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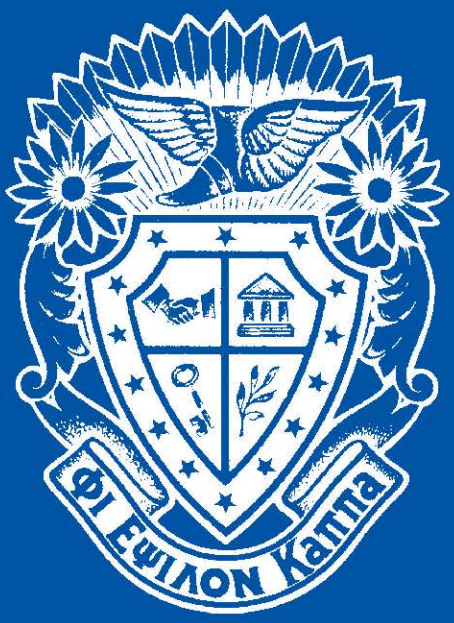

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FITNESS

The Benefits of Health-Related Fitness Education in Secondary PE

Rick C. Ferkel, Zach T. Hutchinson, Selen Razon, Larissa True, Dagny Zupin, Lani M. Jones, Lawrence W. Judge

Abstract

The health status and physical activity levels in the United States of adolescents and adults is disheartening. Many health professionals have been using the term exercise is medicine *to advocate more physically active lifestyles. Unfortunately, the focus of most PE curriculums is directed toward a sport and game model, which research indicates does not prepare students for continued PA, exercise, and fitness. This article challenges higher education and secondary PE programs to re-evaluate the curricular approach of a sport and game model and shift to a health-related fitness education model. Health-related fitness education can empower students to create and execute a plan for lifetime fitness through learning the skills (e.g., exercise modalities) and knowledge (e.g., goal setting, FITT principles, planning) needed for staying fit. Health-related fitness education also helps develop self-efficacy and other affective attributes that can motivate for lifelong habitual adherence. There is no greater time than now for PE to be the leader in exercise is medicine, by equipping youth with the tools to make exercise, PA, fitness, and health a way of life today and forever.*

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Physical educators and other physical activity (PA) providers are under increasing pressure to keep curriculum current and relevant. Research confirms that student outcomes improve when physical educators utilize an evidence-based approach to teaching. The opportunity for physical education (PE) to be the leader in transforming societal health and fitness is greater than ever. Over the last 40 years, substantial evidence has accumulated concerning the importance of PA and health outcomes (Blair & Morris, 2009; Warburton, Nicol, & Bredin, 2006). Research shows children in the United States are healthy and happy as they engage in traditional PA. In addition, families report higher levels of satisfaction if their children participate in PA (Timperio et al., 2013).

Despite the abundant information demonstrating the role of PA in maintaining a healthy lifestyle, informative approaches alone have not been enough to promote lifestyle behavioral changes in much of the population (Nahas, Goldfine, & Collins, 2003). Consequently, the health of the U.S. population is alarmingly poor and the need for change is paramount. Only 21.7% of adults (Centers for Disease Control and Prevention [CDC], 2017c) and 16.3% of adolescents (Song, Carroll, & Fulton, 2013) meet the national guidelines for aerobic and muscle-strengthening activity. Regarding general PA participation, only 49% of adults are active at the recommended levels (B. Lewis, Napolitano, Buman, Williams, & Nigg, 2017). Furthermore, more than one third (36.5%) of adults and one fifth (20.5%) of adolescents (12 to 19 years) are considered obese (CDC, 2017a). Lack of time, lack of motivation, and perceived adverse effects associated with PA are the most commonly cited psychological barriers to PA (Netz, Zeev, Arnon, & Tenenbaum, 2008).

To further complicate matters, prevalence of chronic disease continues to increase, with physical inactivity being a substantial contributor (Booth, Roberts, & Laye, 2012). There is also a relationship between physical inactivity and mental health conditions (Clow & Edmunds, 2014). Of the $2.7 trillion in annual health care costs, chronic and mental health conditions account for 86% of those costs (Gerteis et al., 2014). The $320 billion that was spent on prescription drugs in the United States in 2015 was primarily allocated to chronic conditions that are preventable by behavioral choices concerning PA and nutritional habits (CDC, 2017d).

Meanwhile, the public health community has become increasingly interested in the potential contributions of PE programs offered in public schools to improve children's health and lifestyle habits (Sallis et al., 2012). This renewed interest in PA is understandable given that K–12 PE, a preventive medicine intervention, is in place for youth aged 5 to 18 across much of the United States. To promote this initiative, health professionals have also implemented the concept of *exercise is medicine*, a phrase that implies that a proactive stance rather than a reactive one is much more cost effective and should be the primary approach to wellness (Berryman, 2010; Lobelo, Stoutenberg, & Hutber, 2014; Pedersen & Saltin, 2015).

Until the early 1900s, the focus of PE was on health and exercise, which is aligned with the idea that exercise is medicine. Subsequently, a curricular transition ensued where games and sports became the dominating curricular force in PE. This change in focus halted for a brief period in the 1930s–1940s during the World Wars with the recognition that fitness enhancement was needed for troops to be battle ready (Berryman, 2010). After World War II, PE programming reverted to the sport and game model, which is the staple of most secondary programs today (Mears, 2008; Miller et al., 2017).

Today's trends are perplexing given the evidence indicating that conceptual PE is more effective than the traditional sport and game model for sustained PA and fitness outside the classroom (Dale & Corbin, 2000; Fairclough, Stratton, & Baldwin, 2002). Despite empirical evidence for conceptual PE and long-standing concern from the public health community (Sallis et al., 2012), limited curricular changes in higher education and K–12 PE programs have taken place that allow behavioral change for lifetime fitness and wellness. To that end, Haerens, Kirk, Cardon, Bourdeaudhuij, and Vansteenkiste (2010) argue that very little transfer of learning occurs between what is taught in school PE and subsequent PA habits later in life. This paper elaborates on methods through which health-related fitness education in secondary PE can induce behavioral change to create healthy lifestyle habits for sustained physical fitness, disease-free lifestyles, and higher quality of life in adolescents and adults.

Lifetime Activities vs. Sport Activities

Substantial research indicates that PA patterns and fitness levels during adolescence directly relate to PA habits and fitness dur-

ing adulthood (Craigie, Lake, Kelly, Adamson, & Mathers, 2011; Gordon-Larsen, Nelson, & Popkin, 2004; Högström, Nordström, & Nordström, 2015; Telama et al., 2005). These findings imply that students who develop the tools to stay active and become fit in adolescence can experience the lifelong benefits associated with PA. For example, Wanless et al. (2014) examined an after-school running program and found that PA tracking devices, such as pedometers, can help individuals increase PA through increased monitoring and self-regulation. Significant changes in PA behavior occur when self-monitoring is combined with goal setting and/or performance feedback (Michie et al., 2011). To elicit the desired outcome of lifelong fitness, PE professionals must critically examine and evaluate current curricular choices.

Lifetime activities, which have been defined as activities that carry over into adulthood, can be done on a regular basis and have the potential to help individuals improve their health and/or skill-related fitness (Mohr, Townsend, & Pritchard, 2006; J. Ross, Dotson, Gilbert, & Katz, 1985). To that end, activities such as swimming, biking, running, walking, weight lifting, resistance training, and high intensity training fit the classification as lifetime activities. Learning lifetime activities during the adolescent years can have a great transfer effect into adulthood (Fairclough et al., 2002). Green, Smith, and Roberts (2005) stated that youths' experiences have profound implications for their subsequent patterns of participation in PA. As early as 1999, Roberts indicated that by the age of 16, adolescents have already begun adopting many of their adult leisure practices. Unfortunately, in the field of PE individual fitness activities, especially those related to resistance training and high intensity training, are not considered lifetime activities and are marginalized. This marginalization may be due to a lack of practitioner knowledge regarding how to teach these activities (McGladrey, Hannon, Faigenbaum, Shultz, & Shaw, 2014).

More recently, Barney, Pleban, Wilkinson, and Prusak (2015) examined college students' thoughts and perceptions of their high school PE experiences and current PA patterns. Students specified that they primarily participated in team sports, with several reporting that team sports were the most enjoyable activity, especially among males. Students also reported perceiving their high school PE expe-

rience as irrelevant, and they noted that they would have preferred to learn more lifetime activities (e.g., weight training, golf, swimming). The results of the study suggested that the respondents did not feel that their PE courses equipped them with the tools needed for lifetime PA. A key point to reflect herein is that students enjoyed team sports, yet felt that they did not get any value from team sports as young adults. To that end, it is the job of the educator to provide a rigorous curriculum that is relevant to lifetime fitness and provide students with appropriate challenges to grow. This approach has the potential to help students acquire lifetime habits, instead of other approaches that center around game playing to elicit momentary "fun" (Ferkel, Razon, Judge, & True, 2017).

Conceptual Physical Education vs. Traditional Physical Education

Project Active Teens was a unique, longitudinal, public school project facilitated by a university and was designed to promote PA among teens (Dale, Corbin, & Cuddihy, 1998). The study developed lesson plans for one semester of conceptual PE classes that blended classroom sessions with physical movement sessions. PA and wellness programs were taught in classroom sessions, whereas the movement sessions were spent building skills to develop and promote lifelong fitness habits. The PA patterns of the conceptual PE students were then compared to the students from traditional PE, which consisted primarily of sports and games. A 3-year follow-up study indicated that students in the conceptual PE classes participated in significantly greater levels of PA compared to students in the traditional PE courses (Dale & Corbin, 2000).

Traditional secondary PE is known to have a team sport and game-oriented curriculum (Dale & Corbin, 2000; Mears, 2008). Evidence indicates that traditional team sports and games lead to health-enhancing benefits in participants. However, PA trends suggest that active adults and older teens spend the majority of their active time participating in fitness activities and not in sports (Fairclough et al., 2002; Hulteen et al., 2017; Physical Activity Council, 2017; U.S. Census Bureau, 2012; Woods, 2017). The practicality of sports being an agent to enhance fitness levels as individuals

age is limited in scope and is contingent upon competing demands (e.g., work, family), resources, current fitness levels, and many other contributing factors. Providing students with various forms of exercise and PA (e.g., body-weight training, weight training, group fitness, aerobic dance, high-intensity training, swimming, biking, hiking/backpacking) that can be done individually or in a group setting has the potential to be more effective in inducing behavioral change for lifetime fitness.

It is also important to note that team sport curriculum tends to focus on winning rather than mastery of skills (Mohr, Townsend, & Bulger, 2001; Siedentop, 1994; Stanec & Lay, 2008). When teaching a team sport curriculum, many teachers use the multiactivity approach (Siedentop, 1994; Siedentop, Mand, & Taggart, 1986), which focuses on teaching a compilation of different games and activities throughout the course. Through this curriculum, students usually receive a few days of skill instruction and drill practice, followed by several days of limited supervision game play (Mohr et al., 2006). Consequently, team sports curriculum may cater only to the talented athletes or those with potential to become athletes (Haywood, 1991; Mohr et al., 2006). Haywood (1991) argued this point by demonstrating that a team sports curriculum focuses more on playing games and less on skill development, which in turn negatively affects students with less athleticism, as more advanced students dominate game play. Specifically, evidence shows that team sports curriculum not only favors the athletic students but also has a negative effect on the less athletic males as well as a majority of females (Kimball, Jenkins, & Wallhead, 2009; Myrick, 1996; Rikard & Banville, 2007).

Sport and Game Emphasis

With the fast growth of sport and games knowledge, the challenge of keeping up with the ever-growing body of information is greater than ever. Sport can bring great value to a certain population of students physically and psychosocially but also has potential inherent risks as they move into adulthood. Educators have a responsibility to examine potential risks with the health and safety of all students concerning lifetime PA adherence. One key reason for limited adult participation in sport is the risk of injury that many adults cannot afford. Exposure and long-term participation in certain types

of intense sports/games that require contact such as hockey, football, rugby, basketball, and soccer may sometimes lead to unhealthy outcomes (e.g., injury) during adulthood (Caputo & Mattson, 2005; Cross et al., 2017; Gouttebarge, Aoki, Lambert, Stewart, & Kerkhoffs, 2017; Misra, 2014; Ristolainen et al., 2010; Schallmo, Weiner, & Hsu, 2017; Stein, Alvarez, & McKee, 2015). In contrast, exercise modalities such as resistance training, cardiovascular equipment, group fitness, and swimming focus on functional fitness and with correct programming prescription are less likely to cause injury (Conn, Annest, & Gilchrist, 2003).

Along with injury comes the nature of the importance of body size (e.g., increased body composition or muscle mass) within different sports. Surprisingly, football players (especially linemen) show warning signs and symptoms of metabolic syndrome (Judge, Stone, & Craig, 2010). Although competitive athletes (i.e., football players) may be assumed to be sheltered from risks of cardiovascular disease, metabolic syndrome and other associated adverse biomarkers for heart disease place them at higher risk for a number of post-competitive pathogenic chronic health consequences (Buell, Calland, Hanks, & Thorne, 2008; Judge et al., 2010). This is not an attack on extracurricular sports, as they can have a positive impact in many ways and are highly encouraged for youth outside of school. Instead, this study highlights the importance of health-related fitness education in PE. While sport will end for most, the need to stay physically active and fit will not.

Catering PE curriculum to team sports that involve contact such as soccer, hockey, or football may be unknowingly steering adolescents toward future participation (adulthood) in sports with potential long-term adverse health consequences (e.g., injury) that may hinder their ability to stay active, rather than help. Staying away from a curriculum that emphasizes team sports also ensures that students perceived to be talented athletes, or those with the potential to become talented athletes, are not accommodated at the expense of other students. Team-sport-based curriculum can leave less developed or less athletically gifted adolescents with a distasteful PE experience. This poor PE experience with team sports during adolescence can transfer into a dislike of PA during adulthood. For many years now, secondary PE unknowingly has portrayed to many students that if

they are not competent (i.e., athletically gifted) in sports and games, then fitness and health is not for them. Conversely, fitness and health is for everyone, while sport is just one avenue for enhancement.

Noncontact team sports have their own unique obstacles and barriers. They require multiple participants, a specific playing field or equipment, and sometimes organization and officiating. These limitations make participation difficult for adults and older teens because of busy schedules, limited free time, monetary restrictions, and lack of participants to compete. In this regard, Roberts (1999) proposed that the low rate of participation for older adults in physically active recreational activities might be due to the limited opportunities for pursuing these activities upon leaving school. As more research investigates current practices involving team sports, physical educators need to be more conscious of whether current curricular practices are relavant and evidence based. There is more intentional scrutiny of long-term PA outcomes.

Furthermore, if secondary PE is concerned only with sports, games, and achieving the required amount of PA, then many states and districts that allow athletes to opt out of PE have a valid rationale, as students will receive the same type of experience or an experience at an even higher level than the one provided in PE. These authors are not advocating for this exception, but rather making a point that secondary PE should not exclusively be limited to a sports and games curriculum. Rather, secondary PE should aim to provide students with the tools to stay active and fit now and for a lifetime (Ennis, 2011; Ferkel et al., 2017; Prusak et al., 2011). Accordingly, we believe a secondary PE curriculum predicated on health-related fitness education can meet these goals.

Self-Efficacy and Motivation in Students

An examination of motivation and self-determination in students reveals that students who feel like they cannot adequately perform the skills required for a task are less likely to persist at that task/activity outside of school (Greenwood-Parr & Olsin, 1998). Self-efficacy in students' motivational profiles also plays a role in their ability and willingness to participate and learn within educational settings (M. Ross, Perkins, & Bodey, 2016). The concept of self-efficacy is derived from Bandura's (1986) *social cognitive theory* and can be a useful predictor in assessing behavior. With respect to

PA and fitness, self-efficacy represents one's perceptions of confidence in his or her activity level and/or confidence in an activity. Individuals often report various levels of confidence in different activities or conditions (Nahas et al., 2003). Choosing activities that make students feel less confident and unsuccessful (e.g., competitive team sports) could deter them from continuing these activities on their own.

Considering that self-efficacy and motivation are among the greatest contributors to health behavior (Lox, 2017), PE should aim to increase students' self-efficacy and motivational levels not only for the mere enjoyment of the course content but also for long-term PA behaviors in students. To that end, lowering students' perceptions of self-efficacy through games requiring athleticism can especially deter students, given that a low sense of self-efficacy leads to negative affective responses to activity, and negative affective responses to activity are highly associated with physical inactivity (Ekkekakis, Parfitt, & Petruzzello, 2011). This information is consistent with the view that teaching adolescents skills that increase PA, while focusing on the benefits of high-quality exercise can combat current poor lifestyle habits (Ennis, 2010). In direct opposition of a team sports and game model, an individualized health-related fitness education model that allows students to see personal growth and improvement by adopting a mastery rather than performance standpoint (Louw, Dunlop, Yeo, & Griffin, 2016) can provide them with a more plausible pathway to behavioral change.

Self-Determination Theory

Self-determination theory (SDT) states that behavior can be categorized as intrinsically motivated, extrinsically motivated, or amotivated (Deci & Ryan, 1985, 2000). Per Deci and Ryan (2000), intrinsically motivated people seek out challenges and desire to explore and learn without external rewards. Extrinsically motivated individuals are motivated by a means to an end and not for the inherent satisfaction of engaging in an activity (Deci & Ryan, 2000). Amotivation refers to situations when individuals perceive no contingencies between outcomes and the actions they choose while possibly experiencing feelings of incompetence and uncontrollability (Vallerand et al., 1992). According to the theory, three needs motivate all behaviors (including health behavior): competence, relatedness, and

autonomy (Deci & Ryan, 2010). As such, Deci and Ryan (2010) suggested that people are inherently motivated to operate effectively in their environment (competence), feel a sense of personal initiative and input in the activities they are undertaking (autonomy), and feel connected to others in their environment (relatedness). To this end, they suggested to the extent that social factors satisfy one's needs for perceptions of competence, autonomy, and relatedness, they will foster self-determination in an individual. Consequently, social factors that negatively affect those perceptions reduce motivation and lead to amotivated behaviors.

Research into the use of SDT for predicting long-term PA behaviors has generally concluded that participants who have a sense of competence over task-related skills, autonomy over the specific activity choice, and a sense of relatedness to others who are physically active with them display greater long-term adherence to the activity as opposed to others whose needs for competence, autonomy, and relatedness are not met (Hagger & Chatzisarantis, 2007, 2008; Edmunds, Ntoumanis, & Duda, 2006, 2007). Through these findings, it is evident that PE programming based on athletic games could reduce the sense of competence, autonomy, and relatedness for any participant who may not have the build and/or requisite skills to master the game; that is, these participants may not feel enough autonomy within the structured game design and its rules to relate to others who are better fit for winning the game. Consequently, PE programming that centers on the teaching of noncompetitive and diverse health-related fitness skills (e.g., resistance training, cardiovascular training modalities) instead of competitive gaming would most likely allow a higher sense of mastery and autonomy in all students. Such an approach would ultimately enable long-term PA behaviors in participants—one of the longest standing goals of PE (Sallis et al., 2012).

Of further relevance, SDT proposes that motivation occurs on a continuum from no motivation at all (i.e., amotivation) to extrinsic motivation to ultimately intrinsic motivation (Deci & Ryan, 1994). To that end, it is known that intrinsic motivation is associated with more positive affective responses and with cognitive and behavioral results (Vallerand & Rousseau, 2001). A number of studies have also shown that intrinsic motivation for PA leads to sustained PA behav-

ior (Duncan, Hall, Wilson, & O, 2010; M. Lewis & Sutton, 2010; Teixeira, Carraça, Markland, Silva, & Ryan, 2012). However, in most cases, individuals move through the continuum and do not immediately start from a place of intrinsic motivation (Wiberg, 2016).

From a PE programming standpoint, it is implied that for sustained PA behavior, most individuals need to see results and receive some type of external reward to repeat the activity and/or undertake similar activities (Lox, 2017). Health-related fitness education avails itself to setting goals, experiencing results and outcomes, and adjusting these goals for better results and outcomes (Houston & Kulinna, 2014). Therefore, health-related fitness education allows for considerable chances of satisfying individuals who are extrinsically motivated and, as a result of repeated exposure and some improvement, could help them move to a more internally motivated state. Specifically, changing secondary PE curricula from the traditional game and sport model to a health-related fitness education model would allow students guidance regarding development of a fitness plan and the process that occurs as they look to improve fitness. During this process, students would also start to enhance fitness through programming, which would elicit greater motivation for more activity.

In a game-playing model, however, students' success would be mainly defined as the score of the game, and especially within team play settings, students would have little control and autonomy over their success. Furthermore, for students who may not be athletically adept for the game, a sense of competence would be challenging to develop. From an SDT standpoint, this is important because a high sense of competence acquired through repeated exposure and a sense of autonomy and control over the activity and/or its outcomes are seen as the main precursor of long-term activity (Deci & Ryan, 1994). Thus, the health-related fitness education model would not only have a more positive effect on students' lifestyle choices but would also present greater prospects in facilitating long-term activity adherence.

Health-Related Fitness Education

Health-related fitness education is not merely about providing students with physically active classes, but rather about providing a comprehensive, physically active approach involving instruction on

social, cognitive, and physical skills, along with the affective traits of personal ownership for enhanced quality of life. A health-related fitness education-based curriculum would include didactic content that teaches health and fitness concepts (e.g., F.I.T.T principle, progression, goal setting, time management, fitness plan development) and activity sessions that focus on fitness programming in a noncompetitive setting (Dale & Corbin, 2000; Mohr, Townsend, & Pritchard, 2006). An example of this approach would be a split-week program with different modalities of fitness activities and PA implemented throughout a week (5-day cycle). Table 1 illustrates an example of a split-week program that implements body-weight training education, weight training education, cardiovascular training education, sports and games, rhythmic activities, outdoor recreation, and health-related fitness knowledge.

Learning health-related fitness habits can have a positive carryover effect into adulthood and increase the amount of exercise and PA in the adult population (Craigie et al., 2011; Gordon-Larsen et al., 2004; Högström et al., 2015; Telama et al., 2005). In addition to having a positive effect on exercise in adulthood, health-related fitness education can have favorable effects on adolescent students academic achievement (Sallis et al., 2012). Mears (2008) stated that expanding curriculum diversity in high school PE may lead to students discovering PA that will facilitate motivation for continued participation beyond the school setting. This theory is also consistent with earlier findings (Morgan, Pangrazi, & Beighle, 2003) that indicate that much of the PA that children engage in occurs outside of the PE classroom. In fact, Burgeson, Wechsler, Brener, Young, and Spain (2001) pointed out that only 8.4% of elementary schools, 6.4% of middle schools, and 5.8% of high schools provide enough daily PE for students to reach PA guidelines throughout a school year. This information is crucial, as it stresses the notion that what students learn in the classroom needs to have a carryover effect into real-world situations if they are to sustain fitness habits independently.

Lack of self-management skills is a frequently cited explanation for why adults lack physically active lifestyle habits (Lox, 2017; Sallis & Hovell, 1990). If people miss knowledge concerning health implications of an unhealthy behavior pattern, they may also lack the motivation and self-discipline to alter that behavior (Hirvonen,

Table 1
Health-Related Fitness Education Split-Week Program Example

Monday / Day 1 **Body-Weight Training Education**	Tuesday / Day 2 **Activity Day**	Wednesday / Day 3 **Weight Training Education**	Thursday / Day 4 **Activity Day**	Friday / Day 5 **Cardiovascular Training Education**
• Overall fitness and health knowledge; fitness plan programming • Body-weight and implement movements • Educational body-weight workout	• Sport/games, or outdoor recreation, or rhythmic activities	• Weight training knowledge and training programming • Weight training techniques and movements • Educational weight training workout	• Sport/games, or outdoor recreation, or rhythmic activities	• Knowledge on CV health and monitoring; CV programming • Cardiovascular (CV) training • Small-sided games or nutrition education
Lesson Order and Time Allocations *Times will fluctuate depending on individual school schedule.*				
Monday / Day 1	Tuesday / Day 2	Wednesday / Day 3	Thursday / Day 4	Friday / Day 5
1. 15–20 min. Knowledge session 2. 3–5 min. Warm-up/ movement preparation 3. 10–15 min. Skill teaching for body weight/ implement movements 4. 5–10 min Educational body-weight workout 5. 2–3 min. Cooldown/ check for understanding	1. Sport skills, tactics, and small-sided games. 2. Instructional models such as TGfU[a] and Sport Education[b] are recommended. 3. Outdoor recreation or rhythmic activities instead of sports/games.	1. 5–10 min. Knowledge session 2. 3–5 min. Warm-up/ movement preparation 3. 10–15 min. Skill teaching for weight training movements 4. 15–20 min. Educational weight training workout 5. 2–3 min. Cooldown/ check for understanding	**TGfU Model Example.** 1. 5–8 min. Warm-up/ workout 2. 3–4 min. Small-sided games with stipulations 3. 6–9 min. Skill/tactics practice 4. 4–5 min. Small-sided games with stipulations 5. 6–9 min. Skill/tactics practice 6. 5–6 min. Small-sided games 7. 2–3 min. Cooldown 8. 4–6 min. Lesson closure	1. 10–15 min. Knowledge session 2. 3–5 min. Warm-up/ movement preparation 3. 10–20 min. CV workout 4. or 5. 10–15 min. Small-sided games or nutrition education 5. or 4. 2–3 min. Cooldown/check for understanding

[a]Teaching Games for Understanding (Griffin & Butler, 2005). [b]Sport Education (Siedentop, Hastie, & Van der Mars, 2011).

Huotari, Niemelä, & Korpelainen, 2012). Health-related fitness education programs should teach students to self-access their own fitness levels and use that information to create a personal fitness program. However, in a 2016 survey of high school PE teachers, only 21% of teachers surveyed said they incorporated fitness concepts and knowledge during each class period. In the same survey, 48.9% of teachers said that students did not self-assess their fitness levels and only 33% of those surveyed said their students developed personal fitness plans (Mercier, Phillips, & Silverman, 2016). By effectively learning how to implement fitness programs and asses their own fitness levels, students would be provided with the fundamentals to possess effective fitness habits later in life (Morgan et al., 2003).

Purpose and Reflection

Health professionals and government agencies in the United States are trying to determine how to improve individuals' health as the cost of hypokinetic disease is becoming catastrophic. Physical educators have the unique opportunity to change the lives of students they work with now and in the future. A plethora of educators are trying diligently to provide students with an excellent learning experience. Often, the curriculum being introduced is taught well and learned by the students; unfortunately, most skills and knowledge developed in the classroom have limited translation to sustained PA and fitness.

Conclusion

Changing curricular *practice* is a difficult process, best illustrated by "lag time." Barriers often include implementation difficulties, lack of access to research, and lack of awareness of available educational tools. Establishing a curricular balance between enjoyment, physical fitness, psychological well-being, and lifelong lessons for a healthy and active adult lifestyle is essential for success. National guidelines suggest that adults participate in at least 150 min of moderate or 75 min of vigorous exercise each week (CDC, 2018). Researchers have also suggested that increasing PE and PA within schools and after school (Wanless et al., 2014) may have the greatest impact on improving PA behaviors. Top-down policy and legislative changes pertaining to the curricular emphasis in PE classes focusing on lifelong PA and fitness have been suggested (Story, Nanney, & Schwartz, 2009).

Physical educators must evaluate curriculum and ask the question: Is this preparing students for a lifetime of exercise and PA for sustained health and fitness? If the curriculum taught is a sports and game model, the realistic answer to this question, based on empirical findings, may be no (CDC, 2017a, 2017d; Hulteen et al., 2017; Physical Activity Council, 2017; Woods, 2017; U.S. Census Bureau, 2012). Providing students a curriculum predicated on health-related fitness education can equip them with the tools to facilitate competence and the confidence to engage independently and autonomously in lifetime PA and fitness. Sport and games have their own place and value within the affective realms. However, the amount of sport and games programming needs to be adjusted so that it provides a more comprehensive and applicable educational experience.

Finally, physical educators have shown concern for the decline of time allotment for secondary PE. Many physical educators devote much time and energy to advocating for additional time. This genuine concern is appreciated and commended. However, if secondary PE continues to be a playtime and does not offer rigorous educational subject matter, then the decline will only be exacerbated or paraprofessionals will be hired to monitor a controlled recess. Today, more than ever, PE professionals have an immense opportunity to provide students, communities, and society at large with an education of substantial value. Only a carefully planned and evidence-based education can facilitate long-term PA habits and help increase the quality of life of many. A curriculum focused on health-related fitness education that also includes sport, outdoor recreation, and rhythmic activities has great potential to be that agent of change.

References

Bandura, A. (1986). Social cognitive theory. *Annals of Child Development, 6*, 1–60.

Barney, D. D., Pleban, F. T., Wilkinson, C., & Prusak, K. A. (2015). Identifying high school physical education physical activity patterns after high school. *Physical Educator*, *72*, 278–293.

Berryman, J. W. (2010). Exercise is medicine: A historical perspective. *Current Sports Medicine Reports, 9*, 195–201. https://doi.org/10.1249/jsr.0b013e3181e7d86d

Buell, J., Calland, D., Hanks, F., & Thorne, R. (2008). Presence of metabolic syndrome in football linemen. *Journal of Athletic Training, 43*, 608–616. https://doi.org/10.4085/1062-6050-43.6.608

Blair, S., & Morris, J. (2009). Healthy hearts—and the universal benefits of being physically active: Physical activity and health. *Annals of Epidemiology, 19*, 253–256. https://doi.org/10.1016/j.annepidem.2009.01.019

Booth, F. W., Roberts, C. K., & Laye, M. J. (2012). Lack of exercise is a major cause of chronic diseases. *Comprehensive Physiology*, *2*, 1143–1211. https://doi.org/10.1002/cphy.c110025

Burgeson, C., Wechsler, H., Brener, N., Young, J., & Spain, C. (2001). Physical education and activity: Results from the school health policies and programs study 2000. *Journal of School Health*, *71*, 279–293. https://doi.org/10.1111/j.1746-1561.2001.tb03505.x

Caputo, P., & Mattson, D. J. (2005). Recreational ice hockey injuries in adult non-checking leagues: A United States perspective. *Journal of Sports Science & Medicine, 4(1)*, 58–65.

Centers for Disease Control and Prevention. (2017a). Adult obesity facts. Retrieved August 3, 2017, from https://www.cdc.gov/obesity/data/adult.html

Centers for Disease Control and Prevention. (2017b). Childhood obesity facts. Retrieved August 3, 2017, from https://www.cdc.gov/obesity/data/childhood.html

Centers for Disease Control and Prevention. (2017c). Exercise or physical activity. Retrieved July 21, 2017, from https://www.cdc.gov/nchs/fastats/exercise.htm

Centers for Disease Control and Prevention. (2017d). Health expenditures. Retrieved August 3, 2017, from https://www.cdc.gov/nchs/fastats/health-expenditures.htm

Centers for Disease Control and Prevention. (2018). *Physical activity guidelines for Americans* (2nd ed.). Retrieved from https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf

Clow, A., & Edmunds, S. (2014). *Physical activity and mental health*. Champaign, IL: Human Kinetics.

Conn, J. M., Annest, J. L., & Gilchrist, J. (2003). Sports and recreation related injury episodes in the US population, 1997–99. *Injury Prevention, 9*, 117–123. https://doi.org/10.1136/ip.9.2.117

Craigie, A. M., Lake, A. A., Kelly, S. A., Adamson, A. J., & Mathers, J. C. (2011). Tracking of obesity-related behaviours from childhood to adulthood: A systematic review. *Maturitas*, *70*, 266–284. https://doi.org/10.1016/j.maturitas.2011.08.005

Cross, M. J., Tucker, R., Raftery, M., Hester, B., Williams, S., Stokes, K. A., . . . Kemp, S. (2017). Tackling concussion in professional rugby union: A case-control study of tackle-based risk factors and recommendations for primary prevention. *British Journal of Sports Medicine.* Advance online publication. https://doi.org/10.1136/bjsports-2017-097912

Dale, D., & Corbin, C. B. (2000). Physical activity participation of high school graduates following exposure to conceptual or traditional physical education. *Research Quarterly for Exercise and Sport*, *71*(1), 61–68. https://doi.org/10.1080/02701367.2000.10608881

Dale, D., Corbin, C. B., & Cuddihy, T. F. (1998). Can conceptual physical education promote physically active lifestyles? *Pediatric Exercise Science,10*(2), 97–109. https://doi.org/10.1123/pes.10.2.97

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum.

Deci, E. L., & Ryan, R. M. (1994). Promoting self-determined education. *Scandinavian Journal of Educational Research, 38,* 3–41.

Deci, E. L., & Ryan, R. M. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. https://doi.org/10.1037//0003-066x.55.1.68

Deci, E. L., & Ryan, R. M. (2010). *Self-determination*. New York, NY: Wiley.

Duncan, L., Hall, C., Wilson, P., & O, J. (2010). Exercise motivation: A cross-sectional analysis examining its relationships with frequency, intensity, and duration of exercise. *International Journal of Behavioral Nutrition and Physical Activity, 7*, 1–10. https://doi.org/10.1186/1479-5868-7-7

Edmunds, J., Ntoumanis, N., & Duda, J. (2006). A test of self-determination theory in the exercise domain. *Journal of Applied Social Psychology, 36*, 2240–2265. https://doi.org/10.1111/j.0021-9029.2006.00102.x

Edmunds, J., Ntoumanis, N., & Duda, J. (2007). Adherence and well-being in overweight and obese patients referred to an exercise on prescription scheme: A self-determination theory perspective. *Psychology of Sport and Exercise, 8,* 722–740. https://doi.org/10.1016/j.psychsport.2006.07.006

Ekkekakis, P., Parfitt, G., & Petruzzello, S. J. (2011). The pleasure and displeasure people feel when they exercise at different intensities. *Sports Medicine, 41*, 641–671. https://doi.org/10.2165/11590680-000000000-00000

Ennis, C. D. (2010). On their own: Preparing students for a lifetime. *Journal of Physical Education, Recreation, & Dance*, *81*(5), 17–22. https://doi.org/10.1080/07303084.2010.10598475

Ennis, C. D. (2011). Physical education curriculum priorities: Evidence for education and skillfulness. *Quest*, *63*(1), 5–18. https://doi.org/10.1080/00336297.2011.10483659

Fairclough, S., Stratton, G., & Baldwin, G. (2002). The contribution of secondary school physical education to lifetime physical activity. *European Physical Education Review, 8*(1), 69–84. https://doi.org/10.1177/1356336x020081005

Ferkel, R. C., Razon, S., Judge, L. W., & True, L. (2017). Beyond fun: The real need in physical education. *Physical Educator*, *74*, 255–268. https://doi.org/10.18666/tpe-2017-v74-i2-7426

Gerteis, J., Izrael, D., Deitz, D., LeRoy, L., Ricciardi, R., Miller, T., & Basu, J. (2014). *Multiple chronic conditions chartbook*. Rockville, MD: Agency for Healthcare Research and Quality.

Gordon-Larsen, P., Nelson, M. C., & Popkin, B. M. (2004). Longitudinal physical activity and sedentary behavior trends: Adolescence to adulthood. *American Journal of Preventive Medicine*, *27*, 277–283. https://doi.org/10.1016/j.amepre.2004.07.006

Gouttebarge, V., Aoki, H., Lambert, M., Stewart, W., & Kerkhoffs, G. (2017). A history of concussions is associated with symptoms of common mental disorders in former male professional athletes across a range of sports. *Physician and Sportsmedicine, 45*, 443–449. https://doi.org/10.1080/00913847.2017.1376572

Green, K., Smith, A., & Roberts, K. (2005). Young people and lifelong participation in sport and physical activity: A sociological perspective on contemporary physical education programmes in England and Wales. *Leisure Studies, 24*(1), 27–43. https://doi.org/10.1080/0261436042000231637

Greenwood-Parr, M., & Olsin, J. (1998). Promoting lifelong involvement through physical activity. *Journal of Physical Education, Recreation, & Dance, 69*(2), 72–76. https://doi.org/10.1080/07303084.1998.10605072

Haerens, L., Kirk, D., Cardon, G., Bourdeaudhuij, I. D., & Vansteenkiste, M. (2010). Motivational profiles for secondary school physical education and its relationship to the adoption of a physically active lifestyle among university students. *European Physical Education Review, 16*(2), 117–139. https://doi.org/10.1177/1356336x10381304

Hagger, M., & Chatzisarantis, N. (2007). Editorial: Advances in self-determination theory research in sport and exercise. *Psychology of Sport and Exercise, 8*, 597–599. https://doi.org/10.1016/j.psychsport.2007.06.003

Hagger, M., & Chatzisarantis, N. (2008). Self-determination theory and the psychology of exercise. *International Review of Sport and Exercise Psychology, 1*, 79–103. https://doi.org/10.1080/17509840701827437

Haywood, K. M. (1991). The role of physical education in the development of active lifestyles. *Research Quarterly for Exercise and Sport, 62*, 151–156. https://doi.org/10.1080/02701367.1991.10608705

Hirvonen, N., Huotari, M., Niemelä, R., & Korpelainen, R. (2012). Information behavior in stages of exercise behavior change. *Journal of the American Society for Information Science and Technology, 63*, 1804–1819. https://doi.org/10.1002/asi.22704

Högström, G., Nordström, A., & Nordström, P. (2015). Aerobic fitness in late adolescence and the risk of early death: A prospective cohort study of 1.3 million Swedish men. *International Journal of Epidemiology*, *45*, 1159–1168. https://doi.org/10.1093/ije/dyv321

Houston, J., & Kulinna, P. (2014). Health-related fitness models in physical education. *Strategies*, *27*(2), 20–26. https://doi.org/10.1080/08924562.2014.879026

Hulteen, R., Smith, J., Morgan, P., Barnett, L., Hallal, P., Colyvas, K., & Lubans, D. (2017). Global participation in sport and leisure-time physical activities: A systematic review and meta-analysis. *Preventive Medicine, 95*, 14–25. https://doi.org/10.1016/j.ypmed.2016.11.027

Judge, L. W., Stone, M. H., & Craig, B. W. (2010). Reconditioning the postcompetitive football lineman: Recognizing the problem. *Strength and Conditioning Journal*, *32*(5), 28–32. https://doi.org/10.1519/ssc.0b013e3181df8963

Kimball, J., Jenkins, J., & Wallhead, T. (2009). Influence of high school physical education on university students' physical activity. *European Physical Education Review, 15*, 249–267. https://doi.org/10.1177/1356336x09345226

Lewis, B. A., Napolitano, M. A., Buman, M. P., Williams, D. M., & Nigg, C. R. (2017). Future directions in physical activity intervention research: Expanding our focus to sedentary behaviors, technology, and dissemination. *Journal of Behavioral Medicine*, *40*(1), 112–126.

Lewis, M., & Suttin, A. (2011). Understanding exercise behavior: Examining the interaction of exercise motivation and personality in predicting exercise frequency. *Journal of Sport Behavior, 34*, 82–98. https://doi.org/10.1007/s10865-016-9797-8

Lobelo, F., Stoutenberg, M., & Hutber, A. (2014). The Exercise Is Medicine global health initiative: A 2014 update. *British Journal of Sports Medicine, 48*, 1627–1633. https://doi.org/10.1136/bjsports-2013-093080

Louw, K. R., Dunlop, P. D., Yeo, G. B., & Griffin, M. A. (2016). Mastery approach and performance approach: The differential prediction of organizational citizenship behavior and workplace deviance, beyond HEXACO personality. *Motivation & Emotion, 40*, 566–576. https://doi.org/10.1007/s11031-016-9551-0

Lox, C. L. (2017). *The psychology of exercise: Integrating theory and practice*. Philadelphia, PA: Taylor & Francis.

McGladrey, B., Hannon, J., Faigenbaum, A., Shultz, B., & Shaw, J. (2014). High school physical educators' and sport coaches' knowledge of resistance training principles and methods. *Journal of Strength and Conditioning Research, 28*, 1433–1442. https://doi.org/10.1519/jsc.0000000000000265

Mears, D. (2008). Curriculum diversity and young adults physical activity: Reflections from high school physical education. *Physical Educator, 65*, 195–207.

Mercier, K., Phillips, S., & Silverman, S. (2016). High school physical education teachers' attitudes and use of fitness tests. *High School Journal, 99*, 179–190. https://doi.org/10.1353/hsj.2016.0001

Michie, S., Ashford, S., Sniehotta, F. F., Dombrowski, S. U., Bishop, A., & French, D. P. (2011). A refined taxonomy of behavior change techniques to help people change their physical activity and healthy eating behaviors: The CALO-RE taxonomy. *Psychology & Health*, 26, 1479–1498. https://doi.org/10.1080/08870446.2010.540664

Miller, A., Eather, N., Gray, S., Sproule, J., Williams, C., Gore, J., & Lubans, D. (2017). Can continuing professional development utilizing a game-centered approach improve the quality of physical education teaching delivered by generalist primary school teachers? *European Physical Education Review, 23*, 171–195. https://doi.org/10.1177/1356336x16642716

Misra, A. (2014). *Common sports injuries: Incidence and average charges*. Retrieved from Office of the Assistant Secretary for Planning and Evaluation website: https://aspe.hhs.gov/pdf-report/common-sports-injuries-incidence-and-average-charges

Mohr, D. J., Townsend, J. S., & Bulger, S. M. (2001). A pedagogical approach to sport education season planning. *Journal of Physical Education, Recreation, & Dance,* 73(1), 36–44. https://doi.org/10.1080/07303084.2001.10605866

Mohr, D. J., Townsend, J. S., & Pritchard, T. (2006). Rethinking middle school physical education: Combining lifetime leisure activities and sport education to encourage physical activity. *Physical Educator*, *63*(1), 18–29.

Morgan, C. F., Jr., Pangrazi, R. P., & Beighle, A. (2003). Using pedometers to promote physical activity in physical education. *Journal of Physical Education, Recreation, & Dance*, *74*(7), 33–38. https://doi.org/10.1080/07303084.2003.10609235

Myrick, L. (1996). Does coeducational physical education help high school students reach their full potential? *Journal of Physical Education, Recreation, and Dance, 67*(8), 6–7. https://doi.org/10.1080/07303084.1996.10604825

Nahas, M. V., Goldfine, B., & Collins, M. A. (2003). Determinates of physical activity in adolescents and young adults: The basis for high school and college phyical education to promote active lifestyles. *Physical Educator, 60*, 42–56.

Netz, Y., Zeev, A., Arnon, M., & Tenenbaum, G. (2008). Reasons attributed to omitting exercising: A population-based study. *International Journal of Sport and Exercise Psychology, 6*(1), 9–23. https://doi.org/10.1080/1612197X.2008.9671851

Pedersen, B., & Saltin, B. (2015). Exercise as medicine - Evidence for prescribing exercise as therapy in 26 different chronic diseases. *Scandinavian Journal of Medicine and Science in Sports, 25*(Suppl. 3), 1–72.

Physical Activity Council. (2017). *2017 participation report.* Retrieved from http://www.physicalactivitycouncil.com/pdfs/current.pdf

Prusak, K., Graser, S. V., Pennington, T., Zanandrea, M., Wilkinson, C., & Hager, R. (2011). A critical look at physical education and what must be done to address obesity issues. *Journal of Physical Education, Recreation, & Dance*, *82*(4), 39–46. https://doi.org/10.1080/07303084.2011.10598613

Rikard, G. L., & Banville, D. (2007). High school student attitudes about physical education. *Sport, Education, and Society, 11,* 385–400. https://doi.org/10.1080/13573320600924882

Ristolainen, L., Heinonen, A., Turunen, H., Mannström, H., Waller, B., Kettunen, J. A., & Kujala, U. M. (2010). Type of sport is related to injury profile: A study on cross country skiers, swimmers, long-distance runners and soccer players. A retrospective 12-month study. *Scandinavian Journal of Medicine & Science in Sports, 20*, 384–393. https://doi.org/10.1111/j.1600-0838.2009.00955.x

Roberts, K. (1999). *Leisure in contemporary society.* Wallingford, United Kingdom: CABI.

Ross, J. G., Dotson, C. O., Gilbert, G. G., & Katz, S. J. (1985) What are kids doing in school physical education? *Journal of Physical Education, Recreation, & Dance, 56*(1), 73–76. https://doi.org/10.1080/07303084.1985.10603690

Ross, M., Perkins, H., & Bodey, K. (2016). Academic motivation and information literacy self-efficacy: The importance of a simple desire to know. *Library & Information Science Research, 38*(1), 2–9. https://doi.org/10.1016/j.lisr.2016.01.002

Sallis, J. F., & Hovell, M. F. (1990). Determinants of exercise behavior. *Exercise and Sport Science Review, 18,* 307–330. https://doi.org/10.1249/00003677-199001000-00014

Sallis, J. F., McKenzie, T. L., Beets, M. W., Beighle, A., Erwin, H., & Lee, S. (2012). Physical education's role in public health: Steps forward and backward over 20 years and HOPE for the future. *Research Quarterly for Exercise and Sport, 83*, 125–135. https://doi.org/10.1080/02701367.2012.10599842

Sallis, J. F., McKenzie, T. L., Kolody, B., Lewis, M., Marshall, S., & Rosengard, P. (1998). Effects of health-related physical education on academic achievement: Project SPARK. *Research Quarterly for Exercise and Sport, 70*, 127–134. https://doi.org/10.1080/02701367.1999.10608030

Schallmo, M. S., Weiner, J. A., & Hsu, W. K. (2017). Sport and sex-specific reporting trends in the epidemiology of concussions sustained by high school athletes. *Journal of Bone and Joint Surgery, 99*, 1314–1320. https://doi.org/10.2106/jbjs.16.01573

Siedentop, D. (1994). *Quality PE through positive sport experiences: Sport Education*. Champaign, IL: Human Kinetics.

Siedentop, D., Mand, C., & Taggart, A. (1986). *Physical education: Teaching and curriculum strategies for grades 5–12.* Mountain View, CA: Mayfield.

Song, M., Carroll, D. D., & Fulton, J. E. (2013). Meeting the 2008 Physical Activity Guidelines for Americans among US youth. *American Journal of Preventive Medicine*, *44*, 216–222. https://doi.org/10.1016/j.amepre.2012.11.016

Stanec, A. D., & Lay, E. (2008). Quality physical education: Why the sport requirement can't do it alone. *Independent School, 66*(1), 112–122.

Stein, T. D., Alvarez, V. E., & McKee, A. C. (2015). Concussion in chronic traumatic encephalopathy. *Current Pain and Headache Reports*, *19*(10). https://doi.org/10.1007/s11916-015-0522-z

Story, M., Nanney, M. S., & Schwartz, M. B. (2009). Schools and obesity prevention: Creating school environments and policies to promote healthy eating and physical activity. *Milbank Quarterly*, *87*(1), 71–100. https://doi.org/10.1111/j.1468-0009.2009.00548.x

Telama, R., Yang, X., Viikari, J., Välimäki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine*, *28*, 267–273. https://doi.org/10.1016/j.amepre.2004.12.003

Teixeira, P. J., Carraça, E. V., Markland, D., Silva, M. N., & Ryan, R. M. (2012). Exercise, physical activity, and self-determination theory: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 9*. https://doi.org/10.1186/1479-5868-9-78

Timperio, A. F., Van Stralen, M. M., Brug, J., Bere, E., Chinapaw, M. M., De Bourdeaudhuii, I., & Te Velde, S. J. (2013). Direct and indirect associations between the family physical activity environment and sports participation among 10–12 year-old European children: Testing the EnRG framework in the ENERGY project. *International Journal of Behavioral Nutrition and Physical Activity, 10*. https://doi.org/10.1186/1479-5868-10-15

U.S. Census Bureau. (2012). *Statistical abstract of the United States: 12.* Retrieved from https://www.census.gov/prod/2011pubs/12statab/arts.pdf

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briere, N. M., Senecal, C., & Vallieres, E. F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Education and Psychological Measurement, 52*, 1003–1017. https://doi.org/10.1177/0013164492052004025

Vallerand, R. J., & Rousseau, F. L. (2001). Intrinsic and extrinsic motivation in sport and exercise: A review using the hierarchical model of intrinsic and extrinsic motivation. In R. Singer, H. Hausenblas, & C. Janelle (Eds.), *Handbook of sport psychology* (2nd ed., pp. 389–416). New York, NY: John Wiley and Sons. https://doi.org/10.4135/9781483332222.n163

Wanless, E., Judge, L. W., Dieringer, S., Bellar, D., Johnson, J., & Plummer, S. (2014). Pedometers and aerobic capacity: Evaluating an elementary after-school running program. *Scientific World Journal*, *2014*, 1–6. https://doi.org/10.1155/2014/370759

Warburton, D., Nicol, C., & Bredin, S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*, 801–809. https://doi.org/10.1503/cmaj.051351

Wiberg, C. (2016). Transitional objects: Moving from extrinsic to intrinsic motivation in e-learning environments by using User Experience (UX) Design. *Learning, 3*(1), 3663–3666.

Woods, R. (2017). *Sports and exercise*. Retrieved from U.S. Bureau of Labor Statistics website: https://www.bls.gov/spotlight/2017/sports-and-exercise/pdf/sports-and-exercise.pdf

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FITNESS

The Effect of Music- and Video-Distraction on High School Physical Education Student Exercise Intensity

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Abstract

This study investigated the relationship between use of distractions during exercise and (a) heart rate (HR), (b) rating of perceived exertion (RPE), and (c) enjoyment during exercise. Quasi-experimental design with six intact, single-gender high school classes was used. A control group experienced no distraction, while a treatment group first experienced no distraction, followed by 2 days each of listening to music and of watching a movie. HR was collected continuously in real time and RPE and enjoyment at 5-min intervals. In the treatment group, HR and RPE were not different between no distraction and music conditions but decreased while watching a film. The control group also decreased in the same measures during the third condition. No differences were seen in enjoyment. While various distractions may work in fitness settings, in the PE setting distractions in and of themselves are insufficient and cannot replace quality pedagogy and an engaging teacher. One cannot simply turn on the music or video and leave students to their own devices. Future research needs to investigate distraction use in combination with good pedagogy, engaging instruction, and the impact of sociality in physical education.

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The prevalence of obesity and type 2 diabetes, among other comorbidities, has increased in youth and adults in the United States (Go et al., 2013). These diseases increase the risk of mortality and morbidity and are tied to lifestyle choices such as eating healthy and getting regular physical exercise (Centers for Disease Control and Prevention [CDC], 2015b). Physical activity can help improve a variety of health problems by, for example, lowering blood pressure, promoting weight loss, and reducing risk of some cancers (CDC, 2015a). Despite these facts, only about 50% of adults meet the physical activity recommendations for aerobic activity and about 20% for both aerobic and muscle-strengthening activity (CDC, 2017). American youth also fail to accumulate enough activity with only 24.8% of youth aged 12 to 15 meeting the physical activity guidelines of 60 min of moderate to vigorous activity daily (Fakhouri et al., 2014). In addition, the number of overweight and obese children and adolescents in the United States tripled from 1980 to 2000 (Daniels et al., 2005). Exercise habits formed in childhood and adolescence often last into adulthood (Telama et al., 2005), and the rise of lifestyle diseases and obesity in children and adolescents could be the sign of an even bigger rise of these diseases in American adults in the near future. Finding ways to help people perform and maintain exercise habits is a key to combating the rising tide of these lifestyle diseases and improving quality of life.

One possible way to change people's motivation for exercise is through the use of distractions during exercise. Rejeski (1985) postulated a model of parallel processing in exercise. It proposed that all stimuli are processed simultaneously in one's unconscious mind, but a person only gives conscious attention to those that are strongest. This has been interpreted by several researchers (e.g., Barwood, Weston, Thelwell, & Page, 2009; Nethery, 2002; Pennebaker & Lightner, 1980) to mean that if exercisers are given one of various types of distractions (e.g., listening to music, watching a video, looking at scenery or posters) they might pay more attention to the distraction and less to the sensations (pleasant or unpleasant) of exercise. Accordingly, many fitness centers have installed televisions near their cardio or weight equipment. Other exercisers use personal music players, use personal video players, or read books or newspapers as they exercise in fitness centers or at home. Distraction during exercise may help people focus more on the distraction than on ex-

ercise and may increase enjoyment, decrease unpleasantness of the activity, or prolong the duration of exercise.

For example, studies have been done with adults and youth using music as a distraction and have found that those exercising with music persisted for a longer period than those who heard no music (e.g., Annesi, 2001; De Bourdeaudhuij et al., 2002). Additional studies with adults (e.g., Boutcher & Trenske, 1990; Nethery, 2002; Nethery, Harmer, & Taaffe, 1991) found that exercising with music resulted in a lower rating of perceived exertion (RPE; a numeric value from 6 to 20 that exercisers assign to the level of exercise intensity at which they believe themselves to be working; Borg, 1982). Visual distraction in adults, as tested with a circular versus cross country course through trees and new scenery, resulted in increased intensity (i.e., faster times) with the distraction of running through different scenery (Pennebaker & Lightner, 1980). Participants of various ages exercising with music also reported increased level of enjoyment (Barney, Gust, & Liguori, 2012; Benham, 2014; Boutcher & Trenske, 1990; Dyrlund & Wininger, 2008). Using television viewing as distraction (news; Kukuwich, 1997), sport stunts without sound (Nethery, 2002), or a health video (Russell et al., 2003), some adult participants rated the exercise as more enjoyable (Barwood et al., 2009), whereas others showed no change in enjoyment (Kukuwich, 1997; Nethery, 2002; Russell et al., 2003; Viteri, 1994).

While almost all of the studies with exercise distractors have been done with adult populations, only a few have been done with youth or in a physical education (PE) setting. De Bourdeaudhuij et al. (2002) found that obese youth in a treatment center persisted in treadmill running for longer periods when they listened to music than with no distraction. Only three studies in a PE setting (Barney & Prusak, 2015; Barney, Prusak, & Benham, 2015; Benham, 2014) found that students (a) achieved higher step counts and activity time during the lesson with music than without and that (b) students rated the lesson as more enjoyable when music was played (Benham, 2014). Currently, little is known about the isolated effects (i.e., in absence of teacher influence) of distraction (via music or video) on student RPE and perceptions of enjoyment in the PE setting.

This baseline study examined the effects of (a) listening to popular music or (b) watching a popular film on RPE or enjoyment for high school students during an indoor cycling (spin) unit while con-

trolling heart rate (HR) and in absence of instructor influence. It was hypothesized that with both forms of distraction (a) RPE would decrease, and (b) levels of enjoyment would increase.

Method

Participants and Setting

This study took place at a public high school, Grades 10 to 12, in a state in the Intermountain West. School district, principal, and university institutional review board approval was gained before this study began, along with parent and student assent and consent. A convenience sample of six intact classes that were able to use the spin room were used in this study. The convenience sample led to a larger number of female classes participating in the study than male classes. After attrition (due to absenteeism or failure to complete procedures correctly; $n = 90$), 81 students (58 females in four intact classes and 23 males in two intact classes; $r_{age} = 15–18$ years), participated in this study. For the assessment of student perception in absence of teacher influence, the instructors were not present, though student teachers were present but not instructing during testing. The high school functioned on an A/B block schedule, meaning that 70- to 85-min PE classes were taught every other day. The data were collected during the 6-day, 3-week spin unit of a 16-week PE class.

The cycling unit took place in the school's indoor spin room. There were 37 bicycles (Sunlite F5 Trainer Cycle) arranged to face the instructor's bike at the front of the classroom. On days when a movie was being shown, it was projected onto the front wall to the side of the instructor. Sound for the movie or the music playlist was played over a classroom sound system. For easy reference, posters of the modified RPE and the enjoyment scales were displayed at the front of the room on either side of the movie screen. HR data, in a grid of 36 individual boxes, and question prompts were projected on the left, adjacent sidewall.

Instruments

iClickers. Handheld devices called iClickers were used in the collection of student responses for several dependent variables (i.e., RPE, level of enjoyment). iClickers are individually recognized answering devices that wirelessly register a student's answers (A, B,

C, D, or E) with a software program installed on an accompanying computer. When prompted with a question (in this case, displayed next to the movie screen), students pushed the button on their own device that corresponded to the answer they chose. Student answers could be changed as long as the question was open for answering. Once the question closed, answers could no longer be selected or changed. iClickers allowed for data collection frequently throughout the exercise bout, as opposed to a summary rating at the end of the exercise session.

Polar H7 Bluetooth monitors. HR was continuously monitored via Polar H7 Bluetooth monitors. This model sent the information via Bluetooth from the transmitter of every student to the Polar GoFit app (Polar, 2015) installed on an instructor's iPad (acting as the receiver). Seventy to 79% max HR was chosen as a target range for students to maintain, because the textbook used in these PE classes, *Fitness for Life* by Corbin and Lindsey (2007), listed a target HR zone for achievement of moderate and vigorous physical activity as 65% to 90% of their max HR (Corbin & Lindsey, 2007 pp. 110-115), depending on fitness levels. Seventy to 79% is in that zone and should allow more students of varying fitness levels to reach a moderate-intensity level of activity during these cycling sessions. This HR range also was shown as one color, green, on the Polar GoFit app (Polar, 2015), so students were able to check if they had the correct HR quickly and easily. Students had calculated their maximum HR at the beginning of the course and input that into the Polar GoFit app so all HR ranges would be individually accurate.

Rating of perceived exertion scale. RPE was reported via a modified Borg's scale of 1 to 5 condensed from the original 6 to 20 (Borg, 1982). Student answers were collected on a 1 to 5 scale because there are 15 RPE numbers and only 5 options to answer with on an iClicker. Participants were asked, "Right now, what is your current level of RPE?" with the option of selecting A (1): very, very light; B (2): light; C (3): somewhat hard; D (4): hard; and E (5): very, very hard.

Enjoyment questionnaire. Levels of enjoyment were collected via a Likert scale question also through the iClickers. The question was, "On a scale of 1–5, how much are you enjoying the activity right now?" (where 1 = *I hate it*, 2 = *I don't like it*, 3 = *I don't care either way*, 4 = *I like it*, and 5 = *I love it*; Benham, 2014).

Procedures

The classes participating in the study followed a script directed and given by the lead researcher while student teachers were present. The script consisted of a welcome to class, a statement of what type of treatment they would be experiencing that day, and instruction that they had 5 min to warm up on the bikes. At the end of the 5-min warm-up students were told the warm-up was over and that they should maintain a HR of 70–79% of their maximum for 20 min. Students were not told how to ride (e.g., sitting, standing, how much resistance) and were not hindered from riding as desired as long as they remained in the target HR zone and were not unsafe. At 5-min intervals during each cycling session, students were prompted to record RPE and level of enjoyment via iClickers. Specifically, the researcher would ask the question aloud and point to the visual prompt on the wall. Periodic reminders about maintaining the target HR were given. On the second, fourth, and sixth days, students were asked to complete the Situational Motivation Scale before transitioning to a new class activity, directed by the student teacher, for the second half of the period. The researcher recorded spontaneous student utterances overheard during each session, but no thorough qualitative analysis was conducted.

Cycling lessons (5-min warm-up and 20-min ride) were intentionally created with no change in speed or resistance. To isolate the effects of the distraction from changes due to workout structure or influence from the teachers, the researcher gave no instruction about the ride once the 20 min had begun. This format was chosen to be similar to that of many fitness centers frequented by adults that provide televisions or personal music players near cardio and weight lifting equipment with no instruction given to patrons about how they exercise. Twenty minutes of cycling was chosen because it had been used in similar studies (Dyrlund & Wininger, 2008; Nethery et al., 1991) and fit within the constraints of these PE classes.

The six intact classes were randomly assigned such that two all-female and one all-male classes were in each of the two groups (control and treatment). During the 6-day cycling unit, the treatment group received three conditions: 2 days of no distraction, 2 days of music, and 2 days of video. The control group experienced no distraction for all 6 days of the study; see Table 1. Data from each source

Table 1
Daily Distraction for Treatment and Control Groups

	Condition 1		Condition 2		Condition 3	
Group	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**
Control	No Distraction	No Distraction	No Distraction	No Distraction	No Distraction	No Distraction
Treatment	No Distraction	No Distraction	Music	Music	Video	Video

were matched to the participant, and the same HR transmitter and iClicker were used by the same participant during each session. After the data were matched, the names of participants were removed.

Music and movie selection criteria and procedures. Music selection consisted of a variety of popular songs that had a tempo of 120 to 160 beats per minute (Karageorghis, Jones, & Low, 2006; Priest, Karageorghis, & Sharp, 2004). The researcher compiled a list of songs from the Billboard top 100 songs from the week the survey was distributed and the previous 2 years and also some older songs that had been suggested by youth of the same age as those who would participate in the study. The list of songs and five popular videos already approved, and used previously, by the PE teachers for use in school were placed on a survey. Students were instructed to mark the top five songs they would prefer to listen to and the top two movies to watch while exercising. From the results of this survey the researcher created a playlist of songs that would shuffle while students were riding the bikes.

Males and females had different preferences for the songs and movies given on the survey, so two playlists were created, and different movies were shown to each gender as choice has been shown to impact motivation (Deci, Vallerand, Pelletier, & Ryan, 1991). Movies were shown in the order of student choice; on Day 5, 25 min of the most preferred movies (males: *Shrek*, Katzenberg, Warner, & Williams, 2001; females: *High School Musical*, Schain & Ortega, 2006) was shown, and on Day 6, the second most preferred movies (males: *Remember the Titans*, Bruckheimer, Oman, & Boaz, 2000; females: *Tangled*, Conli, Greno, & Howard 2010) were shown.

Data Analysis

IBM SPSS Statistical Package 22.0 (2013) was used for all statistical analyses. Descriptive statistics (means, standard deviations, and effect sizes) were calculated and examined. Missing RPE and level of enjoyment data were imputed if no more than two of the four scores were missing. Specifically, if on a day of data collection, the participant responded with his or her RPE or level of enjoyment at three of the times but not all four (5, 10, 15, and 20 min), the three responses

were averaged and the average was used in place of the one missing data point. Likewise, if two data points were missing from the four times (5, 10, 15, and 20 min) of data collection on one day, the two data points were averaged and the average was used in place of the two missing data points for that day. If more than two data points were missing, then the participant was not included in that analysis. As is common, listwise deletion was used during omnibus analyses, so participants included in each analysis were different.

Conditional averages were computed for HR, RPE, and level of enjoyment; all eight data points for each variable during that condition (Day 1: 5, 10, 15, and 20 min; Day 2: 5, 10, 15, and 20 min) were used in the average. A repeated-measures ANOVA omnibus test was performed for male and female, control and treatment groups on all response variables. Post hoc Tukey's Honestly Significant Difference (HSD_{Tukey}) follow-up tests were then conducted when indicated. Last, independent-samples *t* tests for demographic and response variables were conducted between groups and across gender and conditions.

Results

Participant mean age was 15.86 (*SD* .839), mean self-reported height was 66.59 in. (*SD* 4.22), and mean self-reported weight was 139.46 lb (*SD* 33.83). An independent-samples *t* test found that mean age, weight, and height were not significantly different between control and treatment groups; see Table 2 for the results of the *t* test between treatment groups. Independent-samples *t* tests also showed that during Condition 1, when both groups received no distraction, there were no significant differences between control and treatment groups in HR, RPE, or level of enjoyment, indicating that no initial differences existed. However, *t* tests indicated a significant difference between genders during Condition 1 when females had significantly higher RPE, $t(77) = 2.24$, $p = .028$, and significantly higher HR, $t(78) = 2.35$, $p = .022$; see Table 3 for results of the *t* test between genders. Due to attrition, there was, perhaps, not enough power to see these differences in the ANOVA omnibus tests and the potential for type II errors increased but could not be controlled for in gender analyses.

Table 2
Independent t Test by Treatment Group During Condition 1

	Control			Treatment			
Variable	***N***	***M***	***SD***	***N***	***M***	***SD***	***ES*(*d*)**
RPE	44	3.22	0.79	35	3.52	0.68	0.40†
HR	44	72.46	4.97	33	72.78	3.94	0.07
Level of enjoyment	45	2.44	1.01	35	2.42	0.96	0.02

Note. Effect size is Cohen's *d* with formula, $d = (M_1 - M_2) / SD_{Pooled}$.
† = small effect, †† = medium effect, ††† = large effect (Cohen, 1988).

Table 3
Independent t Test by Gender During Condition 1

	Female			Male			
Variable	***N***	***M***	***SD***	***N***	***M***	***SD***	***ES*(*d*)**
RPE	57	3.47*	0.75	22	3.06	0.69	0.55††
HR	56	73.32*	4.18	21	70.68	4.97	0.60††
Level of enjoyment	58	2.44	1.00	22	2.41	0.95	0.03

Note. Effect size is Cohen's *d* with formula, $d = (M_1 - M_2) / SD_{Pooled}$. † = small effect, †† = medium effect, ††† = large effect (Cohen, 1988).
*$p < 0.05$ between compared groups (Male and Female).

Table 4 shows the results of the repeated-measures ANOVA. It has the mean HR, RPE, and enjoyment for each group (gender and treatment) during every condition; significant differences are noted in the table. Repeated-measures ANOVA and HSD_{Tukey} show a significant decrease in average HR for both treatment groups and both genders between Conditions 1 and 3 (Treatment: $HSD_{Tukey} = 8.68$, $p < .05$; Control: $HSD_{Tukey} = 7.27$, $p < .05$; Female: $HSD_{Tukey} = 6.36$, $p < .05$; Male: $HSD_{Tukey} = 12.37$, $p < .05$) and between Conditions 2 and 3 (Treatment: $HSD_{Tukey} = 9.32$, $p < .05$; Control: $HSD_{Tukey} = 6.06$, $p < .05$; Female: $HSD_{Tukey} = 5.82$, $p < .05$; Male: $HSD_{Tukey} = 12.22$, $p < .05$); see Table 4. In Condition 3, watching a movie, participants had significantly lower HRs than when they had no distraction or were listening to music. There was no difference in HR between no distraction and listening to music for any group. These differences are true for control and treatment groups and for females and males.

Males had a significantly lower HR than females during Condition 3 while watching a movie ($HSD_{Tukey} = 8.52$, $p < .05$); see Table 4.

RPE followed a similar pattern to HR in that Condition 3 was significantly lower for both treatment groups than Condition 1 (Control: $HSD_{Tukey} = .29$, $p < .05$; Treatment: $HSD_{Tukey} = .54$, $p < .05$) and Condition 2 (Control: $HSD_{Tukey} = .23$, $p < .05$; Treatment: $HSD_{Tukey} = .33$, $p < .05$), see Table 4. When males and females were compared, it was found that males had a significantly lower RPE than females for all three conditions (Condition 1: $HSD_{Tukey} = .43$, $p < .05$; Condition 2: $HSD_{Tukey} = .73$, $p < .05$; Condition 3: $HSD_{Tukey} = .89$, $p < .05$). Additionally, male's RPE significantly decreased with each condition; Condition 2 was lower than Condition 1 ($HSD_{Tukey} = .34$, $p < .05$), and Condition 3 was significantly lower than Condition 1($HSD_{Tukey} = .72$, $p < .05$) and Condition 2 ($HSD_{Tukey} = .38$, $p < .05$). Female's Condition 3 was significantly lower than Condition 1 ($HSD_{Tukey} = .26$, $p < .05$) and Condition 2 ($HSD_{Tukey} = .22$, $p < .05$), but Condition 2, music, was not significantly different than Condition 1, no distraction; see Table 4. A repeated-measures ANOVA omnibus test showed no significant difference in level of enjoyment between any conditions for either control or treatment groups or for females and males; see Table 4. No further analysis was conducted.

Discussion

This study assessed if distraction (music or video) during a spin unit in a high school PE class would affect the levels of enjoyment, RPE, or HR for high school–aged students during exercise, specifically an indoor cycling unit. For both control and treatment groups, there was no significant difference in HR, RPE, or enjoyment between Condition 1 (when treatment had no distraction) and Condition 2 (when treatment had music). The design of the study constrained the students' HR as they rode; they were told to maintain a specified HR range every day of data collection. However, when a movie was played while cycling, differences were seen in HR. What is interesting, however, is that while HR and RPE went down when a movie was played for the treatment group, this was also true for the control group, who did not have any distractions; see Table 4. This led the researchers to believe that the decrease in HR and RPE was not due entirely to the movie distraction but to an outside or unaccounted-for factor. The lead researcher observed and heard many complaints

Table 4

N, Means, and Standard Deviations for Percent of HR Max, RPE, and Level of Enjoyment for Females, Males, Control, and Treatment Groups During each Condition

	Female			Male				Control			Treatment			
Variable	***N***	***M***	***SD***	***N***	***M***	***SD***	***ES(d)***	***N***	***M***	***SD***	***N***	***M***	***SD***	***ES(d)***
Condition 1														
HR	54	73.39^	4.23	18	70.88^	4.95	0.57††	42	72.57^	5.04	30	73.03^	3.74	0.10
RPE	51	3.49^	0.77	22	3.06*^	0.69	0.58††	40	3.24^	0.83	33	3.50^	0.68	0.34†
Enjoyment	51	2.43	0.98	21	2.33	0.90	0.10	38	2.34	0.98	34	2.46	0.94	0.12
Condition 2														
HR	54	72.85^	4.73	18	70.73^	7.41	0.39†	42	71.36^	6.33	30	73.67^	3.92	0.42†
RPE	51	3.45^	0.69	22	2.72*^	0.88	0.97†††	40	3.18^	0.73	33	3.29^	0.92	0.13
Enjoyment	51	2.44	0.99	21	2.10	0.98	0.34†	38	2.13	0.99	34	2.57	0.95	0.45†
Condition 3														
HR	54	67.03^	7.50	18	58.51*^	11.42	0.99†††	42	65.30^	9.38	30	64.35^	9.40	0.10
RPE	51	3.23^	0.86	22	2.33*^	0.97	1.01†††	40	2.95^	0.91	33	2.97^	1.07	0.02
Enjoyment	51	2.45	0.88	21	2.21	0.99	0.26†	38	2.17	0.89	34	2.61	0.90	0.49†

Note. Effect size is Cohen's *d* with formula, $d = (M_1 - M_2) / SD_{Pooled}$. † = small effect, †† = medium effect, ††† = large effect (Cohen, 1988).

*$p < 0.05$ between compared groups (Male and Female, or Control and Treatment). ^$p < 0.05$ between conditions within a single group, Male, Female, Control, or Treatment.

about the uncomfortableness of the bicycle seats. The lead researcher also heard many questions of "Do we really have to do this again?" and "When will this be over?" The researchers believe that the drop during the third condition for both control and treatment groups may be due to simple boredom with and dislike of the activity.

This conclusion was further supported as many students voiced the opinion that they wanted to do a different activity after only a few days. This may have been due to the hardness of the bike seats or the workout design intentionally leaving out changes in pedaling speed and bike resistance. A typical spin class would include different intensities and levels of resistance on the bike. This baseline study intentionally left those elements out to isolate the effects of the provided distractions influencing HR, RPE, and enjoyment. Students were not restricted in how they rode the bike (e.g., stand and pedal, increase pedal rate, or increase resistance) as long as they stayed within the target HR zone. As observed, only a few students ever stood on the bike as they pedaled, and once students had found an intensity to reach the target HR zone, they rarely changed their bike resistance. This lack of resistance and pedaling changes while riding, or the hardness of the bicycle seats, could be one reason for student boredom and drop off of HR and RPE during the final two days of data collection.

The lack of enjoyment and drop in HR and RPE over the unit, potentially due to boredom, illustrates that simply using a distraction during exercise cannot replace good pedagogy for motivating students; having music and/or a video playing while students rode was not enough to hold students' interest in the activity. While the female teacher, whose classes were used in this study, normally does use music and a movie during her spin unit, she uses them as cues for speed or resistance change and encouragement. Also, she is typically riding at the front of the class along with her students. She shows them how to ride, instructs changes in pace and resistance, and calls encouragement as the students copy her. When she shows a movie, she uses it as a tool in the workout. Examples she gave to the lead researcher were that when watching *Tangled* (Conli, 2010) riders increase bike resistance whenever the main character sings, or the riders all do a sprint when they play football in the movie *Remember the Titans* (Bruckheimer & Oman, 2000). Typically, the

music and movies add to the teacher's instruction; they never replace them. Using distraction as another tool in combination with good pedagogy has been helpful to this teacher in the past. One possible replication of this study would be to measure the effect on the same variables with distraction *and* good pedagogy as described.

Another reason that students in this study could have been bored is that this study was set up to gather baseline research data, not as a PE class. The study involved steady-state exercise where students were to maintain a moderate to vigorous energy output for a prolonged duration. Most activities done in high school PE classes are not steady-state, but involve short bursts of energy and short rest periods (e.g., sprinting to steal the ball in soccer and then resting after passing it on to a teammate); it could be that steady-state exercise is unappealing to youth. This is supported by the fact that the average response to how much students were enjoying the activity fell somewhere between "I don't like it" and "I don't care either way" with no significant difference between any groups or conditions on any day. It is also possible that asking students to respond to two prompts every 5 min of the cycling session made the ride feel more like a research lab and not like a PE class. The spin unit in this study was not presented or designed as it would normally be in a PE class.

While the data do not show a difference, positive or negative, in enjoyment when distractions were introduced, the researcher observed a difference in student attitude during cycling. A few females added hand dance motions to the music as they rode, and some males sang along and made fun of a popular song with loud shouts of "Oh" and mock pained expressions. Several students sang along with each song. When the male classes watched *Shrek* (Katzenberg et al., 2001), multiple students were quoting the movie almost line for line and many laughed frequently. Several females sang along and quoted *High School Musical* (Schain & Ortega, 2006) while it was shown during their ride. At the beginning of each day when told that they were going to have music or a movie, several students in each class exclaimed "Yes!" All of these observations tend to tell a slightly different story than the numeric data. Students reported that they did not enjoy the ride any more with distractions, but their comments before and during the ride seemed to be of a more positive nature when there were distractions. It could be that with more

comfortable bike seats, a shortened data collection period, or the presence of an instructor who leads a true spin workout, the data would more closely align with observations of student behavior and comments of enjoyment.

A social component could also have been affected student responses. For when no distraction was presented, many students turned to one another and talked almost the whole time. This indicates the potential that students were trying to create their own distraction by conversing with classmates. With no distraction and no direction to stay quiet during the ride, conversation may make cycling more enjoyable due to the element of sociality. Prusak and Darst (2002) found that seventh- and eighth-grade girls chose social walking activities over game-like, competitive, or fitness walking choices. They stated, "Most participants indicated that doing the activity with their friends was more important than which activity they chose" and suggested adding more social components to other activities to better meet more students' needs (Prusak & Darst, 2002, p. 238). The social part of this study could also have affected students' enjoyment during distractions, as it was more difficult to carry on a conversation when music, or more particularly a movie, was played; hardly any conversation was observed when a movie was played. This deterrent to holding a conversation as a movie was played could help to explain why participants' effort decreased when a movie was played. Students creating their own distraction by holding conversation also illustrates that while the researchers were intending to isolate the effects of distractions, in the end there were more distractions than could be accounted for. Student conversations were one additional distraction, but it is also possible that the directive to maintain a certain HR, while having every individual's HR displayed while riding, became another distraction from consciously thinking about riding. Given these results, teachers should think carefully and strategically about their use of distractions during exercise and not use them as a replacement for good pedagogy in a PE class. As many participants held their own conversations while cycling, teachers may also want to look at social opportunities offered in class and allow more time for conversation as students work together.

A future study with each group experiencing conditions in a random order would be better able to address if this change in both

treatment and control groups was due to time, order of treatment, or an unknown factor. The numerical data from this study found that both the control and treatment groups had a significant drop in HR and RPE during the third week of data collection. Future research could focus on open answers and short interviews of students to probe for deeper understanding of why this occurred. If, as suspected, this is due to boredom, future research should include design elements such as variety in pace or position, challenges, or teacher instruction and encouragement to avoid its occurrence.

This study had several limitations. First, all students involved came from a single school and were enrolled in a required PE class to which the researcher had access. Second, in some classes the teachers had set up the HR software so that student names were shown instead of student identification numbers. This identification of other students could have affected how students rode. Third, many participants needed to be dropped because of attrition, and limited data needed to be imputed for included participants. Fourth, despite efforts to oversample and account for attrition so common to such school-based studies, decreased numbers may have adversely affected statistical power.

References

Annesi, J. J. (2001). Effects of music, television, and a combination entertainment system on distraction, exercise adherence, and physical output in adults. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 33*, 193–202. https://doi.org/10.1037/h0087141

Barney, D., Gust, A., & Liguori, G. (2012). College students' usage of personal music players (PMP) during exercise. *The ICHPER-SD Journal of Research in Health, Physical Education, Recreation, Sport, and Dance, 7*(1), 23–26.

Barney, D., & Prusak, K. A. (2015). Effects of music on physical activity rates of elementary physical education students. *Physical Educator, 72*, 236–244.

Barney, D., Prusak, K., & Benham, L. (2015). The effects of music on student step counts and time in activity in a college basketball activity class [Abstract]. *Research Quarterly for Exercise and Sport, 86*(Suppl. 2), A-62–A-63.

Barwood, M. J., Weston, N. J. V., Thelwell, R., & Page, J. (2009). A motivational music and video intervention improves high-intensity exercise performance. *Journal of Sports Science & Medicine, 8*, 435–442.

Benham, L. (2014). *The effects of music on physical activity rates of junior high physical education students* (Unpublished master's thesis). Brigham Young University, Provo, UT.

Borg, G. A. (1982). Psychophysical bases of perceived exertion. *Medicine & Science in Sports & Exercise, 14*, 377–381. https://doi.org/10.1249/00005768-198205000-00012

Boutcher, S. H., & Trenske, M. (1990). The effects of sensory deprivation and music on perceived exertion and affect during exercise. *Journal of Sport & Exercise Psychology, 12*, 167–176. https://doi.org/10.1123/jsep.12.2.167

Bruckheimer, J., Oman, C. (Producer), & Boaz, Y. (Director). (2000). *Remember the Titans* [Motion picture]. United States of America: Jerry Bruckheimer Films.

Centers for Disease Control and Prevention. (2015, May 15). Physical activity for a healthy weight. Retrieved from http://www.cdc.gov/healthyweight/physical_activity/index.html

Centers for Disease Control and Prevention. (2015, October 27). Strategies to prevent obesity. Retrieved from https://www.cdc.gov/obesity/strategies/index.html

Centers for Disease Control and Prevention. (2017, January 20). Exercise or physical activity. Retrieved from https://www.cdc.gov/nchs/fastats/exercise.htm

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Conli, R. (Producer), Greno, N., & Howard, B. (Director). (2010). *Tangled* [Motion picture]. United States of America: Walt Disney Animation Studios.

Corbin, C. B., & Lindsey, R. (2007). In R. Lindsey (Ed.), *Fitness for life* (Updated 5th ed.). Long Beach, CA: Human Kinetics.

Daniels, S. R., Arnett, D. K., Eckel, R. H., Gidding, S. S., Hayman, L. L., Kumanyika, S., . . . Williams, C. L. (2005). Overweight in children and adolescents: Pathophysiology, consequences, prevention, and treatment. *Circulation, 111*, 1999–2012. https://doi.org/10.1161/01.cir.0000161369.71722.10

De Bourdeaudhuij, I., Crombez, G., Deforche, B., Vinaimont, F., Debode, P., & Bouckaert, J. (2002). Effects of distraction on treadmill running time in severely obese children and adolescents. *International Journal of Obesity & Related Metabolic Disorders, 26*, 1023–1029. https://doi.org/10.1038/sj.ijo.0802052

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*, 325–346. https://doi.org/10.1207/s15326985ep2603&4_6

Dyrlund, A. K., & Wininger, S. R. (2008). The effects of music preference and exercise intensity on psychological variables. *Journal of Music Therapy, 45*, 114–134. https://doi.org/10.1093/jmt/45.2.114

Fakhouri, T. H. I., Hughes, M. P. H., Burt, V. L., Song, M. K., Fulton, J. E., & Ogden, C. L. (2014). *Physical activity in U.S. youth aged 12–15 years, 2012* (NCHS Data Brief No. 141). Hyattsville, MD: National Center for Health Statistics.

Go, A. S., Mozaffarian, D., Roger, V. L., Berry, J. D., Borden, W. B., Bravata, D. M., . . . Turner, M. B. (2013). Heart disease and stroke statistics—2013 update: A report from the American Heart Association. *Circulation, 127*, e6–e245. https://doi.org/10.1161/CIR.0b013e31828124ad

Karageorghis, C. I., Jones, L., & Low, D. C. (2006). Relationship between exercise heart rate and music tempo preference. *Research Quarterly for Exercise and Sport, 77*, 240–250. https://doi.org/10.1080/02701367.2006.10599357

Katzenberg, J., Warner, A., Williams, J. H. (Producer), Adamson, A., & Jensen, V. (Director). (2001). *Shrek* [Motion picture]. United States of America: DreamWorks Animation.

Kukuwich, W. E. (1997). *Selection of exercise intensity using perceptual cues during television distraction* (Unpublished master's thesis). University of Oregon, Eugene, OR.

Nethery, V. M. (2002). Competition between internal and external sources of information during exercise: Influence on RPE and the impact of the exercise load. *Journal of Sports Medicine & Physical Fitness, 42*, 172–178.

Nethery, V. M., Harmer, P. A., & Taaffe, D. R. (1991). Sensory mediation of perceived exertion during submaximal exercise. *Journal of Human Movement Studies, 20*, 201–211.

Pennebaker, J. W., & Lightner, J. M. (1980). Competition of internal and external information in an exercise setting. *Journal of Personality and Social Psychology, 39*, 165–174. https://doi.org/10.1037//0022-3514.39.1.165

Polar. (2015). Polar GoFit (Version 1 .2. 1) [Application].Kempele, Finland: Polar Electro Oy.

Priest, D. L., Karageorghis, C. I., & Sharp, N. C. C. (2004). The characteristics and effects of motivational music in exercise settings: The possible influence of gender, age, frequency of attendance, and time of attendance. *Journal of Sports Medicine and Physical Fitness, 44*, 77–86.

Prusak, K. A., & Darst, P. W. (2002). Effects of types of walking activities on actual choices by adolescent female physical education students. *Journal of Teaching in Physical Education, 21*, 230–241. https://doi.org/10.1123/jtpe.21.3.230

Rejeski, W. J. (1985). Perceived exertion: An active or passive process? *Journal of Sport Psychology, 7*, 371–378. https://doi.org/10.1123/jsp.7.4.371

Russell, W., Pritschet, B., Frost, B., Emmett, J., Pelley, T. J., Black, J., & Owen, J. (2003). A comparison of post-exercise mood enhancement across common exercise distraction activities. *Journal of Sport Behavior, 26*, 368–383. https://doi.org/10.1097/00005768-200205001-00160

Schain, D. (Producer), & Ortega, K. (Director). (2006). *High School Musical* [Motion picture]. United States of America: Disney Channel.

Telama, R., Yang, X., Viikari, J., Valimaki, I., Wanne, O., & Raitakari, O. (2005). Physical activity from childhood to adulthood: A 21-year tracking study. *American Journal of Preventive Medicine, 28*, 267–273. https://doi.org/10.1016/j.amepre.2004.12.003

Viteri, J. E. (1994). *The effects of television viewing on the self-regulation of exercise intensity* (Unpublished master's thesis). Springfield College, Springfield, MA.

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LIFESTYLE FACTORS

Lifestyle Factors Associated With Overweight/Obesity Status in Croatian Adolescents: A Population-Based Study

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Abstract

Much is known about the influence of potential lifestyle factors on adolescents' nutritional status, but in Croatia there are not many studies of this topic. Past studies have shown many variables associated with being overweight/obese. Thus, this study investigated the associations between the overweight/obesity status and lifestyle factors of Croatian adolescents. In this cross-sectional study, participants were 1,950 urban secondary-school students (884 male, 1,066 female) aged 17 to 18 years old. The dependent variable was body mass index derived from self-reported height and weight. The outcome was binarized, where participants with value < 25.0 lb/in were collapsed into normal weight, while those ≥ 25.1 lb/in into the overweight/obesity weight category. Independent variables were gender, type of school, physical activity, sedentary behavior, self-rated health, self-perceived socioeconomic status, and psychological distress. The associations between the dependent and independent variables were analyzed through multiple logistic regression analysis. In the univariate model, being overweight/obese was significantly associated with a male gender (OR 0.31; 95%

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CI 0.23 to 0.42), attending a vocational school (OR 1.87; 95% CI 1.42 to 2.48), not meeting the recommendations for moderate-to-vigorous physical activity (OR 0.44; 95% CI 0.22 to 0.88), more time spent in sedentary behavior (OR 1.53; 95% CI 1.07 to 2.19), poor self-rated health (OR 0.35; 95% CI 0.20 to 0.56), and lower socioeconomic status (OR 0.63; 95% CI 0.48 to 0.84). In the multivariate model, the same associations occured between the dependent and independent variable. In both models, psychological distress was not associated with being overweight/obese. In conclusion, the findings suggest that lifestyle factors are independently associated with body mass index.

Obesity has become one of the major public health concerns in the world, especially in children and adolescents (Lobstein, Baur, & Uauy, 2004; Y. Wang & Lobstein, 2006). In 2005, the prevalence of overweight and obesity in children was 10.6% in high-income countries, yet around 5% in low-income countries (Y. Wang & Lobstein, 2006). Past studies have shown that being overweight/obese is associated with many variables, such as demographic or lifestyle factors (Lobstein et al., 2004; Spear et al., 2007). Those obesity-associated lifestyle factors are often related to many health-related habits and activities (Al-Hazzaa, Abahussain, Al-Sobayel, Qahwaji, & Musaiger, 2012). More specifically, several previous studies have shown, that being overweight/obese in childhood is often associated with lower levels of physical activity (Al-Hazzaa et al., 2012; Bhuiyan et al., 2013; Dupuy et al., 2011; Petribú et al., 2011), more time spent in sedentary behaviors (Bhuiyan, Zaman, & Ahmed, 2013; Lazarou & Soteriades, 2009; Petribú, Tassitano, Nascimento, Santos, & Cabral, 2011; K. Silva, Nahas, Hoefelmann, Lopes, & Oliveira, 2008), poorer self-rated health status (Fonseca & Gaspar de Matos, 2005), unhealthy diet (Al-Hazzaa et al., 2012; Janssen et al., 2005), low socioeconomic status (Kachi, Otsuka, & Kawada, 2015; You & Choo, 2016), higher levels of psychological distress (Kubzansky, Gilthorpe, & Goodman, 2011), and attending vocational schools (Sedej, Lusa, Battelino, & Kotnik, 2016).

In Croatia, data collected from 2001/2002 showed that the prevalence of overweight/obesity in adolescent males aged 13 to 15 years was roughly 14% and adolescent females almost 17% (Zaborskis, Petronyte, Sumskas, Kuzman, & Iannotti, 2008). Moreover, according to the data from the Health Behaviour in School-Aged

Children (HBSC) study, the prevalence of overweight in 2009/2010 in Croatian 15-year-old females and males was 23% and 10%, respectively, and for adult women was 24.5% and for men was 24.1% (Currie et al., 2009). Since overweight and obesity in childhood have negative conotations on morbidity and mortality in adulthood (Reilly & Kelly, 2011) and it is hard to reverse (De Onis & Lobstein, 2010), it is important to notice that adulthood prevalence of obesity in Croatia, following the recent trends, might be 35% for men and 42% for women by the year 2020, yet those numbers will increase by the year 2030 (37% for men and 48% for women; World Health Organization, 2013).

Since the prevalence of overweight and obesity in Croatian children is rising (Currie et al., 2009), and yet there are still a lack of studies investigating which potential lifestyle factors may influence such conditions, it is important to investigate which lifestyle factors could have positive and negative consequences on childhood overweight and obesity status. Thus, this study investigated the associations between overweight/obesity status and lifestyle factors in 17- and 18-year-old Croatian adolescents.

Method

Participants

In this cross-sectional study, participants were 2,100 urban secondary school students from the city of Zagreb. A random sampling approach was used in the selection of schools. At the end, 15 schools (8 public high schools and 7 vocational schools) agreed to take part in the study. Before the study began, both participants and their parents/guardians gave informed written consent to participate in the study. Of these, 100 participants did not want to participate in the study and 50 of them did not fulfill the whole questionnaires during the study protocol. At the end, 1,950 participants (884 male, 1,066 female) were enrolled in the study. All the procedures in the study were done in accordance to the Declaration of Helsinki. Also, the Ethics Committee of the Faculty of Kinesiology approved the study and its protocol.

Dependent Variable

To assess weight status of the participants, we asked for their current height and weight. Body mass index was calculated based on the internationally accepted formula Weight (lb) / [Height (in)]^2 × 703. Participants were categorized into the groups: underweight (x < 18.0), normal weight (18.1–25.0), overweight (x ≥ 25.1–30.0), and obesity group (x > 30.1). For the purpose of this study, we binarized the outcome, where values < 25.0 were collapsed into "normal" category status, while values ≥ 25.1 were collapsed into "overweight/obesity" category status.

Lifestyle Factors

To assess physical activity in the last 7 days, the International Physical Activity Questionnaire-short form was used (Craig et al., 2003). The purpose of this questionnaire is to evaluate different levels of physical activity in the last 7 days, based on the frequency of the days, minutes, and type of physical activity. The results are expressed as metabolic equivalents (MET-values). According to the World Health Organization (2004), the recommendations for participating in physical activity for children aged ≤ 17 are based on doing ≥ 60 min/day of moderate-to-vigorous physical activity (≥ 420 min/week). In that way, we binarized the outcome, where participants who reported doing moderate-to-vigorous physical activity < 60 min/day were collapsed into one category, while those ≥ 60 min/day of moderate-to-vigorous physical activity in the other category.

Sedentary behavior was assessed via a one-item question from the International Physical Activity Questionnaire: "How much time did you spend sitting on a week day during the last 7 days?". Responses were expressed as minutes. According to Tremblay et al. (2011), 120 min/day or less of recreational screen activities such as television watching, video game playing, and using the computer is positively associated with additional health benefits. We binarized the outcome, where participants who reported their sitting time ≤ 120 min /day were collapsed into one category, while those with responses > 120 min/day into the other category (Tremblay et al., 2011).

Next, type of school was assessed via a one-item question: "What type of school do you currently attend?" In Croatia, like in most European countries, there are, in general, two type of schools: (1) public high schools and (2) vocational schools (Sedej et al., 2016). We entered this factor into the model, since a few recent studies have shown that students from vocational schools were less physically active and were more likely to have higher body mass index compared to their public high schools peers (Sedej et al., 2016).

A few studies have shown that self-rated health represents a good mortality predictor, especially in adolescents (Johnson & Richter, 2002; Koivusilta, Arja, & Andres, 2003). The findings suggest that adolescents who smoke or drink report poorer health during adolescence than those who do not. Adolescents who are frequent or heavy alcohol and tobacco users report poorer subjective overall health. Self-rated health was assessed via a one-item question: "In general, how would you perceive your health?" Responses were arranged across the 5-point Likert-type scale: (1) *very poor*, (2) *poor*, (3) *fair*, (4) *very good*, and (5) *excellent*. We also binarized the outcome, where responses *very poor* and *poor* collapsed into poor health, while *fair*, *good*, and *excellent* collapsed into good health (Eriksson, Undén, & Elofsson, 2001).

As a potential factor, we entered self-perceived socioeconomic status. We asked for both parents' occupational status at the time the study was conducted. Socioeconomic status was first categorised in high (professionals and managers—people who own their bussiness or firm or they are in higher positions in the company), middle (white collar—people who usually perform job duties in an office setting, typical examples are accountants, bankers, attorneys, and real-estate agents), and low (blue collar—people who perform labor jobs and work with their hands, typical examples re cleaning, maintenance, and assembly line workers). We binarized the outcome, where responses in the range 2–4 were collapsed into middle/high and responses in the range 5–6 were collapsed into low socioeconomic status (Z. Wang, Byrne, Kenardy, & Hills, 2005).

Also as another potential factor, we assessed the state of the mental health of the participants, using Kessler K6 questionnaire with six items: (1) "During the past month, how often did you feel nervous?" (2) "During the past month, how often did you feel hopeless?"

(3) "During the last month, how often did you feel restless or fidgety?" (4) "During the last month, how often did you feel so depressed that nothing could cheer you up?" (5) "During the last month, how often did you feel that everything was an effort?" and (6) "During the last month, how often did you feel worthless?" Each question had five possible responses ranging from 0–4. We summed up the values (0–24) for each participant, with a lower score indicating a lower level of psychological distress (Kessler et al., 2003). At the end, we binarized the outcome, where participants with scores < 13 were collapsed into the low psychological distress category, while those with scores 13+ into the high psychological distress category (Kessler et al., 2003).

Data Analysis

Categorical variables are expressed as frequencies and percentages. We used Spearman's coefficient to determine relations between the dependent and independent variables. The associations between the dependent and independent variables were analyzed via logistic regression analysis. First, we entered separate lifestyle factors into Model 1 (univariate model) to determine independent associations between each of the factors with being overweight/obese. In the second model (Model 2), we entered each lifestyle factor simultaneously. Results are expressed as odds ratios (*OR*) with 95% confidence intervals (95% CI). Significance was set up at $p \leq 0.05$, and all tests performed in the study were two-sided.

Results

Table 1 presents basic characteristics of the study participants. In public high schools, a higher percentage (72.6%) of students were in the normal weight category compared to their vocational school (27.4%) peers. In general, more than 90% of the study participants did not meet the recommendations for participating in moderate-to-vigorous physical activity, yet a higher percentage of participants with normal weight status reported to meet the recommendations (8.3% vs. 3.9%) according to those categorized as overweight or obese. As expected, a higher percentage (82.8%) of overweight/obese students than normal weight participants (75.8%) reported sitting > 120 min/day. A higher percentage of the participants in the normal weight group than in the overweight/obese group (97.0% vs. 91.8%)

reported having good self-rated health. Poorer socioeconomic status was reported by the overweight/obese participants (38.5% vs. 28.4%), yet no significant differences occured between two groups in psychological distress (14.2% vs. 16.5%).

Table 1
Basic Descriptive Characteristics of the Study Participants

	Total (*N* = 1,950)	**Normal status (*N* = 1,718)**	**Overweight/ obese status (*N* = 232)**
Study variable	***N* (%)**	***N* (%)**	***N* (%)**
Gender			
Male	884 (45.3)	722 (42.0)	162 (69.8)
Female	1066 (54.7)	996 (58.0)	70 (30.2)
Type of school			
Public high school	1383 (70.9)	1247 (72.6)	136 (58.6)
Vocational school	567 (29.1)	471 (27.4)	96 (41.4)
Physical activity			
< 60 min/day	1798 (92.2)	1575 (91.7)	223 (96.1)
≥ 60 min/day	152 (7.8)	143 (8.3)	9 (3.9)
Sedentary behaviour			
≤ 120 min/day	455 (23.3)	415 (24.2)	40 (17.2)
> 120 min/day	1495 (76.7)	1303 (75.8)	192 (82.8)
Self-rated health			
Poor	71 (3.6)	52 (3.0)	19 (8.2)
Good	1879 (96.4)	1666 (97.0)	213 (91.8)
Socioeconomic status			
Low	577 (29.6)	488 (28.4)	89 (38.5)
Middle/high	1372 (70.4)	1230 (71.6)	142 (61.5)
Psychological distress			
Low	1633 (83.7)	1434 (83.5)	199 (85.8)
High	317 (16.3)	284 (16.5)	33 (14.2)

Table 2 presents relations between body mass index and lifestyle factors. As expected, not meeting the recommendations for participating in ≥ 60 min of moderate-to-vigorous physical activity, having poor self-rated health, and sitting > 120 min/day were all related

with being overweight/obese. Also, low socioeconomic status was associated with overweight/obesity status in adolescents.

Table 2
Spearman's Rank of Correlation Between Body Mass Index and Lifestyle Factors

	Body mass index	
Study variable	***r* (95% CI)**	***p***
Gender (male = 1; female = 2)	-0.18 (-0.22 to -0.14)	< 0.001*
Type of school (public high school = 1; vocational school = 2)	0.10 (0.05 to 0.15)	< 0.001*
Physical activity (< 60 min/day = 1; ≥ 60 min/day = 2)	-0.05 (-0.07 to -0.02)	0.018*
Sedentary behaviour (≤ 120 min/day = 1; > 120 min/day = 2)	0.05 (0.01 to 0.09)	0.021*
Self-rated health (poor = 1; good = 2)	-0.09 (-0.14 to -0.03)	< 0.001*
Socioeconomic status (high = 1; low = 2)	0.07 (0.02 to 0.12)	0.002*
Psychological distress (low = 1; high = 2)	0.02 (-0.02 to 0.06)	0.386

*$p \leq 0.05$.

Table 3 presents the associations between overweight/obesity status and lifestyle factors. In the univariate model (Model 1), male students, students from vocational schools, students who did not meet the recommendations for participating in moderate-to-vigorous physical activity, students who spent > 120 min/day sitting, and students who reported poor self-rated health and low socioeconomic status were more likely to be overweight/obese. In the multivariate model (Model 2), the same associations occured between the overweight/obesity status and lifestyle factors. Finally, psychological distress was not associated with being overweight/obese in either models ($p > 0.05$).

Table 3
Odds Ratios for Overweight/Obesity Status

	Model 1[a]		Model 2[b]	
Study variable	***OR* (95% CI)**	***p***	***OR* (95% CI)**	***p***
Gender				
Male				
Female	0.31 (0.23 to 0.42)	< 0.001*	0.30 (0.22 to 0.41)	< 0.001*
Type of school				
Public high school				
Vocational school	1.87 (1.41 to 2.48)	< 0.001*	1.42 (1.04 to 1.94)	0.025*
Physical activity				
< 60 min/day				
≥ 60 min/day	0.44 (0.22 to 0.88)	0.021*	0.37 (0.18 to 0.75)	0.006*
Sedentary behaviour				
≤ 120 min/day				
> 120 min/day	1.53 (1.07 to 2.19)	0.020*	1.75 (1.21 to 2.54)	0.003*
Self-rated health				
Poor				
Good	0.35 (0.20 to 0.60)	< 0.001*	0.26 (0.14 to 0.46)	< 0.001*
Socioeconomic status				
Low				
Middle/high	0.63 (0.48 to 0.84)	0.002*	0.70 (0.51 to 0.95)	0.023*
Psychological distress				
Low				
High	1.19 (0.81 to 1.76)	0.372	1.00 (0.65 to 1.53)	0.998

[a]Univariate model examines the associations between overweight/obese status and lifestyle factors entered separately into the model 1 (7 models); [b]Multivariate model examines the associations between overweight/obese status and lifestyle factors entered simultaneously into Model 2 (1 model).

*$p \leq 0.05$.

Discussion

This study investigated the associations between the overweight/obesity status and potential lifestyle factors in 17- and 18-year-old Croatian urban adolescents.

Results from our study showed that female students were less likely than male students to be overweight/obese, which is similar to results in other studies (Al-Hazzaa et al., 2012; Connecticut Department of Public Health, 2010; K. Silva et al., 2008). Male students, according to gender variable, were strongly associated with overweight/obesity status (Connecticut Department of Public Health, 2010). This could be explained by several reasons. First, female students, in general, reported more frequently that they were on a diet or doing something else to lose weight because they wanted to achieve the ideal image of the female body imposed through the media. Women want to look like people from public life.They also reported that they should lower their weight, even if they were making no efforts to do so (Zaborskis et al., 2008). On the other hand, male students often reported that they wish to put extra weight (Zaborskis et al., 2008). Second, we used results from self-reported height and weight and body mass index calculated from these values. Previous findings have shown that female adolescents often tend to underestimate their weight more than male adolescents do, and overweight individuals often underestimate weight more than nonoverweight individuals do (Sherry, Jefferds, & Grummer-Strawn, 2007). In one Croatian study, overweight female students underestimated their weight and overestimated their height, which led to great variability between the objective and subjective measures (Ambrosi-Randić & Bulian, 2007). Third, female students are more often concerned about their body weight and image than male students are. To confirm that statement, Morrison, Kalin, and Morrison (2004) showed that women perceive their bodies differently than men. Specifically, the ideal women's body figure is slim, while for men the ideal body figure is muscular (McCabe & Ricciardelli, 2005).

Next, our results showed that students from vocational schools were more likely to be overweight/obese than those from public high schools. A study on Slovenian adolescents showed a significantly lower prevalence of overweight and obesity status in adolescents attending public high schools compared to their vocational school

peers (Sedej et al., 2016). Several possible factors might explain such conditions. First, several studies have shown that children in vocational schools are less physically active, spend more time watching TV, spend more time sitting in front of the computer, and have higher body mass index than children attending grammar schools (Alricsson, Domalewski, Romild, & Asplund, 2008; Horst, Oenema, Velde, & Brug, 2009). Second, children attending vocational schools are often shown to have poorer academic achievement, which is in direct association with overweight and obesity status (Do & Finkelstein, 2011). Moreover, adolescents from vocational schools tend to have lower socioeconomic status, which often leads to poor dietary habits (food rich with sugar, fatty acids, fast food) and, occasionally, to overweight and obese status (Do & Finkelstein, 2011).

Being overweight/obese was associated with lower levels of physical activity in our study (i.e., not meeting the recommendations proposed by the World Health Organization, 2004). Previous studies have shown similar findings, where insufficiently active secondary school students were more likely to be overweight/obese (Al-Hazzaa et al., 2012; Bhuiyan et al., 2013; Dupuy et al., 2011; Petribú et al., 2011). In one study, results showed that physical activity, particulary vigorous-intensity physical activity, played the important role of preventing childhood overweight and obesity status (Al-Hazzaa et al., 2012; Patrick et al., 2004). Another study showed that participating in home-based physical activity ≥ 30 min significantly decreased the chance of being overweight/obese (Bhuiyan et al., 2013). Moreover, one review showed that vigorous-intensity physical activity decreased adiposity and increased aerobic capacities in 5- to 18-year-old adolescents (Parikh & Stratton, 2011). The most common reasons why children and adolescents drop out from participating in physical activity are a lack of neighborhood safety, organization of physical activity, victimization (Humbert et al., 2006), and psychosocial barriers (Curtis, 2008). Based on these findings, it is necesary to design and implement public health programs for increased promotion of physical activity, especially in urban adolescents, who are at higher risk for being overweight/obese than their rural peers, which has been reported in some studies (Ghosh, 2011; Petribú et al., 2011).

More time spent in sedentary behavior was significantly and positively associated with overweight/obesity status in Croatian adolescents. Previous findings have shown the same associations, where more time spent in sedentary behavior increased the chance for overweight/obesity status in adolescents (Bhuiyan et al., 2013; Lazarou & Soteriades, 2009; Petribú et al., 2011; K. Silva et al., 2008). Bhuiyan et al. (2013) reported that overweight children spent > 4 hr/day in sedentary activities compared to normal weight children. In one other study, television watching and sedentary activities played the most important factors associated with obesity (Lazarou & Soteriades, 2009). Several potential mechanisms could explain the associations between sedendary behavior and overweight/obesity status, which include the reduction of resting energy expenditure, increased energy intake, and replacing physical activity with television watching (Jordan & Robinson, 2008). Also, it has been shown that sedentary adolescents consume less fresh fruits and vegetables, and a more "Westernized"-type diet, such as sweets, chocolates, and food rich with saturated fatty acids (del Mar Bibiloni, Martínez, Llull, Pons, & Tur, 2012), which might lead to higher body mass index.

Good self-rated health was inversely associated with overweight/obesity status in our study, which is similar to some studies conducted with adolescents (Fonseca & Gaspar de Matos, 2005; Vingilis, Wade, & Adlaf, 1998). Specifically, in the study conducted by Fonseca and Gaspar de Matos (2005), results showed that overweight/obese adolescents were less likely to make new friendship, yet more likely to report poor self-rated health, negative attitude appearance, and a wish to change something about their bodies. The authors concluded that preventive programs helping to promote better body satisfaction, sociability, and diet are needed, especially for overweight and obese adolescents, since they remain overweight/obese in adulthood (Fonseca & Gaspar de Matos, 2005).

Consistent with the results of other studies (Kachi et al., 2015; You & Choo, 2016), our results showed that lower socioeconomic status was positively associated with being overweight/obese in Croatian adolescents. These findings could be explained by several potential mechanisms. First, it has been shown that low socioeconomic status (i.e., that children and adolescents from low-income families were more vulnerable to having a poor diet and to becoming

obese; Costarelli & Manios, 2009). In relation with that, one study showed that low-income families could not afford high-quality products (fruits, vegetables, fish, cereals, olive oil), which cost much more than "Westernized"-type products, often rich with saturated-fatty acids, calories, and sugar (Lopez et al., 2009). Also, socioeconomic status has also been associated with information availability, which some authors think may determine physical activity patterns (G. Silva, Balaban, & Motta, 2005).

Our study had several limitations. First, due to the cross-sectional design, we could not exclude the possibility of reverse causality between the dependent and independent variables. Second, we used subjective measures to assess body mass index and lifestyle factors. Studies have shown that, for example, physical activity reported through previously validated questionnaires (Craig et al., 2003) often lead to overestimation (Gillison, Standage, & Skevington, 2006). Also, we used self-reported height and weight and body mass index calculated from these values as the dependent variable. As highlighted before, subjective measures often lead to potential bias and high variability compared to objectively assessed methods (Ambrosi-Randić & Bulian, 2007; Sherry et al., 2007). Future longitudinal studies need to be performed that track and confirm the direction of association between the nutritional status and potential lifestyle behaviors, especially in developing countries.

Conclusions

In conclusion, our study showed that being overweight/obese was significantly associated with being a male student, attending a vocational school, not meeting the recommendations for moderate-to-vigorous physical activity proposed by the World Health Organization, more time spent in sedentary behaviors, poor self-rated health, and low socioeconomic status. According to our results, special policies and strategies need to be implemented, particulary within the school system (more hours of physical education per week, organized leisure-time physical activities, diet plan, and programming), to decrease the prevalence of overweight/obese children and adolescents and to promote healthy lifestyle habits for better physical and mental health.

References

Al-Hazzaa, H. M., Abahussain, N. A., Al-Sobayel, H. I., Qahwaji, D. M., & Musaiger, A. O. (2012). Lifestyle factors associated with overweight and obesity among Saudi adolescents. *BMC Public Health*, *12*, 1–11. https://doi.org/10.1186/1471-2458-12-354

Alricsson, M., Domalewski, D., Romild, U., & Asplund, R. (2008). Physical activity, health, body mass index, sleeping habits, and body complaints in Australian senior high school students. *International Journal of Adolescent Medicine and Health*, *20*, 501–512. https://doi.org/10.1515/ijamh.2008.20.4.501

Ambrosi-Randić, N., & Bulian, A. P. (2007). Self-reported versus measured weight and height by adolescent girls: A Croatian sample. *Perceptual and Motor Skills*, *104*(1), 79–82. https://doi.org/10.2466/pms.104.1.79-82

Bhuiyan, M. U., Zaman, S., & Ahmed, T. (2013). Risk factors associated with overweight and obesity among urban school children and adolescents in Bangladesh: A case–control study. *BMC Pediatrics*, *13*, 1–6. https://doi.org/10.1186/1471-2431-13-72

Connecticut Department of Public Health, Health Education, Management and Surveillance Section, Hartford, CT. (2010, 20 November). *Gender-specific factors associated with obesity or overweight in adolescents: Connecticut's 2009 Youth Risk Behavior Survey.* Retrieved from http://www.ct.gov/dph/lib/dph/hisr/pdf/gender-specific_factors_associated with_obesity_in_adolescents.pdf

Costarelli, V., & Manios, Y. (2009). The influence of socioeconomic status and ethnicity on children's excess body weight. *Nutrition & Food Science*, *39*, 676–684. https://doi.org/10.1108/00346650911003002

Craig, C. L., Marshall, A. L., Sjorstrom, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., . . . Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, *35*, 1381–1395. https://doi.org/10.1249/01.mss.0000078924.61453.fb

Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., . . . Barnekow, V. (Eds.). (2009). *Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 study* (Health Policy for Children and Adolescents,

No. 6). Copenhagen, Denmark: WHO Regional Office for Europe.
Curtis, P. (2008). The experiences of young people with obesity in secondary school: Some implications for the healthy school agenda. *Health & Social Care in the Community*, *16*, 410–418. https://doi.org/10.1111/j.1365-2524.2008.00759.x
del Mar Bibiloni, M., Martínez, E., Llull, R., Pons, A., & Tur, J. A. (2012). Western and Mediterranean dietary patterns among Balearic Islands' adolescents: Socio-economic and lifestyle determinants. *Public Health Nutrition*, *15*, 683–692. https://doi.org/10.1017/s1368980011002199
De Onis, M., & Lobstein, T. (2010). Defining obesity risk status in the general childhood population: Which cut-offs should we use? *Pediatric Obesity, 5*, 458–460. https://doi.org/10.3109/17477161003615583
Do, Y. K., & Finkelstein, E. A. (2011). Adolescent weight status and self-reported school performance in South Korea. *Journal of Obesity*, *2011*. https://doi.org/10.1155/2011/798409
Dupuy, M., Godeau, E., Vignes, C., & Ahluwalia, N. (2011). Socio-demographic and lifestyle factors associated with overweight in a representative sample of 11–15 year olds in France: Results from the WHO-Collaborative Health Behaviour in School-Aged Children (HBSC) cross-sectional study. *BMC Public Health*, *11*, 1–11. https://doi.org/10.1186/1471-2458-11-442
Eriksson, I., Undén, A. L., & Elofsson, S. (2001). Self-rated health: Comparisons between three different measures—Results from a population study. *International Journal of Epidemiology*, *30*, 326–333. https://doi.org/10.1093/ije/30.2.326
Fonseca, H., & Gaspar de Matos, M. (2005). Perception of overweight and obesity among Portuguese adolescents: An overview of associated factors. *European Journal of Public Health*, *15*, 323–328. https://doi.org/10.1093/eurpub/cki071
Ghosh, A. (2011). Rural–urban comparison in prevalence of overweight and obesity among children and adolescents of Asian Indian origin. *Asia Pacific Journal of Public Health*, *23*, 928–935. https://doi.org/10.1177/1010539511428697
Gillison, F. B., Standage, M., & Skevington, S. M. (2006). Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life, and leisure-time exercise behaviour: A self-determination theory approach. *Health Education Research*, *21*, 836–847. https://doi.org/10.1093/her/cyl139

Grosso, G., Marventano, S., Buscemi, S., Scuderi, A., Matalone, M., Platania, A., . . . Mistretta, A. (2013). Factors associated with adherence to the Mediterranean diet among adolescents living in Sicily, Southern Italy. *Nutrients*, *5*, 4908–4923. https://doi.org/10.3390/nu5124908

Horst, K., Oenema, A., Velde, S. J., & Brug, J. (2009). Gender, ethnic, and school type differences in overweight and energy balance-related behaviours among Dutch adolescents. *Pediatric Obesity*, *4*, 371–380. https://doi.org/10.3109/17477160902953066

Humbert, M. L., Chad, K. E., Spink, K. S., Muhajarine, N., Anderson, K. D., Bruner, M. W., . . . Gryba, C. R. (2006). Factors that influence physical activity participation among high- and low-SES youth. *Qualitative Health Research*, *16*, 467–483. https://doi.org/10.1177/1049732305286051

Janssen, I., Katzmarzyk, P. T., Boyce, W. F., Vereecken, C., Mulvihill, C., Roberts, C., . . . The Health Behaviour in School-Aged Children Obesity Working Group. (2005). Comparison of overweight and obesity prevalence in school-aged youth from 34 countries and their relationships with physical activity and dietary patterns. *Obesity Reviews*, *6*, 123–132. https://doi.org/10.1111/j.1467-789x.2005.00176.x

Johnson, P. B., & Richter, L. (2002). The relationship between smoking, drinking, and adolescents' self-perceived health and frequency of hospitalization: Analyses from the 1997 National Household Survey on Drug Abuse. *Journal of Adolescent Health*, *30*, 175–183. https://doi.org/10.1016/s1054-139x(01)00317-2

Jordan, A. B., & Robinson, T. N. (2008). Children, television viewing, and weight status: Summary and recommendations from an expert panel meeting. *The ANNALS of the American Academy of Political and Social Science*, *615*, 119–132. https://doi.org/10.1177/0002716207308681

Kachi, Y., Otsuka, T., & Kawada, T. (2015). Socioeconomic status and overweight: A population-based cross-sectional study of Japanese children and adolescents. *Journal of Epidemiology*, *25*, 463–469. https://doi.org/10.2188/jea.je20140108

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., . . . Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, *60*, 184–189. https://doi.org/10.1001/archpsyc.60.2.184

Koivusilta, L., Arja, R., & Andres, V. (2003). Health behaviours and health in adolescence as predictors of educational level in adulthood: A follow-up study from Finland. *Social Science & Medicine*, *57*, 577–593. https://doi.org/10.1016/s0277-9536(02)00405-7

Kubzansky, L. D., Gilthorpe, M. S., & Goodman, E. (2011). A prospective study of psychological distress and weight status in adolescents/young adults. *Annals of Behavioral Medicine*, *43*, 219–228. https://doi.org/10.1007/s12160-011-9323-8

Lazarou, C., & Soteriades, E. S. (2009). Children's physical activity, TV watching, and obesity in Cyprus: The CYKIDS study. *European Journal of Public Health*, *20*(1), 70–77. https://doi.org/10.1093/eurpub/ckp093

Lobstein, T., Baur, L., & Uauy, R. (2004). Obesity in children and young people: A crisis in public health. *Obesity Reviews*, *5*(Suppl. 1), 4–85. https://doi.org/10.1111/j.1467-789x.2004.00133.x

Lopez, C. N., Martinez-Gonzalez, M. A., Sanchez-Villegas, A., Alonso, A., Pimenta, A. M., & Bes-Rastrollo, M. (2009). Costs of Mediterranean and Western dietary patterns in a Spanish cohort and their relationship with prospective weight change. *Journal of Epidemiology & Community Health*, *63*, 920–927. https://doi.org/10.1136/jech.2008.081208

McCabe, M. P., & Ricciardelli, L. A. (2005). A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behaviour Research and Therapy*, *43*, 653–668. https://doi.org/10.1016/j.brat.2004.05.004

Morrison, T. G., Kalin, R., & Morrison, M. A. (2004). Body-image evaluation and body-image investment among adolescents: A test of sociocultural and social comparison theories. *Adolescence*, *39*, 571–592.

Parikh, T., & Stratton, G. (2011). Influence of intensity of physical activity on adiposity and cardiorespiratory fitness in 5–18 year olds. *Sports Medicine*, *41*, 477–488.

Patrick, K., Norman, G. J., Calfas, K. J., Sallis, J. F., Zabinski, M. F., Rupp, J., & Cella, J. (2004). Diet, physical activity, and sedentary behaviors as risk factors for overweight in adolescence. *Archives of Pediatrics & Adolescent Medicine*, *158*, 385–390.

Petribú, M. D. M. V., Tassitano, R. M., Nascimento, W. M. F. D., Santos, E. M. C., & Cabral, P. C. (2011). Factors associated with overweight and obesity among public high school students of the city of Caruaru, Northeast Brazil. *Revista Paulista de Pediatria*, *29*, 536–545.

Reilly, J. J., & Kelly, J. (2011). Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: Systematic review. *International Journal of Obesity*, *35*, 891–898.

Sedej, K., Lusa, L., Battelino, T., & Kotnik, P. (2016). Stabilization of overweight and obesity in Slovenian adolescents and increased risk in those entering non-grammar secondary schools. *Obesity Facts*, *9*, 241–250.

Sherry, B., Jefferds, M. E., & Grummer-Strawn, L. M. (2007). Accuracy of adolescent self-report of height and weight in assessing overweight status: A literature review. *Archives of Pediatrics & Adolescent Medicine*, *161*, 1154–1161.

Silva, G. A. P. D., Balaban, G., & Motta, M. E. F. D. A. (2005). Prevalence of overweight and obesity in children and adolescents of different socioeconomic conditions. *Revista Brasileira de Saúde Materno Infantil*, *5*(1), 53–59.

Silva, K. S. D., Nahas, M. V., Hoefelmann, L. P., Lopes, A. D. S., & Oliveira, E. S. D. (2008). Associations between physical activity, body mass index, and sedentary behaviors in adolescents. *Revista Brasileira de Epidemiologia*, *11*(1), 159–168.

Spear, B. A., Barlow, S. E., Ervin, C., Ludwig, D. S., Saelens, B. E., Schetzina, K. E., & Taveras, E. M. (2007). Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics*, *120*(Suppl. 4), S254–S288.

Tremblay, M. S., LeBlanc, A. G., Janssen, I., Kho, M. E., Hicks, A., Murumets, K.,. . . Duggan, M. (2011). Canadian sedentary behaviour guidelines for children and youth. *Applied Physiology, Nutrition, and Metabolism*, *36*(1), 59–64.

Vingilis, E., Wade, T. J., & Adlaf, E. (1998). What factors predict student self-rated physical health? *Journal of Adolescence*, *21*(1), 83–97.

Wang, Y., & Lobstein, T. I. M. (2006). Worldwide trends in childhood overweight and obesity. *Pediatric Obesity*, *1*(1), 11–25.

Wang, Z., Byrne, N. M., Kenardy, J. A., & Hills, A. P. (2005). Influences of ethnicity and socioeconomic status on the body dissatisfaction and eating behaviour of Australian children and adolescents. *Eating Behaviors*, *6*(1), 23–33.

World Health Organization. (2004). *Global strategy on diet, physical activity, and health*. Retrieved from https://www.who.int/dietphysicalactivity/strategy/eb11344/strategy_english_web.pdf

World Health Organization. (2013). WHO Global Health Observatory data repository. Retrieved November 20, 2016, from http://apps.who.int/gho/data/view.main

You, J., & Choo, J. (2016). Adolescent overweight and obesity: Links to socioeconomic status and fruit and vegetable intakes. *International Journal of Environmental Research and Public Health*, *13*(3). https://doi.org/10.3390/ijerph13030307

Zaborskis, A., Petronyte, G., Sumskas, L., Kuzman, M., & Iannotti, R. J. (2008). Body image and weight control among adolescents in Lithuania, Croatia, and the United States in the context of global obesity. *Croatian Medical Journal*, *49*, 233–242.

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PEDAGOGY

Students' Attitude Toward Physical Education: Relations With Physical Activity, Physical Fitness, and Self-Concept

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Abstract

This study investigated the relation between students' attitude toward physical education (PE) and its correlates by simultaneously considering age, sex, enjoying physical activity (PA), self-perceived physically active lifestyle (PAL), self-perception of physical competence, PA, and cardiovascular fitness (CF). This cross-sectional study included 235 students (M = 15.2 ± 2.5 years). All correlates of students' at-

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titude toward PE were assessed via questionnaires. CF was assessed by via Fitnessgram. Pearson correlation coefficients confirmed a large positive correlation between attitude toward PE and PA enjoyment ($r = .71$, $p < .001$) and PAL ($r = .52$, $p < .001$). Moderate positive correlations were found for self-perception of physical competence, nonorganized PA, organized PA, and CF ($.24 \geq r \leq .48$, $ps < .001$) . Multiple linear regression showed that enjoying PA ($\beta = .62$, $p < .001$) was the only significant predictor when all variables were considered simultaneously. The model explained 55% of explained variance on students' attitude toward PE. Binary logistic regressions showed that students who reported enjoying PA were 9.3 times more likely to report a positive attitude toward PE. In contrast, students who did not enjoy PA and those who overperformed in the CF test were 4.2 and 1.1 , respectively, more likely to report a negative attitude toward PE. Coherently across all analyses, from all the predictors studied, PA enjoyment seems to be the most powerful, showing the highest contribution in explaining students' attitude toward PE.

School-based physical education (PE) is one of the most widely available sources of physical activity (PA) for children and adolescents. It is well accepted that PE plays an important role in the overall educational process by helping students to develop a healthy lifestyle (Expert Group on Health-Enhancing Physical Activity [EGHEPA], 2014). School-based PE interventions have been shown to be effective in increasing levels of PA and possibly improving physical fitness of students (Kriemler et al., 2011). Nevertheless, research has revealed that students' motivation to participate in PE at school declines as they grow older (Gu & Zhang, 2016). On the other hand, for many students, PE is the only opportunity to be engaged in PA (Morgan, Beighle, & Pangrazi, 2007; Pate, Ward, O'Neill, & Dowda, 2007). This suggests the importance of better understanding students' attitude toward PE and its correlates for the development of interventions that could contribute to increasing levels of engagement in both PE and independent PA.

Potential correlates of students' attitude toward PE have been studied. Among such factors, age, sex, enjoying PA, self-perception of a physically active lifestyle, self-perception of physical competence, PA, and physical fitness have been shown to strongly relate to students' attitude toward PE (Carroll & Loumidis, 2001; Colquitt, Walker, Langdon, McCollum, & Pomazal, 2012; Gu & Zhang, 2016;

Hagger, Cale, & Almond, 1997; Hünük & Demirhan, 2010; Pate et al., 2007; Stiller & Alferman, 2007; Zeng, Hipscher, & Leung, 2011). For example, while boys and girls seem to show different levels of interest in PE classes, the available literature is still inconsistent. Some studies have shown that boys have a more positive attitude toward PE than girls do (Colley, Comber, & Hargreaves, 1994; Hünük & Demirhan, 2010; Koca, Aşçı, & Demirhan, 2005; Zeng et al., 2011), while others have shown no differences between males and females (Subramaniam & Silverman, 2007). These differences in students' attitudes could be attributed to previous experiences in PE, the level of skills, the PE teacher, the contents, the facilities, and the equipment. Therefore, identifying the primary reasons why some students do not like PE could contribute to the development of school-based interventions that are more effective.

It has been suggested that children and adolescents who have a more positive attitude toward PA are more likely engaged in PA at school and in their leisure time (Hünük & Demirhan, 2010; Koca & Demirhan, 2004; Subramaniam & Silverman, 2007). Similarly, students who experience enjoyment in organized and nonorganized PA show a more positive attitude toward PE at school (Subramaniam & Silverman, 2007). Consequently, PE teachers should help students to develop their physical skills and encourage them to be physically active on a daily basis.

Self-concept, defined as the general evaluation of oneself based on knowledge and an evaluation of one's competences and skills, is an important agent of behavior (Stiller & Alfermann, 2007). Physical educators who promote physically active lifestyles assume a significant role in improving physical self-concept, mainly by using a self-enhancement strategy, promoting self-esteem, and enhancing the skill development strategy and the students' physical competence (Ferrer-Caja & Weiss, 2000; Stiller & Alfermann, 2007). Hence, one can argue that PE classes may influence self-concept, improve competence, and support experiences of success, which could be a key factor for lifelong participation in PA. This highlights the importance of focused interventions in PE classes for the improvement of the motivational climate, the intrinsic motivation, and the general enjoyment (Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari, 2012; Stiller & Alfermann, 2007). This supports the idea that the creation

of a positive learning environment may affect students' learning and attitudes and could play a major role in enabling students to adopt a healthier lifestyle by incorporating regular PA.

Concerning the mentioned self-competence by itself, physical fitness (an integrated measure of psychoneurological, musculoskeletal, cardiorespiratory, blood-circulatory, and endocrine-metabolic functions) is an important well-known goal in PE (American College of Sports Medicine, 2014; EGHEPA, 2014). Research has shown that girls and boys with high physical fitness have a more positive attitude toward PE and better PA-related self-concept than those with low physical fitness do (Aktop, 2010; Colquitt et al., 2012). The improvement of physical fitness in PE classes can be a key component of the educative process, helping students to develop physical abilities, self-confidence, a positive physical concept, and generally, a more positive attitude toward PE and sports (Meredith & Welk, 2010).

Although there is a considerable amount of evidence on the correlates of students' attitude toward PE, studies have not examined the contribution of each aforementioned correlate while predicting the likelihood of students reporting a positive or negative attitude toward PE. This is, however, highly important because it would help to identify the variables that most strongly determine attitudes toward PE. This knowledge could serve as the basis for the design of specific school- and individual-based interventions to improve the students' attitude toward PE and, therefore, enhance PA in general.

This study followed a comprehensive approach in investigating the relations of students' attitude toward PE and its correlates by simultaneously considering multiple individual variables (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, PA, and physical fitness) and by differentiating the relationship patterns of correlates for students with a positive and those with a negative attitude toward PE.

Method

Study Design and Participants

In this cross-sectional study, all healthy students who attended the classes of nine trainee teachers and their promoters, in four urban public elementary and secondary schools from the city of Funchal

were considered eligible to participate. Of these 18 classes (330 students who attended the four schools), 235 students (89 boys, 146 girls) in the seventh to 12th grade, aged 10 to 22 years ($M = 15.2 \pm 2.5$ years), agreed to participate in the study. Participation was voluntary, and all students were assessed in 2016. Data were collected through online self-completion of questionnaires by each student, at the schools' informatics classroom. Physical fitness assessments were conducted in the gymnasium of each school through use of the same protocol and the same equipment and materials.

The study was conducted according to the ethical standards in sport and exercise science research (Harriss & Atkinson, 2009), and the study protocol received approval from the ethics committee of the University of Madeira and the educational authority (Governmental Secretary of Education). All procedures were explained to each participant, and written informed consent was granted by the parents or legal guardians before any assessment. The consent form briefly described the nature, purposes, procedures, data confidentiality, and potential outcomes of the study.

Reliability of Assessments

Nine trainee teachers in PE collected all data. Prior training for data collection was provided by a university training program. This program included theoretical and practical sessions. First, instructions and demonstrations for the physical fitness tests and questionnaires were given. Second, the field team members practiced on each other. Third, the team participated in a pilot study, for which all variables were assessed in 8 boys and 7 girls aged 16–18 years. These adolescents were assessed twice with an interval of 1 week. This pilot study indicated good to acceptable test–retest reliabilities for all assessments.

Students' Attitude Toward PE and Students' Self-Perceptions

For the assessment of students' attitude toward PE and PA, participants were asked, "What do you think about your PE lessons at school?" and "What do you think about practicing PA?" (see applications and validations of these questions by Aaro, Wold, Kannas, & Rimpelä, 1986). Answers were given on a 5-point Likert-type scale ranging from 1 = *I dislike it very much* to 5 = *I like it very much*.

Self-perception of PA was assessed via one question: "How do you classify your own lifestyle?" Responses were given on a 5-point Likert-type scale ranging from 1 = *sedentary* to 5 = *very active*.

Perceived Physical Competence

Perception of physical competence was assessed via Lintunen's (1990) Perceived Physical Competence Scale, with six items regarding (1) movement skills, (2) agility, (3) endurance, (4) speed, (5) strength, and (6) courage, on a 5-point Likert-type scale. For analyses, a composite score (i.e., mean of the six items) was used.

Physical Activity

PA was assessed via a questionnaire developed by Piéron, Telama, Naul, and Almond (1997). Students' PA participation was categorized into three types: structured or organized PA (OPA), unstructured or nonorganized PA (NOPA), and sport school activities (SS). The OPA was defined as sportive activities in a team or a collectivity guided by a trainer or other sports authority. NOPA was defined as nonguided sport activities such as walking, running, and sport games (except from school or team/collectivity contexts). SS was defined as sport-related school activities (for applications and validations of the Portuguese version of this questionnaire in students, see, e.g., Marques, Martins, Santos, Sarmento, & Carreiro da Costa, 2014; Mota, Almeida, Santos, Ribeiro, & Santos, 2009; Mota & Esculcas, 2002).

Cardiovascular Fitness

Cardiovascular fitness was assessed via the progressive aerobic cardiovascular endurance run (PACER) test from Fitnessgram (Meredith & Welk, 2010). A detailed description of the evaluation procedures, equipment, scoring, and safety precautions can be found in the *Fitnessgram/Activitygram Test Administration Manual* (Meredith & Welk, 2010). Test–retest reliability for the PACER in the pilot study was established via calculation of the intraclass correlation coefficient (R). Test–retest reliability for PACER was 0.72 (95% CI [.12, .91]), indicating an acceptable level of reliability.

Statistics

First, Pearson's correlation coefficients inspected bivariate relations between age, sex, PA enjoyment, physically active lifestyle, self-perception of physical competence, PA, physical fitness, and students' attitude toward PE (using a continuous score).

Second, a standard multiple regression (MLR) analysis investigated the amount of variance in students' attitude toward PE that was explained by the related predictors, as well as the relative contribution of each of them.

Third, in a subsequent set of analyses, binary logistic regressions determined the contribution of the related predictors to positive and negative attitude toward PE separately. Responses on the question about the attitude toward PE lessons were given on a 5-point scale ranging from *I dislike it very much* = 1 to *I like it very much* = 5. For analysis purposes, the answers were then grouped into two categories: positive versus neutral attitudes toward PE (scores 4 and 5 = 1; score 3 = 0) and negative versus neutral attitude toward PE (scores 1 and 2 = 1; score 3 = 0).

These subsequent analyses investigated the detailed pattern of relationships separately for students with a positive and for those with a negative attitude toward PE. All statistical analyses were performed using IBM SPSS Statistics 20.0. The level of significance was set at 0.05.

Results

First, the Pearson product–moment correlation coefficient identified a strong and positive correlation between attitude toward PE and self-perceptions of PA enjoyment and physically active lifestyle (Table 1). Moderate positive correlations were found for self-perception of physical competence, NOPA, OPA, and PACER. No other significant correlations were seen.

Second, a model in which all previously observed significant relations were simultaneously accounted for was considered. Specifically, this analysis simultaneously examined the contributions of enjoying PA, physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness in explaining

Table 1
Pearson Product–Moment Correlations Between Attitude Toward PE and Age, Sex, PA Enjoyment, Physically Active Lifestyle, Self-Perception of Physical Competence, PA, and Physical Fitness

Correlate	Attitude toward PE
Age	-.11^{ns}
Sex (0 male; 1 female)	-.09^{ns}
Self-perceptions	
Enjoying physical activity	.71***
Physically active lifestyle	.52***
Perception of physical competence	.51***
Physical activity	
NOPA (days/week)	.24***
OPA (days/week)	.26***
SS (days/week)	.18^{ns}
Cardiovascular Fitness	
PACER	.34***

Note. ns = not significant; NOPA = nonorganized physical activity; OPA = organized physical activity; SS = sport school activity; PACER = progressive aerobic cardiovascular endurance run test.

$^{***}p < .001$. $^{ns}p > .05$.

the variance in students' attitude toward PE, controlling for age and sex (given the age and sex differences in PA and physical functioning commonly observed). In this model, enjoying PA was the only significant (positive) predictor of the attitude toward PE (Table 2). It explained 55% of the variance in students' attitude toward PE.

Third, the detailed pattern of relationships for students with a positive and for those with a negative attitude toward PE was subsequently examined. Specifically, binary logistic regressions were performed to examine the contribution of the predictors to the likelihood of students reporting a positive (versus a neutral) and a negative (versus a neutral) attitude toward PE.

For the positive attitude toward PE, enjoying PA made a unique significant contribution to the model, with an odds ratio of 9.3

Table 2
Standard MLR With Age, Sex, PA Enjoyment, Physically Active Lifestyle, Self-Perception of Physical Competence, Nonorganized PA, Organized PA, and Physical Fitness Predicting the Students' Attitude Toward PE

Correlate	b ± *SE*	β	*p*†	95% CI*
Age (years)	-.00 ± .02	-.01	.915	-.04, .03
Sex (0 male; 1 female)	-.01 ± .02	-.01	.888	-.17, .20
Enjoying physical activity	.64 ± .06	.62	< .001	.52, .76
Physically active lifestyle	.11 ± .06	.12	.093	-.02, .24
Self-perception of physical competence	.14 ± .09	.11	.112	-.03, .32
NOPA (days/week)	-.02 ± .02	-.04	.392	-.07, .03
OPA (days/week)	-.02 ± .03	-.05	.399	-.07, .03
PACER	.00 ± .00	.01	.813	-.01, .01
R^2	.55			

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

†Significant contribution by an independent variable to the total explained variation in the model ($p < .05$). *95.0% confidence interval for B values.

(Table 3). This indicated that students who enjoyed PA were 9.3 times more likely to report a positive attitude toward PE. There were no other significant predictors. The model explained between 30% (Cox and Snell R^2) and 49% (Nagelkerke R^2) of variance in attitude toward PE and correctly classified 89% of cases.

For the negative attitude toward PE, enjoying PA and cardiovascular fitness made a significant contribution to the model, with an odds ratio of 4.2 and 1.1, respectively (Table 4). This indicated that students who did not enjoy PA and those who performed well in the cardiovascular fitness test were 4.2 and 1.1 times, , respectively, more likely to report a negative attitude toward PE. There were no other significant predictors. The model explained between 36% (Cox and Snell R^2) and 50% (Nagelkerke R^2) of variance in attitude toward PE and correctly classified 81% of cases.

Table 3
Binary Logistic Regressions to Examine the Contribution of Each Predictor to the Likelihood of Students Reporting a Positive Versus a Neutral Attitude Toward PE

							95% CI for *OR*	
Correlate	**B**	***SE***	**Wald**	***df***	***p***	***OR***	**Lower**	**Upper**
Age (years)	.07	.10	.46	1	.498	1.07	.88	1.29
Sex (0 male; 1 female)	-.33	.61	.30	1	.582	0.72	.22	2.35
Enjoying PA	2.23	.49	20.97	1	< .001	9.30	3.58	24.15
Physically active lifestyle	.21	.34	.40	1	.529	1.24	.64	2.38
Self-perception of physical competence	.58	.47	1.53	1	.216	1.79	.71	4.51
NOPA (days/week)	-.19	.13	2.04	1	.153	.83	.64	1.07
OPA (days/week)	.10	.20	.28	1	.600	1.11	.75	1.64
PACER	.02	.02	.54	1	.464	1.02	.97	1.06

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

Table 4
Binary Logistic Regressions to Examine the Contribution of Each Predictor to the Likelihood of Students Reporting a Negative Versus a Neutral Attitude Toward PE

							95% CI for *OR*	
Correlate	**B**	***SE***	**Wald**	***df***	***p***	***OR***	**Lower**	**Upper**
Age (years)	0.08	.20	.17	1	.684	1.09	.73	1.61
Sex (0 male; 1 female)	1.05	.99	1.13	1	.289	2.87	.41	20.04
Enjoying PA	-1.43	.53	7.28	1	.007	.240	.09	.68
Physically active lifestyle	-.99	.74	1.77	1	.183	.37	.09	1.60
Self-perception of physical competence	.62	.87	.50	1	.479	1.85	.34	10.18
NOPA (days/week)	-.03	.26	.01	1	.920	.97	.59	1.61
OPA (days/week)	.82	.44	3.48	1	.062	2.27	.96	5.38
PACER	.09	.04	4.58	1	.032	1.10	1.01	1.19

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

Discussion

This study investigated the relation between students' attitude toward PE and its correlates in detail by simultaneously considering multiple individual variables (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, PA, and physical fitness).

The findings show no correlation between students' attitude toward PE and age nor sex. A possible explanation for this could be that the same experiences are presented to both male and female students and in all grades (and associated age groups). While some studies found that students' motivation to participate in PE at school seem to decline as they grow older (Gu & Zhang, 2016; Subramaniam & Silverman, 2007) and that boys seem to have a more positive attitude toward PE than girls do (Carroll & Loumidis, 2001; Colquitt et al., 2012; Hünük & Demirhan, 2010; Koca et al., 2005; Marques et al., 2014; Zeng et al., 2011), others have concluded that attitude toward PE may be unaffected by gender (Subramaniam & Silverman, 2007) and age (Tannehill & Zakrajsek, 1993). The large variety of instruments to assess attitude toward PE was used across these studies, and the differences in school and cultural contexts could explain some of these contradictory results.

The results of this study also confirm that students with a more positive attitude toward PE have higher levels of perceived competence (in terms of athletic qualities, skills, fitness, quickness, strength, and bravery). This is in line with the suggestion of Ferrer-Caja and Weiss (2000), who reported that those who have stronger beliefs about their physical competence are more likely to enjoy the activity than are those reporting lower levels of physical competence. Rationale for this can be found in self-determination theory (Deci & Ryan, 2000) and achievement goal theory (Nicholls, 1989). In a practical way, if PE educators create autonomy support in their classes (e.g., presenting interesting and enjoyable activities) and promote achievement of goals based on task competence, they will probably have more motivated students, who consequently show a more positive attitude toward PE.

Considering that a large percentage of children and adolescents fail to achieve the recommended levels of daily PA (Centers for Disease Control and Prevention, 2014; U.S. Department of Health

and Human Services, 2008) and that the level of PA tends to decline from childhood to adulthood (Currie et al., 2008), the role of PA in the attitude toward PE was investigated in this study. The study found that engagement in NOPA and OPA was positively correlated with students' attitude toward PE, suggesting that students who are more strongly engaged in sports and PA outside of school have a more positive attitude toward PE. Again, this is in line with the theoretical premise that children and adolescents who have a more positive attitude toward PE are more likely to also participate in PA outside of school and have higher levels of PA than those with less positive attitudes (Hünük & Demirhan, 2010; Koca & Demirhan, 2004; Subramaniam & Silverman, 2007). Therefore, one may argue that a positive attitude toward both PE and PA may be crucial for students' engagement in NOPA and OPA and that PE teachers should consider these important issues simultaneously through a focused and motivating intervention. Establishing a student-centered teaching style, where students take part in the learning process, could be a practical way for the teacher to establish a positive climate in classes and consequently increase interest in and enjoyment of PA. For example, the Sport Education Model is an adequate educational approach to trigger enjoyment (Siedentop, Hastie, & van der Mars, 2004), as well as,other general activities such as establishing a connection with local sport clubs or associations, bringing successful athletes to the school, and taking students to observe different sport matches and competitions.

Another important topic studied in this study was the relationship between cardiovascular fitness and attitude toward PE. As expected, a positive attitude toward PE was positively correlated with better performance on the PACER. This is in line with previous research showing that children and adolescents with higher levels of cardiovascular fitness tend to have a more positive attitude toward PE (Aktop, 2010; Colquitt et al., 2012). Once more, this reinforces the idea that students with better physical fitness may develop a better perception of physical competence, leading to greater participation in PA as well as to a more positive attitude toward PE at school. This has important implications for PE teaching. The development of physical fitness in PE teaching is an important component of the educative process. This could be a key factor in increasing the prob-

ability of students adopting regular PA habits and maintaining adequate levels of physical fitness, health, and functioning throughout life (Meredith & Welk, 2010).

The results of this study also confirm that enjoying PA is strongly correlated with having a positive attitude toward PE. This means that if students have enjoyable PA experiences, a more positive attitude toward PE at school will probably emerge. We may argue that PE educators have an important role in providing pleasant opportunities and positive experiences related to PA to improve students' positive attitudes toward PE. As a general strategy for PA promotion, this should be considered as a key element for the promotion of PA habits at school (Pate et al., 2007).

In a deeper statistical analysis with a multiple regression model simultaneously considering all factors in the model (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness), enjoying PA emerged as the unique substantial predictor, accounting for 62% of the variance in students' attitude toward PE. Yet again, this is an interesting and important result suggesting that school- and individual-based interventions in PE should particularly target the enjoyment of PA (in addition to the other predictors).

With the purpose of exploring this relationship in more detail, this paper scrutinizes whether the relationship patterns differed between students with a positive and those with a negative attitude toward PE. This would be particularly relevant because it would identify the correlates of the different facets of attitude toward PE. According to previous results, an enjoyable PA experience was positively correlated with a positive attitude of students toward PE. These detailed findings again suggest that enjoyable PA experiences could foster positive attitudes toward PE and perhaps encourage lifelong participation in PA (Koca & Demirhan, 2004; Kriemler et al., 2011; Pate et al., 2007). Students who overperformed in the PACER were more likely to report a negative attitude toward PE. Simple correlations were suggestive that the better the cardiovascular fitness level, the more positive the attitude toward PE. Yet, in the examination of positive and negative facets of the attitude toward PE, a different relation pattern emerged. A relation of good cardiovascular fitness performance to negative attitude toward PE was observed in

the logistic regressions. This may be related to the hypothesis that if students are not presented with a challenging PA environment, their attitude in relation to PE may be negatively affected. Additionally, one might argue that students who attend PE classes in school have different cardiovascular fitness and awareness backgrounds. For those with high cardiovascular fitness performance and frequent involvement in rich sports experiences, the PE curricula may not be attractive or not challenging enough, leading to a mismatch between the student's actual physical capacity and the level of challenge experienced by that student in PE classes. As a practical implication, one may claim that a tailored approach in PE classes is mandatory for the development of individualized interventions that guarantee an attractive and physically challenging environment that matches the student's expectations and level of performance. This study adds evidence to prior research on the fact that physical fitness performance is an important target in PE that requires continuing evaluation and a contributing factor for the improvement of the quality of PE teaching (Gråstén et al., 2012; Stiller & Alfermann, 2007).

We acknowledge that we used a one-dimensional student-centered approach to investigate the attitude toward PE. In addition, the cross-sectional design of the study limits conclusions regarding the direction of relationships in terms of causality. Therefore, for a better understanding of the investigated relations, further longitudinal research that uses multidimensional attitude inventories should be developed. Additional information about contextual factors such as the quality of PE programs, the status of facilities and equipment at school, school traditions, and teacher skills and expertise should be considered.

In conclusion, several crucial modifiable factors are correlated with students' attitude toward PE. These factors include enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness. From all of these predictors of the attitude toward PE, PA enjoyment seems to be the most powerful. A better understanding of attitude toward PE and its correlates, in the specific school context, seems to be critical for the development of school- and individual-based interventions that promote students' engagement in PE classes and PA in general. This is in line with the view that interventions should focus on es-

tablishing tailored PE environments in which students feel comfortable, confident, and motivated (Chen, 1998; Hagger, Chatzisarantis, & Biddle, 2002). Several strategies can potentiate a positive motivational climate, such as the individualization of the teaching process, the increase of the students' autonomy, the recognition of students, and maximization of the time spent learning.

References

Aaro, L., Wold, B., Kannas, L., & Rimpelä, M. (1986). Health behaviour in school children: A WHO cross-national survey. *Health Promotion International, 1*, 17–33. https://doi.org/10.1093/heapro/1.1.17

Aktop, A. (2010). Socioeconomic status, physical fitness, self-concept, attitude toward physical education, and academic achievement of children. *Perceptual and Motor Skills, 110*, 531–46. https://doi.org/10.2466/pms.110.2.531-546

American College of Sports Medicine. (2014). *ACSM's guidelines for exercise testing and prescription* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Carroll, B., & Loumidis, J. (2001). Children's perceived competence and enjoyment in physical education and physical activity outside school. *European Physical Education Review, 1*, 24–43. https://doi.org/10.1177/1356336x010071005

Centers for Disease Control and Prevention. (2014). *State indicator report on physical activity, 2014*. https://doi.org/10.3945/an.114.007211

Chen, A. (1998). Meaningfulness in physical education: A description of high school students' conceptions. *Journal of Teaching in Physical Education, 3*, 285–306. https://doi.org/10.1123/jtpe.17.3.285

Colley, A., Comber, C., & Hargreaves, D. J. (1994). Gender effects in school subject preferences: A research note. *Educational Studies*, *1*, 13–18. https://doi.org/10.1080/0305569940200102

Colquitt, G., Walker, A., Langdon, J., McCollum, S., & Pomazal, M. (2012). Exploring student attitudes toward physical education and implications for policy. *Sport Scientific & Practical Aspects, 2*, 5–12.

Currie, C., Gabhainn, S., Godeau, E., Roberts, C., Smith, R., Picket, W., & Barnekow, V. (Eds.). (2008). *Inequalities in young people's health: HBSC international report from the 2005/2006 survey* (Health Policy for Children and Adolescents No. 5). Retrieved

from World Health Organization website: http://www.euro.who.int/__data/assets/pdf_file/0005/53852/E91416.pdf
Deci, E., & Ryan, R. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268. https://doi.org/10.1207/s15327965pli1104_01
Expert Group on Health-Enhancing Physical Activity. (2014). *EU work plan for sport: 2014–2017*. Retrieved from European Commission website: http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=19860&no=1
Ferrer-Caja, E., & Weiss, M. (2000). Predictors of intrinsic motivation among adolescent students in physical education. *Research Quarterly for Exercise and Sport, 3*, 267–279. https://doi.org/10.1080/02701367.2000.10608907
Gråstén, A., Jaakkola, T., Liukkonen, J., Watt, A., & Yli-Piipari, S. (2012). Prediction of enjoyment in school physical education. *Journal of Sports Science and Medicine, 11*, 260–269. https://doi.org/10.1111/josh.12228
Gu, X., & Zhang, T. (2016). Changes of children's motivation in physical education and physical activity: A longitudinal perspective. *Advances in Physical Education, 6*, 205–212. https://doi.org/10.4236/ape.2016.63022
Hagger, M., Cale, L., & Almond, L. (1997). The importance of children's attitudes towards physical activity. *European Physical Education Review, 3*, 144–164. https://doi.org/10.1177/1356336x9700300205
Hagger, M. S., Chatzisarantis, N., & Biddle, J. (2002). A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variable. *International Journal of Sport Psychology, 24*, 3–32. https://doi.org/10.1123/jsep.24.1.3
Harriss, D., & Atkinson, G. (2009). International Journal of Sports Medicine – Ethical standards in sport and exercise science research. *International Journal of Sports Medicine, 30*, 701–202. https://doi.org/10.1055/s-0029-1237378
Hünük, D., & Demirhan, G. (2010). Turkish adolescents' attitudes toward physical education. *Perceptual and Motor Skills, 111*, 324–332. https://doi.org/10.2466/06.07.11.13.pms.111.5.324-332

Koca, C., Aşçı, F. H., & Demirhan, G. (2005). Attitudes toward physical education and class preferences of Turkish adolescents in terms of school gender composition. *Adolescence, 40*, 365–375.

Koca, C., & Demirhan, G. (2004). An examination of high school students' attitudes toward physical education with regard to sex and sport participation. *Perceptual and Motor Skills, 98,* 754–758. https://doi.org/10.2466/pms.98.3.754-758

Kriemler, S., Meyer, U., Martin, E., van Sluijs, E. Andersen, L., & Martin, B. (2011). Effect of school-based interventions on physical activity and fitness in children and adolescents: A review of reviews and systematic update. *British Journal of Sports Medicine, 45*, 923–930. https://doi.org/10.1136/bjsports-2011-090186

Lintunen, T. (1990). Perceived physical competence scale for children. In A. Ostrow (Ed.), *Directory of psychological tests in the sport and exercise sciences* (p. 140). Morgantown, WV: Fitness Information Technology.

Marques, A., Martins, J., Santos, F., Sarmento, H., & Carreiro da Costa, F. (2014). Correlates of school sport participation: A cross-sectional study in urban Portuguese students. *Science & Sports, 29*, 31–38. https://doi.org/10.1016/j.scispo.2013.07.012

Meredith, M., & Welk, G. (2010). *Fitnessgram/Activitygram test administration manual* (Updated 4th ed.). Champaign, IL: Human Kinetics.

Morgan, C., Beighle, A., & Pangrazi, R. (2007). What are the contributory and compensatory relationships between physical education and physical activity in children? *Research Quarterly for Exercise and Sport, 78*, 407–412. https://doi.org/10.1080/02701367.2007.10599440

Mota, J., Almeida, M., Santos, R., Ribeiro, J., & Santos, M. (2009). Association of perceived environmental characteristics and participation in organized and non-organized physical activities of adolescents. *Pediatric Exercise Science, 21*, 233–239. https://doi.org/10.1123/pes.21.2.233

Mota, J., & Esculcas, C. (2002). Leisure-time physical activity behavior: Structured and unstructured choices according to sex, age, and level of physical activity. *International Journal of Behavioral Medicine, 9*, 11–21. https://doi.org/10.1207/s15327558ijbm0902_03

Nicholls, J. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Pate, R., Ward, D., O'Neill, J., & Dowda, M. (2007). Enrollment in physical education is associated with overall physical activity in adolescent girls. *Research Quarterly for Exercise and Sport, 78*, 265–270. https://doi.org/10.1080/02701367.2007.10599424

Piéron, M., Telama, R., Naul, R., & Almond, L. (1997). Étude du style de vie d'adolescents européens. Considérations théoriques, objetifs et méthodologie de recherche [Study of the lifestyle of European teenagers: Theoretical, objective, and research methodology]. *Sports, 159*, 43–50.

Siedentop, D., Hastie, P., & van der Mars, H. (2004). *Complete guide to Sport Education*. Champaign, IL: Human Kinetics.

Stiller, J., & Alfermann, D. (2007). Promotion of a health self-concept. In J. Liukkonen, Y. V. Auweele, B. Vereijken, D. Alfermann, & Y. Theodorakis (Eds.), *Psychology for physical educators* (pp. 123–140). Champaign IL: Human Kinetics.

Subramaniam, P., & Silverman, S. (2007). Middle school students' attitudes toward physical education. *Teaching and Teacher Education, 5*, 602–611. https://doi.org/10.1016/j.tate.2007.02.003

Tannehill, D., & Zakrajsek, D. (1993). Students' attitudes towards physical education: A multicultural study. *Journal of Teaching in Physical Education, 13*, 78–84. https://doi.org/10.1123/jtpe.13.1.78

U.S. Department of Health and Human Services. (2008). *2008 physical activity guidelines for Americans.* Retrieved from https://health.gov/paguidelines/guidelines/chapter3.aspx

Zeng, H., Hipscher, M., & Leung, R. (2011). Attitudes of high school students toward physical education and their sport activity preferences. *Journal of Social, 7*, 529–537. https://doi.org/10.3844/jssp.2011.529.537

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PEDAGOGY

Effect of a Physical Education Training Program on the Physical Education Teaching Efficacy of Classroom Teacher Candidates

Hüseyin Ünlü and Mustafa Kayıhan Erbaş

Abstract

This study investigated the effectiveness of a 1-week physical education training program (PETP) on the physical education teaching efficacy (PE teaching efficacy) of classroom teacher candidates (CTCs). A quasi-experimental design with pretest–posttest experimental and control groups was used. The study included two groups: (a) an experimental group of CTCs (n = 24) enrolled in a PETP and (b) a control group of CTCs (n=30) not enrolled in a PETP. Subjects were tested via a PE teaching efficacy scale (Humphries, Hebert, Daigle, & Martin, 2012). A Wilcoxon signed-rank test determined differences between each group from pretest to posttest. The data analysis showed no significant differences between pretest and posttest in the control group; however, it found significant differences in favor of posttest in the experimental group. Finally, the PETP affected the PE teaching efficacy of CTCs.

An increasing amount of scientific evidence points to the positive effects of physical activity (PA; Strong et al., 2005), and regular participation in PA is essential to the optimal health and development of

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any child (World Health Organization [WHO], 2011). During childhood, PA prevents disease and improves health outcomes (Neufer et al., 2015) and it is necessary to increase physical activities in all age groups (Cvejić & Buišić, 2012). National and international public health authorities suggest that all children and adolescents should perform that at least 60 min of moderate- to vigorous-intensity physical activity daily (Türkiye Halk Sağlığı Kurumu, 2014; U.S. Department of Health and Human Services, 2018; WHO, 2011).

However the PA levels of many children are insufficient (Cvejić, & Ostojić, 2018; Hardy, King, Espinel, Cosgrove, & Bauman, 2016). Decreased PA levels may play an important role increasing childhood obesity (Butte, Christiansen, & Sørensen, 2007). It has been reported that between 1980 and 2014 the worldwide prevalence of obesity nearly doubled with 11% of men and 15% of women (i.e., more than half a billion adults) being classified as obese. In 2013, an estimated 42 million children aged under 5 years (6.3%) were overweight, an increase from around 5% in 2000, to 6% in 2010, to 6.3% in 2013, with the highest rates of increase being observed in Africa and Asia (WHO, 2015). The rate of obesity in adolescents has nearly quadrupled (from 5% to 21%) over the past 30 years in the United States (CDC, 2012). The prevalence of obesity in Turkey increased from 0.6% to 7.3% with an 11.6-fold increase between 1990–1995 and 2011–2015. The prevalence of obesity increased in both genders (T. C. Sağlık Bakanlığı, , Temel Sağlık Hizmetleri Genel Müdürlüğü, 2010; T. C. Sağlık Bakanlığı, Türkiye Beslenme ve Sağlık Araştırması, 2011). Unfortunately, obesity rates are the problem of not only Africa, Asia, and the United States but also the world. Considering the low levels of PA typically observed among youth (Ekelund, Tomkinson, & Armstrong, 2011; Hardy et al., 2016) and declining fitness levels of children (Boddy, Fairclough, Hackett, & Stratton, 2012; Tremblay et al., 2010), there is an urgent need to develop and evaluate interventions that promote moderate- to vigorous-intensity physical activity (Kohl & Murray, 2012; WHO, 2011).

Today, children spend a significant part of their time at school (Synder & Dillow, 2012), and schools are the most important places for PA intervention (CDC, 2013; Rink, Hall, & Williams, 2010). However, the PA levels of children are constantly decreasing (Bornstein, Beets, Byun, & McIver, 2011; Konstabel et al., 2014), and

unfortunately, research findings suggest that the majority of students are spending more time in sedentary behaviors (Abbott, Straker, & Mathiassen, 2013; Lou, 2014; Morton, Atkin, Corder, Suhrcke, & Sluijs, 2016).

In this process, schools play a key role and provide a unique opportunity in promoting children's PA and increasing children's daily PA (CDC, 2013; Hills, Dengel, & Lubans, 2015; Janssen & LeBlanc, 2010) because children have to attend school—it is compulsory—and PE is a necessary component of the elementary school curriculum (Motta et al., 2012; T. C. Milli Eğitim Bakanlığı, 2017;). In addition to encouraging students to be active, schools can facilitate increased PA during the school day by providing space, facilities, equipment, and supplies that make participating in activity appealing and by providing organized times and structured physical activities for interested students (CDC, 2013).

With the increasing attention on the PA levels of children in schools (Donnelly & Lambourne, 2011; Gråstén, Watt, Hagger, Jaakkola, & Liukkonen, 2015), factors related to the PA promotion behaviors of teacher are important (Berei, Karp, & Kauffman, 2018; CDC, 2012, 2013; Heidorn & Centeio, 2012). In elementary schools (Grades 1–4) with children aged 7–11, generalist classroom teachers (Hardman, 2008) teach PE.

Classroom teachers are a primary PE contributor (Sherman, Tran, & Alves, 2010), and beyond the possibility of having to teach PE, elementary classroom teachers are called upon to be an important participant in Comprehensive School Physical Activity Programs (CSPAPs; CDC, 2013). However, classroom teacher education programs provide little or no training in PE (Telford et al., 2016) and those who graduate may have low levels of teaching efficacy and a lack of content and pedagogical knowledge in PE (Dyson, 2014; Petrie, 2010; Sinelnikov, Kim, Ward, Curtner-Smith, & Li, 2016). Evidently, generalist classroom teachers are in need of assistance (Miller et al., 2016) and more PE professional development (Miller et al., 2016; Morgan & Hansen, 2007; Sloan, 2010).

While we did review the literature, there was limited research investigating the effect of the programs on the PE and PA efficacy of classroom teachers. Miller et al. (2016) evaluated the efficacy of a professional development intervention in producing changes in PE

teaching practice and PE teaching quality by generalist classroom teachers. They found that intervention was efficacious in improving the quality of PE teaching among the classroom teachers. In an another study, Kulinna, Cothran, and Kloeppel (2011) investigated classroom teachers' self-efficacy changes related to teaching healthy behavior content after participating in workshops. Results of the study showed increased teacher efficacy.

As the role and/or potential of teacher education in preparing CTCs for involvement in CSPAPs has received little investigative attention (Webster, 2011; Webster, Monsma, & Erwin, 2010), and as a review of the literature did not turn up any studies that focused on CTCs and their efficacy of teaching PE, the primary purpose of this study was to determine if professional PETP in PE-related contents (e.g., Teaching PE, Games and Physical Activities, Gymnastics, Educational Games, Track and Field, Foundations Physical Education and Sports) would enhance the PE teaching efficacy of CTCs. So this study carried out a PETP for the CTCs and investigated the effect of the PETP on the PE teaching efficacy of the CTCs.

Relationship Between Classroom Teachers' Physical Education Teaching Efficacy

Classroom teachers who provide instruction in core academic areas such as mathematics, science, reading, writing, and social sciences are also intentionally embedding PA throughout the school day (Dinkel, Schaffer, Snyder, & Lee, 2017). In most elementary schools around the world, classroom teachers, rather than PE specialists, most often have the responsibility for teaching PE (Hardman & Marshall, 2009).

The majority of classroom teachers believe that PE is an important part of the curriculum (DeCorby, Halas, Dixon, Wintrup, & Janzen, 2005). It has been suggested that classroom teachers recognize the importance of increasing PA and are willing to find ways for students to be physically active during normally sedentary classroom activities (Cothran, Kulinna, & Garn, 2010; Heidorn & Centeio, 2012; Parks, Solmon, & Lee, 2007). However, most classroom teachers consider PE a valuable part of the curriculum, yet they find it one of the more difficult subjects to teach (DeCorby et al., 2005), and evidence suggests that classroom teachers also have nega-

tive dispositions relative to teaching PE and PA content (Armour & Duncombe, 2004; Faucette, Nugent, Sallis, & McKenzie, 2002) and are reluctant to implement PA or feel they do not have the instructional autonomy to do so (Cothran et al., 2010; Gately et al., 2013).

Many barriers inhibit teaching PE well (Fletcher, Mandigo, & Kosnik, 2013). These barriers fall into two main categories: *institutional factors* (e.g., professional development, instructional time, opportunities, financial and human resources, class sizes, and facilities and equipment) and *teacher-related factors* (e.g., confidence to teach PE, teacher preparation, and personal school experiences related to PE; Morgan & Hansen, 2007). Classroom teachers who had positive past experiences in school PE and/or sports were more likely to have higher perceived competence in and more favorable attitudes toward teaching physical education (PE; Morgan & Bourke, 2008; Morgan, Bourke, & Thompson, 2001; Webster, Monsma, & Erwin, 2010), and this can affect their efficacy for implementing PE (Parks et al., 2007; Webster, Russ, Vazou, Goh, & Erwin, 2015).

According to the Morgan and Hansen (2007), perceived barriers related to institutional factors that were mostly beyond the classroom teachers' control. However, teacher-related factors may provide the most effective means to improve classroom teachers' programs, because teachers feel that they have more control over these factors (Hargreaves & Fullan, 1992). Based on the results of research cited, teacher-related factors included teachers' self-efficacy to overcome barriers to teaching PE (Faulkner, Reeves, & Chedzoy, 2004; Fletcher et al., 2013).

Based on social cognitive theory, self-efficacy is a person's confidence in his or her capacity to execute behaviors or achieve a specific outcome (Bandura, 1997). Research regarding teacher efficacy has primarily focused on the association with positive teaching behaviors (e.g., trying new instructional ideas and/or better classroom management) and student achievement (Goddard, Hoy, & Hoy, 2004; Ross, 1998). Pan, Chou, Hsu, Li, and Hu (2013) stated that teachers' self-efficacy could have a direct influence on their commitment to teach health and PE curricula in elementary schools. Gorozidis and Papaioannou (2011) found that highly self-efficacious teachers had a positive attitude toward the PE curriculum and intended to continue their current efforts in the future. Additionally, teachers' efficacy

beliefs would seem particularly important to meeting CSPAP goals (Webster, Erwin, & Parks, 2013).

The literature review suggests that teachers' self-efficacy directly and indirectly influences students' satisfaction. Students feel satisfaction when participating in PE activities during school. Efficient classroom teachers provide a quality PE program; this also improves students' willingness to actively participate in PE. Positive and satisfying PE and/or sports participation experiences foster students' physical and mental development as well as significantly motivate the establishment of long-term exercise habits (Chen & Stotlar, 2012). Also, classroom teachers' self-efficacy has a positive effect on learning motivation, learning atmosphere, and learning satisfaction, respectively. Teachers with high self-efficacy may be able to use a variety of methods to stimulate students' motivation and create a quality learning atmosphere, both of which could promote students' satisfaction (Pan, 2014).

The literature shows that the classroom teachers' efficacy in the subject of PE and promotion of PA is important. It has been suggested that during the classroom teachers' training period, the education of the CTCs was insufficient to carry out the courses related to PE and sports (McMullen, Kulinna, & Cothran, 2014; Goh, Hannon, Newton, Webster, Podlog, & Pillow, 2013; Stylianou, Kulinna, & Naiman, 2016). For the lack of training, PETP should be organized for the CTCs to acquire efficacy in teaching PE. A training program was organized for CTCs, and this study tried to find the effect of the PETP on the CTCs. The following research questions were asked:

1. How is the PE teaching efficacy of the CTCs in the control and experimental groups?
2. What are the effects of the PETP on the teaching efficacy of the CTCs?

Method

Research Design

This study used a quasi-experimental design with a pretest–posttest control group. Experimental design can be characterized as a research design that aims to explore causal relationships between variables (Fraenkel & Wallen, 2009). The pretest–posttest control group design is one of the widely used experimental designs. In this design,

participants are measured before and after the experimental procedure in relation to the dependent variable. Because the same people are measured twice on the dependent variable, however, the measurements of the experimental and control groups of different subjects are compared, and in this respect it is irrelevant. Therefore, the pretest–posttest control group pattern can be expressed as a mixed pattern (Howitt & Cramer, 2007). Table 1 shows the experimental pattern used in the research.

Table 1
Experimental Pattern Model Used in Research

Group	Pretest	Experimental process	Posttest
Experimental	$O_{1\,2}$	Implementation of the PETP	$O_{1\,2}$
Control	$O_{1\,2}$		$O_{1\,2}$

The pretest was carried out with the experimental and control groups. For preliminary evidence of PE teaching efficacy to be obtained, the scale was applied as a pretest to the students. At the end of the experimental process, the PE teaching efficacy scale was applied as a posttest to the groups. During the experimental process, the PETP was applied to the CTCs in the experimental group, and those in the control group did not participate in the PETP.

Study Groups

Participants were put in two groups, control and experimental. The experimental group consisted of 12 (50%) male and 12 (50%) female students, who participated in the activity "Physical Education Science Counseling for Classroom Teachers II" and were studying in the classroom teaching programs of 12 different universities in the Aksaray province during the 2016–2017 academic year semester term. Twenty-eight (M_{age} = 20.89 ± 1.333) students were enrolled in the course. Thirty-two (M_{age} = 19.96 ± 1.402) students were enrolled in the control group, 16 (50%) male and 16 (50%) female students attending the Aksaray University Faculty of Education Classroom Teacher Program.

The participants of the study were determined after some work. The experimental group was announced to the target population, CTCs, via social media, teachers, and school management. In total,

240 CTCs applied to the activity via the activity Web page. Based on participant selection criterion (being a freshmen, sophomore, or junior in the classroom teaching departments of universities; age; sexuality; GAP; interest in PE and sport, etc.), 28 were selected.

Both groups were chosen in consideration with the main purpose of the study, "enrolment in classroom teacher educating programs and comparable with regard to all demographic measures and their education." Both groups had the same prior experience with PE or sports participation. It was assumed that control and experimental groups were equal.

Procedure

Data were collected from the CTCs who participated in the "Physical Education Science Counselling for Classroom Teachers II" activity organized within the scope of TUBITAK 2229 scientific activities in February 2017. The activity includes a process for providing CTCs basic knowledge and skills necessary for PE and sports-related courses.

Lessons in the activity fall into three groups: applied lectures, theoretical lectures, and theoretical-applied. Activity continued for 6 days and consisted of a total of 46 hr. Courses started at 8:00 in the morning and continued until 17:00 in the evening. There was also a time for students to rest during and between classes. Each lesson lasted 50 min. Table 2 lists the courses and sample content knowledge.

Theoretical and practical knowledge and skills were taught in this process. This was aimed at increasing the efficiency of the CTCs. The activity courses were given by 11 instructors from different universities who have PhD degrees and are experts in their fields.

The group that participated in the activities organized for the CTCs were evaluated as the experimental group. The group formed for comparison purposes was determined as the control group. The PE teaching efficacy scale and semistructured questions were applied to the experimental group before and after the PETP. The application made before the training was evaluated as the posttest after the pretest training. In addition, the same measuring instrument was applied as a pretest and posttest to the control group on a 3-week basis.

Table 2
Content Knowledge Intervention

Course	Sample content
Applied courses The courses: Games and Physical Activities in Childhood, Gymnastics, Educational Games, Track and Field, Volleyball, Handball, Basketball *Each course is 4 hours*	When we look at the content of these courses, for example, the aim of "Basketball" is to teach the basic knowledge and skills of basic techniques in basketball, basic posture and ball holding, ball driving, passing types, turnstile and shooting techniques, defense and offensive positions, body use and deception techniques. It is also aimed to teach the steps and teaching methods and techniques to be used in the teaching of these techniques.
The courses both theoretically and practically The courses: Special Teaching Methods in Physical Education and Sport, and Current Approaches in Physical Education and Sports Teaching *Each course is 4 hours*	Contents of the courses: for example, "Current Approaches in Physical Education and Sport Teaching" aims for students to gain knowledge and skills related to current teaching models and approaches such as sport education model, tactical games approach, and cooperative learning model, which are used together with the constructivist approach in physical education and sport education.
Theoretical course Foundations of Physical Education and Sports, Sports Education, Sports Injuries and First Aid, Lifelong Sports, and Children and Sports *Each courses is 2 hours*	Contents of the courses: for example, "Child and Sports" aims for students to gain the basic knowledge and skills to make healthy exercise applications in childhood, and also gives basic information about the principles of exercise and exercising in childhood.

Data Collection Tool

The Physical Education Teaching Efficacy Scale (PETES), which was developed by Humphries et al. (2012), was used as the data collection instrument in the research. The PETES was adapted to the Turkish done by Erbaş, Kalemoğlu-Varol, & Ünlü (2011). The scale consists of 35 items and has seven subscales. Table 3 shows the names of the subscales and example items.

Table 3
Names of the Subscales and Example Items

Name of the subscale	Number of items	Sample item
1. Efficacy about PE content knowledge	5	"I know a lot about fitness and I can teach"
2. Efficacy for applying scientific knowledge in teaching PE	4	"I know a lot about fundamental motor skills (manipulative and locomotor) and can teach them effectively"
3. Efficacy about accommodating skill level differences	5	"If one of my students was having trouble with a drill, I know ways to change it to make it easier for them"
4. Efficacy for teaching students with special needs	5	"I know how to effectively teach students with emotional or behavioral problems who are in my PE class"
5. Efficacy about instruction	6	"I can demonstrate and explain a skill/drill so that the class understands what to do"
6. Efficacy for using assessment	5	"I can make up rubrics to assess student learning of skills or game play"
7. Efficacy for using technology	5	"I am aware of technology-based equipment and computer programs for PE, even if I don't have it"

Test–retest method and Cronbach's alpha internal consistency parameters were used in calculating the reliability of the scale. Cronbach's alpha for the internal consistency of the items was calculated and determined as .94 for the scale. Cronbach's alpha for the internal consistency of the subdimensions was calculated as .73 for "Efficacy for physical education content knowledge," .70 for "Efficacy for applying scientific knowledge in teaching PE," .76 for "Efficacy for accommodating skill level differences," .77 for "Efficacy for teaching students with special needs," .82 for "Efficacy about instruction," .76 for "Efficacy for using assessment," and .84 for "Efficacy for using technology." Confirmatory factor analysis was performed for the construct validity of the PETES, and the results demonstrated that the scale preserved that seven-dimension structure as the original form. Finally, it can be concluded that the PETES is a reliable and valid scale that meets research criteria for validity and reliability.

Analysis of Data

Before the techniques for the data analysis in the survey were chosen, the distribution of the data was examined. A Shapiro–Wilk test was performed and the distributions of the data were normal. As a result of the analysis, it was decided that the data did not show normal distribution ($p = .000–.001$; $df = 28$; $p < 0.05$).

Nonparametric tests were decided to be appropriate in the analysis of data in the study. From there, the Wilcoxon signed-rank test determined the difference between the pretest and posttest averages. To examine the practical significance of differences, effect sizes were calculated, as recommended by Cohen (2013). In this regard, Cohen proposed that an effect size of 0.2 represents a small effect; 0.5, a medium effect; and 0.8, a large effect. For all statistical analyses, a probability level of 0.05 or less indicated significance.

Findings

This study included comparisons of the pretest and posttest of PE teaching efficacy of CTCs. The Wilcoxon signed-rank test was performed and the teaching efficacy levels of the CTC in the control group compared. Table 4 and Figure 1 show the results.

Table 4 compares the pretest and posttest of the control group according to PE teaching efficacy. Substantial differences were not

Table 4
PE Teaching Efficacy of CTCs in the Control Group by Pretest–Posttest Results/Values

Variable	Condition	$p^{(\text{Pre vs. Post})}$	Wilcoxon test		ES
			Z	*p*	
Efficacy about PE content knowledge	Pretest	8.15 ± 2.096	-.892[a]	.372	0.07
	Posttest	7.88 ± 2.136			
Efficacy for applying scientific knowledge in teaching PE	Pretest	7.50 ± 1.586	-.073[b]	.942	0
	Posttest	7.50 ± 1.244			
Efficacy about accommodating skill-level differences	Pretest	11.25 ± 2.26	-.402[b]	.688	-0.03
	Posttest	11.38 ± 2.498			
Efficacy for teaching students with special needs	Pretest	10.25 ± 1.665	-1.660[b]	.097	-0.16
	Posttest	10.81 ± 1.874			
Efficacy about instruction	Pretest	15.25 ± 2.502	-.462[b]	.644	-0.08
	Posttest	15.63 ± 1.963			
Efficacy for using assessment	Pretest	11.28 ± 1.955	-.144[a]	.886	0.01
	Posttest	11.25 ± 1.685			
Efficacy for using technology	Pretest	11.78 ± 2.151	-1.520[b]	.128	-0.15
	Posttest	12.28 ± 1.099			
PE teaching efficacy	Pretest	75.47 ± 8.875	-.093[b]	.926	-0.04
	Posttest	76.16 ± 6.773			

Note. ES = effect size.
[a]Small ≥ 0.1. [b]Medium ≥ 0.2. [c]Large ≥ 0.5.

found between pretest and posttest in the PE teaching efficacy scale and its subscales.

In the study, a Wilcoxon signed-rank test compared the teaching efficacy levels of the CTCs in the experimental group. Table 5 and Figure 2 show the results.

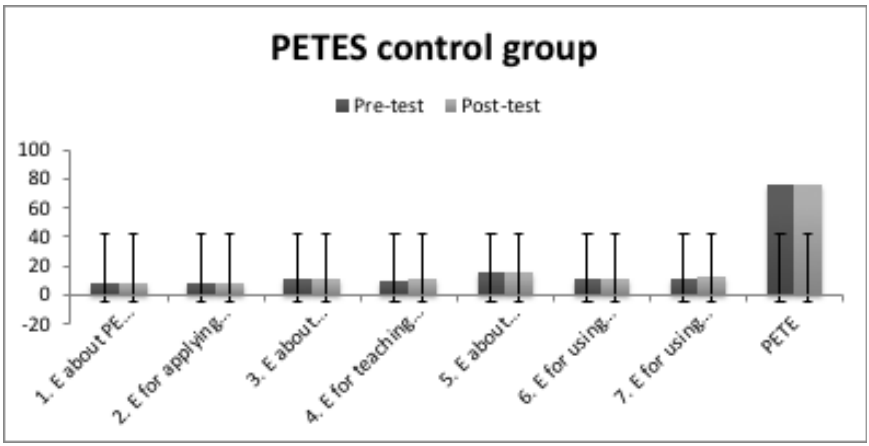

Figure 1. Pretest posttest values of PE teaching efficacy of the control group CTE.

Table 5
Pretest–Posttest Values of Teaching Proficiency of the Experimental Group CTCs

			Wilcoxon test		
Variable	**Condition**	***p*** (Pre vs. Post)	***Z***	***p***	**ES**
Efficacy about PE content knowledge	Pretest Posttest	9.00 ± 1.999 11.54 ± 2.166	-4.042[a]	.000*	-0.52[c]
Efficacy for applying scientific knowledge in teaching PE	Pretest Posttest	8.42 ± 1.744 11.20 ± 1.062	-3.983[a]	.000*	-0.58[c]
Efficacy about accommodating skill-level differences	Pretest Posttest	12.63 ±1.974 14.50 ± .780	-3.642[a]	.000*	-0.53[c]
Efficacy for teaching students with special needs	Pretest Posttest	11.67 ± 1.903 11.70 ± 1.966	-.024[a]	.981	-0.01

Table 5 (cont.)

Variable	Condition	$p^{(\text{Pre vs. Post})}$	Wilcoxon test		
			Z	*p*	ES
Efficacy about instruction	Pretest	16.87 ± 1.361	-2.623[a]	.009*	-0.29[b]
	Posttest	17.54 ± .832			
Efficacy for using assessment	Pretest	12.92 ± 1.717	-2.527[a]	.012*	-0.28[b]
	Posttest	13.79 ± 1.215			
Efficacy for using technology	Pretest	13.17 ± 1.857	-2.305[a]	.021*	-0.34[b]
	Posttest	14.25 ± .989			
PE teaching efficacy	Pretest	84.63 ± 8.816	-4.247[a]	.000*	-0.57[c]
	Posttest	94.54 ± 5.047			

Note. ES = effect size.
[a]Small ≥ 0.1. [b]Medium ≥ 0.2. [c]Large ≥ 0.5.
*p = .05.

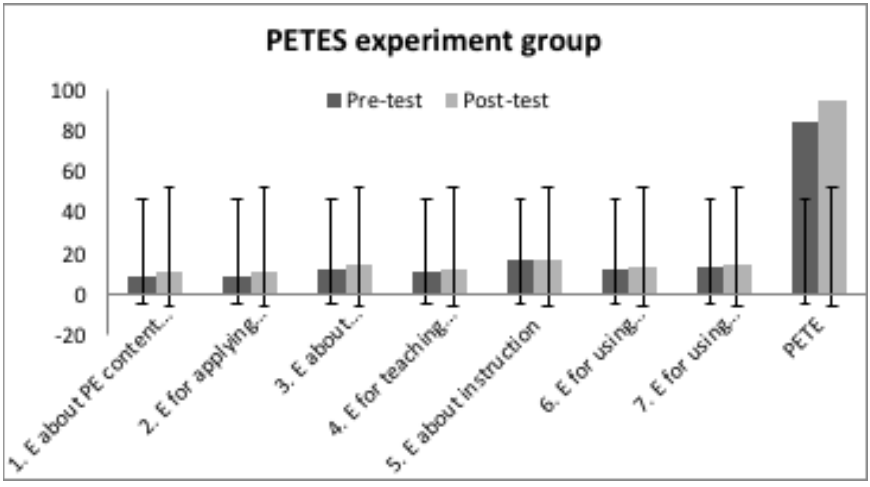

Figure 2. Pretest–posttest values of the PE teaching efficacy of experimental group CTCs.

Table 5 summarizes the effects of the PETP on PE teaching efficacy levels in the experimental group. Substantial differences were found between pretest and posttest in favor of posttest total of PE teaching efficacy (p = .000) and in the subscales of "Efficacy about PE content knowledge" (p = .000), "Efficacy for applying scientific

knowledge in teaching PE" (p = .000), "Efficacy about accommodating skill-level differences" (p = .000), "Efficacy about instruction" (p .009), "Efficacy for using assessment" (p = .012)," and "Efficacy for using technology" (p = .021), whereas no marked changes were observed in the subscale of "Efficacy for teaching students with special needs" (p = .981).

PE teaching efficacy increased significantly in the experimental group between pretest and posttest measurements, with a large effect in general for PE teaching efficacy (ES = 57) and in the subscales of "Efficacy for applying scientific knowledge in teaching PE" (ES = 58), "Efficacy about accommodating skill-level differences" (ES = 53), and "Efficacy about PE content knowledge" (ES = 52); a medium effect for "Efficacy for using technology" (ES = 34), "Efficacy about instruction" (ES = 29), and "Efficacy for using assessment" (ES = 28); and a small effect size for "Efficacy for teaching students with special needs" (ES = 10).

Discussion

This study examined the effectiveness of a PETP organized for CTCs. Pretest and posttest scores of the control and experimental groups were compared and the effect of the applied PETP on PE teaching efficacy of CTCs was examined.

Significant differences were not found between pretest and posttest scores of CTCs in the control group. However, there were significant differences in favor of the posttests in terms of the average scores of CTCs in the experimental group on the general PE teaching efficacy scale and its subscales of "Efficacy about PE content knowledge," "Efficacy for applying scientific knowledge in teaching PE," "Efficacy about accommodating skill level differences," "Efficacy about instruction," "Efficacy for using assessment," and "Efficacy for using technology." This study did not find significant differences in the subscale of "Efficacy for teaching students with special needs." Based on these results, the PE teaching efficacy of CTCs increased.

Participation of students in PE classes in schools (Hallal et al., 2012) plays an important role in increasing the level of PA (Lonsdale et al., 2013) and in the development of basic motor skills (Lubans, Morgan, Cliff, Barnett, & Okely, 2010).

Most educators have a positive perspective of PA and can identify the physical, mental, and academic benefits of PA (Cothran et al.,

2010; Howie, Newman-Norlund, & Pate, 2014; Martin & Murtagh, 2015; Parks et al., 2007; Stylianou et al., 2016). Unless teachers can identify how PA supports academic standards or content areas, they may resist incorporating it into their lessons (Erwin, Beighle, Morgan, & Noland, 2011; Gately et al., 2013; McMullen et al., 2014; Sherman et al., 2010).

Parks et al. (2007) found that the efficacy of classroom teachers was positively correlated with willingness to integrate movement in the classroom. However, the majority of the classroom teachers lack the confidence and competence to implement quality PE programs (Barney & Deutsch, 2009; Miller et al., 2016). They also have low levels of teaching efficacy and content and pedagogical knowledge in PE (Dyson, 2014; Petrie, 2010; Sinelnikov et al., 2016; Goh et al., 2013; Ward & Ayvazo, 2016). Notably, teachers' past experience with integrating classroom PA can affect their efficacy for implementing PA (Parks et al., 2007; Webster et al., 2015). Miller et al. (2016) stated that generalist elementary school teachers need assistance in professional development. Cothran et al. (2010) interviewed classroom teachers and found that those who have positive experiences feel more competent to implement the PE program. Teachers who lack confidence in their ability to understand movement and the use of PA to promote learning may be reluctant to implement PA (Breslin, Morton, & Rudisill, 2008; Parks et al., 2007). It has been found that PE teaching programs organized for CTCs are important for CTCs to gain PE teaching efficacy.

Limitations

This study had several limitations. First, the number of participants was limited, with 56 CTCs, 24 in the experimental group and 32 in the control group. Second, data were collected via the PE teaching efficacy scale, and finally, data were collected for a 1-week PETP. The results show that CTCs need to develop their PE teaching efficacy. In addition, it is thought that classroom teacher education programs should be revised and courses related to PE and sport added. Future studies could use a larger research group, make qualitative inquiries related to the subject, and compare PE teachers and PE teacher candidates contributions to the field.

Conclusions and Recommendations

In childhood, where there are attitudes toward lifelong PE and participation in the sport, there are very important responsibilities for classroom teachers. In the study, it was seen that PE teaching efficacy was positively affected by the teaching program. In classroom teachers' ability to fulfill these responsibilities, the education they received was considered very important. From the results of the research, it is suggested more preservice and in-service training opportunities be offered to increase the qualifications of classroom teachers in PE. It is believed that these effects will persist for the near future.

References

Abbott, R. A., Straker, L. M., & Mathiassen, E. S. (2013). Patterning of children's sedentary time at and away from school. *Obesity, 21*(1), 131–133. https://doi.org/10.1002/oby.20127

Armour, K. M., & Duncombe, R. (2004). Teachers' continuing professional development in primary physical education: Lessons from present and past to inform the future. *Physical Education & Sport Pedagogy*, *9*(1), 3–21. https://doi.org/10.1080/1740898042000208098

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Barney, D., & Deutsch, J. (2009). Elementary classroom teachers attitudes and perspectives of elementary physical education. *Physical Educator*, *66*, 114–123.

Berei, C. P., Karp, G. G., & Kauffman, K. (2018). The status of physical activity opportunities in Idaho schools. *Physical Educator*, *75*, 282–301. https://doi.org/10.18666/tpe-2018-v75-i2-7988

Boddy, L. M., Fairclough, S. J., Hackett, A. F., & Stratton, G. (2012). Changes in cardiorespiratory fitness in 9- to 10.9-year-old children: SportsLinx 1998–2010. *Medicine and Science in Sports and Exercise*, *44*, 481–486. https://doi.org/10.1249/mss.0b013e3182300267

Bornstein, D. B., Beets, M. W., Byun, W., & McIver, K. (2011). Accelerometer-derived physical activity levels of preschoolers: A meta-analysis. *Journal of Science and Medicine in Sport*, *14*, 504–511. https://doi.org/10.1016/j.jsams.2011.05.007

Breslin, C. M., Morton, J. R., & Rudisill, M. E. (2008). Implementing a physical activity curriculum into the school day: Helping early childhood teachers meet the challenge. *Early Childhood Education Journal*, *35*, 429–437. https://doi.org/10.1007/s10643-007-0200-9

Butte, N. F., Christiansen, E., & Sørensen, T. I. (2007). Energy imbalance underlying the development of childhood obesity. *Obesity*, *15*, 3056–3066. https://doi.org/10.1038/oby.2007.364

Centers for Disease Control and Prevention. (2012). Adolescent and school health: Childhood obesity facts. Retrieved https://www.cdc.gov/healthyschools/obesity/facts.htm

Centers for Disease Control and Prevention. (2013). *Winnable battles: Final report*. Retrieved from https://www.cdc.gov/winnablebattles/report/docs/winnable-battles-final-report.pdf

Chen, H. C., & Stotlar, D. K. (2012). An examination of the motivation and satisfaction of college students enrolled in physical education courses. *Sport Science Review, 1*(2), 43–63. https://doi.org/10.2478/v10237-012-0003-9

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. New York, NY: Routledge.

Cothran, D. J., Kulinna, P. H., & Garn, A. C. (2010). Classroom teachers and physical activity integration. *Teaching and Teacher Education*, *26*, 1381–1388. https://doi.org/10.1016/j.tate.2010.04.003

Cvejić, D., & Buišić, S. (2012). Integrisanje nastave u cilju povećanja fizičke aktivnosti dece [Integrating teaching in order to increase the physical activity of children]. *Nastava i vaspitanje, 61*(4), 754–765.

Cvejić, D., & Ostojić, S. (2018). Effects of the FITT program on physical activity and health-related fitness in primary school age children. *Facta Universitatis, Series: Physical Education and Sport*, *15*, 437–451. https://doi.org/10.22190/fupes1703437c

DeCorby, K., Halas, J., Dixon, S., Wintrup, L., & Janzen, H. (2005). Classroom teachers and the challenges of delivering quality physical education. *Journal of Educational Research*, *98*, 208–221. https://doi.org/10.3200/joer.98.4.208-221

Dinkel, D., Schaffer, C., Snyder, K., & Lee, J. M. (2017). They just need to move: Teachers' perception of classroom physical activity breaks. *Teaching and Teacher Education*, *63*, 186–195. https://doi.org/10.1016/j.tate.2016.12.020

Donnelly, J. E., & Lambourne, K. (2011). Classroom-based physical activity, cognition, and academic achievement. *Preventive Medicine*, *52*(Suppl.), S36–S42. https://doi.org/10.1016/j.ypmed.2011.01.021

Dyson, B. (2014). Quality physical education: A commentary on effective physical education teaching. *Research Quarterly for Exercise and Sport*, *85*, 144–152. https://doi.org/10.1080/02701367.2014.904155

Ekelund, U., Tomkinson, G., & Armstrong, N. (2011). What proportions of youth are physically active? Measurement issues, levels, and recent time trends. *British Journal of Sports Medicine*, *45*, 859–865. https://doi.org/10.1136/bjsports-2011-090190

Erbaş, M. K., Kalemoğlu-Varol, Y. K., & Ünlü, H. (2011). Beden Eğitimi Öğretim Yeterliliği Ölçeğinin Türkçe Uyarlaması: Geçerlik ve Güvenirlik Çalışması [Turkish adaptation of the Physical Education Teaching Efficacy Scale: Reliability and validation study]. *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi, 6*(1), 16–27.

Erwin, H. E., Beighle, A., Morgan, C. F., & Noland, M. (2011). Effect of a low-cost, teacher-directed classroom intervention on elementary students' physical activity. *Journal of School Health*, *81*, 455–461. https://doi.org/10.1111/j.1746-1561.2011.00614.x

Faucette, N., Nugent, P., Sallis, J. F., & McKenzie, T. L. (2002). "I'd rather chew on aluminum foil": Overcoming classroom teachers' resistance to teaching physical education. *Journal of Teaching in Physical Education*, *21*, 287–308. https://doi.org/10.1123/jtpe.21.3.287

Faulkner, G., Reeves, C., & Chedzoy, S. (2004). Nonspecialist preservice primary-school teachers: Predicting intent to teach physical education. *Journal of Teaching in Physical Education*, *23*, 200–215. https://doi.org/10.1123/jtpe.23.3.200

Fletcher, T., Mandigo, J., & Kosnik, C. (2013). Elementary classroom teachers and physical education: Change in teacher-related factors during pre-service teacher education. *Physical Education and Sport Pedagogy*, *18*, 169–183. https://doi.org/10.1080/17408989.2011.649723

Fraenkel, J. R., & Wallen, N. E. (2009). *How to design and evaluate study in education*. New York, NY: McGraw-Hill.

Gately, P., Curtis, C., Hardaker, R., McBride, N., McKay, M., Sumnall, H., & Evans, D. (2013). An evaluation in UK schools of a classroom-based physical activity programme—TAKE 10: A qualitative analysis of the teachers' perspective. *Education and Health*, *31*(4), 72–78.

Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2004). Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions. *Educational Researcher*, *33*(3), 3–13. https://doi.org/10.3102/0013189x033003003

Goh, T. L., Hannon, J. C., Newton, M., Webster, C., Podlog, L., & Pillow, W. (2013). "I' ll squeeze it in": Transforming preservice classroom teachers' perceptions toward movement integration in schools. *Action in Teacher Education*, *35*, 286–300. https://doi.org/10.1080/01626620.2013.827600

Gorozidis, G., & Papaioannou, A. (2011). Teachers' self-efficacy, achievement goals, attitudes, and intentions to implement the new Greek physical education curriculum. *European Physical Education Review*, *17*, 231–253. https://doi.org/10.1177/1356336x11413654

Gråstén, A., Watt, A., Hagger, M., Jaakkola, T., & Liukkonen, J. (2015). Secondary school students' physical activity participation across physical education classes: The expectancy-value theory approach. *Physical Educator*, *72*, 340–358. https://doi.org/10.1111/josh.12228

Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., & Lancet Physical Activity Series Working Group. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *The Lancet*, *380*, 247–257. https://doi.org/10.1016/s0140-6736(12)60646-1

Hardman, K. (2008). Physical education in schools: A global perspective. *Kinesiology: International Journal of Fundamental and Applied Kinesiology*, *40*(1), 5–28.

Hardman, K., & Marshall, J. (2009). *Second World-Wide Survey of School Physical Education: Final report*. Berlin, Germany: International Council of Sport Science and Physical Education.

Hardy, L. L., King, L., Espinel, P., Cosgrove, C., & Bauman, A. (2016). *NSW Schools Physical Activity and Nutrition Survey (SPANS) 2010: Full report*. Sydney, Australia: NSW Ministry of Health.

Hargreaves, A., & Fullan, M.G. (1992). Introduction. In A. Hargreaves & M. G. Fullan (Eds.), *Understanding teacher development* (pp. 1–19). London, United Kingdom: Cassell.

Heidorn, B., & Centeio, E. (2012). The director of physical activity and staff involvement. *Journal of Physical Education, Recreation, & Dance*, *83*(7), 13–26. https://doi.org/10.1080/07303084.2012.10598806

Hills, A. P., Dengel, D. R., & Lubans, D. R. (2015). Supporting public health priorities: Recommendations for physical education and physical activity promotion in schools. *Progress in Cardiovascular Diseases*, *57*, 368–374. https://doi.org/10.1016/j.pcad.2014.09.010

Howie, E. K., Newman-Norlund, R. D., & Pate, R. R. (2014). Smiles count but minutes matter: Responses to classroom exercise breaks. *American Journal of Health Behavior*, *38*, 681–689. https://doi.org/10.5993/ajhb.38.5.5

Howitt, D., & Cramer, D. (2007). *Introduction to research methods in psychology*. Harlow, England: Pearson Education.

Humphries, C. A., Hebert, E., Daigle, K., & Martin, J. (2012). Development of a physical education teaching efficacy scale. *Measurement in Physical Education and Exercise Science*, *16*, 284–299. https://doi.org/10.1080/1091367x.2012.716726

Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, *7*(1), 1–16. https://doi.org/10.1186/1479-5868-7-40

Kohl, H. W., & Murray, T. D. (2012). *Overweight and obesity. Foundations of physical activity and public health*. Champaign, IL: Human Kinetics.

Konstabel, K., Veidebaum, T., Verbestel, V., Moreno, L. A., Bammann, K., Tornaritis, M., . . . Wirsik, N. (2014). Objectively measured physical activity in European children: The IDEFICS study. *International Journal of Obesity, 35,* 135–143. https://doi.org/10.1038/ijo.2014.144

Kulinna, P. H., Cothran, D., & Kloeppel, T. (2011). Classroom teachers' efficacy in teaching healthy behaviour content. *Teacher Development*, *15*, 319–331. https://doi.org/10.1080/13664530.2011.608513

Lonsdale, C., Rosenkranz, R. R., Peralta, L. R., Bennie, A., Fahey, P., & Lubans, D. R. (2013). A systematic review and meta-analysis of interventions designed to increase moderate-to-vigorous physical activity in school physical education lessons. *Preventive Medicine*, *56*, 152–161. https://doi.org/10.1016/j.ypmed.2012.12.004

Lou, D. (2014). *Sedentary behaviors and youth: Current trends and the impact on health*. San Diego, CA: Active Living Research.

Lubans, D. R., Morgan, P. J., Cliff, D. P., Barnett, L. M., & Okely, A. D. (2010). Fundamental movement skills in children and adolescents. *Sports Medicine*, *40*, 1019–1035. https://doi.org/10.2165/11536850-000000000-00000

Martin, R., & Murtagh, E. M. (2015). An intervention to improve the physical activity levels of children: Design and rationale of the 'Active Classrooms' cluster randomized controlled trial. *Contemporary Clinical Trials*, *41*, 180–191. https://doi.org/10.1016/j.cct.2015.01.019

McMullen, J., Kulinna, P., & Cothran, D. (2014). Physical activity opportunities during the schoolday: Classroom teachers' perceptions of using activity breaks in the classroom. *Journal of Teaching in Physical Education*, *33*, 511–527. https://doi.org/10.1123/jtpe.2014-0062

Miller, A., Christensen, E., Eather, N., Gray, S., Sproule, J., Keay, J., & Lubans, D. (2016). Can physical education and physical activity outcomes be developed simultaneously using a game-centered approach? *European Physical Education Review*, *22*, 113–133. https://doi.org/10.1177/1356336x15594548

Morgan, P., & Bourke, S. (2008). Non-specialist teachers' confidence to teach PE: The nature and influence of personal school experiences in PE. *Physical Education and Sport Pedagogy*, *13*, 1–29. https://doi.org/10.1080/17408980701345550

Morgan, P., Bourke, S., & Thompson, K. (2001, December). *The influence of school physical education experiences on non-specialist teachers' attitudes and beliefs about physical education*. Paper presented at the Annual Conference of the Australian Association for Research in Education, Fremantle, Australia.

Morgan, P., & Hansen, V. (2007). Recommendations to improve primary school physical education: Classroom teachers' perspective. *Journal of Educational Research*, *101*(2), 99–108. https://doi.org/10.3200/joer.101.2.99-112

Morton, K. L., Atkin, A. J., Corder, K., Suhrcke, M., & Sluijs, E. M. F. (2016). The school environment and adolescent physical activity and sedentary behaviour: A mixed studies systematic review. *Obesity Reviews*, *17*, 142–158. https://doi.org/10.1111/obr.12352

Motta, R. W., McWilliams, M. E., Schwartz, J. T., & Cavera, R. S. (2012). The role of exercise in reducing childhood and adolescent PTSD, anxiety, and depression. *Journal of Applied School Psychology*, *28*, 224–238. https://doi.org/10.1080/15377903.2012.695765

Neufer, P. D., Bamman, M. M., Muoio, D. M., Bouchard, C., Cooper, D. M., Goodpaster, B. H., . . . Hepple, R. T. (2015). Understanding the cellular and molecular mechanisms of physical activity-induced health benefits. *Cell Metabolism*, *22*(1), 4–11. https://doi.org/10.1016/j.cmet.2015.05.011

Pan, Y. H. (2014). Relationships among teachers' self-efficacy and students' motivation, atmosphere, and satisfaction in physical education. *Journal of Teaching in Physical Education, 33*(1), 68–92.

Pan, Y. H., Chou, H. S., Hsu, W. T., Li, C. H., & Hu, Y. L. (2013). Teacher self-efficacy and teaching practices in the health and physical education curriculum in Taiwan. *Social Behavior and Personality*, *41*, 241–250. https://doi.org/10.2224/sbp.2013.41.2.241

Pangrazi, R. P., Beighle, A., & Pangrazi, D. (2009). *Promoting physical activity & health in the classroom*. San Francisco, CA: Benjamin Cummings.

Parks, M., Solmon, M., & Lee, A. (2007). Understanding classroom teachers' perceptions of integrating physical activity: A collective efficacy perspective. *Journal of Research in Childhood Education*, *21*, 316–328. https://doi.org/10.1080/02568540709594597

Petrie, K. (2010). Creating confident, motivated teachers of physical education in primary schools. *European Physical Education Review*, *16*(1), 47–64. https://doi.org/10.1177/1356336x10369200

Rink, J., Hall, T. J., & Williams, L. H. (2010). *Schoolwide physical activity: A comprehensive guide to designing and conducting programs*. Champaign, IL: Human Kinetics.

Ross, J. A. (1998). The antecedents and consequences of teacher efficacy. In J. Brophy (Ed.), *Advances in research on teaching* (Vol. 7, pp. 49–73). Greenwich, CT: JAI Press.

Sherman, C. P., Tran, C., & Alves, Y. (2010). Elementary school classroom teacher delivered physical education: Costs, benefits, and barriers. *Physical Educator*, *67*, 2–17.

Sinelnikov, O. A., Kim, I., Ward, P., Curtner-Smith, M., & Li, W. (2016). Changing beginning teachers' content knowledge and its effects on student learning. *Physical Education and Sport Pedagogy*, *21*, 425–440. https://doi.org/10.1080/17408989.2015.1043255

Sloan, S. (2010). The continuing development of primary sector physical education: Working together to raise quality of provision. *European Physical Education Review*, *16*, 267–281. https://doi.org/10.1177/1356336x10382976

Strong, W. B., Malina, R. M., Blimkie, C. J., Daniels, S. R., Dishman, R. K., Gutin, B., . . . Rowland, T. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics*, *146*, 732–737. https://doi.org/10.1016/j.jpeds.2005.01.055

Stylianou, M., Kulinna, P. H., & Naiman, T. (2016). "...Because there's nobody who can just sit that long": Teacher perceptions of classroom-based physical activity and related management issues. *European Physical Education Review*, *22*, 390–408. https://doi.org/10.1177/1356336x15613968

Synder, T. D., & Dillow, S. A. (2012). *Digest of education statistics 2011* (NCES 2012-001). Washington, DC: U.S. Department of Education, Institute of Education Statistics, National Center for Education Statistics.

T. C. Milli Eğitim Bakanlığı [T. R. Ministry of National Education]. (2018). İlköğretim Kurumları (İlkokul ve Ortaokul) Haftalık Ders Çizelgesi [Primary education institutions (primary and secondary school) weekly course schedule]. Retrieved May 30, 2018, from http://ttkb.meb.gov.tr/ www/haftalik-ders-cizelgeleri/kategori/7

T. C. Sağlık Bakanlığı, Temel Sağlık Hizmetleri Genel Müdürlüğü [T. R. Ministry of Health, General Directorate of Primary Health Care]. (2011). *Türkiye'de okul çağı çocuklarında (6-10 yaş grubu) büyümenin izlenmesi (TOÇBİ) projesi araştırma raporu* [Monitoring the growth of the school-age (6–10 age groups) children (MGSaCT) project research report in Turkey]. Retrieved from http://beslenme.gov.tr/content/files/yayinlar/kitaplar/diger_kitaplar/tocbi_kitap.pdf 23.08.2019

T. C. Sağlık Bakanlığı, Türkiye Beslenme ve Sağlık Araştırması [T. R. Ministry of Health, Turkey Nutrition and Health Survey]. (2010). *Beslenme Durumu ve Alışkanlıklarının Değerlendirilmesi Sonuç Raporu* [Report on the evaluation of nutrition situations and habits]. Retrieved from http://beslenme.gov.tr/content/files/

yayinlar/kitaplar/diger_kitaplar/TBSA_Beslenme_Yayini.pdf. 23.08.2019
Telford, R. D., Cunningham, R. B., Telford, R. M., Daly, R. M., Olive, L. S., & Abhayaratna, W. P. (2016). Physical education can improve insulin resistance: The LOOK randomized cluster trial. *Medicine & Science in Sports & Exercise*, *45*, 1956–1964. https://doi.org/10.1249/mss.0b013e318293b1ee
Tremblay, M. S., Shields, M., Laviolette, M., Craig, C. L., Janssen, I., & Gorber, S. C. (2010). Fitness of Canadian children and youth: Results from the 2007–2009 Canadian Health Measures Survey. *Health Reports*, *21*(1), 21–35.
Türkiye Halk Sağlığı Kurumu [Turkish Public Health Assosication]. (2014). Türkiye Fiziksel Aktivite Rehberi (Yayın No: 940) [Turkish physical activity guide (Publication No: 940)]. Retrieved June 17, 2018, from Sağlık Bakanlığı [Ministry of Health] website: http://dosyaism.saglik.gov.tr/Eklenti/12302,2014-fiziksel-aktivite-rehberipdf.pdf?0
U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd ed.). Retrieved August 23, 2018, from https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf#page=46
Ward, P., & Ayvazo, S. (2016). Pedagogical content knowledge: Conceptions and findings in physical education. *Journal of Teaching in Physical Education*, *35*, 194–207. https://doi.org/10.1123/jtpe.2016-0037
Webster, C. A. (2011). Relationships between personal biography and changes in preservice classroom teachers' physical activity promotion competence and attitudes. *Journal of Teaching in Physical Education, 30*, 320–339. https://doi.org/10.1123/jtpe.30.4.320
Webster, C. A., Erwin, H., & Parks, M. (2013). Relationships between and changes in pre-service classroom teachers' efficacy beliefs, willingness to integrate movement, and perceived barriers to movement integration. *Physical Educator*, *70*, 314–335.
Webster, C. A., Monsma, E., & Erwin, H. (2010). The role of biographical characteristics in preservice classroom teachers' physical activity promotion attitudes. *Journal of Teaching in Physical Education*, *29*, 358–377. https://doi.org/10.1123/jtpe.29.4.358

Webster, C. A., Russ, L., Vazou, S., Goh, T. L., & Erwin, H. (2015). Integrating movement in academic classrooms: Understanding, applying, and advancing the knowledge base. *Obesity Reviews*, *16*, 691–701. https://doi.org/10.1111/obr.12285

World Health Organization. (2011). *Global recommendations on physical activity for health*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44399/9789241599979_eng.pdf;jsessionid=11F9006D50B68857D15938A13C3E37BA?sequence=1 21.08.2019

World Health Organization. (2015). *Fiscal policies for diet and the prevention of noncommunicable diseases*. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/250131/9789241511247-eng.pdf;jsessionid=1974E7EF86E7165BAA028628C2368629?sequence=1

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PEDAGOGY

Influence of Cueing Strategies on Gaze Behavior During Observational Learning

Cheryl Coker

Abstract

This study examined the degree to which cueing strategies were attended when participants viewed a video model using eye tracking technology. It also examined whether visual cues highlighting body movement versus the intended effect of the movement would be attended to equally. Participants (N = 55) were randomly assigned to one of five experimental groups according to the nature of the cueing strategy provided: (a) No cue (Control), (b) Visual cue focused on the arm (Internal), (c) Visual cue focused on the racket (External), (d) Arm visual cue plus verbal directive (internal + VC), and (e) Racket visual cue plus verbal directive (external + VC). Under the impression that their technique would be later assessed, all groups viewed a video model of a tennis forehand groundstroke four times while eye movements were recorded. Mean percentage time that gaze was fixated on the assigned visual cue was determined. All groups with the exception of the external + VC condition attended to the arm LookZone (LZ) significantly more than the racket LZ. Both internal groups also viewed their assigned cue a greater percentage of time than their corresponding external groups did but not more than the control condition did. These data suggest that observers of a model have a tendency to focus their visual attention on the final body segment that carries out the desired action regardless of cueing.

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Human movement practitioners have long used demonstrations to not only provide learners with a general idea of how a movement is performed but also highlight the critical features of a skill. Considerable research supports this practice (for reviews, see McCullagh, Law, & Ste-Marie, 2012; Ste-Marie et al., 2012) and has identified numerous variables that influence the effectiveness of observational learning, including the use of attention directing cues.

The social cognitive theory of observational learning (Bandura, 1986) suggests that learners create a cognitive representation of a skill by abstracting critical features of the movement modeled. This representation serves to guide subsequent movement attempts. Bandura (1986) also noted, however, that unless learners attend to the relevant aspects of the modeled performance, observational learning would be ineffective. The use of verbal cues to focus learners' attention to critical elements of a demonstration has since been investigated and shown to lead to greater learning than the viewing of a visual model alone. For example, Roach and Burwitz (1986) found that verbal cues in conjunction with modeling led to better performance than modeling alone on the development of form and accuracy in cricket batting. Weiss and Klint (1987) reported that children were able to better perform a sequencing task when verbal rehearsal strategies were combined with modeling. They concluded that in addition to a visual model, "verbal rehearsal strategies are also needed to help children selectively attend to relevant task components and remember the specific order in which skills should be executed" (Weiss & Klint, 1987, p. 240). Similar findings were reported by McCullagh, Stiehl, and Weiss (1990), who showed that greater improvements in movement form were achieved when observational learning was combined with verbal cues.

Janelle, Champenoy, Coombes, and Mousseau (2003) extended previous research to include a novel cueing strategy whereby attention-directing visual cues were superimposed on the video of a soccer pass highlighting key areas of interest. Their results indicated that video modeling in conjunction with both visual and verbal cues led to increased kicking proficiency in terms of accuracy, consistency, and movement form compared with other groups who received alternative modeling modalities.

A limitation of their study, acknowledged by Janelle et al. (2003), is that "mere inferences can be made concerning whether the cued model attributes were those in fact attended to" (p. 836). Although the assumption is that cueing strategies constrain learners' selective attention to the critical features of the modeled movement, no direct evidence demonstrates that this is indeed the case. As such, Janelle et al. recommended that future studies incorporate eye tracking technology to examine visual search behaviors while participants view modeled actions. Ste-Marie et al. (2012) concurred, indicating in their review of the literature that the use of eye-movement recording to examine gaze behavior would have been useful in the Janelle et al. "experimentation to determine whether these benefits occurred due to increased focus on the relevant cues in the display" (p. 158). Consequently, the primary purpose of this study was to examine the degree to which cueing strategies were attended when participants viewed a video model using eye tracking technology.

A secondary question of interest was whether attention-directing cues highlighting body movement versus the intended effect of the movement (e.g., on an implement) would be attended to equally. Two visual cue conditions corresponding to an internal (body movement) versus external (movement effect) attentional focus were examined. The first highlighted the action of the arm (internal), while the second highlighted the movement of the racket (external). Research over the past 15 years has demonstrated advantages for instructing learners to adopt an external focus of attention for both learning and performance (see Wulf, 2013, for a review). Yet common practice is to provide information related to specific body movements throughout the learning process. This was illustrated by Porter, Wu, and Partridge (2010), who found 84.6% of elite track and field athletes reported receiving instructions related to body and limb movements from their coaches. Similarly, Durham, Van Vliet, Badger, and Sackley (2009) reported that 95.5% of feedback statements given by physical therapists to stroke patients during treatment referenced body movements.

Initial skill acquisition requires learners to develop an understanding of the basic movement pattern. As such, there is a tendency to allocate conscious attention to the movement(s) of the body. Where a learner directs his or her attention to a model may also

reflect this belief. Conceivably, learners may sometimes abandon attention-focusing cues in exchange for their own strategies or preferences. In fact, Marchant, Clough, and Crawshaw (2007) reported a 77% compliance rate when participants estimated the amount of instructions they used when learning a dart throwing task. Marchant et al. contended that "even with specific instructional direction, participants will inevitably use their own strategies from time to time" (p. 300). It was therefore hypothesized that the percentage of time spent looking at the visual cue highlighting the action of the arm (internal) would be greater than that highlighting the movement of the racket (external) regardless of group.

Method

Participants

Fifty-five undergraduate students (23 males, 32 females; M_{age} = 23.79 years) were randomly assigned to one of five experimental groups according to the nature of the cueing strategy provided: a control group (N = 10), an internal group (visual cue only; N = 12), an external group (visual cue only; N = 12), an internal + VC group (visual cue + verbal directive; N = 10), and an external + VC group (visual cue + verbal directive; N = 11). Participants had no or limited tennis experience. Written informed consent was obtained prior to testing, and the study was approved by the university's institutional reviewboard.

Video and Apparatus

All groups were shown the same 3-min video of two male and two female models executing a tennis forehand groundstroke from both a front and a side view (8 views total). The video differed by the nature of the visual cue provided according to group assignment. The video viewed by the control group was not enhanced and contained no visual cue. For both internal groups, the arm of the performer was superimposed with a pink highlight. The racket of the performer was superimposed with a pink highlight in the videos viewed by both external groups. Six separate videos (2 for each condition) were created to counterbalance the order of model gender viewed by participants, and each clip was separated by a gray screen for 2 seconds. All groups viewed their respective video four times.

While watching the video, eye movements were recorded via the Eye-Gaze Response Interface Computer Aid (ERICA; Eye Response Technologies, Inc., Charlottesville, VA) to determine participants' gaze behaviors. The system tracks eye movement through a table-mounted camera that when individually calibrated monitors features on the eye (glint and bright eye) at a sampling frequency of 30 Hz and translates this to a gaze position.

Procedures

Participants were instructed that they would be viewing several video demonstrations of the tennis forehand groundstroke. To simulate a performance environment and encourage typical observational learning behavior, they were further informed that following the video demonstrations, they would be asked to perform five forehand groundstrokes and that their technique would be assessed for correctness. No additional information was provided to the control, internal, and external groups. Participants in the internal + VC and external + VC groups were, however, verbally directed to focus their attention on the highlighted area of their corresponding video (arm or racket according to group), and it was emphasized that the most pertinent information for the successful reproduction of the skill was located in this area.

Participants were seated in front of a 17-in. computer monitor and their right eye was calibrated with the eye tracking system. They were then shown three sample videos and provided an opportunity to ask questions. Following the completion of the video viewing, participants were informed that they would not perform the skill and were debriefed.

Data Analysis

Two regions of interest, called LookZones (LZ), were created using GazeTracker software (Eye Response Technologies, Inc., Charlottesville, VA) by outlining each visual cue area (arm and racket) to extrapolate gaze behavior. The variable of interest was the mean percentage time that participants' gaze was positioned in the corresponding LZ (visual cue assigned). Mean percentage of time gaze fixations occurred in the opposite LZ was also determined for all groups. A 5 (Group) × 2 (LZ) MANOVA examined the extent to

which participants' visual attention was directed to each LZ. A critical alpha level was set at $p < .05$.

Results

Table 1 shows the means and standard deviations for each condition. A significant main effect for LZ, $F(1, 50) = 55.53$, $p < .05$, was revealed, indicating that visual attention was allocated a greater percentage of time to the arm LZ ($M = 24.08\%$) than the racket LZ ($M = 13.6\%$). A significant Group × LZ interaction was also revealed, $F(4, 50) = 4.19$, $p < .05$. Post hoc analyses indicated that of all groups, with the exception of the external + VC condition, attended to the arm LZ significantly more than the racket LZ (see Figure 1).

Table 1
Means and Standard Deviations for All Conditions

	Arm LZ		Racket LZ	
Group	***M***	***SD***	***M***	***SD***
Control	22.30	7.77	13.08	3.98
Internal	24.81	13.40	11.12	4.53
External	24.88	10.24	13.29	7.11
Internal + VC	28.34	11.06	10.56	4.35
External + VC	20.17	12.97	19.85	8.87

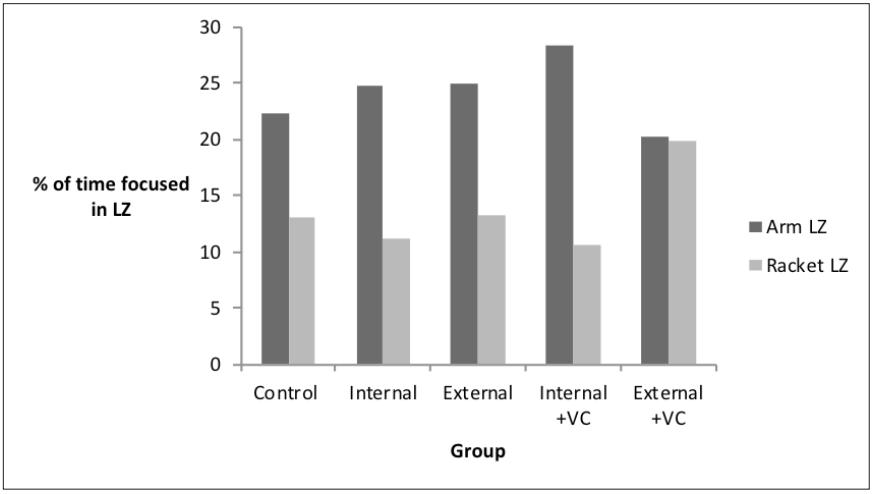

Figure 1. Mean percentage of time gaze was focused in each LZ.

For the cued conditions, the internal group fixated their gaze on the visual cue a significantly greater percentage of time (M = 24.81%) than the external (M = 13.29%) group. Further, gaze fixations were directed at the visual cue a significantly greater percentage of time for the internal + VC group (M = 28.34%) than both the external group (M = 13.29%) and the external + VC group (M = 19.85%; see Figure 2).

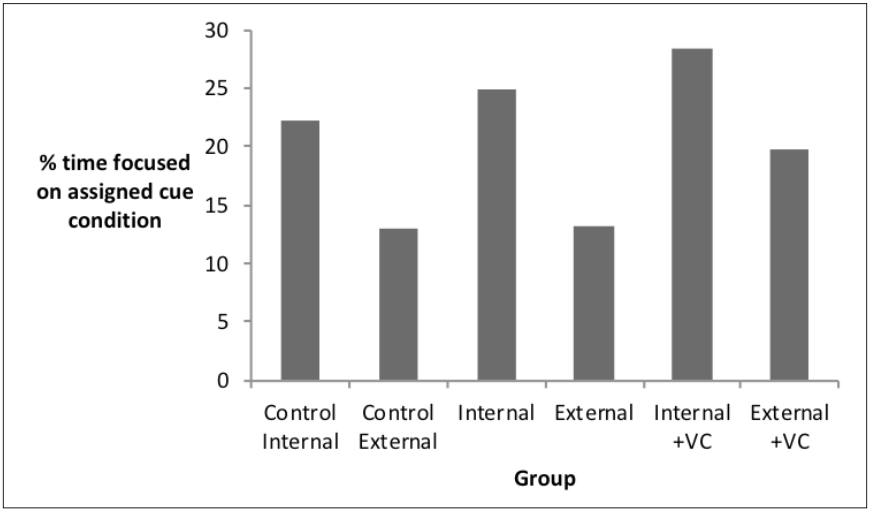

Figure 2. Mean percentage of time groups were focused on their assigned cued condition (mean percentage of time gaze was focused in each LZ displayed for control group).

Regarding visual search behaviors in the LZ opposite to that which was visually cued, both the internal (M = 11.19%) and internal + VC (M = 10.56%) groups spent less time viewing the opposite LZ than the external (M = 24.88%) and external + VC (M = 20.17%; see Figure 3) groups did.

Discussion

The purpose of this study was twofold: (a) to determine the degree to which visual cues were attended when participants viewed a video model and (b) to examine whether visual cues highlighting body movement versus the intended effect of the movement would be attended to equally. The results indicated that the addition of visual cues highlighting either the action of the arm or the movement

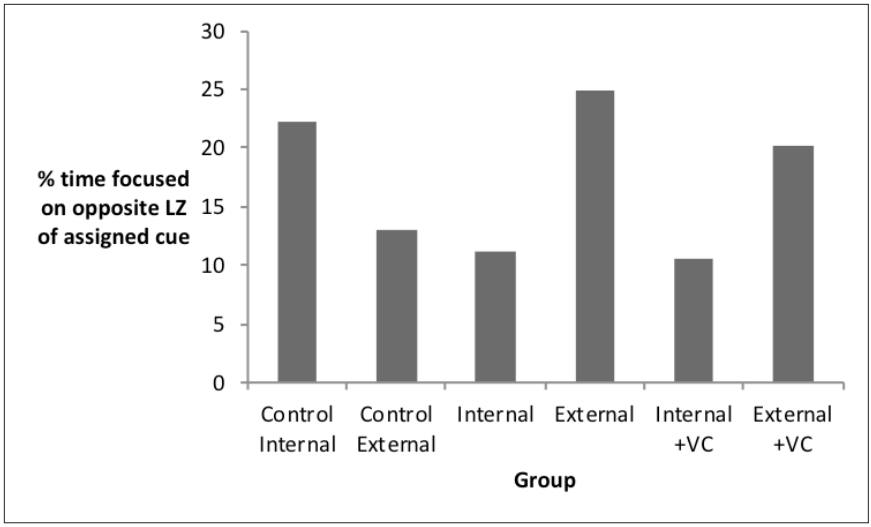

Figure 3. Mean percentage of time groups were focused on the opposite LZ from their assigned cued condition (mean percentage of time gaze was focused in each LZ displayed for control group).

of the racket had no effect, as the percentage of time the control group spent looking at each corresponding LZ was not significantly different from the matching visual cue condition (control internal vs. internal conditions and control external vs external condition). Further, no differences were found between the control group and both the internal + VC and external + VC conditions, although a large effect size was determined for the latter comparison, which also approached significance (d = .97, p = .09). In other words, with the exception of the external + VC condition, the addition of a visual cue superimposed on a video model, even when participants were given a verbal directive to attend it, did not influence visual search behaviors. A disparity therefore exists between the results of this study and the findings of Janelle et al. (2003) where the combination of a video model plus both verbal and visual cues led to greater proficiency in both kicking form and accuracy when compared to five other cueing strategies, including the that of a video model with visual cues directing participants to the critical aspects of the movement. Their results were attributed to the assumption that greater attention was directed to the cued model attributes. In the present

study however, no significant differences were found between the internal and internal +VC groups. Similar findings were revealed for the external vs. external +VC groups, although effect size was determined to be large and the difference approached significance (d = .82, p = .088). In other words, the addition of a directive to focus on the visual cue and the emphasis that this area contained the information most pertinent to the reproduction of the skill did not influence the visual search strategies employed by participants for the internal + VC group but did make a practical difference for the external + VC group.

The action of the arm was selectively attended to significantly more than the movement of the racket LZ. In fact, the percentage of time spent looking in the arm LZ was almost twice that of the racket LZ. Evidently participants perceived that viewing the action of the arm would provide more critical information regarding the performance of the skill. This outcome may also provide insight as to why, as noted earlier, there exists a disconnect between research and practice regarding attentional focus, as well as perhaps some skepticism in the research community itself to the acceptance that an external attentional focus is beneficial for initial learning (Wulf, 2013). Wulf (2016) explained that focusing one's attention is related to the planning of the movement. Yet, through observation, learners seek information to assist their approximation attempts of the movement modeled. In other words, learners use information gleaned from the model to *plan* subsequent movement attempts. These data suggest that learners intuitively perceived the action of the arm in this task to provide more salient information than the movement of the racket. This would likely result in the observer imposing conscious control over the arm during successive movement attempts, which is in direct conflict with the attentional focus literature and perhaps the source of the "perpetuation of the notion that novices (should) show enhanced learning with internal focus instructions" (Wulf, 2013, p. 91).

The greater percentage of time that gaze was focused in the arm versus racket LZ also raises questions regarding the conclusions of Breslin, Hodges, and Williams (2009) that during the initial stages of skill acquisition, viewing "information from the end effector [or the final component of the system that carries out the desired action] is

prioritized during observational learning" (p. 488). In their study, they manipulated the visual information available during the demonstration of a cricket bowling action and found that participants' visual attention was mainly focused on the action of the model's bowling arm. Breslin, Hodges, Williams, Curran, and Kremer (2005) also found that when viewing a full-body model of the bowling action, participants replicated only the model's bowling arm relative motion. In the present study, the end effector was an implement, the tennis racket, rather than a body segment. Also different is that the task observed, executing a tennis forehand groundstroke, is classified as an open skill, whereas a cricket bowling action would be categorized as a closed skill. Savelsbergh, Rivas and van der Kamp (2008) suggested that early in learning, participants initially freeze perceptual degrees of freedom, selectively attending "to one of multiple sources of information that will enable him to more or less successfully perform the task at hand" (p. 157). Accordingly, the movement of the arm in the present study rather than the end effector, the racket, may have been considered more task relevant. On the other hand, if participants interpreted the goal of viewing the model to be one of learning how to move the racket rather than how the racket moves to contact the ball, it could be argued that the arm may have been treated *as* the end effector. Additional studies are needed to fully understand how multiple sources of information are perceived and their relationship to visual search tendencies while participants view a demonstration.

One limitation of this study was that the eye recording equipment utilized could only acquire gaze behaviors that occurred in the created LZs. Given that the percentage of gaze fixations captured ranged from approximately 35–38%, a significant amount of visual search information was not available for analysis. As technologies that allow capture of all gaze behaviors develop, the influence of attention-directing cueing mechanisms will be better understood.

A limitation in previous studies examining cueing strategies and observational learning is the assumption that learners are attending to the cue provided based on physical performance measures. The findings of this study suggest that this may not be the case. Instead, according to eye-movement recordings, it appears that learners have a tendency to focus on the body segment that carries out the desired

action regardless of the cue, with the exception of the verbal directive to attend to the racket. In this case, no significant difference was found between viewing times in the arm LZ (M = 20.17%) and racket LZ (M = 19.85%), implying that this cueing strategy was somewhat effective. Though additional research is needed, it is possible that for facilitation of observational learning to occur, cueing the final body segment that carries out the desired action during a demonstration may be unnecessary or occur initially, and attention should be drawn to other critical features of the movement as practice progresses.

References

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.

Breslin, G., Hodges, N. J., & Williams, A. M. (2009). Effect of information load and time on observational learning. *Research Quarterly for Exercise & Sport, 80*, 480–490. https://doi.org/10.1080/02701367.2009.10599586

Breslin, G., Hodges, N. J., Williams, A. M., Curran, W., & Kremer, J. (2005). Modelling relative motion to facilitate intra-limb coordination. *Human Movement Science, 24*, 446–463. https://doi.org/10.1016/j.humov.2005.06.009

Durham, K., Van Vliet, P. M., Badger, F., & Sackley, C. (2009). Use of information feedback and attentional focus of feedback in treating the person with a hemiplegic arm. *Physiotherapy Research International, 14*(2), 77–90. https://doi.org/10.1002/pri.431

Janelle, C. M., Champenoy, J. D. Coombes, S. A., & Mousseau, M. B. (2003). Mechanisms of attentional cueing during observational learning to facilitate motor skill acquisition. *Journal of Sports Sciences, 21,* 825–838. https://doi.org/10.1080/0264041031000140310

Marchant, D. C., Clough, P. J., & Crawshaw, M. (2007). The effects of attentional focus strategies on novice dart throwing performance and their task experiences. *International Journal of Sport and Exercise Psychology, 5*, 291–303. https://doi.org/10.1080/1612197x.2007.9671837

McCullagh, P., Law, B., & Ste-Marie, D. (2012). Modeling and performance. In S. Murphy (Ed.), *The Oxford handbook of sport and performance psychology* (pp. 250–272). New York, NY: Oxford Press. https://doi.org/10.1093/oxfordhb/9780199731763.013.0013

McCullagh, P., Stiehl, J., & Weiss, M. (1990). Developmental modeling effects on the quantitative and qualitative aspects of motor performance. *Research Quarterly for Exercise & Sport, 61*, 344–350. https://doi.org/10.1080/02701367.1990.10607498

Porter, J. M., Wu, W. F. W., & Partridge, J. (2010). Focus of attention and verbal instructions: Strategies of elite track and field coaches and athletes. *Sport Science Review, 19,* 199–211. https://doi.org/10.2478/v10237-011-0018-7

Roach, N. K., & Burwitz, L. (1986). Observational learning in motor skill acquisition: The effect of verbal directing cues. In J. Watkins, T. Reilly, & L. Burwitz (Eds.), *Sports science: Proceedings of the VIII Commonwealth and International Conference on Sport, Physical Education, Dance, Recreation, and Health* (pp. 349–354). London: E. & F. N. Spon.

Savelsbergh, G. J. P., Rivas, F., & van der Kamp, J. (2008). A perception-action perspective on learning and practice in racket sports. In A. Lees, D. Cabello, & G. Torres (Eds.), *Science and racket sports IV* (pp. 154–162). New York, NY: Routledge. https://doi.org/10.4324/9780203894873

Ste-Marie, D. M., Law, B., Rymal , A. M., Jenny, O., Hall, C., & McCullagh, P. (2012). Observation interventions for motor skill learning and performance: An applied model for the use of observation. *International Review of Sport and Exercise Psychology, 5*, 145–176. https://doi.org/10.1080/1750984x.2012.665076

Weiss, M. R., & Klint, K. A. (1987). Show and tell in the gymnasium. *Research Quarterly for Exercise and Sport, 58*, 234–241.

Wulf, G. (2013). Attentional focus and motor learning: A review of 15 years. *International Review of Sport & Exercise Psychology, 6*, 77–104. https://doi.org/10.1080/1750984x.2012.723728

Wulf, G. (2016). Why did Tiger Woods shoot 82? A commentary on Toner and Moran (2015). *Psychology of Sport and Exercise, 22*, 337–338. https://doi.org/10.1016/j.psychsport.2015.05.006

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PEDAGOGY

How to Promote Positive Youth Development in Physical Education? The Experiences of a Physical Educator and Students Through the Delivery of Project SCORE!

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Abstract

Confidence, character, competence, and connection (i.e., the 4 Cs) have been acknowledged as desired characteristics of positive youth development (PYD)-based programs. Based on the 4 Cs framework, an online tool called Project SCORE! has been designed to help coaches, parents, or other stakeholders facilitate PYD through a specific set of strategies, objectives, and activities. However, research on PYD-focused teacher education programs, specifically using Project SCORE!, is still scarce. This case study analyzed the influence of a PYD-focused intervention based on Project SCORE! on a physical education (PE) teacher's PYD behaviors and the PYD behaviors of his students. The participants were a PE teacher with extensive teaching and coaching experience and seven students involved in the teacher's PE class. Data were collected through

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semistructured interviews, nonparticipant observations, reflexive journaling, and focus group interviews. Findings show how the PE teacher was able to transition from an unintentional approach toward PYD to an intentional one that resulted in more PYD outcomes reported by his students after the PYD-focused intervention. In addition, his coaching experience gave him a unique outlook on how to develop a PYD mandate in PE. Future research should focus on implementing Project SCORE! in a broad array of contexts and understand how parents may be involved in this online platform.

Positive youth development (PYD) is a strength-based approach that has been widely used within physical education (PE) and sport settings to help youth flourish and attain positive developmental outcomes such as confidence, respect for others, and leadership skills (Damon, 2004; Lerner et al., 2014). For an operational definition of PYD, two main components must be considered. First, PYD-based programs should integrate an empowering and caring climate that should be structured to facilitate PYD outcomes through a coherent set of objectives, activities, and strategies (Fraser-Thomas, Côté, & Deakin, 2005; Holt, 2016). Second, these programs should also define specific PYD-related skills and outcomes that should be targeted throughout PYD-based interventions (Hemphill, 2014). Several outcomes, more specifically confidence, character, competence, and connection (titled the 4 *C*s), have been acknowledged as desired characteristics of PYD-based programs (Côté, Turnnidge, & Evans, 2015; Geldhof et al., 2014; Vierimaa, Erickson, Côté, & Gilbert, 2012). According to Lerner, Almerigi, Theokas, and Lerner (2005), competence relates to having a positive view of one's own actions in a broad range of areas (e.g., social, cognitive), confidence is associated to a sense of self-worth, character represents respect for others and for cultural rules and roles, and connection has been linked to positive relationships with others. These 4 *C*s should be viewed as paramount in the assessment of PYD interventions and may provide a more comprehensive understanding of the effectiveness of a program (MacDonald & McIsaac, 2016).

Research (Holt et al., 2017) has acknowledged the need to further reflect on how PYD-based programs should be structured and opportunities for PYD maximized. Most effective intervention programs (Blanco, Delgado-Noguera, & Escartí-Carbonell, 2013)

have used an intentional approach toward PYD outcomes and explicitly developed efforts to attain these type of outcomes. Although this approach may be considered more time consuming and demanding for PE teachers, it has proven to be useful (Chinkov & Holt, 2015; Turnnidge, Côté, & Hancock, 2014). Holt et al. (2017), despite recognizing that an unintentional approach might be conducive to PYD outcomes, mentioned that an intentional approach could enable more PYD outcomes than a PYD climate alone. On this notion, two questions need to be raised: How may PE teachers increase youth's opportunities to attain PYD outcomes? How may PE teachers learn to implement an intentional approach? Research in the field of PYD is still attempting to provide explanations for these questions and add insight that might shed light on how to improve teachers' interventions toward PYD (Coakley, 2016; Holt, 2016). It has been argued that it is important ". . . to realize that personal assets such as confidence, connection, and character should be included as part of the sport experience of youth rather than being offered as a separate component of the sport program" (Strachan, MacDonald, & Côté, 2016, p. 114). To fulfill these premises, teacher education has been acknowledged as a valuable context to help PE teachers learn to foster PYD. However, research on PYD-focused teacher education programs is still scarce.

Based on previous notions, teacher education programs should provide opportunities for teachers to learn to intentionally facilitate PYD outcomes (Newton, Poon, Nunes, & Stone, 2013; Woods & Conderman, 2006). However, there is still the need for further analysis of how teacher education programs promote an increase in PYD behaviors. Research (Camiré, Rocchi, & Kendellen, 2017; Woods & Conderman, 2006) has demonstrated that teacher education initiatives may influence PE teachers' ability to develop a sound PYD philosophy and coherent strategies. In fact, teachers should be exposed to different sources of knowledge acquisition such as teacher education programs, online tools, or books (Wilson, Bloom, & Harvey, 2010; Winchester, Culver, & Camiré, 2013). Informal and formal learning opportunities might provide the foundation for hybrid approaches to PYD-focused teacher education programs based on teachers' preferred sources of knowledge acquisition (Curtner-Smith, 1999). Such hybrid approaches are still scarce within this line of inquiry.

With this in mind, online tools could be used to expose PE teachers to PYD material combined with other formal and informal sources. Project SCORE! (Strachan et al. 2016) has been used as an online tool designed to help coaches autonomously promote PYD. Project SCORE! differs from typical online PYD-focused education programs in that it is not delivered by a course facilitator and relies on a self-directed use of the strategies and activities included in this online platform. This online platform includes sample activities (i.e., SCORE plays), strategies, and objectives based on the 4 *C*s framework. Such tools may enable PE teachers to devote more time to these types of programs, as information is easily accessible. Although studies have tried to develop intervention programs targeting PE teachers, there is the need for a longitudinal analysis of the effect of PYD-focused teacher education programs tailored to fit teachers' skills and experiences to help them foster PYD behaviors (Newton et al., 2013). In fact, little research has used a multiple-methods approach that encompasses observational data combined with self-report data to monitor behavioral change throughout a PYD-focused intervention (Erickson & Côté, 2016; Falcão, Bloom, & Gilbert, 2012; Malete & Feltz, 2000). This type of PYD-focused intervention has been mostly conducted with youth sport coaches rather than PE teachers, and this should be addressed by researchers (MacDonald, Côté, & Deakin, 2010; Vella, Crowe, & Oades, 2013).

This study used a qualitative approach to assess a teacher's and students' PYD behaviors throughout a PYD-focused intervention based on Project SCORE! that combined informal and formal learning opportunities. It used a phenomenological case study design (Yin, 2011) to understand the real-life experiences lived by a teacher learning to facilitate PYD in a PE setting. Researchers have commented that

> Case studies offer a mechanism through which practitioners can have a voice and contribute to knowledge transfer so that research and practice can become better linked, and those working in sport and exercise psychology field can better understand various realities and critical issues requiring solutions. (Keegan, Schinke, Chirban, Durand-Bush, & Cotterill, 2017, p. 88)

Therefore, this case study analyzed the effect of a PYD-focused intervention based on Project SCORE! on the behaviors of a PE teacher and his students.

Method

Participants

The teacher-coach involved in the study was 41 years old and had been teaching PE for 17 years and coaching for approximately 10 years. While the study was being conducted, the participant was teaching a ninth-grade class and coaching the swimming team at a public school located in the north of Portugal. For a larger sense of the context, the school housed more than 600 students ranging from 11 to 18 years of age and employed 15 teachers. The PE teacher had a master's degree in sport for children and youth and was teaching approximately 20 students between 15 and 16 years old. Seven students (i.e., four males and three females) involved in this participant's class were also included in this study. These students were involved in one 45-min PE session and one 90-min PE session per week.

Procedure

Ethical approval was attained through the first author's research center as a part of a larger project that aimed to implement Project SCORE! in the Portuguese context. This study also received approval by the school board of the school where this research took place. Thus, a formal letter was sent to the school's dean, who presented the study to the school board, and then permission to conduct the study was given. The PE teacher was also debriefed about the objectives and data collection protocol of the study, and an informed consent was attained. This participant was used as a key informant to select seven students who could be included in the study. The parents of the students were then contacted and an informed consent attained. All the participants accepted to participate in this study. The Project SCORE! workshops, focus group interviews, and semistructured interviews were scheduled at a mutually convenient time and place.

PYD Intervention Plan and Delivery

A 4-hr workshop (see Table 1 for a detailed description of the PYD-focused intervention) focused on Project SCORE! was delivered

Table 1
Structure of the PYD-Focused Intervention

Session	Contents
1	• Defining PYD • 4 *C*s framework • Project SCORE! and recommended strategies

2	• Implementing recommended SCORE activities (i.e, 1 per C)
	  • Character
	  • Confidence
	  • Competence
	  • Connections

3–10	• Debrief of Session 1 and 2 contents • Designing a PYD-based program for PE • Setting PYD objectives • Using recommended SCORE activities • Defining PYD strategies
10–15	• Debrief of outcomes, challenges, and future PYD objectives • Analysis of support needed to better implement Project SCORE!
15–20	• Debrief of outcomes, challenges, and future PYD objectives • Assessing the PYD-based program • Analysis of support needed to continue implementing the program • Final considerations

in May 2017 and included a 2-hr online component and a 2-hr practical component. The workshop was conducted in both English (i.e., online component) and Portuguese (i.e., in-person component), as the PE teacher was fluent in both languages. The workshops were delivered by the first and second authors; the second author was an expert on PYD and on this online tool (Strachan et al., 2016). The first component focused on (a) the conceptual approach to PYD, (b) the 4 *C*s as desired outcomes of PYD-based programs, and (c) strategies to develop the 4 *C*s in PE. The course facilitators provided insight on how the principles behind Project SCORE! could be

used to fit PE. They used a reflexive approach (Boutet, Vandette, & Valiquette-Tessier, 2017) to engage the participants in reflexive writing and enable discussions and joint reflections with the research team. Further, they provided several Project SCORE! handouts and other didactic materials to stimulate reflection between sessions. In the first component of the workshop, an open discussion about how the contents would fit the participant's coaching and teaching philosophy and practices was promoted. The main aim was to align his approach to teaching with a PYD mandate. In the second component of the workshop, the first author assisted the participant during a PE session and developed collaborative work to create a lesson plan and a set of objectives coherent with the 4 *C*s. As the PE session unfolded, the PE teacher regularly presented situational problems based on his lived experiences and asked for advice. As such, this PYD-focused intervention also involved regular in-person and online meetings (n = 20) that took place at least once a week for on average 35 min. These meetings served the purpose of discussion of changes in philosophy, challenges experienced throughout PE lessons, and possible PYD strategies that could be used to increase program quality. In case of divergent perspectives, the participant's perspective prevailed. This type of situation occurred occasionally and represented context-specific decisions.

Semistructured Interviews

Two semistructured interviews were conducted with the PE teacher. Both interview guides were tested through pilot interviews that resulted in no major changes. Before the PYD-focused intervention, an initial semistructured interview was conducted about the participant's teaching philosophy (e.g., How would you define your teaching and coaching philosophy?), teaching practice (e.g., What importance do you give to confidence in your class?), the main challenges experienced while facilitating PYD (e.g., How do you find PYD challenging?), perspectives on online tools that may help facilitate PYD (e.g., Would you consider using an online tool to help you foster PYD outcomes?). This interview lasted 50 min. At the postintervention stage, a second semistructured interview was conducted about the effect of the PYD-focused intervention on the participant's teaching philosophy (e.g., Did you change your teaching philosophy throughout the workshop?), teaching practice (e.g., What changed

in terms of the importance you give to confidence in your class?), challenges experienced throughout the intervention (e.g., Did you find it challenging to apply what you have learned?), and overall ability to facilitate PYD. This interview lasted 66 min.

Focus Group Interviews

Two focus group interviews were conducted with seven students of their perceptions throughout the PYD-focused intervention. Guided by Sparkes and Smith (2016), the focus group interviews were conducted with more than six participants who were selected based on their gender and attendance rate in PE classes (i.e., students who had attended more than 95% of classes conducted throughout the intervention). Both focus group interviews involved a stimulated recall technique (Lyle, 2003) whereby video segments from the participants' classes were selected to prompt discussion (i.e., videos of critical PYD behaviors). On this notion, critical PYD events were used to prompt students on their experiences developing one of 4 *C*s, strategies used by their teacher, and challenges faced to attain PYD outcomes. The initial focus group interview focused on students' developmental experiences in PE classes (e.g., How would you describe your experience in PE classes?) and perspectives on their teacher's profile (e.g., What life lessons have you learned with your teacher?). The last section included the stimulated recall component. This focus group interview lasted 40 min. The second focus group interview focused on students' perceived changes in their developmental experiences (e.g., Did your experience in PE classes change?) and the teacher's intervention (e.g., How would you describe your teacher's intervention toward confidence now?). Similarly, the last section also consisted of a stimulated recall component. This focus group interview lasted 45 min.

Reflexive Journaling and Nonparticipant Observations

The teacher involved in the PYD-focused intervention used a reflexive journal to report his experiences prior, during, and after the PYD-focused intervention. He also included didactic material (e.g., lesson plans, curricular programs, Project SCORE! handouts) that helped shape his teaching practice. The first author also registered entries on the reflexive journal and commented on specific issues and/or themes raised by the participant (e.g., the participant

asked advice while planning certain PYD strategies). The reflexive journal included several questions to facilitate reflection (e.g., What did you work on today? What were the main challenges that you faced? How did Project SCORE! help you?). Nonparticipant observations were used in the analysis of the PYD behaviors of the participant and his students over time. Several direct observations of PE classes were conducted before (n = 3), during (n = 4), and after (n = 3) the PYD-focused intervention with field notes taken of PYD behaviors, descriptions of the participant's teaching practice, and students' PYD outcomes. All PE sessions were audio and video recorded.

Data Analysis

All the materials were transcribed and analyzed on multiple occasions, which enabled the first author to become familiar with the data set. Data derived from the nonparticipant observations and field notes, alongside the PE teacher's data (i.e., through semistructured interviews and reflexive journaling) and his students' perceptions (i.e., through focus group interviews), provided a rich portrait of the effect of Project SCORE! on their PYD behaviors. A thematic content analysis was used (Silverman, 2000) and several analytical decisions made. First, raw data derived from the semistructured interviews, focus group interviews, reflexive journal, and field notes were inserted into NVivo 11 and coded into subthemes that were then grouped into themes. These themes and subthemes were constantly reviewed as three themes (e.g., before the PYD-focused intervention, during the PYD-focused intervention, after the PYD-focused intervention), and 11 subthemes (e.g., teaching philosophy) emerged and were deemed representative of the data set. These themes were clustered in a hierarchical manner that represented both the teacher's and students' experiences in this PYD-focused teacher education program. An inductive analysis coherent with the nature of this case study generated theory within the data (e.g., recommendations for future Project SCORE! interventions) and added to the literature base.

Qualitative Rigor

To increase the quality of the research, several procedures were used: transparency, internal coherency, and external coherency (Smith & McGannon, 2017; Sparkes & Smith, 2009). A rela-

tivist approach (Smith & McGannon, 2017) that acknowledges the need of selecting a specific set of procedures aligned with the nature of a study was used in this case. In the present study, transparency was obtained by reporting all the decisions made throughout this research and procedures utilized (e.g., detailed description of the PYD-focused intervention and interview guides). In addition, internal and external coherency were attained. Several meetings took place with the coauthors to review the interview guides and discuss the data analysis. The second and third authors served as external consultants (i.e., critical friends) that provided insight and alternative explanations to the coding process and helped to write the manuscript. Several online meetings took place with the second author, who served as an external consultant, to discuss all the decisions made in this research. Finally, the quotes deemed representative of the data set that were included in the findings were translated to English with the help of the third author, as all the interviews and focus groups were conducted in Portuguese.

Results

The results derived from data analysis fall into three main themes: (a) before the PYD-focused intervention, (b) during the PYD-focused intervention, and (c) after the PYD-focused intervention. This section explores each theme and describes the participant's teaching philosophy, PYD outcomes, PYD strategies, challenges experienced while facilitating PYD, and recommendations for future interventions. A pseudonym was given to the PE teacher (i.e., Nuno) and his students to present their stories.

Before the PYD-Focused Intervention

Teaching philosophy. Prior to the Project SCORE! intervention, Nuno alluded to the fact that PYD was a piece of his teaching and coaching philosophy. However, PYD was more explicitly embedded in his coaching philosophy: "I had a lot of positive influences as a coach. I was motivated to consider youth's development as an holistic approach that encompasses technical, tactical, physical, and psychological outcomes. PYD has been a big part of my coaching approach" (Interview 1). Moving forward, Nuno started to focus on a PYD mandate through PE and changed his teaching philosophy from teacher centered to youth centered:

> When I started to pay attention to how teaching styles influenced students, I took some of my coaching principles to PE classes. Previously I was very autocratic and did not share decisions with students. Nowadays, I share decisions with them and I feel students have fun and feel comfortable to speak with me. (Interview 1)

On this notion, Nuno also added,

> I shaped by teaching philosophy through coaching, reflection, and practice. We have more kids now that are completely alone in life than a few years back. I had to create this idea in PE of 'you do not need to be the best athlete in the world, but you have to be a good person'" (Interview 1).

Nevertheless, Nuno presented a narrow vision of PYD and considered PYD a by-product of an unintentional approach to teaching PE: "When I hear you speaking about PYD, I think it is to provide them with more tools for their lives. I'm concerned about this, but this has always been something that just happens" (Interview 1).

PYD outcomes and strategies. A set of PYD outcomes coherent with the 4 *C*s framework was facilitated through PE. Confidence was prioritized throughout all the PE sessions at preintervention: "Taking advantage of the contents associated to gymnastics, today I tried to develop students' confidence in each motor task. I also let two students plan the warm-up" (Reflexive Journal, Lesson 1). Nuno also added in his initial interview, "I try to help them overcome challenges with confidence when they do not believe in themselves and focus on every accomplishment." Few PYD strategies were used to foster confidence, as positive feedback was the main strategy implemented: "I try to help them work on confidence and tell them 'you are capable!' I always try to give them a positive feedback, from little things to more complex skills" (Interview 1). Additionally, Nuno presented a narrow understanding of confidence: "Confidence is to challenge them to become better. I usually tell them 'if you work, you can attain results'" (Interview 1). These applications were observed in PE classes and Nuno did not set clear expectations regarding confidence and occasionally provided opportunities for students to have choices and voices: "In today's session, Nuno focused on reinforcing positive attitudes and behaviors saying 'well done! You can do it!'

However, there were no PYD objectives set at the beginning of the session and few opportunities for students to have choices" (Field Notes, Lesson 3).

Throughout the initial interview, nonparticipant observations, and reflexive journaling, it was clear that Nuno also prioritized character, specifically respect for others: "Respect is a big thing with me. Sometimes high skilled students do not respect others that struggle. I try to provide activities in which everyone can succeed and respect each other" (Interview 1).

In his reflections, Nuno added, "I gave them freedom . . . some students took this opportunity to be off task and/or [show] challenging behaviors. Other students fulfilled the tasks given" (Lesson 2). These applications were confirmed through the observations. However, Nuno used a deficit-based approach to solve challenging behaviors presented by students: "Nuno focused on rules, but does not set clear expectations for students and/or PYD objectives. Rules are created and remembered as students show challenging behaviors" (Field Notes, Lesson 2). Regarding competence, Nuno focused on students' needs and attempted to provide developmentally appropriate learning situations: "I try to create groups that implicitly foster teamwork and inclusiveness. This is something I have been doing more recently. I mix high skilled students with less skilled ones so everyone can succeed" (Interview 1). These applications were corroborated by nonparticipant observations.

Challenges and recommendations. During preintervention, Nuno used an unintentional approach toward PYD: "I use common sense. I do not use an intentionally designed plan. I just decide on the spot what should be developed and how" and "I would like to become capable of promote behaviors instead of eliminating them. This is my concern and huge challenge now" (Interview 1). The lesson plans included in his reflexive journal showed an intentional focus on PYD. Additionally, Nuno reported struggling to foster connections among students: "The biggest challenge I have is to promote connections. They are more and more connected with cell phones, but less and less with people" (Interview 1). Throughout preintervention, This application was confirmed through observations: "Nuno is having a hard time managing this activity as students' are all speaking at the same time and negotiation is providing to be a difficult endeavor"

(Field Notes, Lesson 2). On this notion, Nuno mentioned the need to use an intentional approach toward PYD moving forward and recognized that an online tool could prove useful:

> I need a plan to foster PYD. If I do this, the probability of not doing something critical for my students' decreases. I do not use any program and/or tool, but I'm open to it. I would be very open to an online tool that makes it easier to learn how to foster PYD systematically. (Interview 1)

During the PYD-Focused Intervention

Teaching philosophy. Nuno in one of his reflections recognized his teaching philosophy changed throughout the PYD-focused intervention: "All the knowledge I had about SCORE strategies helped me to predict some of my actions and above all act in a impactful and meaningful way towards students" (Reflexive Journal, Lesson 6) and "This was the first time I had the chance to prepare the contents I was exposed to in the SCORE workshop. My intervention was designed to stress the need for these values [4*C*s]" (Reflexive Journal, Lesson 5). Although Nuno started to prioritize an intentional approach toward PYD, some components of his current teaching philosophy still needed to be refined: "There is an autonomy climate, although there is still the need to further foster PYD. . . .[helping] students through questioning and supporting [them]" (Field Notes, Lesson 7).

PYD outcomes and strategies. At this stage, there was a focus on confidence. Nuno provided students with choices and voices more consistently than before the PYD-focused intervention. In his reflexive journal, Nuno stated,

> Students were supposed to work autonomously based on my proposals [documents I gave them], on the opinions of the members of the group and techniques I had worked with them . . . Today, at the end I focused on all the aspects I had [developed in] class. (Lesson 4)

During the first focus group interview, students were prompted to comment on this situation, and Maria mentioned, "I felt better when I had the chance to choose. Before, that did not happen so often. It

is more fun like this as professor Nuno is more open to us and our thoughts and feelings." These applications were confirmed through observations: "Nuno is assigning roles and tasks for a set of students. This happened in the warm-up, during the activities and at the end of the session. It is an autonomous-based climate that generates fun and enjoyment" (Field Notes, Lesson 4). During the PYD-focused intervention, Nuno also focused on character by taking advantage of teachable moments and promoting awareness about desired behaviors and PYD objectives:

> In today's PE class, there was a physical altercation between students. I spoke with them about the need to respect others for everyone to feel welcome in class. At the end of the session, I reflected with students about their behaviors today and about what needs to improve moving forward in and outside PE. (Field Notes, Lesson 6)

During the first focus group interview, Antonio mentioned, "We have become better at respecting rules and apologizing. We feel professor Nuno helps us and gives us support to improve our behaviors. Before, we just did not paid attention." These applications were confirmed through observations. Regarding connections, in one of his reflections, Nuno attempted to focus on some of the SCORE plays provided in the PYD-focused intervention:

> My involvement in Project SCORE allowed me to carefully prepare the lesson and be more concrete in my intervention . . . [I focused on] Connections and had students working in pairs in order to take full advantage of [the value of] having them work together. (Reflexive Journal, Lesson 7)

During the first initial focus group, two students added, "I feel more connected to everyone here. Before they were all fighting and had more problems" (João) and "I feel we work better with others than before. Before they just started a fight for no reason" (Joana). These applications were confirmed through observations: "Students are engaging with each other in a fun climate as the need to work with each other and Nuno's guidance helps them have positive relationships in PE" (Field Notes, Lesson 6).

Challenges and recommendations. Throughout the PYD-focused intervention, Nuno identified a few challenges. First, Nuno mentioned the need to have more time to integrate PYD objectives with the remaining curricular objectives: "Considering there was an evaluation moment coming soon and students' age and characteristics, this lesson enabled me to partially develop an autonomy [climate]" (Field Notes, Lesson 5). Second, Nuno indicated the need to spend more time planning PE sessions and creating materials than in his other teaching duties: "I'm pressured by the fact the end of the school year is getting close and because evaluation moments are coming soon . . ." (Reflexive Journal, Lesson 6).

After the PYD-Focused Intervention

Teaching philosophy. After the PYD-focused intervention, Nuno viewed PYD as a broad, intentional, and asset-based approach: "PYD implies you to have a perspective that students can learn character, respect, and so on. It is an intentionally designed approach and not just something occasional" (Interview 2). Nuno also added, "My students felt special with my teaching approach. I had less skilled athletes come out of their shell and flourish" (Interview 2). In his reflexive journal, Nuno acknowledged that an intentional approach may generate more PYD outcomes: "Project SCORE! enabled me to integrate each of the 4*C*s while I was planning and reflecting on tasks for students, and facilitated my intervention in this domain" (Lesson 8).

PYD outcomes and strategies. Throughout the PYD-focused intervention, Nuno used the same strategies and recommended SCORE plays implemented during the intervention phase to foster the 4*C*s: "Similarly to the last sessions, Nuno provided moments for decision-making . . . [and] there was an autonomy-based climate despite the focus on evaluation-related tasks" (Field Notes, Lesson 8). In the second focus group interview, two students mentioned, "We have gotten more chances to work on the skills we have discussed and I have improved because of that" (André) and "I have been able to work alone and become more responsible without constant supervision from professor Nuno. As I been able to work on this regularly" (João). These applications were confirmed through the observations.

Challenges and recommendations. Several challenges were recognized at postintervention. Developing a PYD mandate was con-

sidered time consuming and demanding for any PE teacher: "It was complicated to manage time, travelling back home for more than two hours, attending the workshops, and being a parent. It is hard!" (Interview 2). However, Nuno gave the utmost importance to the Project SCORE! workshops and the reflections with the research team to becoming a better PYD-focused PE teacher: "This was great and what I was looking for. I was anxious to learn more and that was what happened" (Interview 2). On the other hand, Nuno struggled to implement the parents' piece in Project SCORE! as few parents showed any interest: "Only two [parents] wanted to know more and tried to understand how things [SCORE implementation] were going, just two. For the others . . . it was not important, it was just more information" (Interview 2). Finally, a 'reflexive area' could be incorporated in Project SCORE!: "One suggestion that would be important is to include an area where students could log in and create a diary between teachers, students and parents" (Interview 2).

Discussion

The purpose of this case study was to analyze the influence of a PYD-focused intervention based on Project SCORE! on a PE teacher's and his students' PYD behaviors. This study provides insight on how a PYD-focused teacher education based on Project SCORE! may enhance a PE teacher's ability to foster PYD and students' outcomes. Hence, teacher education has proved to be an important context that might influence teachers' behaviors and increase students' positive outcomes (Pill, Penney, & Swabey, 2012; Woods & Conderman, 2006). Several studies (e.g., Curtner-Smith, 1999; Escartí, Gutiérrez, Pascual, & Wright, 2013) have attempted to understand the effect of teacher education on PE teachers and have paid attention to how PYD-focused teacher education programs could be designed and delivered to increase the outcomes and experiences within PE settings. As such, the present study corroborates the idea that if PYD is to become a tangible reality in PE, it is necessary to develop PYD-focused teacher education programs that encompass formal and informal learning sources that provide solid grounds for PE teachers to integrate an intentional approach toward PYD.

In this study, Nuno was motivated to foster PYD and prioritized this approach in his teaching philosophy. It was possible to understand how this PYD-focused teacher education program provided

him with a more accurate understanding of teaching for PYD outcomes. Before the PYD-focused intervention, the participant had a narrow vision of PYD that led him to implement an unintentional approach toward PYD focused on creating a PYD climate. Research has suggested the need for a clear definition of PYD within teacher education and coach education programs for the facilitation of learning and avoidance of misconceptions that might lead to an unintentional approach to PYD (e.g., Woods & Conderman, 2006). Project SCORE! may only be used to its full potential as an autonomous learning tool if PE teachers understand what is means to teach for PYD and foster the 4 *C*s (Strachan et al., 2016). Otherwise, PE teachers might not be able to foster PYD. This autonomous learning tool proved useful in helping this PE teacher adapt the 4 *C*s framework to his teaching practice (i.e., principles, recommended SCORE plays, and objectives). Future research could focus on understanding how a less motivated PE teacher would benefit from a similar PYD-focused teacher education program. An analysis of the challenges experienced by such a PE teacher would offer insight and add into this line of inquiry.

Project SCORE! facilitated a transition between an unintentional approach toward PYD to an intentional one that generated more students' PYD outcomes. The 4 *C*s framework entails a systematic and intentional focus on particular setting features that might provide positive experiences and skills for youth to strive in school and other life domains (Geldhof et al., 2014). The PYD strategies shared with the participant were continuously implemented throughout the PYD-focused teacher education program and the 4 *C*s embedded in his teaching practice. Research has supported this notion and claimed that a deliberate PYD focus might generate more PYD outcomes (Goudas, Dermitzaki, Leondari, & Danish, 2006; Hellison, 2011). Theory-driven models (Holt et al., 2017; Pierce, Gould, & Camiré, 2017) have stated that an intentional approach to PYD should guide PE teachers and coaches, which could increase youth's chances of attaining PYD outcomes. Nuno was able to bridge the gap between his teaching philosophy and practice and become more deliberate while defining PYD objectives and strategies. Additionally, Bean, Kramers, Forneris and Camiré (2018) proposed an implicit/explicit continuum of life skills development and transfer, mentioned that

PE teachers might progress from an implicit to an explicit approach, and highlighted this process should be viewed as a dynamic process. Within this approach, PE teachers could benefit more from certain learning sources (e.g., interactive workshops, Project SCORE!) at different stages of this continuum. The present study showcased how a PE teacher with a sound PYD philosophy was able to take advantage of Project SCORE! Future research could analyze which learning sources can prove useful with PE teachers who use an implicit and explicit approach to PYD.

After the PYD-focused intervention, Nuno and his students maintained the same PYD behaviors as during the intervention. However, some strategies were refined and further developed through reflection. In fact, PE teachers should be trained to become increasingly more autonomous and search for formal and informal sources of learning. Project SCORE! and the PYD-focused intervention enabled Nuno to reflect and integrate a set of PYD activities and strategies in his teaching practice instead of attempting to completely change his philosophy and practices, which would have taken more time and, in this case, could have less effective. Teacher education programs could, in certain cases, based on this PE teacher's lived experiences, reflect on developing a pedagogical approach that prioritizes reflection and values teachers' strengths and practices coherent with a PYD approach to create an environment that facilitates behavioral change. Several researchers have alluded to the need of embedding reflection within teacher education programs (e.g., Boutet et al., 2017). Hence, it is necessary to implement a pedagogical approach that focuses on reflection (Alexandrache, 2014) and considers PE teachers' views, opinions, and practices (Cunliffe, 2004). Future research could further develop PYD-focused interventions and attempt to understand the lived experiences of teachers, course facilitators, and students to understand the effect of course design and delivery on specific PYD outcomes.

Nuno recognized several strengths of and also made suggestions to improve future PYD-focused interventions centered on Project SCORE! Nuno acknowledged that the online component facilitated his participation in this intervention, despite considering the lack of time as the more prominent challenge. PE teachers, who also coach, have many demands and obligations and might not be able to have

time to devote to more traditional in-person PYD-focused interventions. However, an online component might have limitations and not provide the knowledge base needed for PE teachers to use an autonomous learning tool such as Project SCORE! More evidence-based PYD-focused teacher education programs that consider using hybrid formats that combine an online and in-person component are needed for an increase in exposure to PYD material over time (Project SCORE!, 2018). Additionally, creating the necessary conditions for PE teachers to use autonomous learning tools might be useful as it could provide solid grounds for sustainable PYD behaviors, which has been corroborated by research in the field (Coakley, 2016; Strachan et al., 2016). The reflexive approach used in this PYD-focused intervention was meaningful to Nuno, who felt the need for a "reflection area" within Project SCORE! where he could share and reflect with other experts in this field and other PE teachers. Future studies could understand how PE teachers, coaches, or other stakeholders develop reflection skills and sustainable PYD behaviors through Project SCORE! A longitudinal design that involves monitoring PE teachers' and students' PYD behaviors over several school years could help fulfill this premise and further understanding on the effect of Project SCORE! Finally, the parents section in Project SCORE! was explored unsuccessfully by Nuno, as parents were not motivated to use this application. Future research could understand parents' perceptions on implementing the parents section in Project SCORE!

Although Project SCORE! has been mainly designed for youth sport coaches and parents, this case provided a novel insight on how a PE teacher with extensive coaching experience was able to adapt these guidelines to PE, specifically how it influenced his philosophy and practice and his students' PYD behaviors. Future studies should build on this first initiative and further implement Project SCORE! in various settings such as underserved communities. Project SCORE! can empower these stakeholders (e.g., parents, PE teachers) for their own learning and reflection process and provide solid grounds for positive skill building.

Conclusion

This study focused on the unique outlook of a PE teacher and his students while adapting Project SCORE! to fit the objectives and

demands of a PE setting. PYD-focused teacher education programs could use hybrid models that include an interactive in-person component and an online component (i.e., autonomous learning tool). This study enabled an in-depth understanding about how online tools may help PE teachers who are motivated to foster PYD become more effective and generate PYD outcomes. Transitioning from an unintentional approach to an intentional approach to PYD was key, in this case, to enable a more systematic use and application of the activities and strategies included in Project SCORE! This study adds insight on how PYD may be embedded in teacher education programs and how it can be used by course facilitators.

References

Alexandrache, C. (2014). Journal reflexive, an instrument for student preparation in the teaching profession. *Procedia - Social and Behavioral Sciences, 149,* 20–24. https://doi.org/10.1016/j.sbspro.2014.08.172

Bean, C., Kramers, S., Forneris, T., & Camiré, M. (2018). The implicit/explicit continuum of life skills development and transfer. *Quest*, *70*, 456–470. https://doi.org/10.1080/00336297.2018.1451348

Blanco, P., Delgado-Noguera, M., & Escartí-Carbonell, A. (2013). Analysis of teaching personal and social responsibility model-based programmes applied in USA and Spain. *Journal of Human Sport & Exercise, 8*, 427–441. https://doi.org/10.4100/jhse.2012.82.10

Boutet, I., Vandette, M.-P., & Valiquette-Tessier, S.-C. (2017). Evaluating the implementation and effectiveness of reflection writing. *Canadian Journal for the Scholarship of Teaching and Learning, 8*(1), 1–16. https://doi.org/10.5206/cjsotl-rcacea.2017.1.8

Camiré, M., Rocchi, M., & Kendellen, K. (2017). A comparative analysis of physical education and non-physical education teachers who coach high school sport teams. *International Journal of Sports Science & Coaching*, *12*, 557–564. https://doi.org/10.1177/1747954117727629

Chinkov, A., & Holt, N. (2015). Implicit transfer of life skills through participation in Brazilian jiu-jitsu. *Journal of Applied Sport Psychology, 28*(2), 1–15. https://doi.org/10.1080/10413200.2015.1086447

Coakley, J. (2016). Positive youth development through sport: Myths, beliefs, and realities. In N. Holt (Ed.), *Positive youth development through sport* (2nd ed., pp. 21–33). New York, NY: Routledge. https://doi.org/10.4324/9781315709499-3

Côté, J., Turnnidge, J., & Evans, B. (2014). The dynamic process of development through sport. *Kinesiologia Slovenica, 20*(3), 14–26.

Cunliffe, A. (2004). On becoming a critically reflexive practitioner. *Journal of Management Education, 28*(4), 407–426. https://doi.org/10.1177/1052562904264440

Curtner-Smith, M. D. (1999). The more things change the more they stay the same: Factors influencing teachers' interpretations and delivery of national curriculum physical education. *Sport, Education, and Society, 4*(1), 75–97. https://doi.org/10.1080/1357332990040106

Damon, W. (2004). What is positive youth development? *Annals of the American Academy, 591*, 13–24.

Erickson, K., & Côté, J. (2016). A season-long examination of the intervention tone of coach–athlete interactions and athlete development in youth sport. *Psychology of Sport and Exercise*, *22*, 264–272. https://doi.org/10.1016/j.psychsport.2015.08.006

Escartí, A., Gutiérrez, M., Pascual, C., & Wright, P. (2013). Observation of the strategies that physical education teachers use to teach personal and social responsibility. *Revista de Psicologia del Deporte, 22*(1), 159–166.

Falcão, W., Bloom, G., & Gilbert, W. (2012). Coaches' perceptions of a coach training program designed to promote youth developmental outcomes. *Journal of Applied Sport Psychology*, *24*, 429–444.

Fraser-Thomas, J., Côté, J., & Deakin, J. (2005). Youth sport programs: An avenue to foster positive youth development. *Physical Education and Sport Pedagogy, 10*(1), 19–40. https://doi.org/10.1080/1740898042000334890

Geldhof, J., Bowers, E., Mueller, M., Napolitano, C., Callina, K., & Lerner, R. (2014). Longitudinal analysis of a very short measure of positive youth development. *Journal of Youth Adolescence, 43*, 933–949. https://doi.org/10.1007/s10964-014-0093-z

Goudas, M., Dermitzaki, I., Leondari, A., & Danish, S. (2006). The effectiveness of teaching a life skills program in a physical education context. *European Journal of Psychology of Education, 21*, 429–438. https://doi.org/10.1007/bf03173512

Hellison, D. (2011). *Teaching personal and social responsability through physical activity* (3rd ed.). Champaign, IL: Human Kinetics.
Hemphill, M. (2014). Positive youth development through physical activity: Opportunities for physical educators. *Strategies, 27*(4), 39–41. https://doi.org/10.1080/08924562.2014.918460
Holt, N. (2016). *Positive youth development through sport* (2nd ed.). London, United Kingdom: Routledge.
Holt, N., Neely, K., Slater, L., Camiré, M., Côté, J., Fraser-Thomas, J., . . . Tamminen, K. (2017). A grounded theory of positive youth development through sport based on results from a qualitative meta-study. *International Review of Sport and Exercise Psychology, 10*(1), 1–49. https://doi.org/10.1080/1750984x.2016.1180704
Keegan, R., Schinke, R., Chirban, S., Durand-Bush, N., & Cotterill, S. (2017). Guidelines for writing applied case studies in sport and exercise psychology. *Revista de Psicologia del Deporte, 26*(3), 85–90.
Lerner, R., Almerigi, J., Theokas, C., & Lerner, J. (2005). Positive youth development: A view of the issues. *The Journal of Early Adolescence, 25*(1), 10–16. https://doi.org/10.1177/0272431604273211
Lerner, R., Wang, J., Chase, P., Gutierrez, A., Harris, E., Rubin, R., & Yalin, C. (2014). Using relational developmental systems theory to link program goals, activities, and outcomes: The sample case of the 4-H study of positive youth development. *New Directions for Youth Development, 2014*(144), 17–30. https://doi.org/10.1002/yd.20110
Lyle, J. (2003). Stimulated recall: A report on its use in naturalistic research. *British Educational Research Journal, 29*(6), 861–878. https://doi.org/10.1080/0141192032000137349
MacDonald, D. J., Côté, J., & Deakin, J. (2010). The impact of informal coach training on the personal development of youth sport athletes. *International Journal of Sports Science & Coaching, 5*, 363–372. https://doi.org/10.1260/1747-9541.5.3.363
MacDonald, D. J., & McIsaac, T. (2016). Quantitative assessment of positive youth development in sport. In N. Holt (Ed.), *Positive youth development through sport* (pp. 83–96). London, United Kingdom: Routledge. https://doi.org/10.4324/9781315709499-8
Malete, L., & Feltz, D. (2000). The effect of a coaching education program on coaching efficacy. *The Sport Psychologist, 14*, 410–417. https://doi.org/10.1123/tsp.14.4.410

Newton, X., Poon, R., Nunes, N., & Stone, E. (2013). Research on teacher education programs: Logic model approach. *Evaluation and Program Planning, 36*, 88–96. https://doi.org/10.1016/j.evalprogplan.2012.08.001

Pierce, S., Gould, D., & Camiré, M. (2017). Definition and model of life skills transfer. *International Review of Sport & Exercise Psychology, 10*(1), 186–211. https://doi.org/10.1080/1750984X.2016.1199727

Pill, S., Penney, D., & Swabey, K. (2012). Rethinking sport teaching in physical education: A case study of research based innovation in teacher education. *Australian Journal of Teacher Education, 37*(8), 118–138. https://doi.org/10.14221/ajte.2012v37n8.2

Project SCORE! (2018). About SCORE. Retrieved from http://www.ProjectSCORE.ca/about-score

Silverman, D. (2000). *Doing qualitative research: A practical handbook* Thousand Oaks, CA: Sage.

Smith, B., & McGannon, K. (2017). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology, 10*(1), 1–21. https://doi.org/10.1080/1750984x.2017.1317357

Sparkes, A., & Smith, B. (2009). Judging the quality of qualitative inquiry: Criteriology and relativism in action. *Psychology of Sport and Exercise, 10*, 491–497. https://doi.org/10.1016/j.psychsport.2009.02.006

Sparkes, A., & Smith, B. (2016). *Qualitative research methods in sport, exercise, and health: From process to product*. New York, NY: Routledge.

Strachan, L., MacDonald, J., & Côté, J. (2016). Project SCORE!: Coaches' perceptions of an online tool to promote positive youth development in sport. *International Journal of Sports Science and Coaching, 11*, 108–115. https://doi.org/10.1177/1747954115624827

Turnnidge, J., Côté, J., & Hancock, D. J. (2014). Positive youth development from sport to life: Explicit or implicit transfer? *Quest*, *66*, 203–217. https://doi.org/10.1080/00336297.2013.867275

Vella, S., Crowe, T., & Oades, L. (2013). Increasing the effectiveness of formal coach education: Evidence of a parallel process. *International Journal of Sports Science & Coaching, 8*, 417–430. https://doi.org/10.1260/1747-9541.8.2.417

Vierimaa, M., Erickson, K., Côté, J., & Gilbert, W. (2012). Positive youth development: A measurement framework for sport. *International Journal of Sports Science & Coaching, 7*(3), 601–614. https://doi.org/10.1260/1747-9541.7.3.601

Wilson, L., Bloom, G., & Harvey, W. (2010). Sources of knowledge acquisition: Perspectives of the high school teacher/coach. *Physical Education and Sport Pedagogy, 15*, 383–399. https://doi.org/10.1080/17408980903273154

Winchester, G., Culver, D., & Camiré, M. (2013). Understanding how Ontario high school teacher-coaches learn to coach. *Physical Education and Sport Pedagogy, 18*, 412–426. https://doi.org/10.1080/17408989.2012.690376

Woods, C. S., & Conderman, G. (2006). Teacher education and positive youth development. *International Journal of Learning, 13*(3), 2–6.

Yin, R. (2011). *Applications of case study research* (3rd ed.). London, United Kingdom: Sage.

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SPORT EDUCATION

Adolescent Sports Participation and Parent Perceptions of Resilience: A Comparative Study

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Abstract

Adolescents encounter a variety of challenges and risk factors that can result in adversity or unsafe behaviors often associated with mental health problems. However, the attribute of resilience can potentially buffer the effects of such risk factors. Sports participation, a form of activity available to a large number of adolescents through school and community programs, may foster resilience. This study compared the resilience levels of adolescents who participated in sports (n = 214) with the resilience levels of peers not participating in sports (n = 62), as reported by parents. Structural equation modeling was used to answer the research questions. Adolescents who participated in youth sports had significantly higher levels of parent-reported resilience (self-regulation/responsibility, social competence, and empathy) than adolescents who did not participate. High school sports predicted higher self-regulation/responsibility, while sports sponsored by recreation facilities predicted greater empathy and social competence. Finally, results demonstrated

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a positive relationship between the number of sports played and increased resilience scores. Implications and limitations of this study are included.

Adolescents encounter a variety of challenges and risk factors that can result in high stress or unsafe behaviors (Masten, 2001; Patel, Flisher, Hetrick, & McGorry, 2007). For example, Kann et al. (2016) reported that during the 30 days prior to the survey, 32.8% of high school students nationwide reported that they had consumed alcohol, 21.7% had used marijuana, and 10.8% had smoked cigarettes, and 7.3% had used smokeless tobacco. These students also reported that in the year preceding the survey, 22.6% had been in a physical fight, 20.2% had been bullied on school property, and 8.6% had attempted suicide. Each year approximately 20% of adolescents experience a mental health disorder, the most common being depression and anxiety (World Health Organization, 2012). Adolescence is the developmental period when most mental health disorders that persist into adulthood are first detected (Patel et al., 2007). Clearly adolescents are surrounded by a number of risk factors and may engage in dangerous behaviors negatively affecting their health. In addition to depression, drug/alcohol use, and victimization, research has highlighted the following risk factors in many adolescents' lives: poverty, divorce, minority status, and early sexual activity (Bryan, Schmiege, & Magnan, 2012; Kann et al., 2016).

Risk factors of adolescence coincide with challenges associated with the transition into secondary school. Such transitions are often disruptive and full of complex social issues (Newman, Lohman, Newman, Myers, & Smith, 2000). Knowles, Niven, and Fawkner (2011) noted that the challenges include shifts toward larger class sizes, unfamiliar peer groups, and decreased physical activity levels—changes that can have negative effects on self-esteem, confidence, and perceptions of competence. Witherspoon and Ennett (2011) described the transition to secondary schools as associated with multiple negative outcomes, including statistically significant changes occurring in the following areas: decreased school belonging, decreased participation in activities, diminished aspirations for postsecondary education, and increased school behavior problems. Newman et al. (2000) provided a similar list of negative outcomes occurring with the transition from junior to high school, includ-

ing decreased attendance, declining GPA, increased disciplinary problems, and decreased participation in extracurricular activities. Developmental challenges can cause frustration and anxiety in adolescents, including rapid physical, intellectual, and social changes that come at different rates and times (Young, Caldarella, Richardson, & Young, 2011), combined with the changing social expectations and educational contexts mentioned.

Considering the various risk factors and particular developmental challenges associated with adolescence and secondary school, research in the area of resilience is particularly salient for its potential to offer insight into why some adolescents are able and others unable to meet challenging circumstances. Additionally, research in this area may help educators better understand how to enhance students' resilience. Masten, Best, and Garmezy (1990) defined resilience as "the capacity, processes, or outcomes of successful adaptation in the context of significant threats to function or development" (p. 426). Rutter (2012) similarly defined resilience as "the overcoming of a stress or adversity, or a relatively good outcome despite risk experiences" (p. 336). With enhanced resilience, choice-based risk factors, such as drug use and early sexual activity, might be avoided, and resistance to the risk factors beyond individual control, such as parent divorce and socioeconomic status, might be increased. Because resilience is a complex phenomenon, a closer examination of its associated protective factors is helpful. Alvord and Grados (2005) observed the multivariate nature of resilience, determining that it involves multiple skills that increase an individual's ability to cope, not a single attribute. They narrowed the protective factors associated with resilience to six areas: (1) proactive orientation; (2) self-regulation; (3) proactive parenting; (4) connections and attachments; (5) school achievement, involvement, and special talents; and (6) community. Awareness of these protective factors provides a context for the examination of interventions with the potential to enhance resilience.

Masten (2001) stated that resilience is a common or ordinary phenomenon arising from normal human adaptive processes. Some have noted that youth develop resilience best by observing the behavior of resilient role models such as peers or adults (Aguilar-Vafaie, Roshani, Hassanabadi, Masoudian, & Afruz, 2011). This suggests that most adolescents have the capacity for resilience if they can be

provided assets and environments that help enhance it. Accordingly, interventions can be designed to help enhance adolescent resilience as well as reduce risks and stressors. Noting that this view provides an optimistic outlook for action, Masten called on researchers to further examine how adaptive systems develop and how these systems can work for or against those served. Similarly, Alvord and Grados (2005) called for further research to investigate resilience-based interventions created to benefit youth and to investigate measures to monitor progress in the field. Cohu (2006) also stated, "It is highly recommended that educational leaders intensively examine the benefits of promoting resilience. Programs that promote resilience must be implemented as the nation faces more at-risk students" (p. 72). Researchers have increasingly designed and implemented programs to increase resilience among those at risk (e.g., Alvord & Grados, 2005), but an area that remains somewhat unexplored is the effect of sports participation on adolescent resilience.

It is well known that regular participation in sports and other athletic activities positively affects the physical health of participants, contributing to optimal weight, healthy blood pressure, and cardiovascular health. Additionally, adolescent sports participation has been found to be associated with psychological health and prosocial behavior, as well as an increased likelihood of college attendance (e.g., see Peck, Roeser, Zarrett, & Eccles, 2008). Compared to those not participating in sports, adolescents who participate in sports report fewer mental health difficulties as well as fewer general health, eating, and dietary problems (Steiner, McQuivey, Pavelski, Pitts, & Kraemer, 2000).

While much research has examined the physical and psychological benefits of sports participation, relatively few studies have examined its relation to resilience. Thorpe and Ahmad (2015) described the use of parkour (also known as free running) among youth living in the Middle East, noting the value of the sport for enhancing resilience for coping with the frustrations, fears, anxieties, and pains of living in refugee camps. Hall (2011) interviewed 14 male adolescent sport participants in Australia, requesting that they share insights about ways in which they were personally affected by sports. All participants described the benefits of staying healthy and fit, and most described some form of resilience or psychological health, such

as feeling good and having increased confidence. Studies not limited to the adolescent age group also showed relationships to sports and increased resilience, although other contributing factors were involved. Martin, Byrd, Watts, and Dent (2015) found that resilience was moderately related to both sport engagement and life satisfaction in a U.S. study of wheelchair basketball athletes. Galli and Vealey (2008) interviewed 10 high-level adult athletes in the United States; documented the process of resilience via sports participation; and noted that "a variety of factors worked together to form this process, including personal resources, sociocultural influences, and agitation created by a combination of unpleasant emotions and coping strategies" (p. 328). Cohu (2006) studied the effects of athletic participation on resilience among 155 college students in the United States, finding a significant positive correlation between college-age students' sports participation and resilience levels, and noting a need for more research, particularly focusing on adolescents.

Extending the limited but promising prior research that has investigated the relationship between sports participation and resilience, we focused on examining this relationship among high school students. This study examined resilience levels of adolescents who participated in sports compared to resilience levels of their peers who did not, focuing on the following research questions: (1) Are parent ratings of resilience higher for adolescents who participate in sports compared to adolescents who do not participate? (2) Does the strength of parent-rated resilience levels of adolescents differ for students on school-sponsored sports teams versus city/recreation sports teams? (3) Is there a positive correlation between the number of sports played by adolescents and their resilience levels as rated by parents?

Method

Setting and Participants

The research was conducted at an average-size high school in Utah with approximately 1,700 students, 35% of whom were of minority descent and 46% of whom were from low-income families (see Table 1). Of the 276 parents who participated, 13% described their children as being from minority backgrounds and 21% described their families as low income.

Table 1
School and Participant Demographics

Demographic information	School %	Participants %
Gender		
Female	48	52
Male	52	48
Ethnicity		
Caucasian/White	66	87
Hispanic	28	6
Pacific Islander	2	2
Asian	2	1
African American/Black	1	<1
American Indian	1	<1
Other/Mixed	-	3
Socioeconomic status		
Low income	46	21
Students by grade		
9th	27	36
10th	26	26
11th	25	21
12th	22	17

Procedures

Institutional review board and school district approval were obtained. The researchers contacted the parents via e-mail using the school's e-mail communication system, which included an online database of e-mail addresses for the students' parents. School administrators had identified this system as the most effective way to contact a high number of the parents. Following survey research recommendations of Gall, Gall, and Borg (2007), we distributed a precontact e-mail message requesting parents to participate in a study

being conducted by the researchers in conjunction with their children's high school, explicitly stating that this was completely voluntary and that information would remain anonymous and be stored on password-protected computers. Approximately one week later, we sent a follow-up e-mail, including an informed consent form. The e-mail communications and online surveys were available in Spanish as well as English, as Spanish was the primary language of many families. Parents who consented were directed to an online Qualtrics survey to enter information regarding their child. As an incentive to encourage participation, those who completed the survey were entered into a drawing for one of ten $50 Visa gift cards.

Measures

Two main types of parent survey information were gathered for this study: (a) basic demographic information including sports participation of the adolescent, reported on a brief five-item questionnaire, and (b) a nationally normed measure used to identify adolescents' resilient behavior. Parents reported their child's resilience data using the Social Emotional Assets and Resilience Scales (Merrell, 2011), parent long form (SEARS-P). The SEARS-P consists of 39 Likert-type items rated on a 4-point scale of *never*, *sometimes, often,* or *always*. It is completed by parents to estimate their child's resilience level, appropriate for assessment of students aged 5 to 18. This tool measures youth strengths, assets, and positive adaptive characteristics, including items regarding empathy, peer relationships, personal responsibility, problem-solving ability, self-control, and social competence. Combined, these items form three factors and a total score, identifying levels of resilience and areas of strengths and deficiencies within the resilience context. The SEARS-P was normed with 2,356 parents or guardians of children and adolescents aged 5 to 18 across multiple geographic regions of the United States. Merrell, Felver-Gant, and Tom (2011) provided various reliability and validity evidence for SEARS-P, including exploratory and confirmatory factor analyses. They provided evidence suggesting a three-factor structure (self-regulation/responsibility, social competence, and empathy), convergent validity with other established measures of similar constructs, and the ability of SEARS-P scores to differentiate between students with and without educational disabilities.

Design and Data Analysis

We used a causal-comparative survey design (Gall et al., 2007) to address the research questions. The two sets of data provided the variables analyzed in this study. The information from the demographics questionnaire, which included sports participation data, provided information for the main independent variables of interest. The data making up the SEARS-P resilience ratings provided the information we used to form the dependent variables.

To examine whether the factor structure of the SEARS-P resilience ratings reported in the test manual (Merrell, 2011) could be replicated in the current study and function as dependent variables, we carried out several psychometric analyses suggested by Worthington and Whittaker (2006). First, we completed an exploratory factor analysis (EFA) on approximately half of the data (randomly selected) to determine the number of the factors to extract. Instead of the traditional EFA approach, we ran a parallel analysis, since using the eigenvalues in a traditional EFA to decide how many factors to extract has been shown to be problematic (Warne & Larsen, 2014). Once our parallel analysis had established the number of factors to be extracted, we completed an EFA with the geomin oblique rotation. We employed the Worthington and Whittaker suggestions for retaining items: (a) all items with factor loadings less than .32 were deleted, (b) all items with cross-loadings less than a .15 difference from the item's highest factor loading were deleted, and (c) any factor with fewer than two items was deleted unless the items were highly correlated ($r > .7$). We completed a confirmatory factor analysis (CFA) on the remaining data, allowing the latent variables to freely covary and implementing the recommendations of Worthington and Whittaker. The SEARS-P data were treated as categorical using the weighted least squares estimator (ESTIMATOR=WLSMV in Mplus), as the items were ordinal. We reported the fit statistics and evaluated competing nested models with the chi-square difference test. Worthington and Whittaker also suggested the use of predictive fit indices (i.e., AIC and BIC) for comparison of models; unfortunately, these indices are not available when the weighted least squares estimator is used and thus could not be considered.

Once the SEARS-P instrument had been validated through the steps described, we ran several structural equation models (SEMs) to

answer the three research questions. For Question 1 the dichotomous sports variable was the independent variable of interest (1 = Student is in any sport, 0 = Student is not in any sport). With Question 2, two separate SEMs were run with two dichotomous variables: high school sports (1 = played in a high school sport, 0 = did not play in a high school sport) and recreational sports (1= played in a recreational sport, 0 = did not play in a recreational sport). Question 3 was also answered with separate SEMs, with the continuous variables of number of high school sports played and number of recreational sports played as the independent variables of interest. In all these SEMs, the independent variable of interest was regressed on the SEARS-P latent variables, which are simultaneously estimated in the SEM framework. Several demographics were included in the models as controls: student gender, student grade, and student age, along with whether the student received free or reduced-price lunch and/or had minority status (1 = is a member of a minority, 0 = is not a member of a minority). As in the EFA and CFA, the weighted least squares estimator (ESTIMATOR=WLSMV in Mplus) was used, as the items for the SEARS-P were treated as categorical. When the main independent variable of interest was categorical (Questions 1 and 2), Cohen's *d* was calculated for effect sizes; otherwise, standardized betas were calculated for effect sizes (Question 3). All the models (EFA, CFA, SEMs) were run in Mplus 7.4, and missing data were handled by the full information maximum likelihood (FIML) method for more trustworthy results than other methods, such as listwise deletion (Little & Rubin, 2014).

Results

This study examined three research questions regarding adolescent sports participation and resilience as reported by parents. Before addressing the research questions, we first examined the psychometric properties of the SEARS-P resilience scores. First, we ran a parallel analysis on approximately one half of the data (randomly selected n = 144) in Mplus 7.4 to determine how many factors to extract. The results showed that four of the latent variables would not occur by chance alone. It should be noted that the fourth factor was very close to the 95th percentile of chance factors produced by the parallel analysis and thus had a weaker signal than the preceding three. Second, we ran an EFA with four factors extracted using a geomax

oblique rotation, following the steps outlined in the Design and Data Analysis section for item retention. The correlation of the extracted factors averaged .24, a small but statistically significant ($p < .05$) result, showing that an oblique rotation was appropriate. An item was assigned to the factor with its highest factor loading. Items 11, 15, 21, 26, and 27 were eliminated for either having low factor loadings (< .32) or high cross-loadings (difference between cross-loadings < .15). Factor 4 had only Items 8 and 18 load onto it but had a correlation of .72, which exceeds the cutoff of .7. Nevertheless, after theoretical consideration, keeping in mind that Factor 4 had the weakest signal according to the parallel analysis, we decided to drop it and instead include Items 8 and 18 on Factor 2. The factors thus formed aligned very closely to the factors extracted in the SEARS-P manual (Merrell, 2011): Factor 1 self-regulation/responsibility, Factor 2 social competence, and Factor 3 empathy. Third, we ran a CFA on the remaining data ($n = 137$) in Mplus 7.4; Table 2 displays the results. The model produced reasonably good statistics on three of the four fit indices (RMSEA = 0.07, CFI = 0.93, TLI = 0.92, WRMR = 1.26) considering the cutoffs used in the literature (RMSEA < .08, Browne & Cudeck, 1993; CFI > .9 and TLI > .9, Wang & Wang, 2012; WRMR < 1.0, Yu, 2002). As there were only three factors, and allowing the three factors to simply correlate would be mathematically equivalent to having a superfactor, we decided to follow the decisions of the SEARS-P manual (Merrell, 2011) and allow all three factors to correlate rather than form a superfactor.

The first research question examined whether parent ratings of resilience were higher for adolescents who participated in sports compared to adolescents who did not. We conducted a SEM with the three SEARS-P factors as outcomes, whether a student played any sports as the main independent variable of interest, and the covariates discussed in the Method section. Results (Table 3) showed that adolescent sports participants received significantly higher self-regulation/responsibility ratings. Those who played any sport scored 0.47 points higher on the self-regulation/responsibility scale than those who did not play sports, which is a standard deviation increase (ES) of 0.48 (medium effect size) holding all the other covariates constant. Adolescent sports participants also scored significantly higher on the social competence and empathy factors than nonparticipants, with small to medium effect sizes.

Table 2
Factor Loadings From the Final Confirmatory Factor Analysis of the SEARS-P Items Conducted With Approximately Half of the Sample (n = 137, Randomly Selected)

Item	Standardized factor loading
Factor 1: Self-Regulation/Responsibility	
3. Stays calm when there is a problem or argument	0.70**
5. Works on chores and projects independently, without help	0.73**
10. Expresses disagreement with other people without fighting or arguing	0.70**
17. Is good at solving problems	0.75**
20. Makes good decisions	0.77**
23. Stays in control when he/she gets angry	0.67**
25. Thinks before she/he acts	0.62**
28. Is dependable, someone you can rely on	0.84**
29. Thinks of her/his problems in ways that help	0.81**
30. Accepts responsibility when she/he needs to	0.68**
31. Is able to handle problems on her/his own	0.88**
32. Knows how to calm down when stressed or upset	0.81**
33. Knows how to identify and change negative thoughts	0.87**
34. I trust her/him	0.77**
35. Can figure out whether or not negative thoughts are realistic	0.76**
36. Can identify errors in the way he/she thinks about things	0.75**
37. Knows how to set goals for what she/he wants in life	0.68**
38. Is able to handle problems that really bother other kids	0.82**
39. When life is hard, doesn't let things get to him/her	0.68**

Table 2 (cont.)

Item	Standardized factor loading
Factor 2: Social Competence	
7. Other people like to be with her/him	0.82**
8. Is comfortable talking to many different people	0.75**
9. Makes friends easily	0.79**
12. Other kids ask him/her to hang out with them	0.81**
13. People think she/he is fun to be with	0.93**
14. Is well-liked by other people	0.94**
18. Is good at starting conversations	0.83**
Factor 3: Empathy	
1. Feels sorry for other people when bad things happen to them	0.51**
2. Knows when people are upset, even when they say nothing	0.71**
4. Is good at understanding the point of view of other people	0.84**
6. Tries to help others when they need help	0.81**
16. Likes doing things for other people	0.85**
19. Understands how other people feel	0.86**
22. Gives compliments to others	0.72**
24. Cares what happens to other people	0.82**
Items eliminated during EFA (loadings < .32 or cross-loadings < .15)	
11. Is a good listener	
15. Friends come to her/him for help	
21. Is good at settling disagreements of other people	
26. Is comfortable being in large groups	
27. Other people see him/her as a leader	

Note. SEARS-P = Social Emotional Assets and Resilience Scales (Merrell, 2011), Parent Long Form.

**$p < .05$.

The second research question examined whether there was a difference in parent-reported resilience scores of adolescents who participated in high school sports versus non-high school (i.e., recreation or city league) sports within the last year. Two SEMs were conducted: one with high school sports as the independent variable of interest and one with recreational sports as the independent variable of interest. Both models were run with the additional covariates described in the Method section. Results showed that adolescents who participated in recreational sports had significantly higher social competence and empathy scores than those who played high school sports, as represented in Table 3. Self-regulation scores were not higher for adolescents who played high school sports or recreational sports compared to those who played no sports, although the *p* values were close.

The final research question examined the relationship between parent-reported resilience scores and the number of sports in which adolescents had participated over the past year. Two SEMs were conducted, one with the number of high school sports as the main independent variable of interest, the other with the number of recreational sports as the main independent variable of interest. Both models were run with the additional covariates described in the Method section. Table 3 shows the results. The number of recreational sports did not predict higher self-regulation scores, but the number of high school sports did. The beta for the number of high school sports means that for every additional high school sport played, the self-regulation score increased by .21 points. The associated effect size means that for every one standard deviation increase in the number of high school sports played, self-regulation scores increased by 0.17 standard deviations, a small effect. Conversely, both social competence and empathy were predicted by the number of recreational sports played (with small effect sizes) but not by the number of high school sports played.

Discussion

The purpose of this study was to contribute to the limited research regarding adolescent sports participation and resilience. The results of each of the three research questions are addressed below. First, adolescents who participated in youth sports had significantly higher levels of parent-reported self-regulation/responsibility, social

Table 3
Results From Separate Structural Equation Models Used With Approximately Half of the Sample (n = 144, Randomly Selected) Addressing Research Questions 1, 2, and 3

	Outcomes								
	Self-regulation			Social competence			Empathy		
Predictor	**B (SE)**	***p***	**ES**	**B (SE)**	***p***	**ES**	**B (SE)**	***p***	**ES**
Research Question 1									
Any sports	0.47 (0.19)	.008	0.48	0.60 (0.33)	.037	0.42	0.22 (0.14)	.050	0.37
Research Question 2									
High school sports	0.28 (0.17)	.053	0.29	0.26 (0.27)	.171	0.18	0.06 (0.11)	.288	0.10
Recreational sports	0.25 (0.17)	.068	0.26	0.51 (0.27)	.027	0.36	0.27 (0.12)	.009	0.45
Research Question 3									
Number of HS sports	0.21 (0.10)	.018	0.17	0.19 (0.16)	.122	0.11	0.05 (0.07)	.241	0.07
Number of rec sports	0.12 (0.09)	.090	0.11	0.25 (0.15)	.044	0.15	0.12 (0.06)	.026	0.18

Note. ES = effect size; HS = high school; Rec = recreational league. Control variables included (a) student gender, (b) student grade, (c) student age, (d) student receipt of free or reduced-price lunch, and (e) student minority status. All *p* values one-sided.

competence, and empathy than adolescents who did not. These results agree with the limited number of studies supporting participation in sports as associated with resilience (Cohu, 2006; Hall, 2011; Martin et al., 2015). Second, results indicated that only high school sports predicted self-regulation. However, for empathy and social competence, the only significant relationship was with recreational sports. Finally, results demonstrated a positive relationship between the number of high school sports played and increased self-regulation/responsibility, as well as between the number of recreational sports played and increased social competence and empathy. The potential resilience benefits gained by playing a higher number of sports could be related to differences between sports involving year-round participation, which would maintain consistent benefits, in contrast to seasonal sports, which are available for only a few months of the year.

Regarding the differences in effect between high school and recreational sports, Hurd and Anderson (2011) described recreational activities as those that individuals engage in during their free time, that they enjoy with less emphasis on winning or losing. They also noted that recreational activities have been used to contribute to society, produce desirable outcomes, and aid in youth development. Such goals may align better with the development of empathy and social competence than the more competitive goals of high school sports, which may focus on the development of skills related to self-regulation and individual responsibility (e.g., attending practice sessions consistently, controlling emotions, and following rules during competition). These findings warrant additional research to determine whether different types of sports participation foster unique types of resilience skills.

Implications

Findings of this study are meaningful not only in terms of their consistency with the limited data on resilience and sports participation (Cohu, 2006; Hall, 2011; Martin et al., 2015) but also in their support of an intervention accessible to a large number of adolescents. The list of protective factors associated with resilience defined by Alvord and Grados (2005), if taken in conjunction with the research provided by Masten (2001) suggesting that most individuals have the capacity for resilience if provided with the proper "assets"

and environments, support the conclusion that most adolescents could have access to protective factors under proper circumstances. By observing the various benefits offered by sports participation, one can understand the likelihood of sports contributing to many of the identified protective factors found by researchers and thus providing youth opportunities for developing resilience. Of particular note, year-round sports provide access to these benefits even during the summer months when youth would not have the benefits of participation in school.

The results suggest that the sports environment may be an important context for fostering youth resilience. Study results become even more important considering that many researchers have noted that adolescence is a critical time to develop, promote, and strengthen resilience, given the unique social, biological, and psychological changes that occur during this developmental stage (Masten, Obradovic, & Burt, 2006; Masten & Tellegen, 2012; Pargas, Brennan, Hammen, & Le Brocque, 2010). As noted by Barnes and Larcus (2015), "The mental toughness that is encouraged by participation in sport no doubt helps students with resilience building and translates into other challenges they face with academics, work, or in their personal lives" (p. 85). The results of this study suggest a broad offering of sports participation opportunities for adolescents. Some types of high school sports participation are limited to varsity teams, with limited access for the majority of students. Given the possibilities for enhanced resilience suggested by this research, as well as the benefits associated with sports participation suggested by previous research (Steiner et al., 2000), much broader school and community offerings through intramural and similar programs are warranted. Schools and communities should consider offering scholarships to adolescents whose low-income families do not have sufficient means to pay the expenses of sports participation (e.g., uniforms, equipment, registration, travel).

Limitations and Directions for Future Research

Despite the promising results of this study, some limitations should be considered. This study demonstrated correlational, not causal, relationships between sports participation and resilience. The sample size was limited to a single high school and participation was voluntary; thus, minority and low-income populations were un-

derrepresented. The response rate was lower than ideal, although it was fairly consistent with other online surveys (Carley-Baxter et al., 2009). Additionally, this study was confined to parent responses and did not include student perspectives. Future studies could attempt stronger research designs, such as randomized controlled studies to evaluate causal relationships, and include adolescent ratings of themselves in addition to ratings by others (i.e., parents, teachers, coaches). To include a broader population of adolescents, future research in this field could study more nationally representative samples. Recognizing the challenges facing specific ethnic and demographic groups, future research should examine sports participation within these groups. Finding how to engage such youth in sports may offer these adolescents coping strategies and the resilience to offset detrimental risk factors associated with maladaptive outcomes. Additionally, future research should investigate sports participation according to socioeconomic status, as poverty and associated risk factors greatly limit opportunities for youth to succeed.

References

Aguilar-Vafaie, M. E., Roshani, M., Hassanabadi, H., Masoudian, Z., & Afruz, G. A. (2011). Risk and protective factors for residential foster care adolescents. *Children and Youth Services Review, 33*(1), 1–15. https://doi.org/10.1016/j.childyouth.2010.08.005

Alvord, M. K., & Grados, J. J. (2005). Enhancing resilience in children: A proactive approach. *Professional Psychology: Research and Practice*, *36*, 238–245. https://doi.org/10.1037/0735-7028.36.3.238

Barnes, A. C., & Larcus, J. (2015). Positive psychology as a framework for leadership development in recreation and sport. *New Directions for Student Leadership, 147*, 77–87. https://doi.org/10.1002/yd.20145

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Bryan, A. D., Schmiege, S. J., & Magnan, R. E. (2012). Marijuana use and risky sexual behavior among high-risk adolescents: Trajectories, risk factors, and event-level relationships. *Developmental Psychology*, *48*, 1429–1442. https://doi.org/10.1037/a0027547

Carley-Baxter, L. R., Hill, C. A., Roe, D. J., Twiddy, S. E., Baxter, R. K., & Ruppenkamp, J. (2009) Does response rate matter? Journal editors use of survey quality measures in manuscript publication decisions. *Survey Practice, 2*(7), 1–7. https://doi.org/10.29115/sp-2009-0033

Cohu, E. (2006). *Participation in athletics and development of certain traits related to resiliency theory* (Unpublished doctoral dissertation). Union University, Jackson, TN.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Pearson.

Galli, N., & Vealey, R. S. (2008). "Bouncing back" from adversity: Athletes' experiences of resilience. *The Sport Psychologist, 22*, 316–335. https://doi.org/10.1123/tsp.22.3.316

Hall, N. (2011). "Give it everything you got": Resilience for young males through sport. *International Journal of Men's Health*, *10*(1), 65–81. https://doi.org/10.3149/jmh.1001.65

Hurd, A. R., & Anderson, D. M. (2011). *The park and recreation professional's handbook.* Champaign, IL: Human Kinetics.

Kann, L., McManus, T., Harris, W. A., Shanklin, S. L., Flint, K. H., Hawkins, J., . . . Zaza, S. (2016). Youth risk behavior surveillance–United States, 2015. *MMWR Surveillance Summaries, 65*(SS-6), 1–174. https://doi.org/10.15585/mmwr.ss6506a1

Knowles, A., Niven, A., & Fawkner, S. (2011). A qualitative examination of factors related to the decrease in physical activity behavior in adolescent girls during the transition from primary to secondary school. *Journal of Physical Activity & Health*, *8*, 1084–1091. https://doi.org/10.1123/jpah.8.8.1084

Little, R. J., & Rubin, D. B. (2014). *Statistical analysis with missing data*. New York, NY: John Wiley & Sons.

Martin, J. J., Byrd, B., Watts, M. L., & Dent, M. (2015). Gritty, hardy, and resilient: Predictors of sport engagement and life satisfaction in wheelchair basketball players. *Journal of Clinical Sport Psychology, 9*, 345–359. https://doi.org/10.1123/jcsp.2015-0015

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, *56*, 227–238. https://doi.org/10.1037//0003-066x.56.3.227

Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology*, *2*, 425–444. https://doi.org/10.1017/s0954579400005812

Masten, A. S., Obradovic, J., & Burt, K. B. (2006). Resilience in emerging adulthood: Developmental perspectives on continuity and transformation. In J. L. Tanner (Ed.), *Emerging adults in America: Coming of age in the 21st century* (pp. 173–190). Washington, DC: American Psychological Association. https://doi.org/10.1037/11381-007

Masten, A. S., & Tellegen, A. (2012). Resilience in developmental psychopathology: Contributions of the project competence longitudinal study. *Development and Psychopathology, 24*, 345–361. https://doi.org/10.1017/s095457941200003x

Merrell, K. W. (2011). *Social and Emotional Assets and Resilience Scales (SEARS)*. Lutz, FL: Psychological Assessment Resources.

Merrell, K. W., Felver-Gant, J. C., & Tom, K. M. (2011). Development and validation of a parent report measure for assessing social-emotional competencies of children and adolescents. *Journal of Child and Family Studies, 20*, 529–540. https://doi.org/10.1007/s10826-010-9425-0

Newman, B. M., Lohman, B. J., Newman, P. R., Myers, M. C., & Smith, V. L. (2000). Experiences of urban youth navigating the transition to ninth grade. *Youth & Society*, *31*, 387–416. https://doi.org/10.1177/0044118x00031004001

Pargas, R. C. M., Brennan, P. A., Hammen, C., & Le Brocque, R. (2010). Resilience to maternal depression in young adulthood. *Developmental Psychology, 46*, 805–814. https://doi.org/10.1037/a0019817

Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). The mental health of young people: A global public health challenge. *Lancet, 369*, 1302–1313. https://doi.org/10.1016/s0140-6736(07)60368-7

Peck, S. C., Roeser, R. W., Zarrett, N., & Eccles, J. S. (2008). Exploring the roles of extracurricular activity quantity and quality in the educational resilience of vulnerable adolescents: Variable- and pattern-centered approaches. *Journal of Social Issues*, *64*(1), 135–155. https://doi.org/10.1111/j.1540-4560.2008.00552.x

Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology*, *24*, 335–344. https://doi.org/10.1017/S0954579412000028

Steiner, H., McQuivey, R. W., Pavelski, R., Pitts, T., & Kraemer, H. (2000). Adolescents and sports: Risk or benefit? *Clinical Pediatrics*, *39*, 161–166. https://doi.org/10.1177/000992280003900304

Thorpe, H., & Ahmad, N. (2015). Youth, action sports, and political agency in the Middle East: Lessons from a grassroots parkour group in Gaza. *International Review for the Sociology of Sport, 50*, 678–704. https://doi.org/10.1177/1012690213490521

Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using Mplus.* West Sussex, United Kingdom: John Wiley.

Warne, R. T., & Larsen, R. (2014). Evaluating a proposed modification of the Guttman rule for determining the number of factors in an exploratory factor analysis. *Psychological Test and Assessment Modeling, 56*, 104–123.

Witherspoon, D., & Ennett, S. (2011). Stability and change in rural youths' educational outcomes through the middle and high school years. *Journal of Youth and Adolescence*, *40*(9), 1077–1090. https://doi.org/10.1007/s10964-010-9614-6

World Health Organization. (2012). *World health statistics 2012.* Retrieved from http://www.who.int/gho/publications/world_health_statistics/2012/en/

Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist, 34*, 806–838. https://doi.org/10.1177/0011000006288127

Young, E. L., Caldarella, P., Richardson, M. J., & Young, K. R. (2011). *Positive behavior support in secondary schools: A practical guide.* New York, NY: Guilford.

Yu, C. Y. (2002). *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes* (Unpublished doctoral dissertation). University of California, Los Angeles, CA.

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PEDAGOGY

A Case Study of the Rock Climbing Self-Efficacy of High School Students

Patrick Boudreau and Sandra Gibbons

Abstract

The popularity of rock climbing continues to increase. However, little research is available on the pedagogy of rock climbing. This study explored the effect of learning activities in a school-based rock climbing program on students' climbing self-efficacy. It used a case study design and data collection methods included (a) observations of the learning environment, (b) individual reflection journals, (c) focus group interviews, and (d) a course outline. Qualitative thematic analysis provided insight into (a) the type of learning environment conducive to improving climbing self-efficacy, (b) the influence of the sources of self-efficacy, and (c) the activities that were most efficient for the development of climbing self-efficacy. Findings indicate that effective learning activities should be meaningful, diversified, individualized, progressively challenging, and take place in a safe and collaborative environment.

Lifetime physical activities are less prominently featured in physical education curricula than team games (Fairclough, Stratton, & Baldwin, 2002). Nevertheless, they may be more effective than team games for promoting lifelong physical activity since they require only one or two people (Fairclough et al., 2002). The popularity of one of these lifelong physical activities, rock climbing, is continuously

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increasing. In 2012, a growth of over 25% was observed in the number of new rock climbers (The Outdoor Foundation, 2013). One explanation for this growth in participation may be related to the increase of indoor rock climbing facilities, which allow climbers to climb year-round and remove several risk factors (Woollings, McKay, & Emery, 2015). The inclusion of rock climbing activities within physical education curricula has been facilitated by the availability of today's rock climbing facilities. Rock climbing activities have been used in school curricula for a variety of physical (Lirgg, Di Brezzo, & Gray, 2006), cognitive (Boschker, Bakker, & Michaels, 2002; Mittelstaedt, 1997), and affective (Hansen & Parker, 2009) outcomes.

An important pedagogical task for teachers of rock climbing is to help their students develop climbing self-efficacy, which is an individual's belief in his or her ability to climb a wall successfully with efficient techniques. Self-efficacy has been discussed as a key motivational factor for participation in adventure physical activities (Llewellyn, Sanchez, Asghar, & Jones, 2008). As well, given the physical and mental complexity of rock climbing (Hardy & Hutchinson, 2007), self-efficacy is a pertinent construct that needs to be examined. Considering the limited scope of research on climbing pedagogy, this research investigated the characteristics of a high school rock climbing program. We explored the learning activities that might be most beneficial for improving the climbing self-efficacy of high school students. Three main research questions were addressed in this study:

1. What are the learning activities that take place in the program?
2. What are the sources of self-efficacy embedded in the learning activities of the rock climbing program?
3. How did the learning activities impact the self-efficacy of high school students?

Literature Review

Climbing self-efficacy is a useful construct for determining the likelihood that participants will attempt rock climbing and persist despite failures. Climbing self-efficacy has been shown to increase the frequency of attempts made by climbers (Gómez, Hall, Hill, & Ackerman, 2007). Bandura (1997) proposed four main sources of

influence that may enhance or decrease an individual's self-efficacy: mastery experiences, vicarious learning, verbal persuasion, and affective states.

Mastery Experiences

According to Bandura (1997), the most effective method of developing self-efficacy is through mastery experiences. In other words, when an individual accomplishes a goal successfully, that person will enhance his or her self-efficacy for that specific goal. As well, mastery experiences will be most influential for determining the self-efficacy of individuals who are learning new behaviors (Bandura, 1997).

The effectiveness of six sessions of a climbing program, which included mastery experiences, for students with special needs found a significant increase and a large effect size ($d = 0.84$) in self-efficacy (Mazzoni, Purves, Southward, Rhodes, & Temple, 2009). In a study examining the effect of a high element ropes course, an activity with similar psychological and physical demands as rock climbing, generalized self-efficacy and ropes course self-efficacy were found to have improved significantly following students' participation on a high ropes course (Cordle, Van Puymbroeck, Hawkins, & Baldwin, 2016). Mastery experiences were suggested to be the most pertinent source of students' self-efficacy.

Vicarious Learning

By observing a social model performing a behavior, a person can establish a belief about his or her ability to perform the same or a similar behavior. These vicarious experiences are thought to be most effective when the model is similar in characteristics and ability levels to the individual making the observation (Bandura, 1997). Harrison and McGuire (2006) examined the effect of observing different models on the climbing self-efficacy of participants. A significant difference in climbing self-efficacy from pretest to posttest between the control and intervention groups was found.

Verbal Persuasion

Bandura (1997) suggested that verbal persuasion is more effective at undermining than enhancing self-efficacy. For example, if a student is provided overenthusiastic verbal persuasion that he or she can accomplish a certain behavior and is afterward confronted by

failure, his or her self-efficacy may diminish. Verbal persuasion can be used in the form of goal setting. Goal setting is defined as the objective of an action limited by time (Baghurst, Tapps, & Kensinger, 2015). For example, if an instructor provides a goal for a participant, the instructor is telling the participant that he or she can accomplish this goal in a specified amount of time. Sarrazin and Famose (2005) examined the effect of different climbing goals on the self-efficacy and performance of novice climbers. The self-efficacy scores of the groups corresponding to difficult and moderate goals increased after every session. The researchers suggested that when a teacher verbally persuaded a student that she or he was able to complete a difficult climb, the student gained self-efficacy and in turn demonstrated improved performance.

Affective States

Finally, the interpretation of physiological and affective states may affect a person's self-efficacy. For example, if a student feels stressed before a competition, a negative appraisal of that stress will result in a diminished self-efficacy. Affective states are not usually considered as powerful a source of self-efficacy as the previous three sources of self-efficacy (Bandura, 1997). However, in challenging activities that can create feelings of fear (e.g., climbing high walls), affective states can be an influential source of self-efficacy (Bandura 1997).

Mental imagery can be an effective method of reducing fears (Martin, Moritz, & Hall, 1999). Jones, Mace, Bray, MacRae, and Stockbridge (2002) provided 70 min of imagery script training to an experimental group and low-impact aerobic exercises to a control group. The experimental group had significantly lower levels of perceived stress and higher levels of self-efficacy in their ability to execute the correct climbing techniques.

Method

Design

A case study, described as a research approach to answer how and why questions within a bounded system (Yin, 2014), was used for the examination of this self-contained climbing program. The focus of this approach is the study of a contemporary phenomenon

and its context. A single-case study design was used in the examination of a climbing pedagogy that takes place in an authentic environment, which, unlike an experimental design, does not constrain behavioral events (Yin, 2014). Prior to data collection, the human research ethics board of the authors' university and the school board of the school under study approved the research.

Case Description

The rock climbing program. The rock climbing program was an elective high school course. Students were provided opportunities to develop a strong foundation in climbing. At the end of the program, students were capable of bouldering, top-roping, leading, setting routes, managing risks, and potentially obtaining an indoor rock climbing instructor certification. The rock climbing program comprised daily 75-min lessons over a 5-month semester.

Participants. Twenty-six out of 30 students enrolled in the rock climbing program volunteered to be included in this study. After being provided with a written description of the study to bring home, the students and their parents submitted their written consent to the teacher. Participants had varying climbing abilities at the beginning of the study (i.e., participants were composed of novice, $n = 12$; intermediate, $n = 9$; and experienced, $n = 5$, rock climbers). The sample comprised 16 female and 10 male students. The ages of the students ranged from 13 to 16 years old.

The instructors. The main teacher responsible for the rock climbing program was a certified physical education teacher and certified indoor rock climbing instructor. Two additional instructors included a competitive professional rock climber and a rock climbing center manager.

Data Collection

The research questions were addressed with four data sources. The use of multiple data sources aided efforts to triangulate findings and ensure trustworthiness.

Observations of the learning environment. The purpose of the observations was to establish and describe the learning activities that took place in the rock climbing program. The principal investigator observed the 75-min lessons daily in the first two weeks of the program and twice a week for the remainder of the 5-month semester.

Program outline. A program outline and schedule of activities was used to complement the observations, provide a more detailed description of the activities, and prepare reflection journal questions.

Student reflection journals. The purpose of the individual reflection journals was to probe general themes regarding key sources of self-efficacy. Participants were given 15 min of class time every other week to answer two to four open-ended questions in a self-reflection journal. These questions were based on the four main sources of self-efficacy and the activities that took place in the preceding two weeks. For example, one question asked students to "Describe any differences in your ability to climb when you are projecting a boulder problem by yourself, as a class, or with partners." An equal number of random journals were transcribed and analyzed from each of the student groups so that the the novice students' voice would not be overrepresented.

Focus group interviews. Three focus group interviews probed deeper into aspects of the learning activities in the rock climbing program and complemented the individual reflection journals. The focus group interviews took place after 5 months of participation in the rock climbing program. The interview was "open-ended and [assumed] a conversational manner"; however, it followed the preestablished protocol questions more closely than a "prolonged case study interview" would (Yin, 2014, p. 110).

As suggested by Yin (2014), focus group interviews utilized a list of preestablished questions presented in a conversational manner by the focus group facilitator. Based on the recommendations by Stewart and Shamdasani (1990), groups were separated based on experience level so that the opinion of novice students was not distorted. These interviews took place during class time that was most convenient for the participants and the teacher. The focus group interviews lasted on average 30 min and were held in groups of five to seven students in a quiet area of the rock climbing gym. All interviews were audiotaped and the principal investigator took notes of any pertinent nonverbal communication.

Data Analysis

Prior to data analysis, the data emanating from the focus group interviews, student journal entries, observations, and course outline were transcribed into the qualitative data management software

NVivo 11. The robust and systematic framework of qualitative thematic analysis was used in the identification of codes, patterns, and themes within the data set (Braun & Clarke, 2006). Analysis was done systematically through the following six phases: (1) familiarize yourself with the data, (2) generate initial codes, (3) search for themes, (4) review themes, (5) define and name themes, and (6) produce the report.

The following strategies were used in the establishment of trustworthiness: (a) triangulation of information through multiple data collection methods; (b) peer review and discussions with two experienced qualitative researchers; (c) an in-depth description of the environment; (d) prolonged engagement; and (e) the examination and restructuring of themes until all cases fit within the final major themes (Yin, 2014).

Findings

This research investigated the characteristics of the rock climbing program and determined which learning activities might be most beneficial for improving the self-efficacy of high school students. Three themes emerged from the four data sources.

Theme 1: A Learning Environment Conducive to Developing Self-Efficacy

This theme describes the complexity of the learning environment, which affected the climbing self-efficacy of students. The learning environment comprised a variety of components, each contributing in some way to changes in climbing self-efficacy and climbing performance.

Social aspect. The social nature of climbing was apparent throughout the program. In the early stages of the program, instructors encouraged the more experienced students to help their novice peers. The following journal entry from a novice climber provides evidence for the collaborative nature of these social interactions: "Everyone was really encouraging, it's [grade] nine to twelve, but everyone was really nice and it worked together."

Throughout the program, students were most often climbing in pairs or in small groups. Some students, as demonstrated by the following interview statement, preferred climbing in groups because it allowed them to benefit from the encouragement and advice of other

students: "One good thing I've realized is that it is always positive, someone is always trying to help you."

Through journal entries and interviews, several students alluded to the increased social nature of climbing activities such as bouldering: "When you are bouldering you are not usually alone, but when I do go alone it is pretty lame, you don't feel motivated to do it." Students described throughout their interviews and journal entries the typical encouragements heard in the rock climbing community: "One of the most common words that I hear people chanting is 'you've got this' and their names and 'come on,' it feels like you're doing the route with them and you're happy when they get it."

Students also described the pure enjoyment of climbing for its own sake. Teachers reinforced this emphasis on fun throughout the program. For example, before the competition one teacher told students, "Focus on having fun, and don't worry about results." The following interview statement from a novice climber describes this atmosphere: "I liked climbing, so it made it fun, it didn't really feel like a school class it felt more like a camp."

Informational expectations and safety responsibilities. Throughout the program, the safety of students was paramount. The course outline specified that assessment would be based on "safety and risk management," among other criteria. The following journal entry from an experienced climber describes the importance of safety protocols: "[The teacher] taught us well and also helped us after to make sure we did everything correctly and safely." Within the rock climbing community, it is often expected that, in addition to belaying one's climber, partners provide each other with information about the climbing route (i.e., the information that climbers refer to as "beta"). The following journal entry from an intermediate climber reflects the observations of students providing beta to each other throughout the program: "I was trying an orange route and [another student] helped me with balance and how to hold a hold."

Being observed. Data from the observations indicated the structure of the facility increased the likelihood a climber would be observed. For example, although bouldering activities were most often done in partners, certain activities were completed in a larger group settings where one student climbed and an average of four students and one instructor provided feedback and observed the climber.

Being observed during competition affected several of the students. Students of all experience levels indicated that being observed made them nervous and hindered their performances. Students identified that they were most nervous when several people were watching them or when observers were strangers. Although the majority of students indicated that being observed had a negative effect on their performance, some students mentioned the neutral or motivating effects of being observed: "There was people watching from above, and I could see them while I climbed, the people were encouraging me, and while it made me more nervous, it also motivated me to get it."

Theme 2: The Influences of the Sources of Self-Efficacy Embedded Within the Climbing Program

This theme represents the statements that students made about the effect of mastery experiences, vicarious learning, verbal persuasion, and affective states on their climbing self-efficacy. Several students, such as a novice climber in a journal entry, indicated that they are "a lot more confident than when [they] first started out." According to Bandura (1997), four sources of self-efficacy may have accounted for this confidence or in some cases lack of confidence. It is clear that, based on the student journals and interviews, all four sources were embedded within the climbing program.

Mastery experiences. According to the outline of the program, active participation was worth 50% of the students' grades. The observations confirmed this emphasis on active participation and mastery experiences. Several students discussed the importance of being challenged adequately through progressive steps. Once students had practiced a related but easier task (e.g., top-roping), they were more confident to attempt more challenging tasks (e.g., lead climbing). The following interview statement from an experienced climber demonstrates how mastery experiences through progressively challenging activities increased self-efficacy: "I took a fall on the route and I thought it wasn't as bad as I expected, I feel that the teacher making me do it on top rope first showed me that I actually can do the route."

When asked for their input on methods for improving their confidence to climb, students suggested that practicing the activity would be the most helpful strategy for improving their self-efficacy.

The following interview statement from an intermediate climber exemplifies the benefit of practicing an advanced climbing move: "When doing speed, the teacher got us to practice our dynos, we were terrified with doing dynos, but then when we were on the speed wall we were not scared anymore."

Vicarious experiences. In addition to providing information on the best path to take up a certain route (beta), observing other climbers provided students with a positive and sometimes negative source of self-efficacy. Overall, students indicated that observing another climber successfully completing a prospective route increased their self-efficacy. The following statement from an experienced climber is representative of these sentiments: "I get really nervous lead climbing, so I like to watch someone else do the route before, it also makes me realize it is possible and I can physically do it." However, the following statement from an experienced climber shows how watching a climber unsuccessfully attempt a route resulted in less self-efficacy for climbing that particular route for the observer: ". . . if they don't get it, I think if they can't do it, I can't do it also."

When the observer perceived him- or herself to be similar in height, age, or climbing proficiency as the model climber, the observer was more likely to be able to relate to the success of the model and develop self-efficacy for climbing that route. For example, an experience climber mentioned, ". . . watching people that are kind of my age, I think I can probably do that."

Verbal persuasion. Verbal praises were noted in observations as being used frequently by both teachers and students throughout the semester. The most frequently heard praises were "come on, you got this!" and "you can do it!" Students identified verbal praise as leading to increased confidence for doing more difficult routes. The following interview statement from an experienced climber describes such instances: "When I am stuck on a move and I think I have an idea of how to do it and I start moving that way and she says 'come on,' I know that she knows that I can do it and it makes me feel better."

Although verbal praise improved the self-efficacy of some students, such as the following journal entry of an experienced climber demonstrates, sometimes the verbal praise was not enough to improve self-efficacy: "[After my partner said] you can do it! I thought maybe I can, then I thought never mind, I definitely can't." The

frequently used verbal praise of "you can do it!" was beneficial for the self-efficacy of most students; however, the following statement demonstrates how one intermediate climber had reservations about hearing verbal praises while climbing: ". . . it helps a lot, sometimes it pressures you and people are making you more nervous."

Affective states. Anxiety from climbing harder routes or from lead climbing resulted in reduced performance and a reduction in self-efficacy for several students. The following excerpt from a novice climber represents these sentiments: "I think [climbing is] a little harder when you are scared of falling, we were definitely strong enough to do it, but we just needed to get over it." Feelings of anxiety or nervousness were frequently reported when students described their experiences with two climbing competitions. For example, an experienced climber mentioned, "I really hate the comp because it's really stressful and I don't feel like I climb my best under that pressure."

However, some students, such as the following intermediate climber, experienced excitement and motivation from participating in the competition: "I did way better during comp, trusted myself way more." Several students attempted to overcome a fear of heights or fear of falling through different strategies. Some students preferred to concentrate on the immediate climbing moves that must be done. One experienced climber mentioned, "Just climbing one move at a time, I feel like I will be able to deal with it when I get there."

Several experienced climbers described using a motivating talk from climbing partners as a strategy to overcome the fear associated with lead climbing: "[My climbing partner] and I have a pep talk before leading and repeat our mantra." Several students explained how resting helped them to reduce their nervousness. For example, one intermediate climber said, "Now when I get nervous, I just don't pay attention to it, . . . I just chalk and rest, and before I would start shaking and ask for a [break]."

The downside of high expectations and high self-efficacy. Despite observations of the teacher frequently asking students to think about the "best of [themselves and] not compare [themselves] to someone else," several students held high expectations for their performance and demonstrated a fear of failure. One experienced climber mentioned in an interview, "When I see people climbing

before me . . . if they got it, I would be scared because there are high expectations for me to get it."

Theme 3: Learning Activities, "I would suggest doing them because it helped"

As the excerpt in the title of this theme indicates, several learning activities were useful for improving the climbing self-efficacy and performance of students. This theme describes the necessity of using different activities for different periods of the learning process. The following four learning activities were identified by the students: goal setting, fitness training, technique-oriented learning activities, and peer teaching.

Goal setting. Goal setting as a learning activity was used informally daily. For example, students were informed that they should complete a set number of routes by the end of the class. At the beginning of the program, a formal goal-setting activity was used. A typical goal set for the novice climbers was, "finish all the [beginner level] bouldering routes" and the typical goal set for the expert climbers was, "climb [an intermediate level route on] lead without stopping."

In addition to the formal goal-setting activity, the following interview statement from an experienced climber describes how needing to meet the requirements for becoming a rock climbing instructor was motivating: "Having a goal or a reason to do something helped me. For example, I needed to climb a certain level of lead to get into the [Climbing Instructor Course]."

Fitness training. The fitness-intensive component of the climbing program took place twice a week. These training sessions took place outside of the climbing gym area and included exercises such as planks, throwing medicine balls with a partner, and working on agility with stepladders. Several students commented on the performance benefits they felt originated from this fitness training. The following interview excerpt from an intermediate climber represents these comments: "In my first year I wasn't training as hard as I could have, [this year] I tried really hard and went from doing a 5.10 and struggling to doing a 5.11 and actually finishing them, the training really helped, and I would suggest doing them because it helped."

Endurance training, which focuses on improving stamina through prolonged climbing, was used extensively in the beginning of the semester. An experienced climber explained how these

exercises helped develop climbing endurance: "Endurance has helped me build strength, especially down-climbing even though it's sort of terrifying."

Technique-oriented learning activities. A variety of techniques for improving climbing performance were taught throughout the year. These techniques included heel-hooking, foot-matching, edging, taking appropriate rests, and sequencing.

Another learning activity focused on taking rests in appropriate places on the route. Students were told to take a minimum of two rest periods in which they would reapply chalk on their hands and breathe slowly. The following interview excerpt from an intermediate climber represents how several students described the effect that this relaxation activity had on them: "They taught us how to rest on the wall, straight arms and breathe, it helped me a lot, especially for lead climbing, not shaking out but doing it slowly in order to not send stress signals."

Several learning activities focused on teaching students to look at a route from the ground and decide how to move up the wall. For example, the storytelling activity asked students to create their sequence and tell the belayer every sequence they will do, before they start climbing. The following journal excerpt from an intermediate climber represents the thoughts several students had about route visualization and sequencing: "Helped me understand different moves and makes me more confident as a climber and increases the chances of onsighting a route."

Peer teaching. Observations of students providing each other with beta or teaching each other climbing moves were numerous throughout the semester. The following interview statement from an experienced climber describes one of the more memorable instances of peer teaching:

> We taught the other school how to top rope which kind of made us more aware of how to teach it to someone, . . . we already know how to top rope confidently and we even know how to teach it to other people, and it makes you feel so much better about yourself if you're teaching someone how and you know exactly how to do everything.

Discussion

The results of this study confirm and extend the research on self-efficacy and rock climbing pedagogy. All three themes emphasize that the contributions of the climbing program to self-efficacy are most effective when learning activities take place in a safe and collaborative environment and are meaningful, diversified, individualized, and progressively challenging.

Creating a Safe and Collaborative Learning Environment

Situating the entire climbing program within an expectation of collaboration and safety afforded students the opportunity to thrive in the learning environment. There was an obvious emphasis on safety at the beginning of a climbing program. In addition, groups were monitored and encouraged for utilizing collaborative practices (e.g., providing each other with beta and encouragements).

In a review of the benefits of rock climbing, Siegel and Fryer (2015) suggested that the use of rock climbing in physical education programs can lead to positive benefits in the social domain. It was apparent that the social aspect was critical to the positive and collaborative learning environment in this program. For example, the class was often organized in small groups, peer teaching was regularly utilized, and bouldering was done in pairs.

Providing Meaningful Learning Activities

Striving to provide meaningful objectives allowed students to practice techniques that are useful for the type of challenge they were confronted with (e.g., teachers provided activities to work on heel-hooking only when students were climbing difficult overhanging climbing routes). Congruent with the findings of Sarrazin and Famose (2005), goal setting was more effective when goals were meaningful, for example, one student was motivated by the goal of meeting the requirements for becoming a rock climbing instructor.

Providing a diversity of learning activities. The themes emphasized the need for diverse learning activities. Climbers in this study reported negative affective states when climbing at a gym with higher bouldering problems. This is consistent with the increased anxiety levels that followed alterations in heights as discussed by Giles et al. (2014). Experiencing a variety of climbing facilities, however,

improved the climbing self-efficacy of students when returning to their school climbing facility. Although climbing self-efficacy may initially diminish in a new environment, providing a diversity of learning activities appears to benefit the long-term climbing self-efficacy of students.

Individualizing learning activities. Individualizing learning activities increased the likelihood that the needs of more climbers were met. For example, more experienced students were encouraged to attempt more difficult lead climbing routes and share their knowledge with novice climbers. Contrary to the findings of Harrison and McGuire (2006), participants stated that having more individualized climbing models who were similar in height, age, or climbing proficiency to the observer made it easier to relate to the success of the model and develop climbing self-efficacy.

Providing progressively challenging learning activities. Cordle et al. (2016) identified mastery experiences as the most influential source of self-efficacy. Similar findings were echoed in this study. Students claimed that practicing specific climbing techniques and being successful at easier climbing drills or activities allowed them to attempt more challenging routes. Providing learning activities to students in a progressively challenging format allows mastery experiences and consequently increases in self-efficacy. For example, students should be provided opportunities to fall on top-rope before attempting progressively larger falls on lead.

Conclusions

The thematic analysis provided insight into (a) the type of learning environment conducive to improving climbing self-efficacy, (b) the influence of the sources of self-efficacy, and (c) the activities that were more efficient for developing student climbing self-efficacy. According to the statements of students, perceived climbing self-efficacy was enhanced when learning activities were meaningful, diversified, individualized, progressively challenging, and took place in a safe and collaborative environment.

Limitations

As a case study, this research gathered insight from a practical setting within one high school rock climbing program. The practitioner needs to ensure that the circumstances of the case study are

similar in nature to that of his or her own physical education class. To be confident in the results, we followed recommended qualitative data collection and analysis methods that allowed us to feel confident in the trustworthiness of our results. However, we also acknowledge that case study design has inherent limits, and future studies should endeavor to include quantitative and/or mixed methods research designs to complement and extend this study.

Implications

The findings of this case study are useful for informing the designers of physical education programs to better meet the needs of students interested in rock climbing or other adventure physical activities. This study advanced theoretical knowledge by exploring how sources of self-efficacy can be translated into learning activities. Considering the overwhelming statements provided regarding mastery experiences relative to other sources of self-efficacy, mastery experiences appeared to be the most influential source of self-efficacy in this program. Affective states were an influential and mostly debilitating source of self-efficacy within this rock climbing program.

Higher levels of self-efficacy can lead to greater motivation for continued participation in rock climbing (Gómez et al., 2007). This could be indicated by participation in climbing activities outside of school hours. A future study can investigate the effect of participation in climbing programs on motivations to pursue climbing independently. Future research can also investigate how climbing self-efficacy can translate to generalized self-efficacy.

References

Baghurst, T., Tapps, T., & Kensinger, W. (2015). Setting goals for achievement in physical education settings. *Strategies*, *28*(1), 27–33. https://doi.org/10.1080/08924562.2014.980876

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: Worth.

Boschker, M. S. J., Bakker, F. C., & Michaels, C. F. (2002). Memory for the functional characteristics of climbing walls: Perceiving affordances. *Journal of Motor Behavior*, *34*(1), 25–36. https://doi.org/10.1080/00222890209601928

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101. https://doi.org/10.1191/1478088706qp063oa

Cordle, J., Van Puymbroeck, M., Hawkins, B., & Baldwin, E. (2016). The effects of utilizing high element ropes courses as a treatment intervention on self-efficacy. *Therapeutic Recreation Journal, 50*(1), 75–92. https://doi.org/10.18666/trj-2016-v50-i1-6439

Fairclough, S., Stratton, G., & Baldwin, G. (2002). The contribution of secondary school physical education to lifetime physical activity. *European Physical Education Review*, *8*(1), 69–84. https://doi.org/10.1177/1356336x020081005

Giles, D., Draper, N., Gilliver, P., Taylor, N., Mitchell, J., Birch, L., . . . Hamlin, M. J. (2014). Current understanding in climbing psychophysiology research. *Sports Technology*, *7*(3–4), 108–119. https://doi.org/10.1080/19346182.2014.968166

Gómez, E., D. P., Hall, S., Hill, E., & Ackerman, A. (2007). An exploration of self-efficacy as a motivation for rock climbing and its impact on frequency of climbs. In C. Leblanc & C. Vogt (Eds.), *Proceedings of the 2007 Northeastern Recreation Research Symposium* (pp. 306–310). Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station.

Hansen, K., & Parker, M. (2009). Rock climbing: An experience with responsibility. *Journal of Physical Education, Recreation, & Dance, 80*(2), 17–55. https://doi.org/10.1080/07303084.2009.10598278

Hardy, L., & Hutchinson, A. (2007). Effects of performance anxiety on effort and performance in rock climbing: A test of processing efficiency theory. *Anxiety, Stress, & Coping*, *20*(2), 147–161. https://doi.org/10.1080/10615800701217035

Harrison, M., & McGuire, F. (2006). An investigation of the influence of vicarious experience on perceived self-efficacy. *Journal of Experiential Education, 28*, 257–258. https://doi.org/10.1177/105382590602800310

Jones, M. M. V., Mace, R. D. R., Bray, S. R. S., MacRae, A. W., & Stockbridge, C. (2002). The impact of motivational imagery on the emotional state and self-efficacy levels of novice climbers. *Journal of Sport Behavior, 25*(1), 57–73.

Lirgg, C. D., Di Brezzo, R., & Gray, M. (2006). Effect of climbing wall use on the grip strength of fourth-grade students [Abstract]. *Research Quarterly for Exercise and Sport, 77*(Suppl. 1), A-64. https://doi.org/10.1080/02701367.2011.10599763

Llewellyn, D. J., Sanchez, X., Asghar, A., & Jones, G. (2008). Self-efficacy, risk taking, and performance in rock climbing. *Personality and Individual Differences*, *45*(1), 75–81. https://doi.org/10.1016/j.paid.2008.03.001

Martin, K. A., Moritz, S. E., & Hall, C. R. (1999). Imagery use in sport: A literature review and applied model. *Sport Psychologist, 13,* 245–268. https://doi.org/10.1123/tsp.13.3.245

Mazzoni, E. R., Purves, P. L., Southward, J., Rhodes, R. E., & Temple, V. A. (2009). Effect of indoor wall climbing on self-efficacy and self-perceptions of children with special needs. *Adapted Physical Activity Quarterly*, *26*, 259–273. https://doi.org/10.1123/apaq.26.3.259

Mittelstaedt, R. (1997, November). Indoor climbing walls: The sport of the nineties. *Journal of Physical Education, Recreation, and Dance*, *68*, 26–29. https://doi.org/10.1080/07303084.1997.10605024

The Outdoor Foundation. (2013). *Outdoor participation report 2013*. Retrieved from http://www.outdoorfoundation.org/pdf/ResearchParticipation2013.pdf

Sarrazin, P., & Famose, J.-P. (2005). Plus c'est difficile et mieux je réussis! Étude des liens entre les buts fixés, l'efficacité personnelle et la performance sportive [The more challenging it is, the more I succeed! A study of the effects of fixed goals and self-efficacy on sport performance]. *Bulletin de Psychologie*, *Numéro, 475*(1), 107–111. https://doi.org/10.3917/bupsy.475.0107

Siegel, S. R., & Fryer, S. M. (2015). Rock climbing for promoting physical activity in youth. *American Journal of Lifestyle Medicine*, *11*, 243–251. https://doi.org/10.1177/1559827615592345

Stewart, D. W., & Shamdasani, P. N. (1990). *Focus groups: Theory and practice*. Newbury Park, CA: Sage.

Woollings, K. Y., McKay, C. D., & Emery, C. A. (2015). Risk factors for injury in sport climbing and bouldering: A systematic review of the literature. *British Journal of Sports Medicine, 49*, 1094–U15. https://doi.org/10.1136/bjsports-2014-094372

Yin, R. K. (2014). *Case study research design and methods* (5th ed.). Thousand Oak, CA: Sage.

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PEDAGOGY

Upper Elementary School Student Perceptions of Physical Education: High Attitude and Moderate/Low Attitudes

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Abstract

This study examined the perceptions of upper elementary school students toward physical education (PE). High and moderate/low attitude students (N = 16) participated. Two themes emerged: (a) it is important to have fun in PE (students are excited to go to PE, PE is their favorite class, the teacher influences perceptions of fun) and (b) class activities are important (moderate/low students enjoyed team problem solving, fitness activities were controversial). The results suggest that class organization and content influence perceptions.

Every day students bring their perceptions to school. These perceptions influence their thoughts and feelings toward each subject and their approach to learning. It has been suggested that student perceptions have a strong influence on learning (Entwistle, McCune, & Hounsell, 2002). These perceptions can influence whether stu-

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dents choose to participate in learning and how hard they work in class (Pajares, 1992; Zimbardo & Leippe, 1991).

In physical education (PE), where students often have strong views toward the subject matter, a great deal of information about student perspectives that can inform the teaching and learning process has been learned (Bernstein, Phillips, & Silverman, 2011; Cothran, Kulinna, & Garrahy, 2003; Graham, 1995; Hopple & Graham, 1995; Portman, 1995; Ravizza & Stratton, 2007). For example, Hopple and Graham (1995) interviewed PE students and found that many aspects of the mile run test influenced their perceptions of physical activity and fitness testing. Studies of student perceptions in PE have provided a diagnosis of instructional practices and suggestions for improving learning of motor skills, fitness, and student attitude.

Upper elementary school is a formative time for students to develop attitudes and perceptions toward PE and physical activity. Student declines in attitude have been suggested to begin by fourth grade and continue to decline until students graduate from high school both in the United States and abroad (Montalvo & Silverman, 2008; Phillips & Silverman, 2015; Subramaniam & Silverman, 2007). A person's physical activity levels begin to decline after adolescence (Sallis, Prochaska, & Taylor, 2000), and PE has been suggested as a way of remediating this decline (Carlson, 1995; Ennis, 1996; Portman, 1995; Robinson, 1990). As government funding, both local and federal, continues to support PE programs with staffing, space, and resources, it is important that we understand how these programs are affecting our youth. Understanding upper elementary students' perceptions of PE can provide an important perspective on their thoughts and feelings before declines in attitude and physical activity take place.

The decline in physical activity (Sallis et al., 2000) has resulted in an obesity epidemic among children (Flegal, Carroll, Ogden, & Curtin, 2010; U.S. Department of Health and Human Services, 1996). Obesity is associated with significant health problems for children and is an important early risk factor for adult morbidity and mortality (Krebs, 2003). One of the major combatants of obesity is physical activity, which should be encouraged among children and adolescents, based largely on the assumption that the behavior will become part of the person's life and carry into adulthood (Kohl

& Hobbs, 1998). It has been suggested that if a student has a positive experience in PE and develops a positive attitude about physical activity, motivation to engage in physical activity outside of school is likely to occur (Solmon & Lee, 1996). Conversely, students who show unfavorable attitudes toward PE may refrain from indulging in physical activity outside of school (Carlson, 1995; Ennis, 1996; Portman, 1995; Robinson, 1990).

These notions are supported by the theoretical framework guiding this study, the Theory of Reasoned Action developed by Fishbein and Ajzen (1975). This theory states that a person's attitude guides his or her behaviors. According to the Theory of Reasoned Action, a person's behavior is decided by his or her intention to perform the behavior (Ajzen & Fishbein, 1980). This intention is influenced by the person's attitude and belief systems toward the behavior. For example, if a person enjoys jogging and thinks jogging is important, the person is more likely to jog. Delving deeper through this study, we find that student perceptions are tied to their beliefs and can influence their attitudes.

Attitudes begin to develop at a young age (Allport, 1935), yet little is known about the early development of student attitudes toward PE. Middle school student perceptions suggest that low-skilled sixth-grade students have definite attitudes toward PE (Portman, 1995). Research also has suggested that sixth- through eighth-grade students' attitudes toward PE are influenced by their enjoyment, perceived usefulness, and feeling of belongingness (Subramaniam & Silverman, 2000). It is unknown if upper elementary school students have these same perceptions. While many people make assumptions about elementary school student experiences, there is no current research on the topic.

There are two primary purposes of this study. The first purpose is to find out what are the perceptions of upper elementary school students toward PE. A secondary purpose is find out what influences fourth- and fifth-grade students with high (or positive) attitudes and moderate (indifferent) and low (negative) attitudes toward PE.

Method

This mixed methods study included the instrument results, interview, and observation data analyses. This section explains these steps. The study took place over one academic year.

Setting

Students at a school in an upper- to middle-class suburban area were chosen to be the pool for interview selection. The school was fairly diverse with 11.2% speaking Spanish and smaller populations speaking Hebrew, Russian, Arabic, Turkish, and Lithuanian. The teacher at the school had nearly two decades of PE teaching experience as well as an extensive background as a fencing coach and was thought to be a successful teacher among the administrators within the district. The students had PE twice a week for 40 min and health once a week for 40 min. The curriculum included units on fundamental motor skills, teamwork and cooperation, and dance. The mission of the program was to help children develop the physical competencies that lead to confidence and participation in physical activity for a lifetime.

Instruments

An attitude questionnaire that assesses student attitude toward PE with scores that have been shown to be reliable and valid (Bernstein et al., 2011) was administered to 146 fourth- and fifth-grade students. Sixteen students with the highest and lowest attitudes toward PE were selected. Two high attitude (HA) female students in fifth grade, two HA female students in fourth grade, two moderate to low attitude (MLA) female students in fifth grade, two MLA female students in fourth grade, two high HA male students in fifth grade, two HA male students in fourth grade, two MLA male students in fifth grade, and two MLA male students in fourth grade were asked to participate in an interview. Once Institutional Review Board clearance was obtained and the eight HA students and the eight MLA students agreed to participate, interview and observation dates and times that were convenient for the school and lead researcher were set up.

Observations

Observations of each student in the study were done once before the first interview and then once after the first interview. Field notes and reflective notes were taken during the observations. The observations took place in the gymnasium and outdoors on the field and blacktop areas. The researcher was invited to the school picnic and

spent the day conducting observations, in addition to the 16 observations originally scheduled.

Interviews

Once the student and researcher met, the initial objective was to make the student feel as comfortable as possible. First, the student was asked to create an alias to secure anonymity. The student was reminded of the option to stop the interview and leave the study at any time. The interviews were digitally recorded.

Each student was interviewed in a semistructured manner twice for approximately 40 min each. The semistructured nature of the interview allowed the researcher to use the initial listing of interview questions as a guide so that the interview could go in various directions for the researcher to elicit responses as needed. The first set of interview questions asked the students to describe their typical experience in PE class, what they like and dislike, what their friends think about PE, what they think about PE in general, and what they think influences student attitudes toward PE, among others. The second set of interview questions was guided by the answers to the first set of questions. The participants were asked how they feel when they know they have PE that day and how they feel about class, whether they feel they are good at PE, how they feel about their academic classes and how that relates to PE, to describe positive and negative experiences in class, how they feel they perform in class, and finally, if there is anything else they would like to offer.

Interview and Observation Data Analysis

After the students were interviewed and observed, data were transcribed. Once the data were ready, the interview transcriptions, observation field notes, and reflective notes were entered into NVivo10. These data were then analyzed for common themes and patterns via the constant comparative method (Bogdan & Biklen, 2007). From this analysis, themes emerged.

Trustworthiness

The main threat to the validity of this study was researcher bias (Maxwell, 2005), so it is important that the background of the researcher is noted. The lead researcher, who collected and initially analyzed the data, is a former Teacher of the Year elementary school

PE teacher. She enjoys and values physical activity and has experience in teaching PE preservice teachers. As data were analyzed, she remained aware of subjectivity to the material (Peshkin, 1988). This awareness was maintained through constant self-monitoring. The self-monitoring process was done through a reflective journal, which allowed the researcher to reflect upon the lens through which the data were collected and analyzed.

Member checks were done with the participants. These were done at the school following the interviews and observations. The member checks were approximately 10-min meetings with each of the participants during their lunch or recess time, during which notes were taken. Students were given the opportunity to hear what the researcher determined from their individual interviews and observations and were encouraged to either agree, contradict, or elaborate on the findings. Only one student did not feel that her feelings regarding her teacher were properly understood, and corrections were made to the data to reflect her perceptions correctly.

Triangulation occurred during data analysis. The items used in data triangulation were the observations and field notes, interview transcripts, and student attitude scores. All three items were reviewed across each subject. Negative case checking was done following theme determination.

Peer review was conducted following theme creation. The peer reviewer was one of the coauthors, a researcher with a doctorate in PE. The peer reviewer read through the interview transcripts, field notes, and themes created, to determine if the themes were appropriate with the data available. Three rounds of theme revisions were conducted until the peer reviewer and lead researcher agreed.

Findings

Two major themes emerged during the analysis of the data from interviews and observation field notes from 16 students. In response to the questions inviting these students to describe their PE class and how they felt about it, all students voiced that it is important to have fun in PE class. The first theme, the importance of having fun in PE class, emerged and was expressed by students with high, moderate, and low attitudes, by males and females, and in both grade levels. This theme had three related subthemes: (a) students are excited to go to PE class, (b) PE is their favorite class, and (c) the teacher influ-

ences what they perceive as being fun. The second theme was class activities are important to them. This theme permeated gender and grade level with the only difference being between the HA and MLA students. This theme had two subthemes, namely, (a) MLA students enjoy team problem-solving activities and (b) fitness activities are controversial. This section elaborates these findings.

Physical Education Class Is Fun

Students in observations and interviews indicated that they enjoy PE class because it is "fun." All HA and MLA students expressed that they feel PE is fun, although for varying reasons. This theme emerged during all interviews and observations.

During interviews, when asked a variety of questions about PE class, students shared anecdotes about how much fun they have during PE class. When asked to describe their PE class, the majority of students ended with a statement about class being fun. For them, fun meant enjoying themselves in class.

For example, Julia, an MLA student, said PE class is "really, really, really, really fun," after being asked to describe a memorable experience. These unprompted descriptions happened regularly and were similar to Bill's, an HA student's, description of his class: "I think that it can be very enjoyable for people, just, you know, doing all this stuff." Similarly, when asked about PE in his school, Cesar, an MLA student, said, "I think it's fun." In observations, several instructional activities were observed and students having fun was repeatedly witnessed. In a majority of class observations, most of the participants were smiling, laughing, and actively participating in the activity. Padre, an MLA student, explained that he and his friends "…think it's really fun." Similarly, Jackie, an HA student, replied, "Most of them feel happy, I guess." John, an HA student, said, "A lot of people I know like it." When asked why he said this, he replied, "Because it's fun." During informal conversations with the students after class when they were lined up to go back to their classroom, many would shout out "that was so cool," "that was so fun," or "you should take gym with us one day, it's so fun!"

Students have fun in PE class. This theme emerged from the interviews and observations. It is important that we understand that in fourth and fifth grade, regardless of students' overall attitude toward

PE or gender, all students have fun in PE class and having fun is important.

Students are excited to go to class. Students expressed that they are excited to go to PE class. This subtheme is related to the students having fun in class, because they are excited to go to class for that reason. All the participants were excited to go to PE class. Upon entering the gym, the students typically walked in with high energy and the class typically had an excited, conversational buzz. All the students were asked how they felt when they knew they had PE that day. The resounding response was almost exactly the same as Sophie's, an MLA student's, response: "I kind of get a little excited because gym is really fun." When asked how she felt when she knows she has PE class that day, Julia replied, "Everyone's excited and so am I . . . because in gym we get to go outside and play and have fun."

On four occasions, classroom teachers dropped off their classes at the door to the gymnasium and commented to the PE teacher about how excited the class was to come. For example, one teacher said to the PE teacher, "The class has been talking about coming to gym all day." Another said, "Here you go, they couldn't wait to get here." Will, an HA student, said that he "[feels] really great because now I know that because I have [gym] at the end of the day, I know I'll be happy, at, when I go home." The basis for this excitement is, as Will said, ". . . because it's fun."

This subtheme suggests the students were excited to go to class. All students showed feelings of excitement regarding going to class, across gender, grade, and attitude level. This informs us that students came into class with a positive attitude.

Physical education is their favorite class. An overwhelming number of students indicated that PE is their favorite class. This fits within the theme of fun, because having fun in class is the main reason that PE is their favorite class. In discussing their other classes in relationship to PE, these 15 students said that PE is their favorite class because it is fun. This was true across gender, grade, and attitude level.

Bob, an MLA student, was the only one out of 16 students who did not choose PE class as his favorite subject. He explained, "I don't really have favorites, I just go with the flow." Although he did not have a favorite class, throughout his interviews Bob repeatedly dis-

cussed how much fun he has in PE and he was observed smiling, laughing, and actively participating in both observed classes.

When asked how she feels about PE compared to her other classes, Jackie replied, "I have to say that physical education is, like, one of the best out of every subject we take." In observations, Jackie was found to be listening intently, participating actively, and often taking leadership roles among her friends during class. When the class was doing an activity related to striking, she often cheered for her friends and even offered advice. Other students supported this claim that PE is their favorite class because it is fun. Padre replied, "Phys. ed. is better . . . gym's the best period of the day except for recess and lunch." When Rebecca, another MLA student, replied that PE is her favorite subject, she was asked why. Her response was because "it is fun, I think it will always be fun." John explained, "It's better [than other classes] 'cause not every game is gonna be a project like social studies. And you only get to do it like once a week or twice a week, but it's definitely better."

Students clearly chose PE as their favorite class in school. This trend was evident in HA and MLA students, fourth and fifth graders, and both genders. The popularity of PE was related to the students thinking that class was fun.

The teacher influences the fun level. In the majority of cases, students spoke about the activities the teacher planned, the personality of the teacher, and how strict or fair they perceived their teacher. The teacher was mentioned frequently during interviews when students were asked what influences whether they like or dislike PE. When probed further, students went on to explain how the teacher influences their class and related the teacher with the fun level.

During informal conversations, the teacher was eager to share information about his program and clearly took pride in his teaching. This pride obviously came through to the students. When Cesar was asked about what he feels influenced student attitudes toward PE, he stated,

> Probably, in this school, I would say the teacher and the activities. But, in other schools, I would say the activities because I don't know what their teachers are like. All I know is that this teacher here, everybody likes him.

Bob answered the same question by stating that "whether or not the teacher is nice" influences students' fun levels in PE class. Anna, an MLA student, said that the teacher makes the class fun and described her teacher, similarly to how others described him, in this way:

> He's fun, yeah, he's really fun and he's funny. He has a sense of humor and he's not too strict. He's very big on, like, safety rules and stuff like that, but at the same time, he makes gym class fun and enjoyable. Like, he makes us laugh and is kind of sarcastic, but he's also funny. He's just an enjoyable teacher.

During observations, students seemed to respond positively to the teacher. He joked around frequently with the students, which made them laugh and engaged them. He used humor to gain their attention, and approximately 95% of the students, both boys and girls in fourth and fifth grades, seemed to pay close attention to his instructions. Stephanie, an HA student, said, "He's fun. He's active. He likes to do examples [of skill lessons], like in the beginning when we're starting, he likes to show them what we're doing and how it's done. So, he's fun." Stephanie's comment is reflective of other student responses including Jackie's and Rebecca's. When questioned about her teacher, Jackie said,

> Our gym teacher is really fun. He makes us experience, like, stuff that he thinks that might be fun for us and which they are. Like, it may be fun for me more than other people, but I know they're really fun to play, our gym teacher, wants it to be fun for us and not like arguing about stuff like 'our team lost . . .' or something . . . Well, I think the teacher matters, like, in their attitude. Like, if they have a nice personality, that see, and, like, great attitude, something like that, I think that really matters.

Rebecca, an MLA student, concurred and described her teacher by saying that "he makes everything exciting for all the students in gym . . ." This teacher was very active in giving the students constant feedback, both individually and as a class, during all classes that were observed. While giving feedback, he altered the activity to make it more or less challenging depending on how the class or individual was performing. John stated,

> He's nice, because he gets us to do a lot of fun things that I don't think I would be able to do at other schools . . . Because, well, he adds, well, sometimes he adds things to a part of a game, like, he might add one ball, and then he adds another, to make it faster and catch those.

While most students felt that the teacher made the class exciting and fun, one student, Padre, had definite feelings about the teacher, although not as positive as his other classmates'. Class management was not seen as an issue; during most observations, the students were well behaved. Behavior was an apparent issue in only one class. During this class, the teacher stopped the activity, reprimanded everyone, and went over the instructions a second time once he had everyone's attention. This occurred during Padre's class, which might explain his statement about the teacher being angry sometimes. Padre discussed at length that the teacher has a strong influence on whether students like PE class:

> I feel that sometimes the teacher gets a little angry for some reason and in some classes, we review way too much. Like we review the same thing day after day, like we're not learning anything new and we're just reviewing.

Teacher influence on the fun level was a theme that once again permeated gender, grade, and attitude level. The teacher having an engaging personality and the teacher being an active participant in the learning process were noted as important to the students. The students clearly connected having fun in class with these characteristics of their teacher.

Class Activities Are Important

All participants stated that the activities done in class are important and influence their attitude toward PE. Class activities were discussed in a variety of ways throughout all of the interviews. This theme was supported by two subthemes: (a) MLA students love problem-solving activities and (b) fitness activities are controversial. In both subthemes, males and females and fourth and fifth graders did not differentiate their opinions. There were, however, clear differences between HA and MLA students. The MLA students spoke

often and positively about problem-solving activities. The HA students seemed to enjoy these activities during observations but hardly spoke about them during interviews. The HA students seemed to enjoy fitness activities more than the MLA students did, and neither HA nor MLA students liked taking the Progressive Aerobic Cardiovascular Endurance Run (PACER) test.

This theme was clearly evident from the final question asked during the first round of interviews: "What do you feel makes a student like or dislike gym?" All the students responded with an answer that included the activities they do in class. Jackie replied, "I think what makes a student like gym is the games we get to play and the fun playing them." Will responded to what students dislike: "If a student doesn't like gym it might be because, like because, maybe sometimes, the teacher will have games planned that they don't really like." Bob had a similar response: "Well, um, maybe they don't like the games we would play." Other students' responses also related to this theme. Julia answered and discussed a specific game that she and her friends wanted to play and how that influenced their attitude toward PE: ". . . Like, well, um, my friends and I really want to, like, play Capture the Flag and so, like, if we don't do that, it's OK as long as we do another game that is fun." Cesar said, "Most people like physical education because of the activities."

Class activities and the large influence they have on students were evident through the observations of the classes. Each time the class would come into the gym or go outside onto the field or the blacktop area, they would whisper and look around, either knowing what the activity was or trying to figure it out by the equipment that was set up. There was air of excitement as the teacher explained the activity for that day.

From Padre's facial expression, it was clear whether he was excited about the activity. During one class, he came into class with no definitive expression. Once he found out they were having a home run derby, his face lit up into a big grin and he high-fived his friend. During the next observation, he came to class with much of the same look on his face. His face dropped when he heard that they would have bowling instruction in class and he scuffed his sneaker into the floor. Later during his interview, he explained,

> . . . If the activity is really, really boring and I'm good, I won't like it, but if the activity is really fun even if I'm the worst at it in the class, I still love it. I just care about the activity . . . Like, we do bowling in four lanes and we do speed bowling and then we get to the next lane, same exact thing. Like, [the PE teacher] thinks that most kids will like it, but it's not very fun.

All of the students across grade, gender, and attitude level indicated that what they do in class influences their experience. This theme centered around the idea that if the students like or dislike the activity, it will have a strong influence on whether they have a positive attitude toward class. These activities were then delineated further into team problem-solving and fitness activities.

Moderate to low attitude students love team problem solving. Problem-solving activities are popular among MLA students, which is directly related to the overarching theme that class activities are important. MLA students repeatedly discussed team problem-solving activities, the majority of whom spoke about it positively. While only 2 out of 8 HA students spoke about team problem-solving activities, all eight showed that they enjoyed these activities during observations.

Team problem-solving activities incorporated physical activity with cooperative challenges. At this school, the favorite seemed to be Volcano Island, with Subway a close second. When asked their favorite experience in PE and what they like most, the MLA students constantly mentioned team problem-solving activities. During observations, the HA and MLA students were laughing, smiling, and enjoying team problem-solving activities. The MLA students, however, were the ones who spoke about it during interviews.

Volcano Island was observed and was a team-building activity in which the class works together to get everyone from one place to the other (i.e., mat to mat) using various pieces of equipment such as jump ropes, pool noodles, and scooters while working around obstacles. The challenge is changed slightly each year. Jackie explained the activity Subway:

> We play—like once [our teacher] brought an [activity] called Subway and it's really fun because you have to bring everyone out of—like it's kind of like a subway so the train has to carry

> everyone and then put them back in their, like, where they want to go and stuff.

The researcher then clarified with Jackie that this activity is one in which everyone has to work as a team to transport their classmates around the gymnasium using various pieces of equipment. Other students had similar responses. Rebecca was asked, "Do you have a favorite activity or favorite thing you do?" She replied, "I like when we play Volcano Island and that's really fun to play." After further probing, she said, "Yeah, everybody seems to like Volcano Island . . . because it's just, like,—like, I like the competition thing also and I like competitions." In an interview, Anna explained,

> Like, for example, Volcano Island, it's not really—we don't really exercise and more it's just like fun for us to play . . . Well, because it involves a lot of like humor, but it's like one of those games where you're timed and it's like you're freaking out at one point because 'Oh, I got stuck and I'm going to explode' . . . Like it also involves a lot of skill too and we don't play it often so it's kind of almost like a thrill when play it. Sometimes, you'll walk, we see like the younger grades playing it and we have to play something different and I'm like 'I want to play Volcano Island' . . .

Cesar said, "And everybody mostly likes the game Volcano Island . . . Yes [it's my favorite]. Like, you have a lot of this strategy involved and we played it during the school picnic." The researcher was invited to attend the school's picnic. Informal observations were completed, and Volcano Island was one of the stations that each class attended. Students would run over to that station when they realized that Volcano Island was next. It was evident how enthusiastic both MLA and HA students were for this type of activity.

Clearly, MLA and HA students enjoy team problem-solving activities. It is interesting that only MLA students spoke about these types of activities during the interview. Student perceptions about these team problem-solving activities and the frequency with which they were discussed during interviews fit well with the overarching theme that class activities are important.

Fitness activities are controversial. Doing fitness activities during PE class was a controversial topic among students, which also

relates to the concept that class activities influence student perceptions. Nearly all of the HA and MLA students had a strong opinion about fitness activities. The HA students had positive feelings about fitness activities. The only aspect the HA students spoke about negatively was the PACER test. The PACER test measures cardiovascular endurance in students from kindergarten to college. Only a few HA students spoke positively about the PACER test. All of MLA students did not say much about fitness activities but spoke negatively about fitness testing, especially the PACER test.

In this PE program, each time students have class they do fitness activities. This was witnessed during the observations and explained by the students when asked to describe a typical day in their PE class. Rebecca described her class: "We usually, like-like, I said, like warm-ups. We do, like, jumping jacks. We jog. We do push-ups, curl-ups, and all these other things." In observations of each class, students came and immediately engaged in fitness activities to warm up. During most observations, students went right into stations, which included stationary bikes, a rock climbing wall, a stretching or yoga station, an upper body strength station, and a jump rope station. These stations acted as the class warm-up. The teacher noted that the students do Fitnessgram physical fitness testing twice a year, once in the beginning and once toward the end of the school year. The students are given personal printouts with their fitness levels each time they do the Fitnessgram. These printouts act as a guide from which students can work on their fitness and test preparation all year.

The students participated in these activities during the warm-ups, chatting with their friends or concentrating on the task at hand. It was challenging to determine from the observations whether the students were enjoying these activities, because they were routine and did not elicit much of a response. The interviews, however, gave insight into how students feel about fitness activities. HA students spoke highly about exercising, the fitness activities done in class, and fitness testing, whereas MLA students did not talk about exercise or fitness activities much at all but spoke negatively about the fitness testing, especially the PACER test. Many of the MLA students complained that the PACER test is boring and that it makes them tired.

During three observations, the students were learning how to run at a pace. This activity consisted of students taking turns run-

ning back and forth from cone to cone in teams. In an informal conversation with the teacher, he said that they were doing this to practice for the PACER test and learn how to run long distances. The MLA students, such as George T., were clearly uncomfortable. He was observed with a look of discomfort on his face as well as hesitation to start each time it was his turn. He was heard complaining to his friends about how much he hated the activity. He asked, "Why do we have to do this? It's so boring" and making comments such as "I hope we don't do this the whole class." His friends shrugged in response. Other students had similar responses. For example, Julia described the PACER test as her least favorite activity:

> I really don't like PACER, even though I do it very well. I don't like it . . . Well, I get tired out and then when everybody gets tired out, we're like mad that they didn't get just, like, the point 75, which is the highest.

Anna also said that it was her least favorite activity "because you just get, like, out of breath and it's kind of boring, back and forth, although I don't really run a lot. Yeah, I just don't like it." Cesar agreed,

> Well, I don't like when we have the tests and we have to do pull-ups and we have to do an amount of curl-ups or push-ups. And I hate PACER because you just keep going and somehow I think everybody just makes it a contest.

He was then asked, "So, do you like the Fitnessgram and all that stuff?" Cesar replied, "No, no." George Washington, an HA student, explained, ". . . [PACER is] really boring because all you really do is jogging." Star, an HA student, also said, "PACER and things like that are really boring."

When the HA students spoke about other fitness activities, it was in a positive way. When asked about good experiences in class, Will explained, "Well, when I did PACER I got the highest [laps] you can get and like sit-ups, I did the most in the class." It was clear that Will was proud of his running ability and seemed to enjoy this activity. This was evident by his enthusiasm throughout the class. John also explained that his favorite experience in class was getting "all 75 [laps] that you can get on PACER." He said it made him feel "awesome." Bill explained that the "exercise is what makes it fun."

During the observation of the PACER practice activity, John was seen jogging easily from cone to cone, smiling, and high-fiving his friends at the finish. During the same activity, Will got a lot of attention from his friends and compliments on how fast he can run, which also garnered smiles and high fives from Will.

The class activities are important in student perceptions regarding what influences their attitudes. Within class activities, fitness activities were noted throughout the interviews and observations. Gender and grade level seemed to have little effect. The MLA and HA students seemed to differ in their opinions. The HA students tended to enjoy fitness activities more than the MLA students did, and neither group seemed to have positive feelings toward the PACER test.

Discussion

Fun in PE was found throughout the study to influence student perceptions toward PE. This was not surprising given the research on the importance of fun in PE. Fun has been suggested to be a pervasive construct in PE (Garn & Cothran, 2006). Research has also suggested that students rate fun or enjoyment as one of their top goals for PE class (Cothran & Ennis, 1998; Garn & Cothran, 2006; O'Reilly, Tompkins, & Gallant, 2001; Supaporn & Griffin, 1998). The results of this study suggest that having fun is a key to students enjoying PE, and upper elementary school students clearly equate fun with PE class. It appears that if students do not enjoy learning in PE, this will likely influence their attitude toward PE and, ultimately, physical activity since students equate experiences in PE with physical activity outside of school (Carlson, 1995; Ennis, 1996; Portman, 1995; Robinson, 1990; Solmon & Lee, 1996). Therefore, it is important that students have fun in PE class, because this may influence their perceptions and beliefs.

The teacher was another factor that was found to influence student attitudes toward PE. Upper elementary school students related their teacher to influencing how much fun they have in class. This aligns with the research on student attitude that has found the teacher, within the constructs of perceived usefulness and enjoyment, influences attitude (Luke & Sinclair, 1991; Montalvo & Silverman, 2008; Subramaniam & Silverman, 2000, 2007). Even more specific to this finding is the research that suggests the teacher can help create negative attitudes (Luke & Sinclair, 1991). Conversely, results of this

study suggest that the teacher can also create an atmosphere of fun, which can help create positive attitudes.

Team problem-solving activities are important for MLA students. Research on student attitudes for upper elementary school students through middle and high school students has noted that the curriculum influences student attitude (Montalvo & Silverman, 2008; Subramaniam & Silverman, 2000). Students' perceived usefulness and their enjoyment of the curriculum have been suggested to influence student attitude. While student skill level may be the obvious conclusion why MLA students like team problem-solving activities, it is not as obvious as it seems. During observations, student skill level varied between HA and MLA students, and students' perceptions of their own skill level were skewed. All but one of the 16 students interviewed said that they were high skilled in class, when in reality the skill level was varied. This finding that team problem-solving activities are popular among MLA students creates a basis for future research on the Project Adventure, or similar, curriculum and its influence on student attitudes and perceptions.

Exercise and fitness activities were frequently referenced in conjunction with fitness testing, preparation for fitness testing, and the PACER test, and HA students were vocal about their enjoyment of exercise, while MLA students were vocal about their dislike of exercise. The PACER test was strongly disliked by both HA and MLA students. Hopple and Graham (1995) suggested that these types of aerobic fitness testing activities may be detrimental, and the students in this study confirmed that finding. It is clear, in this study, that MLA students do not enjoy fitness activities for which they do not feel prepared and do not experience success. This is an important finding, because research has suggested that if used inappropriately, fitness testing can be detrimental to physical activity levels (Corbin, Pangrazi, & Welk, 1995; Keating, 2003; McKenzie & Kahan, 2004). Many have noted that fitness testing is only helpful to students when done appropriately (Cale, Harris, & Chen, 2007; Corbin et al., 1995; Montalvo & Silverman, 2008). These student perceptions toward fitness activities can help inform the future use of fitness activities and testing.

During the data analysis process, three girls, all in fifth grade, mentioned sweating was an issue. Here, however, there was not

enough data to substantiate a finding. It might be interesting for future research to pursue sweating as a gender-related concern for developing adolescents in the upper elementary school grades. This finding warrants further investigation and could add insight into why, starting in sixth grade, females dislike PE more than males do (Subramaniam & Silverman, 2007).

This study continues in a line of research in PE that suggests a great deal of information can be learned from the study of student perceptions. In this study, upper elementary school students diagnosed issues, both positive and negative, by sharing their perceptions. In this instance, a program that has been well thought of still provided student perceptions that suggest some well-used techniques and practices may not yield the skill, fitness, or attitudes that teachers suggest they do. These perceptions can influence whether students choose to participate in learning (Pajares, 1992; Zimbardo & Leippe, 1991), making understanding them invaluable. Because this study and other research in PE (Bernstein et al., 2011; Carlson, 1995; Graham, 1995; Hopple & Graham, 1995; Portman, 1995) suggest the importance of student perceptions in informing what we know about the teaching and learning of PE, these findings can help inform future teaching of motor skills and fitness and how to foster positive attitudes toward PE. If we want students to learn what is intended, we must understand how their experiences in PE shape what they think and feel and how it influences their future physical activity.

References

Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *A handbook of social psychology* (pp. 798–844). Worcester, MA: Clark University Press.

Bernstein, E., Phillips, S. R., & Silverman, S. (2011). Attitudes and perceptions of middle school students toward competitive activities in physical education. *Journal of Teaching in Physical Education, 30*(1), 69–83.

Bogdan, R., & Biklen, S. (2007). *Qualitative data*. Boston, MA: Allyn and Bacon.

Cale, L., Harris, J., & Chen, M.-H. (2007). More than 10 years after "The horse is dead…": Surely it must be time to "dismount"?! *Pediatric Exercise Science, 19*, 115–131.

Carlson, T. B. (1995). We hate gym: Student alienation from physical education. *Journal of Teaching in Physical Education, 14,* 467–477. https://doi.org/10.1123/jtpe.14.4.467

Corbin, C. B., Pangrazi, R. P., & Welk, G. J. (1995). A response to "The horse is dead; let's dismount." *Pediatric Exercise Science, 7,* 347–351. https://doi.org/10.1123/pes.7.4.347

Cothran, D. J., & Ennis, C. D. (1998). Curriculum of mutual worth: Comparison of students' and teachers' curricular goals. J*ournal of Teaching in Physical Education, 17*, 307–327. https://doi.org/10.1123/jtpe.17.3.307

Cothran, D., Kulinna, P., & Garrahy, D. (2003). "This is kind of giving a secret away...": Students' perspectives on effective class management. *Teaching and Teacher Education, 19,* 435–444. https://doi.org/10.1016/s0742-051x(03)00027-1

Ennis, C. D. (1996). Students' experiences in sport-based physical education: [More than] apologies are necessary. *Quest, 48,* 453–456. https://doi.org/10.1080/00336297.1996.10484211

Entwistle, N. J., McCune, V., & Hounsell, J. (2002). *Approaches to studying and perceptions of university teaching–learning environments: Concepts, measures, and preliminary findings*. Paper presented at Higher and Community Education, School of Education, University of Edinburgh, Edinburgh, Scotland.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Curtin, L. R. (2010). Prevalence and trends in obesity among U.S. adults, 1999–2008. *Journal of the American Medical Association, 303*, 235–241.

Garn, A. C., & Cothran, D. J. (2006). The fun factor in physical education. *Journal of Teaching in Physical Education, 25*, 281–297. https://doi.org/10.1123/jtpe.25.3.281

Graham, K. C. (1995). Physical education through students' eyes and in students' voice: Implications for teachers and researchers. *Journal of Teaching Physical Education, 14,* 478–482. https://doi.org/10.1123/jtpe.14.4.478

Hopple, C., & Graham, G. (1995). What children think, feel, and know about physical fitness testing. *Journal of Teaching Physical Education, 14,* 408–417. https://doi.org/10.1123/jtpe.14.4.408

Keating, X. D. (2003). The current often implemented fitness tests in physical education programs: Problems and future directions. *Quest, 55,* 141–160. https://doi.org/10.1080/00336297.2003.10491796

Kohl, H. W., & Hobbs, K. E. (1998). Development of physical activity behaviors among children and adolescents. *American Academy of Pediatrics*, *101*, 549–554.

Krebs, N. F. (2003). Prevention of pediatric overweight and obesity. *American Academy of Pediatrics*, *112*, 424–430.

Luke, M. D., & Sinclair, G. D. (1991). Gender differences in adolescents' attitudes toward school physical education. *Journal of Teaching in Physical Education, 11*, 31–46. https://doi.org/10.1123/jtpe.11.1.31

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Thousand Oaks, CA: Sage.

McKenzie, T. L., & Kahan, D. (2004). Impact of the Surgeon General's report: Through the eyes of physical education teacher educators. *Journal of Teaching Physical Education, 23,* 300–317. https://doi.org/10.1123/jtpe.23.4.300

Montalvo, R., & Silverman, S. (2008, April). *Urban secondary school students' attitudes toward physical education*. Paper presented at American Education Research Association, New York, NY.

O'Reilly, E., Tompkins, J., & Gallant, M. (2001). 'They ought to enjoy physical activity, you know?': Struggling with fun in physical education. *Sport, Education, and Society, 6*, 211–221. https://doi.org/10.1080/13573320120084281

Pajares, F. M. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 42,* 307–332. https://doi.org/10.2307/1170741

Peshkin, A. (1988). In search of subjectivity—One's own. *Educational Research, 17*(7), 17–22. https://doi.org/10.2307/1174381

Phillips, S. R., & Silverman, S. (2015). Upper elementary school student attitudes toward physical education. *Journal of Teaching in Physical Education, 34*, 461–473. https://doi.org/10.1123/jtpe.2014-0022

Portman, P. A. (1995). Who is having fun in physical education classes? Experiences of sixth grade students in elementary and middle schools. *Journal of Teaching in Physical Education, 14,* 445–453. https://doi.org/10.1123/jtpe.14.4.445

Ravizza, D. M., & Stratton, R. K. (2007). Students' perceptions of physical education teachers' caring. *Research Quarterly for Exercise and Sport, 78,* 70–72.

Robinson, D. W. (1990). An attributional analysis of student demoralization in physical education settings. *Quest, 42,* 27–39. https://doi.org/10.1080/00336297.1990.10483977

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise, 32,* 963–975. https://doi.org/10.1097/00005768-200005000-00014

Solmon, M. A., & Lee, A. M. (1996). Research on social issues in elementary school physical education. *Elementary School Journal, 103*, 229–239. https://doi.org/10.1086/529105

Subramaniam, P. R., & Silverman, S. (2000). Validation of scores from an instrument assessing student attitude toward physical education. *Measurement in Physical Education and Exercise Science, 4*, 29–43. https://doi.org/10.1207/S15327841Mpee0401_4

Subramaniam, P. R., & Silverman, S. (2007). Middle school students' attitudes toward physical education. *Teaching and Teacher Education, 23*, 602–611. https://doi.org/10.1016/j.tate.2007.02.003

Supaporn, S., & Griffin, L. L. (1998). Undergraduate students report their meaning and experiences of having fun in physical education. *Physical Educator, 55,* 57–70.

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. (1996). *Physical activity and health: A report of the Surgeon General.* Atlanta, GA: Author.

Zimbardo, P., & Leippe, M. (1991). *The psychology of attitude change and social influence*. Philadelphia, PA: Temple University Press.

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PEDAGOGY

Physical Education Teachers' Behaviors and Intentions of Integrating STEM Education in Teaching

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Abstract

Integrating science, technology, engineering, and mathematics (STEM) education in physical education (PE) has received increased attention. PE teachers' past behaviors and behavioral intentions of integrating STEM education in their teaching were investigated in this cross-sectional survey via the lens of the theory of planned behavior (TPB). Primary and secondary school PE teachers (n = 165) completed a survey that measured their behaviors and intentions surrounding STEM. The results indicated that only 19.4% of the PE teachers sometimes or often integrated STEM education in their teaching. Attitudes, subjective norms, and perceived behavior control positively predicted PE teachers' behavioral intentions, which was consistent with the TPB. These findings support the utility of TPB in understanding PE teachers' intentions to integrate STEM education in PE classrooms. The findings also provide the first evidence-based data for policymakers to promote STEM education in PE.

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Physical education (PE) classes are possible venues for the integration of STEM education; however, the concept of STEM may be new for some physical educators. The term *STEM* stands for science, technology, engineering, and mathematics. Indeed, PE has a science basis that integrates and applies scientific theories and technologies to improve performance in sports or to enhance physical health via exercise. Studies have shown that STEM education can enhance students' learning (Becker & Park, 2011) and academic performance (Barker & Ansorge, 2007), as well as critical thinking and problem-solving skills (Fortus, Krajcik, Dershimer, Marx, & Mamlok-Naaman, 2005; Mehalik, Doppelt, & Schuun, 2008; Su, 2008). Therefore, many countries, including Australia and the United States, have implemented STEM programs to improve students' achievement and remain competitive in the global economy (Kuenzi, 2008).

In response to the changes of the modern world, the Education Bureau of Hong Kong recommended local teachers integrate STEM education into the school PE curriculum (Curriculum Development Council, 2017). The 2015 Policy Address (Hong Kong Special Administrative Region Government, 2015) stated that the promotion of STEM education is a key emphasis under the ongoing renewal of the school curriculum, including PE. According to the Curriculum Development Council (2017), the promotion of STEM education will provide more opportunities for the innovative integration and application of different subject knowledge and skills in real settings. For example, students can develop health applications (e.g., Spotify Running) via smartphones for exercise programs (Erwin, 2017). In addition, promoting STEM in PE will reduce the marginalization of PE, as it is increasingly being recognized as an academic subject (Johns & Dimmock, 1999).

Despite the benefits of promoting STEM in PE, the integration of STEM education (e.g., integrating one or more STEM components such as mathematics and physics in PE) may pose challenges to PE teachers. Indirect evidence indicates that preservice and in-service science teachers need to expand their knowledge to implement STEM programs (Teo & Ke, 2014). Similarly, mathematics and science teachers note that there are insufficient guidelines on the integration of STEM education in the classroom (Brown, Brown, Reardon, & Merrill, 2011). Unfortunately, there is a lack of empirical

evidence regarding PE teachers' perceptions about the integration of STEM education in their teaching. Since PE is different from other STEM subjects (e.g., mathematics and science), PE teachers may have different views about the integration of STEM education compared with teachers of other subjects. More important, ignoring teacher-related factors (e.g., attitudes, knowledge, and perceptions) may affect the progress of education reform (Van Driel, Beijaard, & Verloop, 2001), including the promotion of STEM in PE. Therefore, it is necessary for researchers to investigate PE teachers' perceptions of STEM in PE. Moreover, it is also important to know how often PE teachers integrate STEM education in their classes; this will provide policymakers with preliminary data that will inform decision making regarding STEM.

The theory of planned behavior (TPB; Ajzen, 1991, 2005) may be a useful model for examining teachers' behaviors when they integrate STEM education into PE classes. According to the TPB (Ajzen, 1991), individuals' behavioral intentions are a salient predictor of human behaviors (e.g., integrating STEM into PE). The TPB also posits that behavioral intentions are shaped by three conceptual determinants: attitudes toward the target behavior, subjective norms, and perceived behavioral control (PBC).

Attitudes are defined as the degree to which a person has a favorable or unfavorable evaluation of the outcomes of a target behavior. For example, if a PE teacher expects the use of mobile applications (e.g., Angry Birds) will increase students' skill achievement (e.g., throwing distance of a beanbag), he or she is more likely to form a positive attitude toward using mobile applications in teaching. *Subjective norms* refer to the perceived social pressure from significant others about whether to engage in a target behavior. In a different behavioral context, significant others or reference groups are different. In the aforementioned example, the significant others may include students, parents of students, colleagues, and school principals. Finally, *PBC* concerns an individual's perceived abilities and resources to perform a target behavior. For example, it is impossible for a PE teacher to use the Angry Birds game to teach beanbag throwing if he or she does not have the resources to purchase it or the expertise to use it, even if the application is accessible. Indeed, the TPB has been tested and supported in different fields, including mobile learning (e.g., Cheon, Lee, Crooks, & Song, 2012) and the

promotion of physical exercise (e.g., Schüz, Li, Hardinge, McEachan, & Conner, 2017). However, the application of TPB to understanding teachers' intentions to integrate STEM education in PE is unknown.

In summary, although there is a call for the implementation of STEM in PE, little is known about teachers' behaviors and intentions to implement STEM. Guided by the TPB (Ajzen, 1991), this cross-sectional survey was therefore developed to understand how often PE teachers integrate STEM education in teaching and their behavioral intentions to integrate STEM education into PE lesson. Based on the tenets of TPB (Ajzen, 1991), it was hypothesized that attitudes, subjective norms, and PBC would be positive predictors of intentions. In other words, PE teachers who have higher levels of positive attitudes, subjective norms, and PBC will have stronger intentions to integrate STEM education into their teaching.

Method

Participants

Participants included 165 PE teachers (40 females, 41 males, 50.9% did not report their gender) who were recruited from primary and secondary schools in Hong Kong. Approximately half (46.7%) of the teachers were recruited from primary schools. The majority of the participants (75.8%) were 26 to 45 years old. All participants had at least a bachelor's degree; the sample varied in their teaching experience. Table 1 presents detailed information about participants' demographics.

Measures

Demographic data including gender, school, age range, education level, and years of teaching were collected. In addition, in accordance with the guideline for constructing the TPB-based questionnaire (Ajzen, 2002), a researcher trained in PE developed the survey items that measured the participants' attitudes, subjective norms, PBC, behavioral intentions, and behaviors regarding the integration of STEM education into PE. Two experts in PE checked the developed items and made minor changes to item wording. The updated items were then administered to 10 in-service PE teachers, who assessed the items and indicated that they were understandable and did not require further changes.

Table 1
Demographic and Other Characteristics of Participants (n = 165)

Characteristics	Valid frequency (%)
Gender	
Male	41 (24.8)
Female	40 (24.2)
Missing	84 (50.9)
Age	
≤ 25	11 (6.7)
26–30	33 (20.0)
31–35	31 (18.8)
36–40	30 (18.2)
41–45	31 (18.8)
≥ 46	29 (17.6)
School	
Primary school	77 (46.7)
Secondary school	85 (51.5)
Missing	3 (1.8)
Education level	
Bachelor's degree	62 (37.6)
Postgraduate diploma	53 (32.1)
Master's degree	49 (29.7)
Missing	1 (0.6)
Years of teaching	
0–3	33 (20.0)
4–6	12 (7.3)
7–10	23 (13.9)
11–15	26 (15.8)
16–20	32 (19.4)
21–25	15 (9.1)
≥ 26	23 (13.9)
Missing	1 (0.6)

TPB-based variables. The stem "In the coming month, integrating STEM education in PE is…" was employed for the assessment of participants' attitudes. Their responses were rated on five six-point semantic differential scales: "valuable–worthless," "beneficial–harmful," "pleasant–unpleasant," "enjoyable–unenjoyable," and

"good–bad." The items measuring subjective norms (three items; e.g., "The people in my life whose opinions I value would approve of me integrating STEM education in PE"), PBC (five items; e.g., "I have complete control over integrating STEM education in PE"), and intentions (three items; e.g., "I intend to integrate STEM education in PE") were rated on a 7-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7).

An exploratory factor analysis (principal axis factors) was conducted and the factorial validity of the items examined. According to the TPB (Ajzen, 1991), a four-factor solution with direct oblimin rotation was used in the extraction of the data (Costello & Osborne, 2005). The four-factor solution explained 80.6% of the variance in the data set. Table 2 presents the item loadings. The item PBC1 was removed because it failed to load on the target factor. The Cronbach's alphas for the four subscales were .95 (attitudes), .92 (subjective norms), .92 (PBC), and .96 (behavioral intentions). A mean score for each subscale was calculated for subsequent analyses.

Behavior. In Hong Kong, there are two to three PE lessons per week and each lesson lasts about 35 to 40 min. Participants were asked about how often they integrated STEM education into their teaching during the last month. Participants rated their response on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*).

Procedure

The institutional review board at the Education University of Hong Kong granted ethical approval for the study. The survey was conducted during the Summer School for PE Teachers held in June 2017. The Summer School was a 1-day event with the theme "Nurturing Positive Values and Attitudes Through PE." PE teachers (N = 303) who participated in the Summer School were invited to complete this survey. The second author provided the PE teachers with information about the study in a large lecture hall. The PE teachers were then asked to sign the informed consent form, and, if they agreed to participate, were asked to complete the survey at that time. The second author also encouraged the participants to answer the questions honestly. The survey took approximately 10 min to complete; 166 participants completed the survey, with a response rate of 54.8%.

Table 2
Item Factor Loadings of TPB-based Variables after Direct Oblimin Rotation

Item	Factor 1	Factor 2	Factor 3	Factor 4
AT Item 1		.64		
AT Item 2		.84		
AT Item 3		.87		
AT Item 4		.99		
AT Item 5		.98		
SN Item 1				.67
SN Item 2				.94
SN Item 3				.91
PBC Item 1	.35			.32
PBC Item 2			.69	
PBC Item 3			.97	
PBC Item 4			.84	
PBC Item 5			.79	
INT Item 1	.78			
INT Item 2	.75			
INT Item 3	.96			

Note. Factor loadings < .30 have been omitted for clarity. TPB = theory of planned behavior; AT = attitude; SN = subjective norm; PBC = perceived behavioral control; INT = intention.

Data Analysis

One participant only completed half of the survey form and was excluded from the data analysis (Hair, Black, Babin, & Anderson, 2010). In addition, there was one missing data point for attitudes, which was imputed by the mean (Hair et al., 2010). Descriptive statistics (means, standard deviations, or percentage) for all of the

study variables were computed. Zero-order correlations between demographic variables (i.e., school, gender, age range, years of teaching, and education level) and TPB-based variables (i.e., attitudes, subjective norms, PBC, and intentions) were examined. Hierarchical regression analyses were adopted and the effects of attitudes, subjective norms, and PBC on behavioral intentions examined. In Step 1, demographic variables were entered if they significantly correlated with attitudes, subjective norms, PBC, and/or intentions. In Step 2, attitudes, subjective norms, and PBC were added to the model. All statistical analyses were conducted with SPSS 24.0; the significance level was set at .05.

Results

Descriptive Statistics

For target behavior, the participants reported that during the last month they almost never (50.9%) or occasionally (29.1%) integrated STEM education in PE; only 19.4% reported that they sometimes or often integrated STEM education into their PE lessons. The participants reported a moderate level of attitudes (M = 4.15, SD = 1.09), subjective norms (M = 3.86, SD = 1.27), PBC (M = 4.01, SD = 1.19), and behavioral intentions (M = 4.18, SD = 1.36).

Zero-Order Correlations

Table 3 presents the zero-order correlations among the study variables. Age was significantly correlated with attitudes (r = -.31, p < .01), subjective norms (r = -.28, p < .01), and intentions (r = -.26, p < .01). Years of teaching was negatively related to attitudes (r = -.30, p < .01), subjective norms (r = -.34, p < .01), and intentions (r = -.31, p < .01). The rest of the demographic characteristics (i.e., gender, school, and education level) were not significantly related to TPB-based variables (attitudes, subjective norms, PBC, and intentions). Thus, age and years of teaching were entered in the regression models as control variables. In line with the hypothesis, attitudes, subjective norms, and PBC were positively associated with intentions (rs = .67 to .76, ps < .01).

Table 3
Zero-Order Correlations Among the Study Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. School	—								
2. Gender	.06	—							
3. Age	−.28**	−.00	—						
4. Years of teaching	−.31**	.08	.93**	—					
5. Education level	−.01	.07	.01	.04	—				
6. Attitudes	.13	−.08	−.26**	−.30**	.04	—			
7. Subjective norms	.15	−.04	−.28**	−.34**	.06	.56**	—		
8. Perceived behavioral control	−.05	−.19	−.09	−.10	.07	.56**	.59**	—	
9. Intentions	.15	−.19	−.26**	−.31**	.10	.67**	.76**	.68**	—

**$p < .01$.

Regression Analyses

Table 4 shows the results of the hierarchical regression analyses. In Step 1, years of teaching (ß = -.50, p = .02) was a significant predictor of intentions. In Step 2, years of teaching (ß = -.16, p = .19) was no longer a predictor of intentions, while the newly added variables were significant and positive predictors of intentions (attitudes, ß = .26; subjective norms, ß = .43; and PBC, ß = .28; ps < .01). Attitudes, subjective norms, and PBC explained an additional 61% of the variance in the prediction of intentions on top of the two demographic variables (i.e., age and years of teaching). In total, all predictors accounted for 71% of the variance in the model.

Table 4
Hierarchical Regressions of Age, Years of Teaching, Attitudes, Subjective Norms, and Perceived Behavioral Control on Intentions

Predictor	ß (Step 1)	ß (Step 2)
Step 1		
Age	.20	
Years of teaching	−.50*	
Step 2		
Age		.11
Years of teaching		−.16
Attitudes		.26**
Subjective norms		.43**
Perceived behavioral control		.28**
R^2	.10	.71
ΔR^2		.61**

Note. ß = standardized regression coefficient; R^2 = coefficient of determination (variance explained); ΔR^2 = change of coefficient of determination. *p < .05. **p < .01.

Discussion

This research investigated the role of PE teachers' past behaviors and intentions to integrate STEM education in their teaching. Most of the participants reported that they seldom integrated STEM education into their classes, even though the STEM in PE program has been implemented in Hong Kong since 2015. These findings suggest

a need for the provision of sufficient guidelines to PE teachers about how to integrate STEM education into their teaching. According to earlier research (e.g., Brown et al., 2011; Teo & Ke, 2014), mathematics and science teachers also need similar guidelines on how to integrate other STEM components into their subject.

This study also examined whether TPB is applicable to further understanding of PE teachers' behavioral intentions to integrate STEM education into their teaching. The results of the regression analyses support the tenets of TPB in the context of STEM in PE. This finding extends the applicability of the theory and is consistent with research in other domains, including physical activity (Martin & Kulinna, 2005) and technology use (Teo & Lee, 2010). The findings of this study indicate that PE teachers who report higher levels of attitudes, subjective norms, and PBC are more likely to integrate STEM education into their classes.

According to Ajzen (1991), the three determinants of behavioral intentions vary across different study contexts (e.g., education, health, and volunteerism) and groups (e.g., teachers, patients, and volunteers). For example, PBC was a stronger predictor of intentions to help others than attitudes and subjective norms in the context of volunteerism (Hyde & Knowles, 2013). However, subjective norms was a stronger predictor of behavioral intentions than the other two predictors in this study (i.e., an educational and collectivistic setting). As Hong Kong is a society that is predominantly collectivistic, PE teachers' perceived social pressures (i.e., subjective norms) may be intensified (Ham, Jeger, & Frajman Ivković, 2015). In addition to cultural influences, PE teachers may be more willing to comply with referents' opinions than other groups of people. These may explain why subjective norms was the strongest predictor among the three determinants of PE teachers' intention to integrate STEM education in this study.

Limitations and Future Research Directions

This study had a few limitations. First, while the sample size was relatively large, the use of convenience sampling limits the generalizability of the findings. Future research should examine whether the findings can be replicated in other samples or contexts. Second,

the study used a cross-sectional design; therefore, readers should be cautious about inferring causation between the three belief-based variables and behavioral intentions. In addition, the data were self-report, which may contribute to shared method bias. Thus, future research in this area should implement longitudinal studies with objective measures. Third, participants were asked to report their behaviors and intentions of integrating STEM education as a whole rather than each of the STEM components (e.g., integration of mathematics into PE). To provide more information for stakeholders to promote STEM in PE, future investigations need to address this limitation. Finally, attitudes, subjective norms, and PBC explained 61% of the variance in the prediction of intentions; however, the integration of other theories such as self-determination theory (Ryan & Deci, 2000) and the health action process approach (Schwarzer, Lippke, & Luszczynska, 2011) may provide additional explanations for the prediction of intentions.

Implications

Despite the outlined limitations, several practical implications can be derived from this research to promote STEM in PE. The majority of PE teachers responded neutrally about integrating STEM education into their teaching. Therefore, it is necessary for policymakers and stakeholders to take action to improve local PE teachers' attitudes. In addition to attitudes, PE teachers' behavioral intentions are strongly influenced by subjective norms. As such, significant others' (e.g., principals, parents, and students) perceptions should also be enhanced. For example, messages about the benefits of integrating STEM education into PE should be disseminated among teachers and significant others. Moreover, for an enhancement of PE teachers' PBC, financial support and resources should be allocated to schools for STEM integration into PE. Finally, there is a need for PE teachers to expand their knowledge about how to implement STEM in PE programs. A detailed guideline (e.g., analyzing fitness scores using software, using accelerometers, applying mobile applications, and employing Newton's laws of motion) about the implementation of STEM in PE should be prepared.

Conclusions

PE teachers seldom integrate STEM education into their PE lessons in Hong Kong. This survey provided initial empirical evidence that could guide policymakers and stakeholders to promote STEM in PE. This study extends the application of the TPB to the context of STEM in PE. It is hoped that the findings of this study spur further research on STEM in PE.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211. https://doi.org/10.1016/0749-5978(91)90020-t

Ajzen, I. (2002). *Constructing a theory of planned behavior questionnaire*. Retrieved from http://people.umass.edu/aizen/tpb.measurement.pdf

Ajzen, I. (2005). *Attitudes, personality, and behavior*. Maidenhead, England: Open University Press.

Barker, B. S., & Ansorge, J. (2007). Robotics as means to increase achievement scores in an informal learning environment. *Journal of Research on Technology in Education, 39*, 229–243. https://doi.org/10.1080/15391523.2007.10782481

Becker, K., & Park, K. (2011). Effects of integrative approaches among science, technology, engineering, and mathematics (STEM) subjects on students' learning: A preliminary meta-analysis. *Journal of STEM Education: Innovations and Research, 12*(5–6), 23–37.

Brown, R., Brown, J., Reardon, K., & Merrill, C. (2011). Understanding STEM: Current perceptions. *Technology and Engineering Teacher*, *70*(6), 5–9.

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, *59*, 1054–1064. https://doi.org/10.1016/j.compedu.2012.04.015

Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation, 10*(7), 1–9.

Curriculum Development Council. (2017). *Physical education key learning area curriculum guide (primary 1 – secondary 6)*. Retrieved from http://www.edb.gov.hk/attachment/en/curriculum-development/renewal/PE/PE_KLACG_eng_draft_2017_05_v3.pdf

Erwin, H. E. (2017). Full STEAM ahead in physical education. *Journal of Physical Education, Recreation, & Dance, 88*(1), 3–4. https://doi.org/10.1080/07303084.2016.1249759

Fortus, D., Krajcik, J., Dershimer, R. C., Marx, R. W., & Mamlok-Naaman, R. (2005). Design-based science and real-world problem-solving. *International Journal of Science Education, 27*, 855–879. https://doi.org/10.1080/09500690500038165

Gatch, C. L., & Kendzierski, D. (1990). Predicting exercise intentions: The theory of planned behavior. *Research Quarterly for Exercise and Sport, 61*, 100–102. https://doi.org/10.1080/02701367.1990.10607485

Gonzalez, H. B., & Kuenzi, J. J. (2012). *Science, technology, engineering, and mathematics (STEM) education: A primer* (Research Rep. No. R42642). Retrieved from Congressional Research Service website: https://www.upd.edu.ph/~updinfo/oct13/articles/R42642.pdf

Hair, J. F., Black, B., Babin, B., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Ham, M., Jeger, M., & Frajman Ivković, A. (2015). The role of subjective norms in forming the intention to purchase green food. *Economic Research-Ekonomska Istraživanja, 28*(1), 738–748. https://doi.org/10.1080/1331677x.2015.1083875

Hong Kong Special Administrative Region Government (2015). *Policy address 2015.* Retrieved from https://www.policyaddress.gov.hk/2015/eng/index.html

Hyde, M. K., & Knowles, S. R. (2013). What predicts Australian university students' intentions to volunteer their time for community service? *Australian Journal of Psychology, 65*(3), 135–145. https://doi.org/10.1111/ajpy.12014

Johns, D. P., & Dimmock, C., IV. (1999). The marginalization of physical education: Impoverished curriculum policy and practice in Hong Kong. *Journal of Education Policy, 14*(4), 363–384. https://doi.org/10.1080/026809399286242

Kuenzi, J. J. (2008). *Science, technology, engineering, and mathematics (STEM) education: Background, federal policy, and legislative action* (Research Rep. No. RL33434). Retrieved from Congressional Research Service website: http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1034&context=crsdocs

Martin, J. J., & Kulinna, P. H. (2004). Self-efficacy theory and the theory of planned behavior: Teaching physically active physical education classes. *Research Quarterly for Exercise and Sport, 75*, 288–297. https://doi.org/10.1080/02701367.2004.10609161

Martin, J. J., & Kulinna, P. H. (2005). A social cognitive perspective of physical activity related behavior in physical education. *Journal of Teaching in Physical Education, 24*, 265–281. https://doi.org/10.1123/jtpe.24.3.265

Martin, J. J., Kulinna, P. H., Eklund, R. C., & Reed, B. (2001). Determinants of teachers' intentions to teach physically active physical education classes. *Journal of Teaching in Physical Education, 20*, 129–143. https://doi.org/10.1123/jtpe.20.2.129

Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research, 2*, 173–191. https://doi.org/10.1287/isre.2.3.173

Mehalik, M. M., Doppelt, Y., & Schuun, C. D. (2008). Middle-school science through design-based learning versus scripted inquiry: Better overall science concept learning and equity gap reduction. *Journal of Engineering Education, 97*(1), 71–85. https://doi.org/10.1002/j.2168-9830.2008.tb00955.x

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. https://doi.org/10.1037//0003-066x.55.1.68

Schüz, B., Li, A. S. W., Hardinge, A., McEachan, R. R., & Conner, M. (2017). Socioeconomic status as a moderator between social cognitions and physical activity: Systematic review and meta-analysis based on the theory of planned behavior. *Psychology of Sport and Exercise*, *30*, 186–195. https://doi.org/10.1016/j.psychsport.2017.03.004

Schwarzer, R., Lippke, S., & Luszczynska, A. (2011). Mechanisms of health behavior change in persons with chronic illness or disability: The Health Action Process Approach (HAPA). *Rehabilitation Psychology*, *56*, 161–170. https://doi.org/10.1037/a0024509

Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research, 15*, 325–343. https://doi.org/10.1086/209170

Su, K.-D. (2008). The effects of a chemistry course with integrated information communication technologies on university students' learning and attitudes. *International Journal of Science and Mathematics Education, 6*, 225–249. https://doi.org/10.1007/s10763-006-9062-7

Teo, T. W., & Ke, K. J. (2014). Challenges in STEM teaching: Implication for preservice and inservice teacher education program. *Theory Into Practice, 53*(1), 18–24. https://doi.org/10.1080/00405841.2014.862116

Teo, T., & Lee, C. B. (2010). Explaining the intention to use technology among student teachers: An application of the theory of planned behavior (TPB). *Campus-Wide Information Systems*, *27*(2), 60–67. https://doi.org/10.1108/10650741011033035

Tsupros, N., Kohler, R., & Hallinen, J. (2009). STEM education: A project to identify the missing components. *Intermediate Unit, 1*, 11–17.

Van Driel, J. H., Beijaard, D., & Verloop, N. (2001). Professional development and reform in science education: The role of teachers' practical knowledge. *Journal of Research in Science Teaching*, *38*, 137–158. https://doi.org/10.1002/1098-2736(200102)38:2<137::aid-tea1001>3.0.co;2-u

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SPORT MANAGEMENT

Mid-Career Faculty Development Model: Sport Management Faculty Perspectives

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Abstract

The purpose of this study was to determine sport management faculty members' perspectives on the merit and applicability of the mid-career faculty development model proposed by Baldwin and Chang (2006). Thirteen associate and four full sport management professors participated in semistructured interviews. An inductive analysis was used in the development of categories. The results showed positive support for the model and revealed reflection and assessment as important. The participants supported recognition as a form of reinforcement, but felt it should be individualized. The suggestions can assist administrators in developing mid-career mentoring and professional development programs.

Higher education faces many challenges today, such as budget reductions, faculty and staff furloughs, and the elimination of academic programs. According to Lumpkin (2009), "the challenges facing higher education may mean that meeting the developmental needs of faculty during transitional stages in their careers becomes

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even more critical" (p. 213). Thus, it is important that we not only retain our current sport management faculty but also provide avenues for them to be successful. Baldwin, DeZure, Shaw, and Moretto (2008) define mid-career as the time after a faculty member's probationary years until retirement preparation. Strage, Nelson, and Meyers (2008) indicated that over half of higher education faculty in the United States were at mid-career. Since mid-career faculty make up a large percentage of all college and university faculties, it is important to examine their professional development and mentoring needs.

One avenue that can help with sport management faculty retention and success is a high-quality mentoring and professional development program. Faculty mentoring and professional development has received much attention at the junior faculty level (Foote & Solem, 2009; Leslie, Lingard, & Whyte, 2005). While it is important to mentor junior faculty members so they can be successful in tenure and promotion, mentoring and professional development programs should not stop at this level. Mid-career faculty play a key role in universities and academic disciplines, such as sport management. Additional studies are necessary to advance the knowledge base, and a study on mid-career faculty within sport management is timely. Thus, this exploratory study of mentoring for mid-career faculty in sport management was undertaken.

The literature on mid-career mentoring includes key challenges and components that influence growth and renewal (Baker-Fletcher, Carr, Menn, & Ramsay, 2005; Baldwin et al., 2008; Buch, Huet, Rorrer, & Roberson, 2011; Strage et al., 2008), recommendations for supporting mid-career faculty (Canale, Herdklotz, & Wild, 2013; Nottis, 2005), programs to improve teaching (Romano, Hoesing, O'Donovan, & Weinsheimer 2004), and a professional development model (Baldwin & Chang, 2006).

Mid-career faculty face a number of trials at their career stage. Baker-Fletcher et al. (2005) asked individuals who were attending a workshop on mid-career teaching the challenges they faced. The challenges that emerged included competing claims for time, research changes, increased generational gap with students, and feelings of fatigue. Buch et al. (2011) examined the "career challenges facing associate professors, as well as a comprehensive mid-career

mentoring program for associate professors" (p. 39). The findings from the study suggested the need for clear/transparent criteria for promotion to full professor, equitable service loads, promotion decisions made fairly, and regular feedback on associate professors progress toward promotion. In 2008, Strage et al. conducted a study of mid-career faculty to "identify key factors affecting the professional growth and renewal of mid-career faculty" (p. 72). The study participants represented various academic disciplines and were interviewed individually as well as in small groups. Strage et al. reported three themes and that "taken together…They also provide evidence of the positive impact that facilitative environments can have on engaging, sustaining, and nurturing a thriving faculty" (p. 73). Suggestions for institutional leaders were presented and one suggestion included the development of professional growth opportunities.

One of the more prominent studies conducted on mid-career faculty was completed by Baldwin et al. (2008). In their study, the researchers interviewed 20 mid-career faculty and 20 chairs of departments/schools at Michigan State University to understand their situation in a research university and identify best support practices. A number of themes occurred under the challenges and support for mid-career faculty in which the faculty and chairs were similar in agreement. Examples of themes under challenges included more work, neglect, relief, next steps, and unclear goals. Baldwin et al. also discussed an additional challenge for chairs, which was "time and money." Relative to the support themes, the following emerged: aid and encouragement, and disciplinary, departmental, and programmatic differences. Baldwin et al. further discussed themes in which there was disagreement among faculty and chairs, and examples included need/support, expectations for promotion and merit increases, and annual review. The findings provided suggestions for department chairs to consider when working with mid-career faculty.

In 2013, Canale et al. investigated national programs that support mid-career faculty. Specifically, a team of researchers from Faculty Career Development Services (Rochester Institute of Technology) completed a benchmark analysis of 39 institutions. The results showed 18 institutions offered mid-career support in the way of "leadership development, support for women faculty, mentoring

(both mentor and protégé), grants and awards, sabbaticals, fellowships or some other stipend or financial remuneration (e.g., travel) and general opportunities" (Canale et al., 2013, p. 3). Further, the researchers found that few benchmark schools had programs that specifically support mid-career faculty. Rather, the focus was on support throughout the career of a faculty member.

Relative to programs to improve teaching, Romano et al. (2004) discussed a Mid-Career Teaching Program (MCTP) that was developed by the Center for Teaching and Learning Services (CTLS) at the University of Minnesota. MCTP included four goals: (a) pedagogical strategies to improve student learning, (b) applying new knowledge and techniques, (c) conversations with peers about student learning, and (d) discussions of midlife events. According to Romano et al., this program gave faculty the opportunities to reflect on classroom practices, provided thought-provoking activities about one's teaching and learning, and provided a support system to try new teaching approaches. MCTP groups consisted of six to 15 members from varying academic disciplines and met several times during the academic year. The scholars collected data from 37 faculty members to determine the impact of the program. The results showed "positive changes in teaching behaviors and knowledge as well as an increase in teaching satisfaction and confidence" (p. 21). For suggestions on how to support the mid-career researcher, Nottis (2005) wrote a scholarly article and presented suggestions based on a review of the literature. Examples of support included time to pursue new research ideas, research mentors, and research mentoring across disciplines. Nottis concluded the article by stating, "Resources and incentives for research longevity need to be examined and viable ways to support both male and female researchers need to be considered" (p. 98).

Baldwin and Chang (2006) developed a model for mid-career faculty development and mentoring. They proposed a model that can provide a support system for faculty in the middle years of academic life. This model was chosen for the study because the scholars completed "a national web-based investigation to identify strategies specifically designed to address the needs of mid-career faculty in colleges and universities" (Baldwin & Chang, 2006, p. 28). Small to large as well as public and private institutions were reviewed for the support the schools provided for mid-career faculty. The model

is comprehensive in nature and therefore able to be employed in a number of settings. Additionally, while this is the first empirical test of the whole model, several of the different aspects making up the model have been supported by research on this topic (Austin, 2002; Baker-Fletcher et al., 2005; Romano et al., 2004). Finally, this model represents the best attempt, to date, at identifying the necessary elements to keep an integral campus demographic engaged and contributing to the effectiveness of the higher education mission.

The model consists of three steps in the mid-career faculty development process. The steps include (1) career reflection and assessment, (2) career planning: short- and long-term goals, and (c) career action/implementation. Additionally, three areas of support to maintain the development process are proposed in the model and include (a) collegial support, (b) resources, and (c) reinforcement.

Although the aforementioned studies and articles have contributed to the literature, additional ones are necessary to advance the knowledge base on sport management mid-career faculty. A study on mid-career faculty within sport management is timely, and the findings have the potential to help institutions of higher education develop high-quality faculty mentoring programs. Mentoring is a key topic of study in many fields (e.g., business, education, nursing, occupational therapy, and physical education; Dodds, 2005; Jones, Harris, & Miles, 2009; Paul, Stein, Ottenbacher, & Liu 2002), and one avenue that may be able to help with faculty retention and success is a high-quality mentoring program. Further, given that faculty members at the mid-career stage "have been largely ignored in higher education policy and practice" (Baldwin & Chang, 2006, p. 28), an exploratory study of mentoring for mid-career faculty in sport management was undertaken.

The purpose of the study was to determine the merit and applicability of the mid-career faculty development model proposed by Baldwin and Chang (2006) within sport management. The research questions were

1. What are sport management associate and full professors' perspectives regarding the three key facets, (a) career reflec-

tion and assessment, (b) career planning: short- and long-term goals, and (c) career action/implementation), in the mid-career faculty development process?
2. What are sport management associate and full professors' perspectives regarding the three areas of support needed, (a) collegial support, (b) resources, and (c) reinforcement, to maintain the development process?

Method

Research Design

This study followed the qualitative case study approach (Merriam, 1998) with the case of participants being mid-career sport management faculty members. The case study is considered a single case of sport management associate and full professors; however, since the participants of the study were not all housed in the same institution of higher education, their affiliation to differing institutions are deemed as *embedded* units (Merriam, 1998) of the larger case. The larger case is that they all resided within a large Midwestern state.

Setting and Participants

The setting for the study consisted of institutions of higher education from a large Midwestern state. The following demographics were utilized in the selection of the participants: rank, gender, ethnic background, race, years in rank, and type of institution (i.e., teaching, teaching and research, research). Table 1 provides the participant demographics. Although a variety of demographic information was gathered, there was no diversity among the participants regarding race. A purposive sampling method was used. Twenty-two sport management faculty members from varying institutions were invited to participate in the study through semistructured interviews. Thirteen associate professors and four full professors responded to the request to participate in the study and agreed to participate. Nine institutions were represented in the sample (i.e., 3 teaching institutions, 5 teaching/research institutions, 1 research institution).

Table 1

Participant Demographic Information

Participant letter	Age	Gender	Ethnic background	Race	Faculty rank	Years in current rank	Type of institution
A	54	Male	Jewish	White	Professor	1	Teaching & Research
B	52	Female	Italian-American	White	Associate	13	Teaching & Research
C	37	Male	German-Irish	Caucasian	Associate	14	Teaching & Research
D	48	Male	Caucasian	White	Associate	4	Research
E	50	Female	Polish-Slovak	Caucasian	Associate	4-5	Teaching
F	64	Female	Irish, Scottish, French Canadian	White-Caucasian	Professor	10	Teaching & Research
G	62	Male	Caucasian-Irish	White	Associate	16	Teaching & Research
H	50	Male	German	White	Associate	7	Teaching & Research
I	59	Female	Caucasian	Caucasian-White	Associate	4	Teaching & Research
J	49	Male	Caucasian, Irish-German	White	Professor	9	Research
K	38	Female	White	White	Associate	4	Teaching & Research
L	49	Male		Caucasian	Associate	14	Teaching & Research
M	52	Male	German, Irish, Norwegian	Caucasian	Associate	8	Teaching & Research
N	64	Male		Caucasian	Professor	19	Teaching
O	43	Male	White American	White	Associate	10	Teaching & Research
P	65	Female	Caucasian		Associate	10	Teaching & Research
Q	44	Female	Portuguese		Associate	5	Teaching & Research

Of the 17 participants ($N = 17$) in the study, 13 identified themselves as coming from Teaching and Research institutions, whereas two were classified as coming from Teaching institutions and two from Research institutions. In terms of gender, 10 of the participants were male and seven were female. Additionally, 16 of those in the study determined themselves as White/Caucasian with one participant not self-identifying in terms of race. Regarding age, the range of the participants was between 37 and 65 years old, with the mean age at approximately 52 years old. Furthermore, when asked what year they were in at their current rank (i.e., associate or full professor), the participants reported a range between 1 and 19 years of experience, with the mean amount of years at current rank being 9.

Interview Guide and Pilot Test

As seen in the review of literature, Baldwin and Chang's (2006) model was founded upon steps for mid-career faculty members (i.e., career reflection and assessment, career planning [short- and long-term goals], and career action/implementation) as well as three proposed areas of support (i.e., collegial support, resources, and reinforcement) to assist them. The interview guide consisted of six questions implemented consistent with Baldwin and Chang's mid-career faculty development model. It is also important to clarify that the questions from the interview guide were developed to align with the research questions of this study. Prior to participant interviews for the establishment of trustworthiness and credibility, a pilot test was conducted. Two sport management faculty members from institutions outside the sample list were interviewed and asked to provide feedback on the semistructured interview. As a result of the pilot test, the questions were slightly changed and expanded to gather more perspectives from the participants.

Data Collection and Analysis

The study utilized semistructured interviews that lasted from 26 min to 1 hr and 10 min. The interviews occurred on the participants' campus except for one interview which took place via Skype. Each interview was recorded with a digital voice recorder. The interviews were transcribed verbatim and shared with each participant for member checking. In addition to interviews, field notes were kept. Each participant completed a demographic information sheet.

Themes and subthemes were developed from an inductive analysis (Patton, 2015) and are shown in Table 2. Two peer debriefers were used as part of the review and confirmation process of the transcripts (Lincoln & Guba, 1985).

Table 2

Major Themes and Subthemes

Themes	Subthemes
Career Reflection and Assessment	Importance of reflection
	Informal reflection
	Formal reflection/annual reviews
Career Planning	Focused more on short-term goals
	Frequent leadership turnover
Career Action/Implementation	Positives of career plans
	Informal assessment
Collegial Support	Importance of collegial support
	External collaborations
Resources	Time
	Funding
Reinforcement	Individualized recognition

Findings

The purpose of this study was to determine the merit and applicability of the mid-career faculty development model proposed by Baldwin and Chang (2006) within sport management. The major themes identified were Career Reflection and Assessment, Career Planning, Career Action/Implementation, Collegial Support, Resources, and Reinforcement (see themes and subthemes in Table 2).

Career Reflection and Assessment

Under the major theme of Career Reflection and Assessment, the participants' perceptions highlighted the subthemes of Importance of Reflection, Informal Reflection, and Formal Reflection/Annual Reviews.

Importance of reflection. It is apparent that reflection is a tool that Participant F values, when stating, "I agree with the approach because I think reflection is valuable," with Participant K giving a similar statement: ". . . I absolutely agree with this approach and it gets incredibly important." Participant E gave her take on the importance of how reflection helps with achieving goals: "I think evaluation is pretty necessary to continue to determine where you want to go and what you want to do and in what regard . . ." Participant I explained not only how reflection helps with present and future goals, but also the detriment of not utilizing reflection to its fullest capacity:

> And so I think it's important that reflection and assessment is critical, not only in using the past to kind of inform what you're going to do in the present and the future, but really more important to achieve my future goals, of which I have some. And I think if you stop reflecting and assessing, I think you almost push the pause button on staying in the present and moving forward.

Similarly, two other participants described how reflection has affected them in their careers even to the point that Participant O's quote shows how he reflects more over the years: ". . . reflection and assessment, I think has become real important and I think as my career has progressed, I do it more often." Participant P said, ". . . to me reflection is important in my life in general and so I do believe it's important in one's career."

The quotes from the participants show evidence of the importance of reflection not only within their own career progression but also in their own lives as seen from Participant P's comment.

Informal reflection. As seen from Participant Q, informal reflection can be used yearly to help determine longer term plans: "And then informally I usually do it every year. I usually have a process just for myself, what my goals are for that year and then I adjust my five-year plan."

Participants A and C, on the other hand, spoke on how they have used informal assessment on a more frequent basis. Participant A said, "I think I always try to assess my strengths and weaknesses and where I am going." Participant C noted, " . . . I think a self-evaluation reflection happens if not on an ongoing basis every single day when

you re-evaluate what you're going to teach to your students in a given class, when you start to do something administratively . . ."

Several participants from the study noted that they engage in informal reflection, with the examples being a snapshot of its utility with mid-career faculty members, which appears to be perceived by these quotes as a constant, continual process.

Formal reflection/annual reviews. One feature that emerged was that several participants engaged in formal reflection sometimes through or because of annual reviews. The examples in this section note these approaches, typically as some type of annual review, as stated by Participant D: " . . . our annual reviews that we all have to complete does cause some reflection on what we've done in the past and also provides the opportunity for future goals."

The participants also described that if it were not for the formal review process then they might not necessarily do formal assessment on their own otherwise:

> Where I am you have to write it up in the form of an abstract and then provide evidence . . . then you highlight on your CV – and that's the only time really that I think anybody I know at my place does any type of reflection . . . (Participant F)

> The annual evaluation process provides that on a year-to-year basis, but if wasn't for kind of being forced to give more than a year looking back and reflecting, I'm not sure I would do it as often. (Participant K)

Last, Participant J gave his take on how in his role as an administrator he has utilized formal assessment as a tool to assist faculty members plan for their future:

> I think when we go through the promotion to associate professor and tenure that the missing piece is often the what's next step and getting people to think about kind of where they're at, where they want to go next. I've been trying to do that in my current role, and so when I meet with faculty and they ask me what to put into their contextual statement, one of the things I encourage them to do is do a somewhat of a forward thinking thing . . . (Participant J)

It was interesting how formal reflection was couched as an activity that was related with the annual reviews the participants alluded to. In the case of Participant F and Participant K, without annual reviews, they would not go through the formal process of reflection as often, whereas Participant J explained the administrative side and how he used formal evaluations as a chance to assist his faculty members in planning ahead.

Career Planning

Regarding the theme of Career Planning, the subthemes that emerged from the participants' perceptions were highlighted as Focus More on Short-Term Goals and Frequent Leadership Turnover.

Focused more on short-term goals. As outlined in Baldwin and Chang's (2006) model, a few of the participants from this study paid more attention to short-term goals. Participant B said, " . . . I like the approach of looking at what are the short-term goals versus what are the long-term goals because I think it gives people some direction . . ." For Participant M, his focus on the short term seems to have been based on attaining promotion to full professor and would likely shift afterward:

> . . . I would say short-term goals for me, probably focus on the notion of promotion up to full professor . . . I think after that has taken place, I think that will change a little bit of my focus, and little bit of the perspective just because I have some other areas that I'm currently engaged in . . .

Based on the quotes, the focus on short-term goals has given the participants something that appears more tangible to work toward opposed to long-term goals with Participant M's main objective being the promotion to full professor, which is dependent upon the decisions made by administration.

Frequent leadership turnover. The following excerpts show the influence of leadership changes on goal setting, particularly long term:

> . . . every time you have a new provost, you have a new goal for the institution, every time you have a new president, you have a new goal, every time we get a new dean, a new provost, and sometimes a new president, you do a new strategic

plan . . . so it's hard to keep up with the university, it's hard to make your plans according to the university. (Participant F)

It's really difficult to plan where do we want to be in 5 years, where do we want to be in 10 years because you're so in the trenches that you can't really see that far in advance. Our institution has been doing some strategic planning where they're looking at new online programs and new innovative programs, but that's been in some way a response of the declining enrollment in higher education across the board. . . . And every time leadership changes, they want to have a new strategic plan. They want it to be their plan. (Participant G)

The problem that I have faced with long term goals it seems as though with the change in administration those goals change . . . the administration changes although they've all been good changes and good people, it's just with the different philosophies and emphases they have, makes long-term planning a little bit more challenging. (Participant O)

. . . I've counted the number of presidents, provosts, deans, directors and chairs, program chairs, and there's been so much turnover that in terms of getting a good sense of where the institution's going, it changes every time we have someone at one of those levels change . . . in 2 or 3 years these administrators will be gone and we'll be talking about doing it again, so it's hard to align with any kind of institutional goals when there's that kind of turnover. (Participant P)

The participants commented on how turnover in leadership positions affected their goal setting to the point that it has hindered their own goal setting at times when administrative or institutional goals took precedence.

Career Action/Implementation

For the overarching theme of Career Action/Implementation, the following subthemes were indicated from the transcripts of the participants: Positives of Career Plans and Informal Assessment.

Positives of career plans. A number of participants commented on the positives of career plans. Participant M stated, "I think it's feasible and plausible," and Participant K commented, ". . . I do and like a long-term personal career plan." Participant D described how career plans can help with next steps: "I think it would definitely help someone in my case that's been an associate for several years—kind of a guidepost to that next step of becoming a full professor."

Participant J noted having a plan, but an opportunity changed the direction of the plan: "I will say I had a plan, but it took some detours because opportunities came along that I wasn't expecting, so I never expected to be in the provost office as the example."

The quote by Participant J is a great example of the fact that career plans can change in an instant based on what direction our professional and/or personal lives take us, thus leading to the ever-evolving process of informal assessment.

Informal assessment. Participants noted they make informal assessments when thinking about career action. The following excerpt shows Participant B's approach to informal assessment, which appears to be an evolving process:

> Well, I guess mine is still evolving . . . I'm not really the type of person who writes down a lot of stuff, so I guess I am following a career, implementing a career plan, but I don't know that I necessarily write all of that down.

Participant L, on the other hand, explained his approach a little differently:

> . . . I think it's great to have a plan and have some direction, but again, just through experience, buddy you better be ready to adapt because you can't lay it out and say, well this is where I want to be in 2 years, this is where I want to be in

> 3 years, this is where I want to be in 5 years; when you know, life gets in the way. It's good to have some structure, so you know what you're trying to do and know what you're trying to accomplish. I do, I don't know that I plan, but I prioritize. I think that's probably my better definition of how I do it.

In his case, Participant L highlighted that his informal assessment is contingent upon being able to adapt and prioritizing goals and tasks.

Collegial Support

According to the participants, Collegial Support was an underlying theme that aligns with the framework for this study. The subthemes emphasized were Importance of Collegial Support and External Collaboration.

Importance of collegial support. Another topic of discussion per the participants was the importance of collegial support. Participant O and Participant G emphasized how imperative it is for faculty members. Participant O said, "I think collegial support is vital and here we had a great structure and so there was lots and lots of collegial support… I think it's incredibly important." Participant G said,

> . . . I think it's when you have it, I think you can really do a lot of really good things and you can feel good about what you're doing and you can feel growth because you're able to bounce things off of people.

Participant D, for instance, described his fortunate circumstance with the colleagues in his department: "I'm lucky here. I get along with all of the people. I know other colleagues who really struggle in their departments. There's not a lot of collegiality between faculty in some programs I know, but we're pretty fortunate here."

Furthermore, some participants provided examples of how collegial support works at their institutions. Participant K said, ". . . knowing that if you do have to run something by somebody, their door is open and they're going to stop what they're doing and give you their time." Participant F said,

> . . . collegiality to me is right now, we have a pretty good collegiality on our hallway because most everybody gets along, most everybody likes each other, most everybody supports each other. You tell somebody what they're doing, or they ask you what you're doing and they think it's great. It's the best it's ever been . . .

To sum up the participants' perception of collegial support, Participant A phrased it in the following way: "I truly believe it's the life blood of the university."

External collaborations. In a different vein, some participants identified collaborations with others outside the institution:

> Probably regional, national conferences. When I started this gig as teaching Sport Management, fortunately I had somebody who was I thought pretty well established who introduced me [at the] first conference I went to, NASSM conference in Louisville, KY and I was introduced to a lot of people. If I was on my own, I never would have met. This person introduced me to a lot of people and in a couple years, I'm now [at a position in] the organization, not because I did anything special, but I had someone who they respected who introduced me and figured out, oh this is how you do things. (Participant N)

> I'm still involved with the NCAA Women's Leadership Symposium, which has always been developed around the collaborative approach of using a committee in order to accomplish our tasks and goals, and it's been really supportive obviously in order to make it as successful as it has been. (Participant E)

Similar to the quotes for collegial support, the quotes from Participant N and Participant E show their sentiments of involvement with organizations and committees and support from colleagues outside of their own institutions in their own effectiveness as academics within their field of study.

Resources

Under the major theme of Resources, the participants' perceptions highlighted the subthemes of Time and Funding.

Time. The participants noted the importance of flexible schedules and release time. One participant commented: ". . . to me the biggest one is time to be able to have flexible scheduling . . ." (Participant O). Another participant noted, "I think the release time part is important . . ." (Participant H). Participant B emphasized flexibility with time to take advantage of pursuing other things on campus and that the release time at her instituion was an uncommon occurrence:

> Yeah, I personally have been able to take advantage of the scheduling. Typically in the fall, I teach Monday, Wednesday, Friday schedule, and then in the spring, I have a Tuesday, Thursday schedule. So that's very important, very helpful because that gives me time to again take advantage of some of the services on campus that are offered, the workshops or whatever. Here they're not so crazy about release time; you know that's probably not going to happen.

In the case with Participant E, she explained her need to have one day out of the week to write:

> . . . we need flexible schedules . . . being able to have a writing day is important to me, one day a week, and I'd like to have more . . . and like I said, one writing, just give me one writing day.

One participant identified a sabbatical as being important and suggested it be required: "It almost seems like we should make it mandatory for associate professors to take a sabbatical in their third year after you're tenured and promoted" (Participant Q).

For each participant quoted, the concept of release time was perceived as something different. For instance, Participant B pointed out that having time meant being able to take advantage of resources on campus (e.g., workshops, services), whereas Participant E referred to the fact that her free time was needed for writing in terms of research. Then, Participant Q expressed that having time was related to taking a sabbatical after achieving tenure. In each case, a large part of

how time outside of teaching is decided is based on the expectation of the institution in terms of teaching, research, and service.

Funding. The participants commented on the importance of travel funds to attend professional conferences. Participant N commented on what is provided at his institution for conferences:

> We're at a university where we do provide a couple of internal grants which you can get. Some are travel grants you can get, and then there's another one and then fortunately if you're presenting at a conference here, the conference is paid for, unless it's international, then up to $2000 . . .

Some participants acknowledged that their institutions did not provide enough travel funds:

> …I don't know of a colleague anywhere in any institution that hasn't experienced a drop off in the amount of financial support to be sent to conferences and/or to purchase software, to run a particular data analysis or whatever. I think that's been a real frustrating piece. (Participant I)

> We have so little. We just had an external review and they could not believe the amount of money that we got for travel expenses—$650, and there's other pools we can take it from on campus. There's a pool if you want to go to a workshop that you can get a couple hundred dollars, there's another pool if you're presenting research that you can add to your $650, you know it's up to $250, so I mean there's just not a lot of support. We want to be a research institution, but we don't have the resources to support faculty. A lot of faculty pay their own way for these kinds of things. (Participant F)

In the case of funding, there was more consistency from the three participants' quotes. They all equated funding for the most part to travel to an academic conference or workshop.

Reinforcement

Again, consistent with Baldwin and Chang's (2006) framework, the participants placed emphasis on Reinforcements as a theme

of this study, particularly focused on the subtheme *I*ndividualized Recognition.

A number of participants commented on the importance of reinforcement. Participant N and Participant G stressed that recognition is a significant piece to the puzzle, whether by one's institution or even outside of the institution. Participant N said, ". . . I think that's important to create some type of recognition system, even if it's minimal. If money goes with it, that's great, I need some recognition as well." Participant G said,

> Everyone likes to feel as if they're appreciated, and it's nice sometimes when that is a monetary reward, but that's not always the case and it doesn't always need to be the case. So I think when you're recognized by your institution, as well as for the work that you do outside of your institution, it is very rewarding.

Several participants noted the importance of receiving appreciative notes from others. Participant B said,

> I'm more of a person that if I get a sort of a note from the department chair, or get a note from the dean or something saying, hey congratulations on this, or, for me that goes a longer way than necessarily standing up at a faculty meeting or something and making an announcement about something like that.

Participant C said, "Like I said, everybody likes to get that pat on the back, and when you do reward people, whether it's just a thank-you, once again, can mean the most. But when it's in writing, it's beneficial." Participant K said,

> I would suggest thank-yous. I mean, I think that because time is such a precious resource that there is this just frenetic pace on developing things and implementing things by deadlines and getting documents, committees, and . . . and there's no thank-you.

Participant Q and Participant I described that external motivators are another form of recognition that could be beneficial,

although both participants also stated that it is not what solely motivates them:

> I think in this area it really depends on what motivates people. Like for me those kinds of external things, I mean it's nice to get, but it's not what drives me. But I think for other people, you know, who need that kind of external recognition, it could really be meaningful. (Participant Q)

> External motivations I think are still really nice to get. That being said, also again, I don't know that I really think that's any more important than someone just coming to you and saying thank you, or saying I really appreciate the work you did on this. That's just as valued to me and that goes back to that generation where a thank-you is really kind. (Participant I)

It is evident from these quotes that the participants in the study feel that recognition from their colleagues and/or administrators (e.g., department chair, dean) goes a long way in feeling appreciated, whether that be with a simple thank-you note or a monetary benefit.

Discussion

This study sought to learn the perspectives associate and full sport management professors had toward the merit and applicability of the mid-career faculty development model (Baldwin & Chang, 2006). The key steps of the mid-career faculty development process (i.e., career reflection and assessment, career planning: short- and long-term goals, and career action/implementation), as outlined by Baldwin and Chang, were evident in the responses of this sample of faculty. Additionally, the three essential elements of support for the development process were verified by the participants as being important aspects of posttenured faculty development. The majority of participants said they engage in career reflection and assessment and that this assessment was helpful in navigating the next steps of their faculty career. However, there was not a consistent application of this step. Some faculty commented that reflection and assessment took place during formal reviews with administrators, while others said that it was an informal, self-guided reflection. This formal versus informal dynamic was consistent throughout the responses and

certainly has a bearing on how faculty and administrators should interpret these results.

The importance of the formal versus informal dynamic lies in the necessity of participation. For mid-career faculty to benefit from the development model, it holds that they need to take part in the outlined steps. This idea was also supported by the findings of Buch et al. (2011). They found that faculty felt regular feedback on progress toward promotion was necessary for mid-career faculty to continue to be successful. If an institution is not providing a formal way for mid-career faculty to continue their development, then it is left to the individual faculty member to decide whether to engage in these key steps. Without the institution formalizing the process, they are leaving to chance the continued development of one of the most important resources on campus.

Similar to career reflection and assessment, this sample of sport management faculty supported the elements of career planning and implementation as essential steps to mid-career development. However, there were different perspectives from the Baldwin and Chang (2006) model. While the participants supported the idea of setting short-term goals to further development, long-term planning proved to be more difficult. A number of respondents noted the frequent turnover of leadership positions made it difficult to make long-term plans, as new leadership often wants to change the course of past strategic plans. Additionally, the unexpected happenings of life often interrupt long-term plans. While this group of faculty did not say it was unimportant to engage in long-term planning, they cautioned that it was important to be able to adjust those types of plans.

According to Baldwin and Chang (2006), there must also be a foundation to support the development process of mid-career faculty. The findings of this study support this portion of the Baldwin and Change model. The three support elements of collegial support, resources, and reinforcement were all deemed important in helping mid-career faculty continue their career development after earning tenure. This sample of sport management faculty viewed collegial support as institutional colleagues as well as external colleagues. The participants consistently commented on how beneficial it is to have people to rely on. Additionally, there were numerous

comments about the negativity that comes with a lack of collegiality. Besides institutional collegiality, the participants acknowledged the importance of external collaborations as a type of support. These collaborations help with accomplishing research goals and providing alternative viewpoints. As institutions put together search committees for faculty hires as well as administrator hires, it is paramount that they are instructed to consider collegiality in the evaluation of candidates. This is especially true as it relates to mid-career faculty, who will be working with new faculty members as well as possibly looking to move into administration.

Of the resources discussed by these participants, time was the most widely discussed. This supports the findings of Canale et al. (2013), who found that faculty felt sabbaticals were an important support mechanism for mid-career faculty. Additionally, Baker-Fletcher et al. (2005) and Baldwin et al. (2008) found that mid-career faculty often face an increased workload after tenure, which escalates the demands on and importance of time.

An oft-repeated answer from these participants was the desire for a more flexible schedule that allows for more time to focus on research or even to prepare classes better. Coupled with the desire for sabbaticals, this focus on more time leads to the conclusion that, even more than funding, time is the most valuable resource available to mid-career faculty. This time certainly comes at a cost. Allowing for a course release requires that the institution pay someone else to teach that course. However, investing in resources that allow mid-career faculty to take more time is a wise course of action for institutions that want to keep the posttenured faculty engaged and at their most effective. The final element of support, reinforcement, was also verified by the participants of this study. However, the only consistent aspect of the responses was that there are numerous ways to encourage mid-career faculty. The majority of respondents noted that the best way to recognize a faculty member's efforts depends on the type of individual receiving the encouragement. Answers ranged from a quick pat on the back from the chair to a formal recognition in front of colleagues to monetary incentives. Despite the varying methods of reinforcement, the participants felt it is an important aspect of career development.

The results of this study support the six elements of the Baldwin and Chang (2006) model for mid-career faculty development. Many of the resources and types of support the participants desired are available to junior faculty and seem to dissipate for newly promoted associate professors. Many mentioned that there were formal, helpful programs available for faculty working toward tenure, but that once tenure was achieved the support faded away. This emphasis on tenure seems to create a situation in which newly tenured faculty are left feeling adrift with little direction about how to achieve the next promotion or how to prepare for a career change into administration. Some of the common types of support available to junior faculty are increased research funding for the first year or two of employment, course releases, increased travel funds, multiple tenure reviews, research support, decrease in service requirements, and start-up funds. All of this support is aimed at ensuring junior faculty have everything they need to earn tenure at the institution. Unfortunately, the results of this study show that this type of support does not often extend to newly tenured faculty despite the apparent need.

Practical Application

Based on these results, it is recommended that institutions implement a formal program dedicated to mid-career faculty. This programs should involve many of the elements that exist for junior faculty, as noted above. The six elements of the Baldwin and Chang (2006) model should be used as guideposts for the establishment of this program. A formal reflection on at least an annual basis should be performed by faculty members with their chair and/or dean. This should lead to the construction of a short-term plan in which the faculty member identifies areas of opportunity for growth that align with the goals of the department. At this stage, we would differ slightly from the Baldwin and Chang model in that we would eliminate formally establishing a long-term plan. The results of this study tell us that due to the high turnover rate of institutional leadership, long-term planning is overly difficult. It is recommended that long-term planning be done on an informal basis and incorporated into short-term planning as time passes. Finally, it is suggested that there is a formal evaluation for the implementation of short-term plans. It is critical that administrators are involved in this evaluation of implementation. This will help to ensure that faculty members are

following through on new initiatives as well as ensure that these new initiatives are beneficial not only to the faculty member but also the department as a whole.

As discussed, the results of this study lead to the conclusion that mid-career faculty need elements of support to the keys to career growth. These elements of support should also mimic the support given to junior faculty. To provide collegial support, institutions should look to provide resources that assist with mentoring and networking both on and off campus. This could include providing newly tenured faculty increased travel funds, which would allow them to further establish external collaborations. It could also include creating gatherings of mid-career faculty on campus.

The main resource these participants coveted was time. For a formalized program dedicated to mid-career faculty development, this could take the form of course releases or sabbaticals for newly tenured faculty, a decrease in service requirements for a year, or an increase in graduate/student support. The key is the recognition that mid-career faculty often feel directionless, and providing more time to implement short-term plans will aid in them staying motivated and on track. Finally, mid-career faculty and administrators should work together to create a recognition program for reinforcement. The recognition of successful faculty takes many forms and largely depends on the individual. Therefore, it is important that chairs and deans consider this even after having created a recognition program. It may still be necessary for chairs and deans to occasionally write a note to congratulate a professor on getting a manuscript accepted to a top journal or writing a successful grant. The key is for administrators to recognize the importance of reinforcement and to learn how best to accomplish it with their individual faculty members.

Limitations and Future Recommendations

While this study expands the literature on mid-career faculty by exploring associate and full professor perspectives on mentoring, there is still a strong need for further research. First, the interview questions utilized in the study were very broad. It is recommended that future studies include more specific questions to determine participants' ideas for what mentoring they would ideally prefer. Second, in this study, a single state was used. Future investigations on mid-career faculty mentoring may opt to use institutions in sev-

eral states. By including additional states, broader perspectives and new ideas for mid-career faculty mentoring may emerge. Third, this study only collected data through interviews. It would have been of value to include a survey along with the interviews. The responses from a survey could provide additional insights into mid-career faculty mentoring and professional development programs. Future studies can include a mixed-method strategy by combining qualitative with quantitative approaches to better understand mid-career faculty mentoring.

An additional limitation to this study was the lack of racial diversity among participants. It is possible that faculty of color view the elements of the Baldwin and Chang (2006) model differently than their White counterparts. Future studies should incorporate a wider array of representation in their participants. While there was a lack of racial diversity in the participants of this study, there was diversity in the types of institutions for which they work. This diversity presents another possible limitation. Future studies could investigate the views of faculty at one type of institution at a time to further develop the distinctions between the application of the Baldwin and Chang model at teaching, teaching and research, and research institutions.

References

Austin, A. E. (2002). Creating a bridge to the future: Preparing new faculty to face changing expectations in a shifting context. *The Review of Higher Education, 26*, 119–144. https://doi.org/10.1353/rhe.2002.0031

Baker-Fletcher, K., Carr, D., Menn, E., & Ramsay, N. J. (2005). Taking stock at mid-career: Challenges and opportunities for faculty. *Teaching Theology & Religion*, *8*(1), 3–10. https://doi.org/10.1111/j.1467-9647.2005.00217.x

Baldwin, R. G., & Chang, D. A. (2006). Reinforcing our "keystone" faculty. *Liberal Education*, *92*(4), 28–35.

Baldwin, R., DeZure, D., Shaw, A., & Moretto, K. (2008). Mapping the terrain of mid-career faculty at a research university: Implications for faculty and academic leaders. *Change*, *40*(5), 46–55. https://doi.org/10.3200/chng.40.5.46-55

Buch, K., Huet, Y., Rorrer, A., & Roberson, L. (2011). Removing the barriers to full professor: A mentoring program for associate professors. *Change: The Magazine of Higher Learning*, *43*(6), 38–45. https://doi.org/10.1080/00091383.2011.618081

Canale, A. M., Herdklotz, C., & Wild, L. (2013, October 23). *Mid-career faculty support: The middle years of the academic profession*. Retrieved from http://www.rit.edu/academicaffairsfacultydevelopment/sites/rit.edu.academicaffairs.facultydevelopment/files/images/FCDS_Mid-CareerRpt.pdf

Dodds, P. (2005). Chapter 4: PETE women's experiences of being mentored into postsecondary faculty positions. *Journal of Teaching in Physical Education*, *24*, 344–367. https://doi.org/10.1123/jtpe.24.4.344

Foote, K. E., & Solem, M. N. (2009). Toward better mentoring for early career faculty: Results of a study of US geographers. *International Journal for Academic Development, 14*(1), 47–58. https://doi.org/10.1080/13601440802659403

Jones, R. L., Harris, R., & Miles, A. (2009). Mentoring in sports coaching: A review of the literature. *Physical Education and Sport Pedagogy*, *14*, 267–284. https://doi.org/10.1080/17408980801976569

Leslie, K., Lingard, L., & Whyte, S. (2005). Junior faculty experiences with informal mentoring. *Medical Teacher*, *27*, 693–698. https://doi.org/10.1080/01421590500271217

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

Lumpkin, A. (2009). Follow the yellow brick road to a successful professional career in higher education. *The Educational Forum*, *73*, 200–214. https://doi.org/10.1080/00131720902991251

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco, CA: Jossey-Bass.

Nottis, K. (2005). Supporting the mid-career researcher. *Journal of Faculty Development*, *20*(2), 95–98.

Patton, M. Q. (2015). *Qualitative evaluation and research methods* (4th ed.). Newbury Park, CA: Sage.

Paul, S., Stein, F., Ottenbacher, K. J., & Liu, Y. (2002). The role of mentoring on research productivity among occupational therapy faculty. *Occupational Therapy International*, *9*(1), 24–40. https://doi.org/10.1002/oti.154

Romano, J. L., Hoesing, R., O'Donovan, K., & Weinsheimer, J. (2004). Faculty at mid-career: A program to enhance teaching and learning. *Innovative Higher Education*, *29*(1), 21–48. https://doi.org/10.1023/b:ihie.0000035365.92454.a5

Strage, A., Nelson, C., & Meyers, S. (2008). "Stayin' alive:" Meeting faculty mid-career professional renewal needs. *Metropolitan Universities*, *19*(1), 71–83.

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YOU AND THE LAW

Time for a Reassessment of Assumption of Risk in Golf? Don't Count on It

Anthony C. Rosselli

FORE! Those four letters are often the only thing that alerts spectators attending golf tournaments of danger heading their way. With professional golfers swinging the golf club at upwards of 120 mph, sending the ball an average of 295 yards (Wilco, 2018), and with professional long drive competitors swinging up to 150 mph, a small hard golf ball can become a dangerous projectile with serious potential for catastrophic injury. In this article, I examine the courts' stance on assumption of risk for spectators, provide real-world examples of injuries within golf, and provide potential safeguards for minimizing risk for spectators.

Assumption of Risk: Spectators

When sports fans head to the game, there are certain assumptions that are inherent to the nature and type of sport being viewed (Augustine, n.d.). Objects and equipment regularly leave the area of play and find their way into the stands. For example, a study of 127 games in the National Hockey League found that 122 people were injured by hockey pucks leaving the ice (Winslow & Goldstein, 2007).

Historically, the courts have upheld that the spectator assumes the risks inherent within the sport of golf when watching a golf tournament. Namely, spectators expect golf balls to fly in their direction

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on occasion. Fans often line the greens, and some sit within 60 ft of the flagstick. Professional golfers are prone to miss-hit the golf ball (although a bad shot alone is not grounds for liability, see *Bartlett v. Cheduhar*, 1992, and Savell, 1998), and a slight miscalculation of the wind, elevation, or force necessary for hitting the ball can cause a spectator to be hit. More often than not, the golfer gets away with an apology and a signed glove or ball. Some fans even take it as a badge of honor to be hit by one of their favorite golfers. For golfers directly around the green, it is expected that they are prepared for a ball to be hit toward them (the flagstick is within their line of sight), and the courts do not protect spectators in this case (DeVoto, 1993). Furthermore, the professional golf tours do their diligence to inform golfers that errant golf balls may come their way. The risks associated with golf are printed on the backs of the tickets in a disclaimer that states spectators "voluntarily assume all risk and danger incidental to the game of golf" (Ralph, 2018, para. 6). For a detailed examination of spectator injuries due to errant golf shots and the courts' rulings, see Tonner, Sawyer, and Hypes (1999) and Lee (2014).

Additionally, the courts have not upheld the golfer's duty to warn others when a shot is hit offline, when the spectator should be aware that the golfer is about to hit or when the spectator is so far out of the intended path of play that they are deemed "reasonably safe" (see *Cavin v. Kasser*, 1991). It could be argued that golfers who know their tendency to hit an errant shot should be responsible for hitting a spectator, fellow golfer, or another person, and failing to warn said party. However, in *Thompson v. McNeil*, "the Supreme Court of Ohio held that negligent conduct of a golfer could not result in liability" (DeVoto, 1993, para. 10). In a more bizarre example (*Ludwikoski v. Kurotsu, 1995*), a bystander was sitting in her car in a driveway across the street from a golf course. An errant ball subsequently hit the bystander, and she sued the offending golfer. The courts could not find evidence of negligence on the part of the golfer in this case. In short, the road is long and uphill for a plaintiff in a negligence case against a golfer, course owner, or sponsor.

Example From 2018 Ryder Cup

Perhaps the most recent case that has received much publicity comes from the 2018 Ryder Cup tournament held in Paris, France. American golfer Brooks Koepka (the number 3 ranked golfer in

the world at the time) hit a shot that went offline. Spectator Corine Remande was struck in the eye, which resulted in permanent loss of vision in that eye (McCann, 2018). The European Tour claims that "fore" was yelled after it was evident the ball was heading offline, but Remande claims to not have heard the warning. Furthermore, Koepka stated, "You can yell 'fore' but it doesn't matter from 300 yards, you can't hear it" (as cited in McCann, 2018, para. 4). Remande says she is contemplating legal action.

Example From World Long Drive Competition

The World Long Drive competition has gained in popularity in recent years. These competitions (featuring both men's and women's divisions) showcase competitors' ability to hit a golf ball as far as humanly possible. Some golfers hit the ball over 500 yards during competition. For these athletes, the golf ball can leave the club head at over 220 mph (James, 2017). While long drive does not have spectators lining the fairway where the golfers are hitting their balls (and the ball itself is not the hazard relevant here), the golf club itself has become a projectile on more than one occasion. Spectators at World Long Drive events view from the back and sides of the golfer. During one competition, competitor Wes Patterson snapped his club shaft across his back on his follow-through swing. The club then flew into the stands, where spectators were watching the ball fly down the fairway, completely oblivious to the flying projectile coming their way (Kerr-Dineen, 2017). As this example demonstrates, this fiberglass projectile is even more dangerous due to the nature of the spectator's actions during this event. As soon as the golfer hits the ball, the spectator's line of sight transfers from the golfer and follows the golf ball down range. Spectators who are not directly behind the golfer are no longer viewing the golfer after the ball has been hit. This incident could have caused serious injury to the spectator, and all were fortunate that no injuries resulted.

Discussion

As demonstrated, the law is not on the side of the spectator of sporting events (in general). However, golf is different from any other spectator sport. The playing area is immensely larger than a basketball court, hockey rink, football field, or baseball diamond, among

others, and the action often comes from different sides at the same time. As in baseball and hockey (the sports with perhaps the closest similarities to golf, i.e., projectiles flying toward the path of the spectator), in golf, spectators could have multiple projectiles heading their direction at any time. Furthermore, in the case of World Long Drive competitions, the spectator follows the golf ball as it is hit down range. This is the natural spectator action inherent in this activity. Due to the positioning of the long driver in relation to the spectator, the patron has no reason to continue watching the golfer after the ball has been hit. This is the inherent risk associated with this sport. As demonstrated, when the golf shaft breaks and flies into the audience, the spectator does not watch the golfer, but rather follows the path of the golf ball.

Perhaps it is time for golf sports to reconsider spectator safety. A potential solution for World Long Drive is the installation of plexiglass barriers (similar to those at a hockey rink) that protect patrons from flying golf shafts. On the traditional golf course, this becomes unreasonable. However, other measures of encouraging patrons to pay more attention to their surroundings could be taken. In the past, the PGA Tour has banned the use of cellular phones during tournaments. At some tournaments, patrons have to turn in their devices at the entrance gate and can retrieve them as they leave, or can use them only within a designated space (usually far away from the potential of flying golf balls). However, the PGA Tour has since relaxed this policy (Heath, 2018). Other measures could include more golf marshals on the fairways whose responsibility it is to alert patrons of incoming golf balls (the professional tours already utilize wands from the tee box to indicate the direction the ball is traveling—either down the fairway, to the right of the fairway, or to the left of the fairway. More voices and eyes are always beneficial for alerting fans. Finally, professional golf tournaments could institute more announcements and reminders to patrons to pay attention to golfers, marshals, and their surroundings while within the field of play. Similar to the public service announcements at basketball games in which the announcer reminds fans to avoid certain behaviors, ticket takers could repeat a standard warning statement to each person as they take tickets. This is just one further method of informing the spectator of the inherent risk of the activity, and it serves to protect

all parties. In any case, the law is not on the spectator's side and does not appear it will be anytime soon.

References

Augustine, L. (n.d.). Who is responsible when spectators are injured while attending professional sporting events? Retrieved from https://www.law.du.edu/documents/sports-and-entertainment-law-journal/issues/05/05-Augustine.pdf

Bartlett v. Cheduhar, 479 N. W. 2d. 321, 322, 323 (1992).

Cavin v. Kasser, 820 S. W. 2d. 647, 650 (1991).

DeVoto, L. J. (1993). Injury on the golf course: Regardless of your handicap, escaping liability is par for the course. *University of Toledo Law Review*, *24*, 859–882.

Heath, E. (2018, March 9). Are fans allowed mobile phones on the PGA Tour? *Golf Monthly*. Retrieved from https://www.golf-monthly.co.uk/features/the-game/are-fans-allowed-mobile-phones-on-the-pga-tour-152052

James, J. (2017, October 3). Champion's corner: World Long Drive's increasing relevance in the golf landscape. Retrieved from https://www.worldlongdrive.com/news/champions-corner-world-long-drives-increasing-relevance-golf-landscape/

Kerr-Dineen, L. (2017, September 6). Golfer snaps driver, hits a fan at the World Long Drive competition. *USA Today*. Retrieved from https://ftw.usatoday.com/2017/09/golfer-snaps-driver-and-hits-a-fan-at-the-world-long-drive-competition-video-highlights

Lee, K. (2014). *Court decisions regarding golf-related injuries: A quantitative content analysis and binary logistic regression*. (Unpublished doctoral dissertation). University of New Mexico, Albuquerque, NM.

Ludwikoski v. Kurotsu, 875 F. Supp. 727 (1995).

McCann, M. (2018, October 2). Breaking down a potential lawsuit after Ryder Cup fan loses vision from errant shot. *Sports Illustrated*. Retrieved from https://www.si.com/golf/2018/10/02/ryder-cup-spectator-brooks-koepka-eye-injury-lawsuit

Ralph, P. (2018, October 9). What happens after 'fore'? Injured fans face legal hurdles in golf-ball lawsuits. Retrieved from https://www.golf.com/tour-and-news/2018/10/09/spectators-legal-hit-golf-ball/

Savell, L. (1998). Litigious links. *Golf Magazine*, *40*(2), 96–97.

Tonner, C., Sawyer, T. H., & Hypes, M. G. (1999). Legal issues in golf: A 25 year litigation history 1973–98. *Journal of Legal Aspects of Sport*, *9*, 125–149. https://doi.org/10.1123/jlas.9.3.125

Wilco, D. (2018, July 3). How driving distance has changed over the past 40 years on the PGA Tour. Retrieved from https://www.pga.com/news/pga-tour/how-driving-distance-has-changed-over-past-40-years-pga-tour

Winslow, J. E., & Goldstein, A. O. (2007). Spectator risks at sporting events. *Internet Journal of Law, Healthcare, and Ethics*, *4*(2), 1–6.

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