8	−0.19	−0.19
wrestling	43	0.04	0.04	42	0.15	0.15	1	−0.11	−0.11
skating: roller	44	0.04	0.04	35	0.22	0.22	9	−0.19	−0.19
orienteering	45	0.04	0.04	38	0.19	0.19	7	−0.15	−0.15
team handball	46	0.04	0.04	53	0.08	0.08	−7	−0.05	−0.05
dance: modern	47	0.03	0.03	56	0.06	0.06	−9	−0.03	−0.03
dance: creative	48	0.03	0.03	50	0.10	0.10	−2	−0.08	−0.08
martial arts: others	49	0.02	0.02	55	0.07	0.07	−6	−0.04	−0.04
crew	50	0.02	0.02	80	0.01	0.01	−30	0.01	0.01
card games	51	0.02	0.02						
snowshoeing	52	0.02	0.02						
gymnastics: apparatus	53	0.02	0.02	58	0.06	0.06	−5	−0.04	−0.04
dance: folk/ethnic	54	0.02	0.02	39	0.17	0.17	15	−0.15	−0.15
speedball	55	0.02	0.02	64	0.05	0.05	−9	−0.03	−0.03
handball	56	0.01	0.01	46	0.11	0.11	10	−0.10	−0.10
lacrosse	57	0.01	0.01	71	0.03	0.03	−14	−0.02	−0.02
fishing: spin casting	58	0.01	0.01	45	0.12	0.12	13	−0.11	−0.11
sailing	59	0.01	0.01	48	0.11	0.11	11	−0.10	−0.10

Table 4 (cont.)

	Final round			First round			Changes		
Activity	**Rank**	***M***	**Disp.**	**Rank**	***M***	**Disp.**	**Rank**	***M***	**Disp.**
shuffleboard	60	0.01	0.01	62	0.05	0.05	−2	−0.04	−0.04
kayaking	61	0.01	0.01	65	0.04	0.04	−4	−0.03	−0.03
hocker	62	0.01	0.01	84	0.01	0.01	−22	0.00	0.00
horseshoes	63	0.01	0.01	51	0.09	0.09	12	−0.09	−0.09
skiing: water	64	0.01	0.01	68	0.04	0.04	−4	−0.03	−0.03
hockey: field	65	0.00	0.00	49	0.11	0.11	16	−0.11	−0.11
shooting: riflery	66	0.00	0.00	57	0.06	0.06	9	−0.06	−0.06
boxing	67	0.00	0.00						
walking: race	68	0.00	0.00	22	0.61	0.61	46	−0.61	−0.61
horseback riding	69	0.00	0.00	47	0.11	0.11	22	−0.11	−0.11
gymnastics: rhythmic	70	0.00	0.00	52	0.09	0.09	18	−0.09	−0.09
fishing: fly casting	71	0.00	0.00	54	0.07	0.07	17	−0.07	−0.07
climbing (rock)	72	0.00	0.00	59	0.06	0.06	13	−0.06	−0.06
diving: SCUBA	73	0.00	0.00	60	0.06	0.06	13	−0.06	−0.06
Frisbee: ultimate	74	0.00	0.00	61	0.06	0.06	13	−0.06	−0.06
paddleball	75	0.00	0.00	63	0.05	0.05	12	−0.05	−0.05
pickleball	76	0.00	0.00	66	0.04	0.04	10	−0.04	−0.04
martial arts: judo	77	0.00	0.00	67	0.04	0.04	10	−0.04	−0.04
diving: springboard	78	0.00	0.00	69	0.03	0.03	9	−0.03	−0.03
shooting: clays/trap	79	0.00	0.00	70	0.03	0.03	9	−0.03	−0.03
dance: jazz	80	0.00	0.00	72	0.03	0.03	8	−0.03	−0.03
dance: tap	81	0.00	0.00	73	0.02	0.02	8	−0.02	−0.02
fencing	82	0.00	0.00	74	0.02	0.02	8	−0.02	−0.02
water polo	83	0.00	0.00	75	0.02	0.02	8	−0.02	−0.02
croquet	84	0.00	0.00	76	0.02	0.02	8	−0.02	−0.02
dance: ballet	85	0.00	0.00	77	0.02	0.02	8	−0.02	−0.02
diving: skin	86	0.00	0.00	78	0.02	0.02	8	−0.02	−0.02
bocce ball	87	0.00	0.00	79	0.01	0.01	8	−0.01	−0.01
swimming: synchronized	88	0.00	0.00	81	0.01	0.01	7	−0.01	−0.01
tennis: platform	89	0.00	0.00	82	0.01	0.01	7	−0.01	−0.01
tetherball	90	0.00	0.00	83	0.01	0.01	7	−0.01	−0.01
shooting: other	91	0.00	0.00	85	0.01	0.01	6	−0.01	−0.01
squash	92	0.00	0.00	86	0.01	0.01	6	−0.01	−0.01
aerial darts	93	0.00	0.00	87	0.01	0.01	6	−0.01	−0.01
rugby (modified)		0.00	0.00				0	0.00	0.00
korfball		0.00	0.00				0	0.00	0.00
snowboarding		0.00	0.00				0	0.00	0.00

According to the results summarized in Table 4 for all respondents, the single most important activity for students to master through participation in a quality PE program in Michigan is competency in swimming. The activity's mean rating of 4.64 was 0.32 higher than the next activity, and its final mean rating dispersion of 0.36 was nearly half as large as any other of the highest rated activities. Of the first 11 activities, swimming, jogging/power walking, strength training, cycling, and aerobic dance can be classified as fitness oriented, and basketball, volleyball, softball, and soccer are more skill and team oriented.

Of the 96 lifelong activities listed on the survey in the first round, 64 received ratings in the final round. Walking and step aerobics were added after the first round as a result of participants' recommendations, even though walking is included in the activity of jogging/power walking and step aerobics is a form of aerobic dance. Because of the difficulty in providing effective rationales to anonymous contributors as to why their suggestions were disregarded, it was decided to include them among potential activities in subsequent rounds. Self-defense, card games, snowshoeing, and boxing were also added per participants' suggestions.

Convergence in Priorities Within and Across Groups

The overall results for lifelong activities from Table 4 show that the number of activities receiving a rating decreased from 81 activities in the initial round to 64 activities in the final round. Only 37 lifelong activities received ratings by 10 or more of the 350 respondents who completed this section of the survey. Of those that received ratings in the first round, the mean rating dispersion increased on two activities (track: running and crew), stayed the same for two other activities (cross-country skiing and hockey), and decreased on the other 82 (95.3% of the activities).

The binomial test was used to test the probability that the observed number of lifelong activities that decreased in rating dispersion from the first round to the third round would occur by chance. The results, appearing in Table 5 for all participants, indicate that the convergence obtained is highly significant ($p < .001$). The number of lifelong activities that decreased in rating dispersion for each subgroup are also displayed in Table 5. The ratings of lifelong activities also indicate a significant convergence within all stakeholder groups

and all school districts and across all household incomes, regions of the state, and genders.

Table 5
P Values Associated With the Probability of Rating Convergence on 87 Lifelong Activities

Grouping category	No. of lifelong activities	*p*
Overall	84	$p < .001$
Stakeholder Groups		
central administrator	77	$p < .001$
building administrator	81	$p < .001$
classroom teacher	80	$p < .001$
physical education teacher	82	$p < .001$
parent	77	$p < .001$
school board member	82	$p < .001$
student	72	$p < .001$
recreation director	77	$p < .001$
intermediate school district	74	$p < .001$
subject matter expert	73	$p < .001$
MAHPERD delegate	80	$p < .001$
legislator	75	$p < .001$
School District		
A	80	$p < .001$
B	71	$p < .001$
C	76	$p < .001$
D	85	$p < .001$
E	75	$p < .001$
F	84	$p < .001$
G	77	$p < .001$
H	75	$p < .001$
I	81	$p < .001$
J	74	$p < .001$
K	80	$p < .001$
L	80	$p < .001$
M	73	$p < .001$
N	76	$p < .001$
O	77	$p < .001$

Table 5 (cont.)

Grouping category	No. of lifelong activities	*p*
Household Income		
< $15 K	87	$p < .001$
< $30 K	81	$p < .001$
< $45 K	80	$p < .001$
< $70 K	87	$p < .001$
> $70 K	79	$p < .001$
Region		
North	78	$p < .001$
West	64	$p < .001$
Central	80	$p < .001$
East	80	$p < .001$
Gender		
female	75	$p < .001$
male	80	$p < .001$

Change in Relative Importance Within and Across Groups

Changes in rankings of lifelong activities by participants between the first and third rounds are portrayed in Table 4. Changes in rank must be observed with caution because of the addition of lifetime activities included after the first round. For example, the ranking for every activity appearing after boxing (ranked 67) increased six places because of the inclusion of six activities after the first round (walking, step aerobics, self-defense, card games, snowshoeing, and boxing). The total increase in this case is not related to changing opinions or priorities.

Wilcoxon's matched-pairs signed-ranks test was used to determine if a statistically significant change in rank order occurred. The test assesses the degree to which the distribution of lifetime activities around their median is significantly different from the first to the third round. The Wilcoxon test accounts for the degree of change that occurs on each item. The *p* values from the Wilcoxon test appear in Table 6.

The tests indicate the rank order of the entire list of lifelong activities for the participants as a whole changed significantly from the first and final round ($p < .001$). With respect to stakeholder groups, the rank order from the first and final rounds was significantly different at the .01 level for building administrators, classroom teachers, PE teachers, parents, and school board members. The rank order changed significantly for only one of the 15 participating school districts (School O) at the 0.01 level and three others (A, B, G) at the 0.05 level. The rank order changed for those with household incomes between $30,000 and $45,000 ($p < .05$) and for those with household incomes of over $45,000 ($p < 0.01$). The order changed for all regions of the state except West Michigan ($p < 0.01$) and for males and females ($p < 0.01$).

Information about significant changes in rank order is useful to justify the benefits of sharing information when considering program inclusions. It may not be useful in the practical process of selecting lifetime activities to include in a PE program because districts lack the time and resources to address so many lifelong activities effectively. Accordingly, a practical approach to analyzing changes in relative priority would be to analyze the 15 highest ranked activities (excluding walking, which is embedded in jogging/power walking).

The 15 highest ranked activities appear in Table 4. Analysis of the top 15 lifelong activities shows few large changes in rank order among the 15 highest ranked activities. Fourteen activities remained among the top 15 in both rounds. Five activities maintained their ranking from the first to the final round, and five changed their rank one position, four moved two positions, and one moved three places. In all, 10 of the 15 highest ranked activities changed in order.

The Wilcoxon test was administered to determine the significance of the changes in order of the 15 highest ranked activities. The p values for the tests appear in Table 6. The change in rank order of the first 15 activities for all participants as a whole was more than what would have been attributed to chance ($p = .0045$). Among stakeholder groups, changes for central building administrators, classroom teachers, and community recreation directors were significant at the 0.01 level, whereas changes for building administrators, intermediate school district representatives, PE teachers, and parents were significant at the 0.05 level. The p values were below

.05 for all school districts except one (G). The changes in order were significant at $p = 0.05$ for all levels of household income except those earning less than $15,000 ($p = .7695$), both genders, and all regions of the state except West Michigan.

Table 6
P Values for Changes in Rankings of Lifelong Activities From the First and Third Rounds

Grouping category	All activities	First 15 activities
All Participants	$p < .001$	.0045
Stakeholder Groups		
central administrator	.0745	.0045
building administrator	.0144	.0199
classroom teacher	.0046	.0064
intermediate school district	.9615	.0268
legislator	.2473	.0571
MAHPERD delegate	.4180	.0571
physical education teacher	.0005	.0231
parent	.0082	.0231
recreation director	.4712	.0054
school board member	.0025	.0736
subject matter expert	.1060	.0738
student	.1350	.2681
School Districts		
A	.0462	.0231
B	.0362	.0309
C	.0691	.0146
D	.0531	.0171
E	.1224	.0309
F	.0636	.0076
G	.0146	.0884
H	.0959	.0115
I	.0571	.0468
J	.0900	.0356
K	.3769	.0022
L	.2265	.0018
M	.4665	.0184
N	.1361	.0268
O	.0059	.0184

Table 6 (cont.)

Grouping category	All activities	First 15 activities
Region		
North	.0002	.0268
West	.2196	.0691
Central	.0042	.0076
East	.0012	.0022
Gender		
female	.0002	.0106
male	.0007	.0064

Discussion

Results of the Prioritization Process

The most practical finding in this study is the overall priorities assigned to lifelong activities and program objectives by Michigan stakeholders. The credibility of this information is enhanced to the degree that priorities held by stakeholders converged from the first to the final round. Convergence in priorities across stakeholder groups implies increased agreement. Increased agreement in turn may result in increased advocacy for programs that consist of high-priority content and may provide insight to consumer needs, values, and interests.

The three lifelong activities held in highest regard by all participants are competence in swimming, jogging/power walking, and strength training, respectively (see Table 4). Swimming and jogging/power walking were ranked first and second, respectively, in both the first and the final rounds. The mean rating for strength training is .49 higher than the fourth ranked activity, which substantially separates it and the two higher ranked activities from the remaining lifelong activities.

Of the first 12 activities (excluding walking) from Table 4, seven could be categorized as individual activities and five could be dual or team in nature. Swimming is unique because its utility includes fitness, sport, safety, and recreation. It also provides a unique bridge to safe participation in many other water sports. Six activities (swim-

ming, jogging/power walking, strength training, cycling, aerobic dance, and cross-country skiing) are activities commonly used to achieve or maintain personal fitness level (Physical Activity Council, 2014). The high ratings are consistent with the growing body of evidence heralding the benefits of participation in regular physical activity.

The combination of the first 12 lifelong activities is varied enough to meet a wide range of criteria (e.g., cost, indoor/outdoor, climatic, large/small group, variable intensity). Providing learners with a varied set of experiences is critical. According to Sherwood and Jeffery (2000), physical activity is a complex and dynamic process in which individuals typically move through various phases of exercise participation. From an educational perspective then, it makes sense conceptually to equip graduates with a battery of diverse activities that enable them to transition into different activities as their life circumstances change.

Effectiveness of the Procedure

Because the curriculum construction process is a sociopolitical process, an integral part of curriculum construction should include building consensus among stakeholder groups (Curry & Temple, 1992). The Delphi technique provides a systematic procedure for achieving a consensus within a controversial sociopolitical arena of debate (Goodlad, 2004; Goodson, 2005; Kirst & Walker, 1971; Levin, 2008). Using the Delphi technique to guide the selection of curricular content is justified when the procedure meets two criteria. First, the technique needs to facilitate a convergence in opinions. A convergence in opinions results in greater support of and confidence in the results across stakeholder groups. Second, there should be change in the priorities obtained as a result of the process. The Delphi technique is a rigorous and time-consuming procedure when used to prioritize potential content for educational programs. If the process of sharing information and considering the opinions of others does not result in changes in priorities held by stakeholders, a simple survey technique would suffice.

This study resulted in a convergence in ratings of lifelong activities. The number of lifelong activities that received a rating in the first and final rounds decreased by 21%. The dispersion in ratings on

each activity also decreased on 95.3% of the lifelong activities. There was convergence on a majority of lifelong activities for all stakeholder groups, for all school districts, within all regions of the state, for all divisions of household income, and for males and females.

These data clearly support the notion that use of the Delphi technique can increase agreement in ratings and change stakeholder priorities when assigning relative value to lifelong activities and program objectives suitable for inclusion in PE programs. This finding supports, therefore, the use of the Delphi technique as a viable process for establishing content priorities as part of an eclectic model for developing quality PE programs.

Limitations

The application of these findings regarding what stakeholders hold most important to teach as lifelong activities in PE programs is limited, in this case to programs in the state of Michigan. Stakeholders across America hold similar values and expectations of their educational programs as do those residing in Michigan, but differences can be assumed to exist. Factors contributing to overall priorities may include climate and terrain as well as socioeconomic status.

Results from this study are limited in the representation of stakeholder groups, specifically members of the legislature and representatives from the Departments of Education and Community Health. Two participants from the legislature completed all phases of the study, and no participants completed the study from the Departments of Education or Community Health. The lack of participation limits the generalizability of the study across these populations of stakeholders.

Conclusion

The purpose of the study was to identify stakeholders' priorities regarding the inclusion of lifelong activities in K–12 PE programs in Michigan. The stakeholders' priority ranking of lifelong activities resulted in swimming, jogging/power walking, and strength training as the most important activities for inclusion in K–12 PE programs in Michigan. The highest rankings include a balance of fitness-oriented and skill/team-oriented activities.

The Delphi technique is a consensus-building process that is frequently used in the curriculum development process; therefore, it is most suitable for this research. Engaging stakeholders in a modified Delphi procedure resulted in greater agreement in content priorities with respect to potential lifelong games, sports, and activities. The process resulted in a convergence in ratings across stakeholders and changes in relative order. Consequently, use of the Delphi can increase the likelihood that content included in PE programs better represent the priorities held by informed stakeholders. With regard to the procedure itself, special care must be taken to emphasize the importance of participation in stakeholders who are not directly affected by the results. Face-to-face invitation and personal contact through the procedure may result in larger numbers completing the study.

The potential applications of this study occur on three levels. First, the results from the study can guide policy and program improvement in general terms. Although this study does not represent a definitive set of priorities for any single school district, it provides the best information available about what informed stakeholders across Michigan can agree upon as being the most important lifelong activities to teach in Michigan's PE programs. Focusing on creating quality materials and assessments on activities deemed of highest priority in this study will provide the greatest rate of return in achievement for the time and resources invested in their creation. The identification of what is deemed most important across the entire state assists with professional development as well. If programs across a state are more similar in content than dissimilar, greater collaboration can occur within and across districts.

Teacher preparation programs can benefit through use of these results in preparing preservice teachers as well. No teacher preparation program can prepare future teachers to teach every activity effectively that they will be required to teach. The results from this study can help those programs decide which ones to focus on the most.

At the local level, the procedure used in this study can be used to navigate through what will undeniably be a sociopolitical process. This procedure demonstrated the ability to engage a large number of subjects from diverse backgrounds and contexts to a greater degree

of agreement on what is most important to teach. Results by a significant number of respected individuals across the community can educate stakeholders on the potential value of specific activities in the curriculum. Greater agreement on what to teach can result in a better aligned curriculum, resulting in more competent graduates.

Because participants in this study were located exclusively in Michigan, the degree to which the findings would apply in other locations across the country is questionable. The process used in deriving the findings, however, would be beneficial for each state's organization to complete. The results specific to that state can result in the same applications as for the state of Michigan.

All stakeholder groups also need educated on the importance of systematic content selection. Stakeholders who understand the importance of appropriate content and the selection of it will become better advocates for quality programs. It is reasonable to expect that informed stakeholders will have a greater commitment to the program and to participating in the rigors of content selection.

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PHYSICAL ACTIVITY

Effects of Requiring Physical Fitness in a Lecture-Based College Course: Students' Attitudes Toward Physical Activity

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Abstract

In this study, we investigated students' attitudes toward physical activity (PA) when including a required PA component in a university-required personal wellness class. The study included (a) an experimental group of students enrolled in a personal wellness course in which there was a required PA requirement and (b) a control group of students enrolled in a personal wellness course in which there was no PA requirement. Subjects were tested using the Corbin Attitude Test. The students in the experimental group were exposed to an additional PA requirement in which they were to exercise at least twice per week at a perceived exertion level of 4 or above on the modified 1 to 10 scale. Students in the control group were only required to complete the university-required personal wellness course, which did not include a required PA component. A repeated measures ANOVA was used to determine if adding the PA component had an effect on students' attitudes and perceptions toward their personal health and to check for significance between gender and

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attitude toward physical activity. The analysis of the data showed no significant gain or decline in attitude for either group, suggesting that although specific required PA does not significantly improve attitude, it does not hurt it either. It could be surmised from this study and similar studies that choice of activity is the most important factor for improving attitude toward PA.

"Physical fitness is not only one of the most important keys to a healthy body; it is the basis of dynamic and creative intellectual activity" – John F. Kennedy (LaLanne, 1995).

Student attitude toward physical activity (PA) is not a new area of research. However, with trends in PA and health changing for the worse, it is a subject matter that should be revisited consistently to understand the current attitudes toward PA as they relate to current activity and health levels.

Currently, the adult recommendation for PA is at least 150 min of moderately intense aerobic activity each week, along with at least 2 days/week of strength training (American College of Sports Medicine, 2011). The recommendation for children and adolescents is 60 min or more of PA per day. As a part of the 60 min, aerobic activity, bone strengthening, and muscle strengthening are to be included (Centers for Disease Control and Prevention [CDC], 2014). What is being recommended, however, is not being followed. Currently, less than half of adults (48%) meet the activity levels and only 3 of 10 children and adolescents are meeting their recommended levels (CDC, 2014).

Healthy People 2020 (U.S. Department of Health and Human Services, 2013) reported that regular PA throughout life is important for maintaining a healthy body, enhancing psychological well-being, and preventing premature death. Physically active people live longer and have a better quality of life than do those with a sedentary lifestyle. A sedentary lifestyle is also a primary reason for overall loss of functional capacity (Hensley, 2000). Because lifetime PA is important to a longer and better quality of life, it is important to understand differences in motivational characteristics of those who are active versus inactive.

Researchers have suggested that one key to the differences between active individuals and inactive individuals is attitude

(Forrester, Arterberry, & Barcelona, 2006; Kahn et al., 2008; Mack & Shaddox, 2004; Mowatt, Depauw, & Hulac, 1988; Nelson, Benson, & Jensen, 2010; Pearman & Valois, 1997; Poobalan, Aucott, Clarke, & Smith, 2012). However, interventions and factors affecting attitude have not been as present in the literature. We will discuss various research concerning the relationship in attitude and PA and factors surrounding the topic.

To begin to understand the motivational characteristics and attitude toward PA, it is important to examine the factors contributing to attitude and PA in adolescence. Subramaniam and Silverman (2007) examined middle school students' attitudes toward physical education. The students had a moderately positive attitude toward physical education, yet this positive attitude declined with an increase in grade level. According to the authors, this decline in positive attitude may be related to the repetitive nature of physical education activities in Grades 6, 7, and 8 and consequently decreases enjoyment of physical education—a major indicator of student attitude toward physical education. Subramaniam and Silverman concluded that interventions at the middle school level—meaningful engagement in physical activities—can prepare students for lifetime PA participation.

Another cohort of children and adolescents was examined using an accelerated longitudinal analysis to depict trajectories of PA to investigate the activity levels from 1997–1999 of over 12,000 10- to 18-year-old males and females included in a previous study in the United States. In this study, Kahn et al. (2008) established that PA was affected by parental attitudes toward PA, personal attitudes about body image, and subsequent perceived peer attitudes toward body shape and fitness (not all-inclusive). In addition, Kahn et al. determined that age was the only element that forecasted change in PA over time. For instance, parental attitudes were positively associated with PA in both genders and in perceived peer attitudes about body shape—thin for females and muscular for males. Because activity levels seemed to decline during adolescence, Kahn et al. also suggested that interventions to increase PA should be in place prior to adolescence.

Conversely, it has also been found that interventions in young adulthood can also influence attitude toward PA. Mack and Shaddox

(2004) examined college students' attitudes toward PA during a required personal wellness course, which consisted of lecture and lab activities. For the lab portion, students had to choose between aerobic activities such as aqua aerobics, biking, aerobic cross-training, power walking/jogging, or cardio-kickboxing and skill-based activities such as dance, badminton, racquetball, volleyball, weight lifting, or yoga. Upon completion of the course, participants showed significant improvement in attitude toward PA at least in the short term. The variety of activities available may be a key element to increasing the positive attitude.

Even more significant, when considering lifetime PA, are the findings of Pearman and Valois (1997). They found that college students who participated in a required health and physical education course (College A) had a more positive attitude toward PA than college students who were not required to take such a course (College B). The choice of postgraduation PA was also evidence of continued active lifestyle in the study; College A alumni were more likely to choose jogging, an aerobic activity, as their preferred choice of PA, whereas the alumni from College B more often reported gardening, hunting, and fishing as the preferred activities of choice.

As depicted above and found by Mowatt et al. (1988), college students with a positive attitude toward PA are more likely to be active throughout their lives and, in turn, demonstrate more intense exercise behaviors than do those with a less positive attitude. This research included lecture and activity sessions as well, as the activity was already a part of the course; in the analysis, students who received lecture material indicated only a slightly more positive attitude toward PA than did those without the presentation of lecture material. In addition, although females had a more positive attitude toward PA than did males, the majority of the students indicated that PA was important.

Furthermore, despite the young adults knowing that PA is important, Poobalan et al. (2012) found that only 28% of 18- to 25-year-olds achieve recommended levels of PA; attitudes, motivators, and barriers were considered influential factors for the participants. They also concluded that positive attitudes that lead to an active lifestyle are associated with PA that is easy to do and enjoyable. In addition, despite an awareness of the benefits of exercise and good intentions,

young people found it difficult to increase PA (Poobalan et al., 2012). Reported barriers for increasing PA were few choices of activities and few concerns about their future health (Poobalan et al., 2012). These barriers may provide insight as to what interventions should entail when targeting young people.

Additionally, Forrester et al. (2006) found that the more importance a college student places on sport, fitness, and PA, the more importance they place on PA postgraduation. One major aspect of determining this importance was the perceived effect of the benefits of physical health and well-being. Such benefits included a sense of accomplishment, sense of adventure, fitness, physical strength, balance/coordination skills, and stress reduction; indeed, the strongest predictor of positive responses toward the importance of sports and fitness after graduation was the benefits of physical health and well-being.

Many studies show that a positive attitude is associated with PA; however, in many instances, a positive attitude is influenced by certain conditions. Therefore, although many individuals have a good attitude toward PA, a considerable number still have a negative attitude. This can create a barrier to participating in PA. According to Nelson, Benson, and Jensen (2010), negative attitudes stem from beliefs that exercise is unpleasant (painful) or has negative consequences; this may also be a stronger indicator of nonparticipation in PA than a positive attitude is toward participation in PA. They also concluded the importance of interventions to increase PA in children and adolescents.

Much of the research previously performed on attitude and PA is in reference to recreational activity and not required activity. Therefore, the outcomes of this study on attitude toward required PA among college students are important additions to the literature and may provide significant insight on how to promote and increase PA among college students.

Method

The purpose of this study was to compare the effect of adding a PA component to a university-required personal wellness course. To investigate the hypotheses, we used preliminary procedures and operational procedures. Preliminary procedures included the selec-

tion of subjects, instrumentation, research design, and statistical analysis to create a foundation and prepare for the study. The operational procedures, including the administration of the treatment and data collection and preparation, were used to explain the process by which the testing and investigation was conducted.

Participants and Procedures

The sample for this study consisted of 55 male and 38 female students enrolled in four personal wellness courses at a Midwestern university. The course was a required general education course. The students in the class participated voluntarily and were not eligible for the study if they were varsity student-athletes and/or health and human performance majors. The athletes were excluded from the study because they were already participating in mandatory exercise. Health and human performance majors were excluded because some of the courses they were taking already required PA. The participants were assigned to either the control group or the experimental group based on the personal wellness class in which they were enrolled. Before the test was given, students who were willing to participate completed the informed consent form. The researcher read instructions to all classes being tested to prevent variance in basic instructions. The study was administered in three phases: (1) pretest, (2) treatment (personal wellness class with the PA component for the experimental group), and (3) posttest. The experimental group was instructed during the class lecture, the same as the control group; however, the experimental group was also required to complete an added PA component. It consisted of PA/exercise at least two times per week, at an intensity of 4 or above on the perceived exertion scale (Figure 1). This component was to be completed on personal time in the university wellness center. To fulfill this requirement of their university-required personal wellness class, the students were instructed to sign in at the wellness center before working out and then after working out and record their rate of perceived exertion.

Rating = Descriptor

0 = Rest
1 = Very, Very Easy
2 = Easy
3 = Moderate
4 = Somewhat Hard
5 = Hard
6 = Hard
7 = Very Hard
8 = Very Hard
9 = Very Hard
10 = Maximal

Figure 1. Modified perceived exertion scale.

Instrumentation

The instrument used to measure the dependent variable was the Corbin Attitude Test. The test was taken from the text *Concepts in Physical Education* (Corbin, Dowell, Lindsey, & Tolson, 1981). The instrument was chosen because it has been shown to have a reliability of greater than 0.90 and validity in excess of 0.80 (Corbin et al., 1981). The test consisted of 16 statements. Students responded to these statements by choosing one of the following answers: *strongly agree, agree, undecided, disagree,* and *strongly disagree.* A Likert scale was used to assign a score of 1–5 to the individual questions. Attitude was evaluated with an overall composite score of the individual's responses.

Research Design

For the study, we used a pretest, posttest, group-at-hand design. More specifically, two groups were tested: (a) the control group, which consisted of two classes of personal wellness students not receiving the PA component, and (b) the experimental group, which consisted of two classes of personal wellness students receiving the PA component in which they were required to engage in exercise twice a week at a perceived exertion level of 4 or higher on the modified perceived exertion scale from 1 to 10 (Figure 1). The experimental and control groups were given the Corbin Attitude Test in

the second week of the semester and again on the 14th week of the semester. Means were compared from the posttest control group and experimental group and between males and females. This was done to investigate significant differences between the groups' attitudes toward PA and exercise and to investigate gender differences among students toward PA and exercise. A repeated measures ANOVA was used to determine if adding a PA component to a required college personal wellness class had an effect on students' attitudes and perceptions toward their personal health and to determine differences in attitude changes between males and females. The repeated measures ANOVA was used to analyze if the PA component affected students' attitudes toward PA and exercise and to compare differences between males' and females' attitudes toward PA and exercise pretest versus posttest. The independent variable was the PA component that two of the four classes received. The dependent variable, student attitude toward PA and exercise, was compared through the evaluation of scores obtained from each subject on the Corbin Attitude Test. The null hypothesis was tested at the 0.05 level of significance. To aid in the analysis process, SAS Software was used.

Results

The null hypothesis was formulated to test if there would be a significant difference in attitude between the control group pretest and the control group posttest and between genders.

The results of the repeated measures ANOVA are presented in Tables 1 and 2, indicating no significant effect in the treatment. Mean scores are displayed in Tables 3, 4, and 5 and illustrated in Figure 2. The mean scores support the findings of nonsignificance. This is illustrated in Figure 2, with the mean differences close among all groups. Therefore, the null hypothesis was accepted, and no significant differences were found in attitude between the pretest scores and posttest scores of students enrolled in personal wellness courses and no differences between attitude toward PA and gender.

Table 1
ANOVA Results for Within Subjects Effects

Source	*df*	SSw	*MS*	*F*	*p* > *F*
Pretest–Posttest Difference Overall	1	323.25	323.25	27.99	< .0001
Pretest–Posttest Difference in Gender	1	7.14	7.14	0.62	0.433
Pretest–Posttest Differences Experimental vs. Control	1	0.11	0.11	0.01	0.9208
Pretest–Posttest Difference in Gender and Experimental vs. Control	1	3.67	3.67	0.32	0.57
Error (Difference)	90	1039.33	11.55		

Table 2
ANOVA Results for Between Subjects Effects

Source	*df*	SSw	*MS*	*F*	*p* > *F*
Gender	1	18.69	18.69	0.22	0.64
Experimental vs. Control	1	9.07	9.07	0.11	0.74
Gender and Experimental vs. Control	1	317.94	317.94	3.83	0.05
Error	90	7497.67	83.107		

Table 3
Overall Means for Males and Females

Gender	Pretest	Posttest
Female	59.31	61.61
Male	59.56	62.67

Table 4
Overall Means for the Experimental Group and Control Group

Group	Pretest	Posttest
Control	59.64	62.39
Experimental	59.24	61.89

Table 5
Means for the Experimental Group and Control Group Males and Females

Gender/group	Pretest	Posttest
Female Control Group	61.00	63.07
Female Experimental Group	57.63	60.17
Male Control Group	58.28	61.72
Male Experimental Group	60.84	63.62

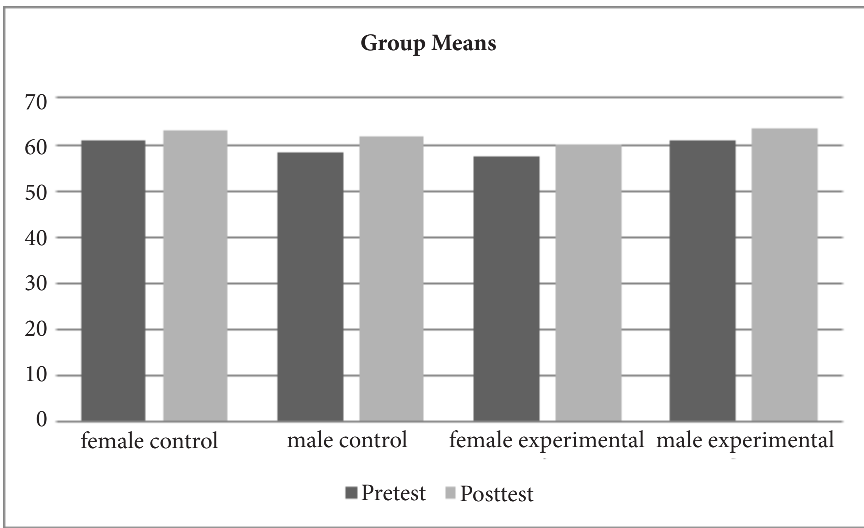

Figure 2. Group means for female and male control and experimental pretest and posttest scores.

Discussion

Based on the literature reviewed, physical inactivity is a serious problem among children, adolescents, and adults. This sedentary lifestyle has led 69.2% of adults in America to be overweight or obese (CDC, 2014). It is vital as a society to investigate ways of developing attitude to promote PA to improve the health of Americans.

Numerous attitudinal studies suggest that individuals with a positive attitude toward PA are more likely to be active throughout their lives and, in turn, demonstrate more intense exercise behav-

iors than are those with a less positive attitude (Forrester et al., 2006; Mowatt et al., 1988; Pearman & Valois, 1997; Poobalan et al., 2012).

Research also supports the notion that although a positive attitude is associated with PA, much of it seems to be related to the conditions in which individuals are active. It is also important to note that a considerable number of individuals have a negative attitude toward PA. This results in a barrier, hindering the individual from participating in PA (Nelson et al., 2010). Therefore, to find out how a positive attitude toward PA is established, it is important to understand which activities contribute to a positive attitude, negative attitude, and activities that do not seem to have any effect on an individual's attitude.

In this inquiry, we compared the effect of adding a PA component to a university-required personal wellness course. The results suggest the addition of an assigned PA component to university-required personal wellness courses did not significantly affect attitude toward PA and exercise among either the control or experimental groups tested. We also compared gender differences, and those results also suggest no significant differences. In 2004, Mack and Shaddox's research contradicted these findings. They found significant differences in attitude toward PA and exercise upon completion of an added PA component to a required personal wellness class. Our inquiry indicated some improvement in mean attitudinal scores, but it clearly did not have the results Mack and Shaddox found. However, a main difference in the research methods in our study compared to those of Mack and Shaddox is that their required PA component allowed variety and choices. This attitudinal comparison was also noted by Mowatt et al. (1988). They added lecture to activity courses; however, the activity courses were electives and students had a choice of the activity course they wanted to take. It seems this is a commonality in research of attitude toward PA. When individuals are given a choice, have a structured environment, and have time, their attitudes improve. However, in our inquiry, it can be reasoned that because the PA was prescribed and did not vary, it caused no effect on participants' attitudes. If students were given more options, they may have found physical activities more enjoyable, resulting in a greater increase in attitude toward PA.

Although the specific, required PA did not improve participants' attitudes, it also did not negatively affect the participants' attitudes. Knowing what does not work regarding improving attitude toward PA is as important as knowing what does work. Information such as this is important in that it provides a basic guideline for individuals in positions that can potentially affect attitude toward PA, specifically in situations when these individuals are looking for the participants to enjoy what they are doing and wanting to create a positive attitude in hopes they continue being active.

The results of this research can help with decision making concerning required PA, but it is important to acknowledge that this research did not have the same *N* as some of the others in the literature. Based purely on mean scores, participants in each group improved their attitudes toward PA, and the findings could have been significant if there had been a larger *N*. So it can also be deduced that if the only option is to require a specific type of PA, it will not harm participants' attitudes as this research suggests.

Although the findings of this study did not concur with findings in similar research, in which significant differences were found in attitude toward PA upon completion of required PA, research in this area is still essential in identifying indicators that will improve and promote PA and exercise, in turn improving overall health.

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PHYSICAL ACTIVITY

Physical Education and Recess Contributions to Sixth Graders' Physical Activity

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Abstract

Background: *The purpose of this study was twofold: (a) to examine the percentage of the daily threshold (12,000 steps) that physical education (PE) class and recess contribute to 6th grade students' overall daily physical activity (PA) and (b) to examine the relationships between gender, PA outside of school, BMI, and steps during both recess and PE.* ***Method:*** *One hundred thirty-eight 6th grade students aged 11–13 years participated. Students completed the Physical Activity Questionnaire for Older Children (PAQ-C) and wore a pedometer to measure steps taken for 6 consecutive PE classes and recess sessions.* ***Results:*** *The overall contribution of recess and PE to the daily step goal ranged from 7.1% to 9.6% of the target step count of 12,000. All PA variables were positively correlated with one another (all $p < 0.05$) and children who took more steps during recess and PE tended to have lower BMI percentiles (both $p < 0.05$). However, when all variables were entered into the multiple linear regression model simultaneously, only*

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steps taken during PE was predictive of BMI percentile (total model $r^2 = 0.145$, $p = 0.001$). ***Conclusion:*** *Further research is needed to explore PA in schools along with potential interventions to increase PA.*

According to the Centers for Disease Control and Prevention (CDC, 2014c), over one third of children in the United States are overweight or obese. Activity levels are decreasing for reasons such as lack of safe areas to play, lack of community recreational programs, and increased amount of screen time with media outlets as well as for economic reasons (lack of program funding and familial budgetary choices; CDC, 2014c; Gordon-Larsen, McMurray, & Popkin, 2000; Knowles, Niven, & Fawkner, 2011). Middle school–aged children should receive at least 60 min of physical activity (PA) every day as well as accumulate 12,000 steps/day (Colly, Janssen, & Tremblay, 2012; National Association for Sport and Physical Education & American Health Association, 2012; President's Council on Physical Fitness and Sports, 2001; Vincent & Pangrazi, 2002). During adolescence, it has also been shown that females' PA is significantly less than males' PA (Flohr, Todd, & Tudor-Locke, 2006; Tudor-Locke, Lee, Morgan, Beighle, & Pangrazi, 2006; Vincent & Pangrazi, 2002). Children who are not attaining this amount of PA have a higher chance of premature death from heart disease; a higher chance of developing type 2 diabetes, high blood pressure, and certain cancers; and an increased risk of anxiety and depression (CDC, 2014b). A good setting to address and increase PA levels may be schools because of the amount of time students spend there each day.

Physical education (PE) is an important subject within the school setting when considering the amount of PA students achieve because they spend upwards of 6 to 7 hr in school per day (Flohr et al., 2006; Tudor-Locke et al., 2006; Vincent & Pangrazi, 2002). It has been shown that middle school students can achieve as much as 17% (2,046 steps) of their daily steps during PE days when PA is based on 12,000 steps/day (Flohr & Todd, 2003; Flohr et al., 2006). Similarly, Tudor-Locke et al. (2006) found students took an average of 1,417 steps during a 30-min PE period, which accounted for ~18% of their daily PA. In comparisons of boys and girls in PE, no significant difference has been shown (Flohr et al., 2006; Tudor-Locke et al., 2006)

Additionally, within the school setting, recess can also play a significant role in contributing to students' overall daily PA. Tudor-Locke et al. (2006) found that lunchtime (time eating lunch and unstructured recess) provided the biggest portion of PA obtained during the school day. When a 15-min, unstructured recess time was factored in, in addition to the aforementioned lunchtime, students received roughly 30% of their daily PA when based on an average daily count step of 12,000 steps/day. Further supporting this finding, Beighle, Morgan, Le Masurier, and Pangrazi (2006) found that elementary school students receive 9% of their daily steps during an unstructured recess, with an average step count of 1,090 during a 15-min recess. In comparisons of girls' and boys' PA during recess, it has been shown that boys participate in significantly more PA (Beighle et al., 2006; Brusseau et al., 2011; Tudor-Locke et al., 2006).

Many researchers have examined PA throughout the segmented day, but few have examined the amount of steps students take in schools that do not offer daily PE, but do offer a structured, daily recess. Additionally, few researchers have compared the amount of PA in PE and structured recess (Smith & Biddle, 2008). The purpose of this study was twofold. The first purpose was to examine the percentage of the daily threshold (12,000 steps) that PE class and structured recess contribute to sixth grade students' overall daily PA. Additionally, our goal was to examine the relationship between gender, PA outside of school (PAQ-C), BMI, and steps during both recess and PE.

Method

Participants

Sixth grade students from one elementary school in a large, rural community in the Midwest were invited to participate in the study. Students and primary caregivers were informed of the procedures of the study. The primary caregivers provided informed consent, and the students provided assent to participate in the study. Prior to data collection, the university institutional review board and school administrators approved this study. One hundred thirty-eight students (72 males, 66 females) aged 11–13 years (*M* = 11.7, *SD* = 0.6) participated. The race of participants included White non-Hispanic (97.1%), multiracial (2.2%), and African American (0.7%).

Setting

Participants attended PE twice a week and were taught by a certified PE teacher. The average class had 24 students. PE lessons were 30 min in length and included pickleball activities (e.g., skills, drills, lead-up games, and tournament play). The PE lessons were taught in the school gymnasium, which was the size of a regulation basketball court and held four pickleball courts.

Recess occurred before lunch and lasted approximately 20 min. The planning and execution of the structured recess was a main focus for the assistant principal. Therefore, each recess had planned activities that the assistant principal set up with some input by the PE teacher. Each activity was supervised for appropriate behavior (e.g., playing fairly, using appropriate language, using the equipment appropriately). The playground was a blacktop surface, approximately 115 ft × 170 ft. It was split into three areas for the following activities: four square courts, six basketball hoops, and a space for jump ropes. The participants had access to equipment for all activities. The participants were not allowed to move freely throughout the playground, but rather they were required to pick an activity at the beginning of recess and continue with it until recess was over. Also, the participants had the option to walk around the school on the sidewalk with a recess supervisor.

Instrumentation

Demographic information. Demographic information (race, gender, and age) was gathered by accessing the principal investigator's student database from a secure school computer.

BMI. In this study, a BMI value was calculated by dividing a participant's body mass by height squared (kg/m^2). According to the CDC (2014a), BMI is a reliable indicator of body fatness, but is not a direct measure of body fat. It has been shown to correlate with direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (CDC, 2014a; Mei et al., 2002). It is easy to perform as well as inexpensive. For children and adolescents, BMI is referred to as BMI-for-age because age and sex are taken into consideration. In this study, participants' BMI measurements occurred within the school day, but outside of PE. The school health clerk performed the measurements. The principal investigator recorded the

measurements into the BMI for schools tool, as offered by the CDC (2014a).

Physical Activity Questionnaire for Older Children (PAQ-C). The PAQ-C was used and is a self-administered, 7-day recall instrument (Kowalski, Crocker, & Donen, 2004). Participants completed the investigator-led PA self-report questionnaire during the school day, but outside of their PE class. Once the surveys were completed, scores were compiled into an Excel worksheet.

Pedometers. The New Lifestyles SW-701 Digi-Walker was used to assess the number of steps that participants took during PE classes and recess sessions. According to the New Lifestyles (n.d.) website, it works best for those who are not considered obese and for those traveling at a speed greater than 2.5 mph. The SW-701 was shown to have the smallest mean error (–0.1) when compared with nine other pedometers (Schneider, Crouter, Lukajic, & Bassett, 2003).

Procedures

Data collection occurred over 6 weeks. During the first week, participants were instructed how to attach, wear, and use the pedometer appropriately. The participants practiced picking up, attaching, wearing, and returning their pedometers in PE class and in recess prior to data collection.

In Weeks 2 to 6, step counts in six consecutive PE classes, occurring two times a week, and in six outdoor structured recesses were recorded. The principal investigator observed the class to ensure that tampering was not taking place. If tampering was observed, the participant was identified and those data were thrown out. Immediately following the conclusion of the PE class and recess, participants were instructed to remove their pedometers and return them to the appropriate place. An investigator recorded the steps from each pedometer on a data sheet and reset the pedometer to 0 for the next class or recess session. Throughout the 6-week collection period, participants were measured for height and weight by the school health clerk and completed the PAQ-C during school hours.

Data Analysis

Statistical analysis was completed using IBM SPSS 21 (IBM Corp., 2012). Descriptive statistics were computed for all variables and are presented as $M \pm SD$. Independent t tests were used to examine gen-

der differences, and a Pearson chi-square test for independence was used to compare the percentage of overweight and obesity in boys and girls. Partial correlations were computed to examine how well the variables were related to one another independently while controlling for gender and age. Finally, a multiple linear regression was used to examine the shared contribution of gender, PA outside of school (PAQ-C), BMI, and steps during both recess and PE to BMI percentile. Four models were used: Model 1, age and sex; Model 2, age, sex, and PAQ-C; Model 3, age, sex, PAC-Q, and recess steps; and Model 4, age, sex, PAC-Q, recess, and PE steps.

Results

Inclusion criteria for this study were attending four out of six PE classes and four out of six recesses. Every student met those criteria. Descriptive statistics for variables are presented in Table 1. The independent samples *t* test indicated boys were significantly different than girls in terms of scoring higher on the PAQ-C (3.05 ± 0.60 vs. 2.80 ± 0.57, $p < 0.05$), taking more steps during recess (1,150 ± 375 vs. 890 ± 327, $p < 0.05$), the percentage contribution of recess to the 12,000 step threshold (9.6 ± 3.1 vs. 7.4 ± 2.7, $p < 0.05$), taking more steps during PE (1,116 ± 301 vs. 847 ± 219, $p < 0.05$), the percentage contribution of PE to the 12,000 step threshold (9.3 ± 2.5 vs. 7.1 ± 1.8, $p < 0.05$), and total contribution to the 12,000 step threshold in both PE and recess (18.9 ± 4.7 vs. 14.5 ± 3.4, $p < 0.05$).

Table 1
Descriptive Statistics by Gender

Statistic	Boys (*n* = 72)	Girls (*n* = 66)	Combined (*N* = 138)
Age (years)	11.7 (0.6)	11.7 (0.6)	11.7 (0.6)
BMI (kg/m2)	21.5 (4.8)	21.6 (5.5)	21.5 (5.1)
BMI Percentile	70.1 (26.4)	66.2 (27.8)	68.2 (27.0)
% Overweight/Obese	36.1%	31.8%	34.1%
PAQ-C	3.05 (0.60)	2.80 (0.57)*	2.93 (0.59)
Steps During PE	1,116 (301)	847 (219)*	987 (296)
Contribution of PE to 12K Target (%)	9.3 (2.5)	7.1 (1.8)*	8.2 (2.5)

Table 1 (cont.)

Statistic	Boys ($n = 72$)	Girls ($n = 66$)	Combined ($N = 138$)
Steps During Recess	1,150 (375)	890 (327)*	1,025 (375)
Contribution of Recess to 12K Target (%)	9.6 (3.1)	7.4 (2.7)*	8.5 (3.1)
Total Contribution to 12K Target (%)	18.9 (4.7)	14.5 (3.4)*	16.8 (4.7)

*Statistically significant difference between boys and girls ($p < 0.05$).

The partial correlations were adjusted for age and gender. Results indicated statistically significant associations between the following variables (see Table 2): BMI percentile and PE steps (–0.318, $p < 0.05$), recess steps (–0.191, $p < 0.05$), and PE/recess contribution (–0.305, $p < 0.05$); PAQ-C and PE steps (0.214, $p < 0.05$), recess steps (0.318, $p < 0.05$), and PE/recess contribution (0.339, $p < 0.05$); PE steps and recess steps (0.286, $p < 0.05$) and PE/recess contribution (0.735, $p < 0.05$); and recess steps and PE/recess contribution (0.860, $p < 0.05$). No significant association was found between BMI percentile and PAQ-C.

Table 2
Partial Correlations for BMI Percentile and Physical Activity

Variable	BMI percentile	PAQ-C	PE steps	Recess steps	PE/recess contribution
BMI Percentile	–	–0.120	–0.318*	–0.191*	–0.305*
PAQ-C	–	–	0.214*	0.318*	0.339*
PE Steps	–	–	–	0.286*	0.735*
Recess Steps	–	–	–	–	0.860*
PE/Recess Contribution	–	–	–	–	0.860*

*Statistically significant correlations ($p < 0.05$).

Four models of multiple linear regressions were conducted for predicting BMI percentile from PA (see Table 3). Each model was found to be a significant predictor for BMI percentile: Model 1 (age + sex), $p = 0.028$, $r^2 = 0.051$; Model 2 (age + sex + PAQ-C), $p = 0.028$, $r^2 = 0.065$; Model 3 (age + sex + PAQ-C + recess steps), $p = 0.013$, $r^2 = 0.090$; and Model 4 (age + sex + PAQ-C + recess steps + PE steps), $p < 0.001$, $r^2 = 0.159$. The predictor β-coefficient for PE steps within Model 4 was also found to be significant, −0.028, $p < 0.001$, respectively.

Table 3
Multiple Linear Regression Predicting BMI Percentile From Physical Activity

Model	Model p	Predictor β coefficient p	Model r^2	r^2 change from previous
1: Age + Sex	0.028*	–	0.051	–
2: Age + Sex + PAQ-C	0.028*	–	0.065	0.014
PAQ-C		−5.442 (0.164)		
3: Age + Sex + PAQ-C + Recess Steps	0.013*	–	0.090	0.025
PAQ-C		−2.992 (0.463)		
Recess Steps		−0.013 (0.060)		
4: Age + Sex + PAQ-C + Recess Steps + PE Steps	< 0.001*	–	0.159	0.069
PAQ-C		−1.227 (0.757)		
Recess Steps		−0.008 (0.259)		
PE Steps		−0.028 (0.001)*		

*Statistically significant predictor.

Discussion

The most important findings from this study were the roles PE and structured recess play in contributing to sixth grade students' overall PA. Additionally, boys were found to be significantly more

physically active than girls, and participants with higher BMI percentiles were found to be less active than their counterparts with lower BMI percentiles during both PE and recess. As mentioned above, PE was found to account for 8.2 ± 2.5% of the overall daily PA or 987 ± 296 steps, whereas structured recess was found to account for 8.5 ± 3.1% or 1,025 ± 375 steps. The combined overall contribution of both PE and recess (50 min combined) was found to be 16.8 ± 4.7%. When broken down into steps per minute, participants took 40.8 steps/min overall. These findings are well below participants in fourth to sixth grades who took 50.9–59.5 steps/min during their PE and recess times (Brusseau et al., 2011; Tudor-Locke et al., 2006). However, it is important to note that previous studies did not include structured recesses and also included periods that allowed for free play, lunchtime (time spent eating lunch and free time following the conclusion of eating) for 40 min, and an additional recess for 15 min. This factor alone allowed for more opportunity for the participants to be physically active, which could account for the higher step rates overall. Also, it is thought that the focus of the PE classes during this study played a notable role in the amount of steps participants took during PE when compared with previous studies. This will be further explained in the following paragraphs.

The sixth grade participants in this study took an average of 987 ± 296 steps during a 30-min PE class, accounting for roughly 8% of their overall daily PA. When broken down into steps per minute, participants took 32.9 steps/min during PE. These findings are well below the research findings for PE, of the same grade: 43.4–47.3 steps/min (Alderman, Benham-Deal, Beighle, Erwin, & Olson, 2012; Tudor-Locke et al., 2006). Their counterparts' steps in a 30-min PE accounted for 11%–12% of the overall daily PA (Alderman et al., 2012; Tudor-Locke et al., 2006). A possible explanation for the difference in results could be the focus of the lessons. Research has shown that adolescents' perception in skill ability and actual skill ability play a role in PA (Hill & Hannon, 2008; Reed, Metzker, & Phillips, 2004). Specifically, Hill and Hannon (2008) reported that lower skilled students "perceive their inability to perform the basic skills will limit their success in competitive situations" (p. 186). In this study, pickleball skills and tournament play were the main foci of the lessons. Because none of the students had played pickleball

or had experience with a racket sport in PE, a lower amount of PA during PE may be explained by perceptions of skill level and actual skill level. However, it is important to note that this is an assumption based on previous research, as skill level and/or skill perceptions of pickleball were not measured in this study, and limited skill improvement could be expected in only six 30-min PE lessons.

Current pedometer-determined PA literature in PE has shown mixed results in regard to gender differences in PE (Alderman et al., 2012; Brusseau et al., 2011; Flohr & Todd, 2003; Tudor-Locke et al., 2006). In this study, an examination of gender showed boys took more steps than did girls in PE. A possible explanation for this is that as adolescents age, they become less physically active, girls more so than boys (Pate, Dowda, O'Neill, & Ward, 2007). It is important to note the biological difference between the boys and girls in this study. It has been reported that girls mature roughly two years before boys (12 years vs. 14 years; Malina, Bouchard, & Bar-Or, 2004; Tanner, 1989). Sherar, Esliger, Baxter-Jones, and Tremblay (2007) reported boys aged 10–13 were engaged in significantly more moderate to vigorous physical activity overall than were girls. Additionally, it has also been shown that boys prefer playing competitive sports more than girls do (Courtier, Chepko, & Coughlin, 2007; Hill & Hannon, 2008). Therefore, the way in which girls in this study perceived pickleball may have played a role in the amount of PA they accumulated in PE.

A 20-min structured recess accounted for roughly 9% of sixth graders' overall daily PA. Participants took an average of 1,025 ± 375 steps (51.25 steps/min). Participants were found to receive more pedometer-determined PA during a structured recess than were participants in previous research findings (Grades 1 to 4) who were reported to take 870 ± 250 steps during a 15-min (58 steps/min) structured recess, accounting for 7% of their overall daily PA (Stellino-Babkes, Sinclair, Partridge, & King, 2010). Differences in findings between this study and prior research may be explained by the way the recess was structured. In this study, participants had four activities from which to choose each day, whereas the participants in the work of Stellino-Babkes et al. (2010) participated in one activity each week. Perhaps having a choice in activities in which to participate daily explains why participants in this study had a higher level of

pedometer-determined PA. According to self-determination theory (Deci & Ryan, 1985), a basic need of all people is to engage in activities of one's choosing and be the origin of one's behavior. Research in motivation has shown that choice can play a role in what drives a person to be physically active. When given a choice, it has been shown that motivation to participate in physical activities can increase in students in Grades 5 and 6 (Cox & Williams, 2008). Further studies conducted with only one activity offered versus many activities offered during a structured recess may help determine if PA is more affected by the structure of the recess or the number of activities offered during the structured recess.

Current research in pedometer- and accelerometer-determined PA during a structured recess has shown that boys are more physically active than girls (Huberty et al., 2001; Ridgers, Stratton, Fairclough, & Twisk, 2007; Stellino-Babkes et al., 2010). This study supports the existing literature in terms of the effect of gender and PA levels in structured recess. Our examination of structured recess steps showed that boys (1,150 ± 375) accumulated significantly more steps than did girls (890 ± 327) during a 20-min structured recess. This accounted for roughly 10% and 7% of overall daily PA as well as 64 steps/min and 49.4 steps/min for boys and girls, respectively. The overall contribution to daily PA and the step rates were found to be similar for boys (909 ± 257 steps and 58 steps/min) and marginally larger for girls (825 ± 2,360 steps and 55 steps/min) in a study to examine structured recess steps of boys and girls (825 ± 2,360) in first to fifth grades (Stellino-Babkes et al., 2010). Further examination should include activities geared toward increasing overall PA that girls receive during recess.

Significant gender differences were also found in the PAQ-C. Boys on average scored 3.05 ± 0.60, whereas girls scored 2.80 ± 0.57. Albeit a small difference between scores, the results add to current research that boys are more physically active overall than girls. Tudor-Locke et al. (2006) also reported a significant difference in gender for middle school participants (13,000 ± 4,398 steps vs. 10,455 ± 3,648 steps) in PA outside of school on weekends for boys and girls, respectively. These findings continue to suggest that the importance of PA needs to be continually emphasized to girls, and perhaps examples of PA need to be offered that girls may be more interested to participate in outside of school.

Participants with higher BMI percentiles were found to be less active than their counterparts with lower BMI percentiles during both PE and recess. These findings are in line with those from a study conducted by Gao, Oh, and Sheng (2011), who found a significant difference in PA levels during PE between middle school students labeled *overweight* and *healthy weight.* They reported that students with a BMI percentile greater than 85% spent significantly less time in moderate to vigorous physical activity (61.1%) and significantly more time being sedentary (13.5%) during PE than did those with a healthy BMI (68.2% and 7.6%, respectively; Gao, Oh, & Sheng, 2011). Likewise in structured recess, Stellino-Babkes et al. (2010) reported higher PA levels in participants with a healthy BMI percentile as compared with those with a BMI percentile greater than 85% (912 ± 250 steps vs. 810 ± 258 steps) in 15 min. The findings in our study continue to highlight the importance of PE and structured recess in the amount of PA that students receive during the school day, even more so for those with higher BMI percentiles.

The data in this study show a low percentage of steps contributing to overall daily PA; thus, it is important to note how schools can contribute more to increasing PA. A comprehensive school physical activity program (CSPAP) incorporates PA "programming before, during, and after the school day" (American Alliance of Health, Physical Education, Recreation, and Dance [AAHPERD], 2013, p. 2). It makes sense that PE and recess, structured or unstructured, allow for PA to occur during the day, but there are many other opportunities for PA to occur at school. For example, a focused PA break can be taken throughout the day in the classroom. These breaks could be as easy as getting the students up and doing simple calisthenics. PA opportunities should also be offered prior to school starting as well as after school. These activities can include "intramural sports (volleyball or basketball), self-directed activities (walking or jogging clubs), classes (dance, yoga, or martial arts) and activity clubs (jump rope, hiking, and fitness)" (AAHPERD, 2013, p. 5). It is important to give attention to the interests of the student body so as to offer activities, competitive and noncompetitive, in which they would be willing to participate. The timing of when such activities are offered should also be considered so as to offer PA opportunities that all students are able to take advantage of (AAHPERD, 2013).

It is also important to note limitations to the study. There was not enough space in the gym for all participants to be engaged in PA during the game play portion of the lessons. The average class size was 24, and the setup of game play only allowed for four courts of doubles to play at one time, thus accounting for three fourths of the class to be active at one time. The other one fourth not participating in game play was responsible for refereeing the games and reporting the scores at the end of the 5-min games. Modified rules to the game also limited movement, and the participants were restricted to staying on their side of the court (they were not allowed to cross over the dividing line on their side of the court). The rules were made to ensure participants were getting equal opportunity to play, thus not allowing one person to play the whole court. PA may have been different had the participants been playing an invasion type of game, allowing for more movement throughout the game.

A second limitation was the way in which the recesses were structured. Participants were not allowed to move freely from one activity to another; if participants became bored, they simply stopped what they were doing. Supervisors in the current structured recesses were not trained to nor told to encourage engagement in PA during recess, but rather they were there to ensure proper behavior (no inappropriate use of words, fighting, etc.) was occurring.

Additionally, the timing of the study and age level of the participants studied was a limitation. This study occurred at the end of the school year with the oldest age group at the school; therefore, the participants were possibly bored of the activities offered during recess and would rather have spent their time hanging out with their friends than engaging in meaningful PA during the time allotted for recess.

Conclusions

This study is important because it is the first in which the contributions of both PE and structured recess to adolescents' total daily PA are examined. Understanding PA contributions during PE and structured recess, as well as throughout the school day, is important in designing and structuring opportunities for adolescents to engage in PA, as they accounted for 16.8% of the participants' total daily PA. These findings are even more important when considering the BMI percentiles of adolescents, as PA was found to decrease significantly

with all PA variables except in self-reported PA. Therefore, special emphasis for creating opportunities to be engaged in PA during both PE and structured recess should concentrate on those who have BMI percentiles greater than the 85th percentile, as well as on girls, who were also shown to have significantly lower levels of PA during the same time periods.

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