

2009

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The University of San Francisco

ADMINISTRATION PRACTICES OF PHYSICAL EDUCATION TEACHERS
FOR THE CALIFORNIA PHYSICAL FITNESS TEST

A Dissertation Presented
to
The Faculty of the School of Education
Learning and Instruction Department

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
Susan Lynn Eastham
San Francisco, CA
May 2009

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

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ABSTRACT

Administration Practices of Physical Education Teachers for the California Physical Fitness Test

The State of California uses the California Physical Fitness Test (CaPFT) to test all public-school students in grades five, seven, and nine. The CaPFT is based on the FITNESSGRAM® with the primary purpose of the test being to promote students to be physically active. If this goal is to be accomplished, it is important for teachers to educate students about health-related fitness because when students understand the value of physical activity they are more likely to adopt the behavior. The purpose of this study was to examine teachers' physical-fitness-test administration practices, specifically, how physical-education teachers help the students to develop a cognitive understanding of the health-related physical-fitness components before and after test administration.

Middle-school and high-school physical-education teachers (n = 10) from Central California were interviewed about their physical-fitness-test-administration practices. The teachers were asked to describe how they conduct the tests and how the students are educated about the health-related-fitness components before and after test administration.

The results of the study indicated that the participants chose similar tests to administer but varied the methods they used to conduct the tests. Only three of the teachers described giving specific health-related-fitness instruction. Middle-school teachers and teachers with access to a classroom were more likely to conduct in-depth health-related-fitness instruction. Before test administration, the teachers described various instructions given to the students about the test purposes, but none of the teachers reported discussing with their students that the purpose of the CaPFT was to promote a physically-active lifestyle. After test administration, only half of the teachers reported

providing the students with their test results. If an explanation of the test results was given to the students, the explanation typically was brief.

In order for students to make the connection between the CaPFT results and health-related fitness, it is important for teachers to provide specific health-related-fitness instruction. When effective test administration, instruction of health-related fitness, and interpretation of test results to the students occurs, physical-fitness testing may be a valuable assessment leading students to be more likely to adopt a physically-active lifestyle.

ACKNOWLEDGEMENTS

The process of completing my doctoral degree at the University of San Francisco has been a challenging yet rewarding experience. When I began this endeavor five years ago, I never imagined the extent of learning that would occur, not only academically, but personally as well. This has been a journey I could not have traveled alone. Many individuals contributed to the completion of this degree and to them I am truly grateful.

I would like to thank the faculty in the School of Education. I appreciate their willingness to share their expertise and knowledge. I am especially grateful to my committee chairperson, Dr. Patricia Busk. Her constant guidance through the dissertation process was greatly appreciated and I am thankful for having the opportunity to work with such a kind and giving person. To the rest of my dissertation committee, Dr. Caryl Hodges, Dr. Julia Orri, and Dr. Robert Burns, I am thankful for their time and for their willingness to contribute their various areas of expertise.

This accomplishment would never have been possible without the love and support of my family. I am grateful to my parents, Ron and Phyllis VanderMolen, who have encouraged me throughout my entire life and taught me, through example, the work ethic needed to achieve this goal. I am thankful for the understanding and patience of my two wonderful daughters, Alexandra and Carly. I know it was difficult for them to give up so much “mommy time.” Finally, I would like to thank my husband, Chuck. This journey would not have been possible without him. His constant love, support, and encouragement have been amazing. I am so grateful to have such a wonderful husband who was willing to do so much in order for me to complete this degree.

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CHAPTER I

INTRODUCTION TO THE STUDY

Statement of the Problem

Standardized testing at the elementary- and secondary-school levels is a common practice. Much attention is given to the various academic tests that are administered on a regular basis but little attention is given to other types of assessments, such as, physical-fitness tests. Physical-fitness tests are administered regularly in the United States, and even though there is no national mandate, physical-fitness testing is often required at the state, county, district, or school level. In the State of California, the California Physical Fitness Test (CaPFT) is required for all public school students in grades five, seven, and nine using the FITNESSGRAM® test battery (California Department of Education, 2007).

The primary goal of fitness tests is to motivate students to participate regularly in physical activity (The Cooper Institute, 2007). Regular physical activity is important because it is associated with good health and greatly reduces the risk of developing or dying from certain diseases, such as coronary artery disease, high blood pressure, high cholesterol, type 2 diabetes, and some cancers (Derri, Aggeloussis, & Petraki, 2004; Kahn et al., 2002; U.S. Department of Health and Human Services [USDHHS], 2007). A physically-active lifestyle not only reduces the risk for chronic diseases but also helps to decrease stress, improve muscle tone and strength to prevent injury, and increase self-confidence and the ability to perform various motor tasks (Roberts, 2000; Rowland & Freedson, 1994). Additionally, there appears to be a positive relationship between academic achievement and physical fitness (California Department of Education, 2005).

Students who are physically fit appear to perform better academically, are more attentive, and have fewer discipline problems (Kahn et al.).

Even though the benefits of a physically-active lifestyle are well established, a majority of children and adults fail to engage in healthy behavior. Less than 50% of adults, and only 33% of children, engage in the recommended level of physical activity (USDHHS, 2007). Additionally, physical inactivity is associated with an increase in obesity risk (Roberts, 2000). Obesity rates among children and adults have doubled in the United States since the 1970s and continue to increase. Currently in the United States, one-third of children and adolescents and two-thirds of adults are overweight or obese. It is estimated that by 2015 approximately 75% of adults will be overweight or obese (Wang & Beydoun, 2007). Studies indicate that children who are inactive and obese are more likely to continue the unhealthy behaviors into adulthood (Stone, McKenzie, Welk, & Booth, 1998). In order to decrease the obesity rates of tomorrow's adults, an increase in physical activity in today's children is needed.

Knowing the benefits of a physically-active lifestyle and the consequences of physical inactivity, too many children are still failing to engage in regular physical activity. Physical-fitness testing is one means of promoting physically-active lifestyles (The Cooper Institute, 2007). Although physical-fitness tests have been administered in schools for many years, the topic of physical-fitness testing has been debated and the value of measuring children's physical-fitness levels has been questioned. It has been argued that if the goal of physical-fitness testing is to motivate children to develop a physically-active lifestyle, the emphasis should be on assessing physical activity rather than physical fitness (Butts, Heitman, & Gilley, 1995). Additionally, it is not clear that

children who perform well on physical-fitness tests are physically active, and children who are physically active do not always perform well on physical-fitness tests (Naughton, Carlson, & Greene, 2006). It appears as though children's physical-fitness-test results are influenced by factors other than physical fitness. Factors, such as age, maturation, heredity, and environmental conditions appear to influence the test results of children to a greater extent than they do in adults (Fox & Biddle, 1986; Harris & Cale, 2006; Morrow, 2005; Naughton et al.). In adults, there is a strong positive relationship between physical fitness and physical activity, but in children the relationship is unclear (Naughton et al.).

Although problems of physical-fitness testing do exist, there is support for physical-fitness testing as a valuable and appropriate assessment tool for evaluating physical fitness and for promoting a physically-active lifestyle. Physical-fitness testing can be beneficial in educating children about the value of a physically-active lifestyle (Pate, 1989; Physical Education Association, 1988), motivating children to be physically active (Cale & Harris, 2002; Hill & Miller, 1997), and predicting adult physical-activity levels (Dennison, Straus, Mellits, & Charney, 1988). Although there are limitations of physical-fitness tests, they can be valuable assessments when administered effectively. Physical-fitness tests should not be administered merely to comply with the state requirements but used as an educational tool to help teach students about the benefits of physical activity (Pate & Shephard, 1989). When students understand the value of a physically-active lifestyle, they are more likely to engage in regular physical activity (Dale & Corbin, 2000; Dale, Corbin, & Cuddihy, 1998; Pearman et al., 1997).

Research conducted on physical-fitness testing has focused on collecting reliability and validity data on individual physical-fitness tests. Although several studies have examined individual tests, limited research has been performed on whole test batteries or on school-based physical-fitness-testing practices. Whitehead and Corbin (1991) examined the effects of two different fitness test batteries on exercise intrinsic motivation and self-worth. They found no differences between the test batteries suggesting that students had similar exercise intrinsic motivation and self-worth regardless of test battery. Hill and Miller (1997) compared fitness-test-administration accuracy between fifth-grade students and adults and found a high correlation between the student and adult scores. Only one study has investigated teacher practices of physical-fitness testing in the schools. Keating and Silverman (2004b) examined how teachers used physical-fitness tests in school-based physical-education programs. Surveys were used to investigate how physical-education teachers prepared and administered physical-fitness tests and found the tests to be an isolated part of the physical-education curriculum.

The most researched area on school-based physical-fitness testing includes studies on attitudes toward physical-fitness testing. Four studies have investigated student and teacher attitudes toward physical-fitness testing. Of those four studies, two studies have examined student perceptions (Flohr & Williams, 1997) and attitudes (Hopple & Graham, 1995) toward physical-fitness testing, whereas two additional studies have explored preservice (Keating, Silverman, & Kulinna, 2002) and secondary physical-education (Ferguson, Keating, Bridges, Guan, & Chen, 2007) teacher attitudes. These

studies generally found student attitudes toward fitness testing to be negative or neutral whereas teachers' attitudes were only slightly positive.

Because the value of physical-fitness testing depends largely on how they are administered (Ferguson et al., 2007; Harris & Cale, 2006; Pate, 1989; Pate & Shephard, 1989), it is important to investigate test-administration practices. Research has failed to examine current physical-fitness-testing practices in the schools. Knowing how teachers use physical-fitness testing in the schools can increase the understanding of physical-fitness-testing implementation and help facilitate effective physical-fitness-testing practices in the schools. With effective and appropriate physical-fitness-testing practices, students can learn to value a physically-active lifestyle (Ferguson et al., 2007; Keating, Silverman, & Kulinna, 2001; Naughton et al., 2006; Pate, 1989). When students understand the value of physical activity in promoting physically-active lifestyles, the primary goal of physical-fitness testing can be accomplished.

Purpose of the Study

Physical-fitness tests regularly are administered in the school. Although the primary goal of physical-fitness testing is to promote a physically-active lifestyle, whether or not this goal is achieved through physical-fitness testing has been challenged. The value of physical-fitness testing practices has been questioned as it is believed to lead to possible negative effects in children (Hopple & Graham, 1995); however, if administered correctly, physical-fitness testing can be a valuable assessment for children (Ferguson et al., 2007; Harris & Cale, 2006; Pate, 1989; Pate & Shephard, 1989). Proper test administration includes teaching students about the benefits a physically-active lifestyle and ways to improve physical fitness (Ferguson et al.; Pate & Shephard).

Physical-fitness tests should not be administered strictly to produce a score but as part of the total physical-education curriculum where the students are taught to understand the value and benefits of a physically-active lifestyle. Therefore, the purpose of this study was to examine teachers' physical-fitness test administration practices. Specifically, I explored how physical-education teachers helped their students develop a cognitive understanding of the health-related physical-fitness components relative to physical-fitness testing.

During this study, I interviewed physical-education teachers about their physical-fitness-test-administration practices. Interview questions focused on how the teachers conducted the tests, prepared the students for the tests, and how the test results were reported and interpreted to the students. In addition to asking the teachers to explain how they administered the tests, the teachers were asked to describe instructional techniques used before and after physical-fitness-test administration.

Theoretical Rationale

Because the primary goal of physical-fitness testing is to promote a physically-active lifestyle, gaining an understanding of the behavior of physical activity is important. Social-cognitive theory (Bandura, 1986, 1997) explains how behaviors are acquired and maintained and has been the leading theory for understanding physical-activity behavior (McAuley & Blissmer, 2000; Motl, 2007).

Although social-cognitive theory is based on several assumptions (i.e., people learn by observing, behavior is goal directed, individuals are self-reflective, and behavior is self-regulating), at the center of social-cognitive theory is Bandura's conceptual triadic reciprocal determinism. This involves a bidirectionally interaction between three factors:

behavior, environment, and person (Figure 1). All three factors are essential and influence each other in what is known as reciprocal causation (Bandura, 1989). The interdependence among the three factors means that behavior depends on personal (e.g., cognitive and affective events) and environmental (e.g., physical and social surroundings) factors, personal factors depend on environmental and behavioral factors, and environmental factors depend on behavioral and personal factors.

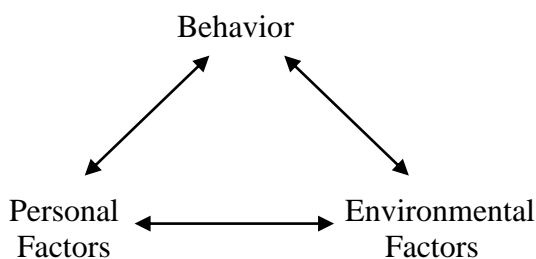


Figure 1. Social-cognitive theory's interrelationship between behavior, personal factors, and environmental factors (Bandura, 1986)

Social-cognitive theory relates to physical activity in that the behavior of a physically-active lifestyle depends on personal and environmental factors. Personal factors include cognitive and affective events. Specifically, what people think, feel, and believe (e.g., knowledge, expectations, beliefs, and self-perceptions) will influence how they behave. Environmental factors include the physical (e.g., space and temperature) and social (e.g., family and friends) environment and can influence also how people behave. According to Bandura's (1986) triadic model, whether or not the behavior of physical activity will be adopted depends on personal and environmental factors. Specifically, the personal factors involve the cognitive and affective domains that relate to an individual's knowledge and value of the health-related fitness components; the environmental factor involves health-related-fitness instruction. The interrelationship between the behavior of physical activity, the personal factors of knowledge and value of health-related fitness,

and the environmental factor of health-related-fitness instruction are consistent with social-cognitive theory's central theme of triadic reciprocal determinism (Figure 2).

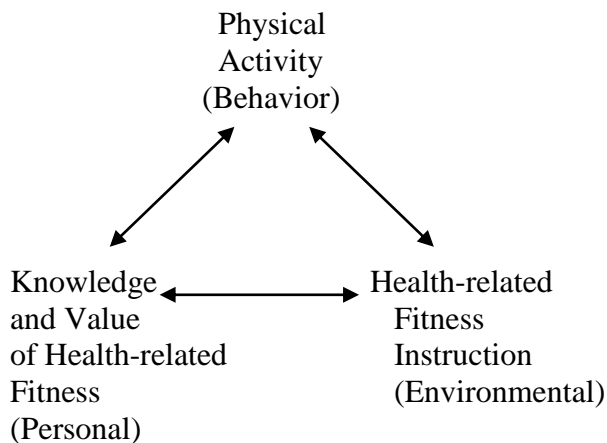


Figure 2. Social-cognitive theory's interrelationship between behavior, personal, and environmental factors as it applies to physical activity

Physical education is an ideal setting to provide quality instruction so students may learn to understand and value a physically-active lifestyle. One means through which a physically-active lifestyle may be accomplished is with physical-fitness testing. When fitness tests are administered properly and are integrated with health-related-fitness instruction, students may learn to understand and value a physically-active lifestyle. In order to promote physical activity, health-related-fitness instruction must be provided. It is important for physical-education teachers to provide quality fitness instruction and help students make the connection with physical-fitness testing. According to social-cognitive theory, once students learn to understand and value a physically-active lifestyle, through health-related-fitness instruction, the behavior of physical activity is more likely to be acquired and maintained.

Background and Need

Physical-fitness tests have been conducted in elementary and secondary schools since the 1880s but did not become widespread in the United States until the 1950s (Corbin & Pangrazi, 1992; Plowman et al., 2006). The increased interest was in response to the Kraus and Hirschland (1954) study comparing United States and European children's performance on the Kraus-Weber test. The report indicated that children in the United States were less fit in muscular strength and flexibility than European children. Although the Kraus-Weber test was conducted using small convenience samples with limited ability to generalize to other populations (Morrow, 2005) and was not considered to be a valid measure of physical fitness in youth (Corbin & Pangrazi), the results were interpreted by the general public to mean that children's health in the United States was at risk as they were considered to be physically unfit. As a result, a new found interest in physical fitness among the youth began.

The concern for youth physical fitness motivated President Eisenhower, in 1956, to establish the President's Council on Physical Fitness (now known as the President's Council on Physical Fitness and Sport) to promote youth fitness nationwide (Corbin & Pangrazi, 1992; Freedson, Cureton, & Heath, 2000). Additionally, the American Alliance for Health, Physical Education and Recreation (AAHPER) Youth Fitness Project was formed to develop a fitness test battery. (AAHPER is now known as American Alliance for Health, Physical Education, Recreation and Dance – AAHPERD.) As a result, in 1958, the AAHPER Youth Fitness Test was published (Whitehead, Pemberton, & Corbin, 1990). The original test was a 7-item fitness-test battery intended to assess

comprehensively youth fitness nationwide (Corbin & Pangrazi). The test was norm-referenced, skill-oriented, and included an awards system.

Since the early 1990s, the concept and philosophy of physical-fitness testing underwent several changes. The three primary changes in physical-fitness testing included a shift in focus from norm-referenced standards to criterion-reference standards, skill-related physical-fitness components to health-related physical-fitness components, and an emphasis on the product of fitness performance (and awards) toward the process of regular physical activity (Freedson et al., 2000; Harris & Cale, 2006; Keating, 2003; Plowman et al., 2006).

The first change in physical-fitness testing involved the shift from using norm-reference standards to the use of criterion-referenced standards to interpret test results. Originally, the physical-fitness test results were based on norm-referenced standards. The norm-referenced standards for physical-fitness testing involved a comparison of test scores among students of similar age and gender but did not indicate a desired level of fitness (Harris & Cale, 2006; Kemper & Van Mechelen, 1996; Whitehead et al., 1990). Currently, criterion-referenced standards are the preferred method for test interpretation because they categorize students into one of two groups based on whether or not they meet the criterion standard of a desirable level of fitness. The criterion level is based on empirical data used to establish the criterion values on what is thought to be acceptable for good health (Freedson et al., 2000; Harris & Cale; Kemper & Van Mechelen; Pate, 1989; Plowman et al., 2006).

Although criterion-reference standards are preferred and recently have been used more widely for interpreting physical-fitness test results (Freedson et al., 2000; Naughton

et al., 2006), criterion-reference standards are not without limitations. A criticism of criterion-reference standards is that it may be difficult to set the cut-off point for the criterion values. Although the criterion standards are based on empirical data, they are considered to be somewhat subjective (Freedson et al.). Additionally, the research is plentiful among adults, but the results are not generalizable to children (Pate, 1989). Another disadvantage is that criterion-reference standards may not be sufficient motivation for students to achieve a higher level of fitness. They may only try to reach the minimum score required to meet the criterion standard and fail to strive for maximal achievement (Freedson et al.; Harris & Cale, 2006). Notwithstanding the limitations of criterion-reference standards, it is considered to be a better method of interpretation than norm-referenced standards because it is not dependent upon the reference population and is based on physical-fitness levels related to good health that realistically are attainable by everyone (Freedson et al.).

The second change in physical-fitness testing involved a shift in emphasis from skill-related physical-fitness components to a focus on health-related physical-fitness components. Skill-related physical-fitness components include the qualities of agility, speed, balance, coordination, power, and reaction time. Although these components are helpful in performing various sport and motor skills, they are not related directly to health. Alternatively, the health-related physical-fitness components do include qualities directly related to health and consist of the following components: cardiovascular endurance, body composition, muscular strength and endurance, and flexibility (Corbin, Pangrazi, & Franks, 2000). These health-related physical-fitness components are related to a reduced risk for hypokinetic diseases such as cardiovascular disease, certain cancers,

type 2 diabetes, and obesity (Corbin & Pangrazi, 1992; Harris & Cale, 2006; Rice & Howell, 2000). The health-related components are emphasized over skill-related components because they are associated with the prevention of diseases caused by a sedentary lifestyle.

The third important change in physical-fitness testing included a decreased emphasis on the product of fitness performance toward a focus on the process of becoming physically active. This new focus shifted the emphasis away from awards for performance and toward participation of regular physical activity. As children who perform well on physical-fitness tests are not necessarily more physically active, it is incorrect to assume that children who score high on physical-fitness tests are physically active and that children who score low are physically inactive. There are many contributing factors to physical-fitness test scores, with physical activity as only one of those factors (Pangrazi & Corbin, 1993). Additionally, in the process of students becoming more physically active, it is important that the physical-education curriculum includes educating the children about physical fitness. It is more important to have a cognitive understanding of the importance of a physically-active lifestyle and the benefits it has on one's health than simply to produce an acceptable score on a fitness test (Pangrazi & Corbin). With the conceptual and philosophical changes in physical fitness, improvements in physical-fitness testing have resulted in the development of more valuable and useful instruments.

With the changing philosophy of fitness testing, the FITNESSGRAM® test battery was developed. The FITNESSGRAM® is a criterion-referenced test used to assess the health-related-fitness components that focuses on the process of becoming

physically active (The Cooper Institute, 2007). Although there is no national mandate for physical-fitness testing, California passed legislation in 1998 mandating the annual administration of the CaPFT (Education Code Section 60800). The CaPFT uses the FITNESSGRAM® test battery that includes six test categories and 13 individual fitness tests used to assess health-related-physical fitness (Table 1). The California mandate for physical-fitness testing requires that all public-school children in grades five, seven, and nine be tested between February 1 and May 31. The test results are collected by the California Department of Education who posts the results on the Internet. In addition to reporting the test results to the California Department of Education, the mandate stipulates that the students receive their individual test scores after the test is completed. In high school, the students are required to take 2 years of physical education but if they pass five of the six test categories in grade nine, they may receive an exemption for their second year of physical education (California Department of Education, 2007; Education Code Section 51241).

Table 1
CaPFT Categories and Associated Individual Tests

CaPFT Category	Individual Fitness Tests
Aerobic Capacity ^a	PACER ^c One-Mile Run Walk Test (only for ages 13 and older)
Body Composition ^a	Skinfold Measurement ^c Body Mass Index (BMI) Bioelectrical Impedance Analyzer (BIA)
Abdominal Strength ^b	Curl-Up
Trunk Strength ^b	Trunk Lift
Upper Body Strength ^a	90° Push-Up ^c Modified Pull-Up Flexed Arm Hang
Flexibility ^a	Back-Saver Sit and Reach Shoulder Stretch

^aOne test is selected from each of these categories for the CaPFT.

^bThese are required tests for the CaPFT.

^cThese tests are recommended by The Cooper Institute (2007).

Physical-fitness testing was implemented originally for the purpose of improving physical fitness among United States' youth (Keating et al., 2002; Seefeldt & Vogel, 1989). Through a changing philosophy and by operationally defining physical fitness, physical-fitness testing has progressed into a more viable assessment and has allowed researchers to identify the goals and purposes of physical-fitness testing. Currently, the primary purpose of physical-fitness testing is to encourage regular physical activity. This important change in focus has shifted the emphasis from the product of fitness performance to the process of regular physical activity. With the emphasis on regular physical activity, individuals can focus on qualities of good health encouraging participation for all students regardless of skill level.

With the emphasis on promoting regular physical activity for all students, the merit of physical-fitness testing has been debated. Because physical-fitness tests measure physical-fitness performance, the purpose of promoting the behavior of physical activity has been challenged. It has been argued that rather than measuring physical fitness, it is physical activity that should be assessed (Butts et al., 1995; Rowland & Freedson, 1994). Measuring physical activity instead of physical fitness appears to be a logical solution; however, the problem lies in physical-activity assessments. Several assessments of physical activity have been presented (e.g., self-report, diaries, direct observation, monitoring devices), but a consensus has not been reached on a reliable and valid measure for children and adolescents' physical-activity levels (Biddle, Gorely, & Stensel, 2004; Butts et al.; Rice & Howell, 2000; Sallis, Prochaska, & Taylor, 2000; Steinbeck, 2001). There are, however, reliable and valid measures of physical fitness that have been used widely in the schools.

With the failure to present an acceptable assessment of physical activity and with the continued use of physical-fitness testing to promote physical activity, how are physical activity and physical fitness related? In adults, the correlation between physical fitness and physical activity is high, but in children evidence linking physical fitness and physical activity is weak (Butts et al., 1995; Naughton et al., 2006). Research has indicated that physical activity in children is not always directly related to high fitness scores (Pangrazi & Corbin, 1993). There are many factors that contribute to physical-fitness-test results in children, such as, age, maturation, genetics, motivation, physical activity, test familiarization, and test procedures (Harris & Cale, 2006; Morrow, 2005; Naughton et al.). Although physical activity is one factor, there are many more variables contributing to physical-fitness-testing results.

To understand the possible disconnect between physical fitness and physical activity, the key may lie in how physical activity and physical fitness are associated with health. Blair, Clark, Cureton, and Powell (1989) demonstrated the link between physical activity and health represented in Figure 3.

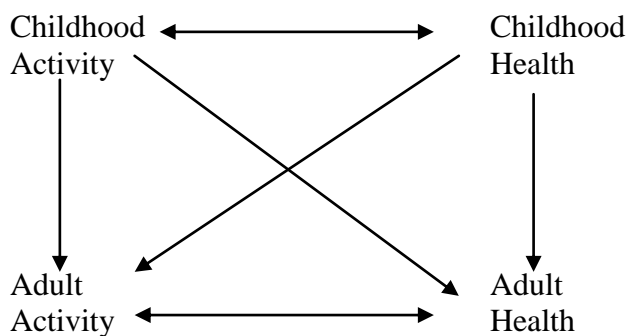


Figure 3. The relationship between physical activity and health in children and adults (Blair et al.)

This figure represents the following three hypothesized relationships between physical activity and health in children and adults: physical activity influences current health status, physical activity influences future health status, and physically active children are more likely to be physically active adults.

In adults, there is a definite link between physical activity, physical fitness, and good health; however, in children, this relationship is not as clear. Cale and Harris (2002) found a weak relationship between fitness level and health in children. This weak relationship was explained by suggesting that many chronic diseases do not manifest themselves in children. More recent research, however, has indicated that evidence of cardiovascular disease can begin in childhood and that physical fitness can be an important factor in reducing that risk (Ortega, Ruiz, Castillo, & Sjostrom, 2008). Although chronic diseases are more prevalent in adults, the incidence among children is on the rise (Groner, Joshi, & Bauer, 2006), and, therefore, the focus needs to be on prevention. By encouraging children to be physically active and improve their physical fitness, it is the hope that these chronic diseases may be delayed or even prevented when they reach adulthood.

Even though the relationship between physical-fitness testing and physical activity has been disputed, support for the relationship exists. Dennison et al. (1988) found that youth-fitness testing could predict physical-activity levels in adults suggesting that children who scored low on physical-fitness tests were more likely to be inactive adults. Therefore, physical-fitness testing can be beneficial in identifying individuals at risk of becoming sedentary adults and thereby providing appropriate interventions to

prevent the behavior. Helping children to adopt healthy lifestyles can be an important step in preventing diseases in adulthood (Ortega et al., 2008).

With an emphasis on promoting physically-active lifestyles, it is important to consider the factors influencing children's decisions to be physically active. Factors such as physical-education programs, extracurricular activities, family and peer influences, and medical interventions are all potential motivators impacting physically activity among children. With the various ways in which children may be influenced to be physically active, research appears to indicate that school-based interventions play a key role in influencing children's decisions to be physically active (Salmon, Booth, Phongsavan, Murphy, & Timperio, 2007). Participation in school-based physical-education programs has been identified as the most readily available way for increasing student's physical-activity levels (Kahn et al., 2002). Research on school-based interventions indicates that students who participate in quality physical education have an increase in physical-activity levels (Thomas, 2004).

With school-based physical-education programs providing a primary way for promoting physical activity among children, it is essential that a quality program is offered. The two primary components of physical-education programs include motor-skill development and physical-fitness development (Kovar, Combs, Campbell, Napper-Owen, & Worrell, 2009). Previous physical-education programs primarily focused on motor-skill development with little attention given to physical-fitness development. Currently, although motor-skill development is still important, it is not the primary focus. Instead, quality physical-education programs provide a balanced curriculum including both motor-skill and physical-fitness development. Both components are essential to a

physical-education program in promoting a physically-active lifestyle. Motor-skill development is helpful for improving confidence and enjoyment in physical activity (Roberts, 2000) and increases the likelihood that participation will occur in the future (Boreham & Riddoch, 2001). Physical-fitness development is important for improving physical abilities and attaining a positive attitude toward physical fitness, both of which are helpful in promoting healthy behaviors leading to optimal health and wellness (Derri et al., 2004; Harris & Cale, 2006). By presenting a quality physical-education program, a program that teaches students the knowledge, attitudes, and skills of an active lifestyle, the students can learn to understand the importance of physical activity, to value the benefits of an active lifestyle, and to develop adequate motor-skill performance. When all of these elements are presented, the students can learn to develop a physically-active lifestyle (Kahn et al., 2002; Lee, Burgeson, Fulton, & Spain, 2007; Pate, 1991).

Physical-fitness testing can be valuable if it is a part of the physical-education curriculum where students are taught the knowledge and understanding of health-related fitness. When physical-education teachers fail to integrate physical-fitness assessments into the physical-education curriculum, the goal of promoting physically-active lifestyles is in jeopardy (Pate, 1989). As explained by Masterson and Walkuski (2004), "Fitness assessment is a meaningful learning activity only if it is linked to the total physical education curriculum and to physical education lessons" (pp. 35-36). If physical-fitness testing is going to lead to a physically-active lifestyle, it is important to include the cognitive component (Keating, 2003). Therefore, when physical-fitness testing is connected to the physical-education curriculum, students can learn the value of a

physically-active lifestyle leading to a greater likelihood that the behavior will be adopted (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997).

With the ultimate goal of physical-fitness testing being to promote a physically-active lifestyle that is beneficial for good health, it is *how* physical-fitness testing is administered that can determine whether or not this goal is achieved. If physical-fitness tests are to be valuable assessments, they must be administered correctly. Proper test-administration procedures include teaching students about health-related fitness and to understand the value of a physically-active lifestyle (Pate & Shephard, 1989).

Unfortunately, there is a large gap between how fitness tests are intended to be used and how they actually are used in the schools (Ferguson et al., 2007). Administering fitness tests to obtain a score without educating the students about health-related fitness and the value of a physically-active lifestyle negates the intended purpose of physical-fitness assessment. Physical-fitness testing can be valuable if they are used in conjunction with a physical-education program that teaches the students to understand the value of a physically-active lifestyle (Ferguson, 2007; Keating et al., 2001; Masterson & Walkuski, 2004; Naughton et al., 2006; Pate, 1989).

Research Questions

The study addressed the following research questions:

1. How do physical-education teachers describe their physical-fitness-test-administration practices?
2. How do physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components?

3. Prior to physical-fitness testing, to what extent do physical-education teachers develop their students' cognitive understanding about the health-related physical-fitness components?

4. After physical-fitness testing, to what extent do physical-education teachers interpret test results to their students?

Significance of the Study

This study has implications for physical-education teachers' physical-fitness-test-administration practices and health-related-fitness instruction. This study is important for three reasons. First, this study will provide a better understanding of how physical-education teachers administer physical-fitness tests in the schools. Examination of physical-fitness-test-administration practices can help identify ways to improve test-administration practices.

Second, this study will provide a better understanding of how physical-education teachers incorporate health-related physical-fitness instruction in the curriculum. Incorporating instruction about health-related physical-fitness is important to promoting a physically-active lifestyle. A better understanding of how physical-education teachers help students develop a cognitive understanding of physical fitness can lead to improvements in health-related-physical-fitness instruction.

Third, this study will provide information regarding physical-fitness testing and health-related-physical-fitness instruction. To promote physical activity, the primary goal of physical-fitness testing, health-related-physical-fitness instruction must be provided. This study will provide a better understanding of the connection between physical-fitness

testing and health-related-fitness instruction so the primary goal of fitness testing may be accomplished.

Definition of Terms

The following terms are defined for this study. There may be other definitions that apply to these terms, but these are the definitions that are used for this study.

Health-related physical fitness focuses on the aspects of fitness that are related to promoting health and achieving an active lifestyle. The components include cardiorespiratory endurance, muscular fitness, body composition, and flexibility (Connaughton & Poor, 2000).

Physical activity is any bodily movement produced by skeletal muscles that result in energy expenditure (Caspersen, Powell, & Christenson, 1985).

Physical fitness is a set of attributes that people have or achieve that relates to the ability to perform physical activity (Caspersen et al.).

Skill-related physical fitness focuses on the ability to perform various motor skills. The components include agility, balance, coordination, power, and speed (Connaughton & Poor).

Summary

Physical activity is important to a healthy lifestyle and the benefits of a physically-active lifestyle are well documented; however, too many people are choosing to be inactive. An effective physical-education program can be an integral part of promoting physical activity. Physical-fitness testing has long been a part of physical education and has the primary purpose of promoting physical activity. Although physical-fitness tests commonly are administered, their value has been questioned. The practice of

physical-fitness testing in the schools has been challenged. If the goal is to promote physical activity, then it is physical activity that should be assessed rather than physical fitness. The problem, however, is that physical-activity assessments are not as reliable and valid as physical-fitness assessments because measuring the behavior of physical activity is more challenging than measuring the quality of physical fitness.

Even though the practice of physical-fitness testing has been questioned, it can be a valuable assessment if administered correctly. If the physical-fitness tests are to be meaningful, students must be taught to understand the value of a physically-active lifestyle. It is important for teachers to educate students about the benefits and value of a physically-active lifestyle. Physical-fitness testing has little value when administered without educating the students about health-related fitness and the role physical activity plays.

The research on physical-fitness testing in the schools is limited. Although the majority of fitness-testing research has focused on validating the individual fitness tests, research relating to the effectiveness of entire fitness test batteries and how they are implemented in the schools is lacking. By examining how physical-fitness tests are administered in the school and how these tests relate to fitness instruction, a better understanding of how they are connected may be obtained. The following chapters will present a review of the literature, methodology, results, and summary and conclusions of the study.

CHAPTER II

REVIEW OF THE LITERATURE

The primary goal of physical-fitness testing is to promote a physically-active lifestyle. Whether or not this goal can be accomplished through physical-fitness testing has been questioned. The key to using fitness testing to promote physical activity is to incorporate fitness-testing procedures with health-related-physical-fitness instruction. When students are able to make a connection between physical-fitness testing and health-related fitness, the goal of promoting a physically-active lifestyle can be accomplished.

This study examined teachers' physical-fitness test administration practices; specifically, how physical-education teachers educate students about the health-related physical-fitness components before and after test administration. In this chapter, I review previous research relating to physical-fitness testing and the importance of physical activity, the debate between physical activity and physical fitness and health-related-fitness instruction. Although there is limited research on physical-fitness-testing practices in the schools, studies conducted on motivation, attitudes, and uses of physical-fitness testing were reviewed.

Importance of Physical Activity

The benefits of physical activity are well documented and play an important role in reducing risk for disease (Tremblay, Inman, & Willms, 2000; Warburton, Nicol, & Bredin, 2006), improving mental health (Piko & Keresztes, 2006), and decreasing the incidence of overweight or obesity (Anderson & Butcher, 2006; Roberts, 2000; Wang & Beydoun, 2007). The benefits of physical activity are well established in adults; however, the physical-activity benefits in children are not always observable directly because

symptoms sometimes do not present themselves until adulthood. To support the benefits of physical activity, researchers have examined how physical activity tracks from childhood into adulthood and how physical activity and academic performance are related.

Tracking Physical Activity from Childhood into Adulthood

Tracking refers to a variable's stability over time and the measurement's predictability in early life compared with the same variable later in life (Twisk, Kemper, & Van Mechelen, 2000). If physically-active children are more likely to become physically-active adults, then the health benefits can be enjoyed throughout the lifespan. In addition to the health benefits, research suggests that a physically-active lifestyle may provide academic benefits as well. Studies indicate that students who are physically active perform better academically than their more sedentary counterparts (California Department of Education, 2005; Kahn et al., 2002; Shephard, 1997).

Preventive strategies are a common method for reducing risk for various diseases such as coronary artery disease. If healthy lifestyle behaviors can be adopted early in life, an individual's risk for certain diseases may be decreased. Physical activity, if adopted in childhood, is a healthy behavior that is more likely to continue into adulthood (Dennison et al., 1988; Raitakan et al., 1994; Twisk et al., 2000). It has been suggested that physical-fitness testing may play an important role in identifying children at risk of becoming inactive (Dennison et al.). If intervention is offered early, physical-fitness testing has the potential for providing necessary information to help promote physical activity and reduce the risk for disease.

By examining physical-activity patterns and cardiovascular-disease risk, it may be possible to identify individuals at risk early in life so that education and appropriate intervention may be provided. Twisk et al. (2000) and Raitakan et al. (1994) conducted longitudinal studies that involved tracking the physical-activity patterns of individuals and examining their cardiovascular-risk profiles. Using data from the Amsterdam Growth and Health Longitudinal Study, Twisk et al. examined physical-activity patterns and cardiovascular-risk profiles in 181 participants (ages 13 to 27 years). The participants were examined over 15 years to investigate their physical-activity and physical-fitness levels. The data were examined to investigate if tracking from adolescence into adulthood occurred and how tracking related to cardiovascular-disease-risk factors. The study revealed low to moderate tracking for daily physical activity (stability coefficient = .34) and cardiovascular fitness (stability coefficient = .31) and good tracking for neuromuscular fitness (stability coefficient = .76). Daily physical activity was associated with a favorable cardiovascular-risk profile, whereas neuromuscular fitness' relationship to cardiovascular risk was unclear.

Raitakan et al. (1994) studied 961 Finnish students, tracking their physical activity behaviors over a 6-year period, from adolescence into early adulthood. They discovered that physically-active adolescents were more likely to continue the healthy behavior as young adults. Additionally, they determined that inactive individuals had less favorable cardiovascular-risk profiles than active individuals. The studies by Twisk et al. (2000) and Raitakan et al. support the idea that active children are more likely to become active adults, thereby decreasing their risk for cardiovascular disease.

Dennison et al. (1988) used children's physical-fitness test scores to investigate factors that may determine adult physical-activity patterns. Using a large sample ($N = 453$) of young men (ages 23 to 25 years), physical-activity levels were compared with childhood physical-fitness-test scores. The study found that, for the 600-meter run, the physically-active adults had better physical-fitness scores as children ($z = -.07$) than the inactive adults ($z = .26$); in fact, the lower the childhood test scores, the higher the risk for physical inactivity as adults. The results of this study suggest that children's physical-fitness-test scores may be able to identify children who are at risk of becoming inactive adults so that intervention may be provided.

Physical inactivity leads to an increase in cardiovascular-disease risk. In order to help decrease one's risk for cardiovascular disease, adopting a physically-active lifestyle is beneficial. Studies suggest that children who are physically inactive tend to continue the unhealthy behavior into adulthood (Dennison et al., 1988; Raitakan et al., 1994; Twisk et al., 2000). Because lifestyle habits are established early, it is important to encourage physical activity in childhood so that the behavior may be continued into adulthood. Additionally, physical-fitness tests may play an important role in identifying children who are at risk of becoming physically inactive as adults so that intervention programs may be offered. By identifying physical-fitness-test-administration practices, ways to improve test administration may be identified leading to the identification of students at risk so health intervention may be provided.

Academic Achievement

Educators and health professionals have studied the relationship between physical fitness and academic performance as it has been suggested that students who are more

physically active and have higher fitness levels are more likely to perform well academically (California Department of Education, 2005; Castelli, Hillman, Buck, & Erwin, 2007). Although studies examining this relationship have primarily supported this association, not all the research has confirmed these findings (Tremblay et al., 2000).

Two separate meta-analyses examined the relationship between physical fitness and cognition. Etnier et al. (1997) included 134 studies from which they determined an average effect size of .25 (SD = .69) indicating a small positive effect on cognition. Although many studies were included in the analysis, the studies were primarily a correlational design and of poor quality. Additionally, the studies included a wide range of ages that resulted in a large variation in effect sizes. The effect sizes were larger for high-school students (.77) and smaller for the elementary students (.36). To improve on the Etnier et al. study, Sibley and Etnier (2003) also conducted a meta-analysis but limited the age range (6 to 13 years) to focus on younger children and only included true-experimental design studies. Sixteen studies were included in the analysis with an average effect size of .32 (SD = .27), indicating a statistically significant positive relationship between physical activity and cognition in children. These studies suggest that, although physical activity may not have a large effect on cognition, there does appear to be a positive affect.

The meta-analyses conducted by Etnier et al. (1997) and Sibley and Etnier (2003) support two controlled experimental studies that examined the effect on academic performance when the time spent in physical education was increased (Dwyer, Sallis, Blizzard, Lazarus, & Dean, 1983; Shephard, Lavalley, Volle, LaBarre, & Beaucage, 1994). Shepard et al. demonstrated improvements in academic performance when time

spent in physical education was increased. The experimental group received enhanced physical education and a 13% reduction in academic teaching. Grades and academic test scores increased among the experimental group when compared with the control group who participated in regular physical education. Dwyer et al. (1983) randomly assigned the participants to groups to examine the association between academic performance and physical activity and fitness in children. The experimental group showed no change in academic performance even though they spent less time in the classroom receiving instruction. The results appear to suggest that even when time spent in physical education increased, thereby decreasing time spent in the classroom, academic performance was not hindered, and in some cases improved.

Additional studies have been conducted to examine the relationship between physical fitness and academic performance. The California Department of Education (2005) conducted a statewide study to examine the relationship between physical fitness and academic performance of fifth-, seventh-, and ninth-grade students. A correlational design was used to compare student scores on the state-mandated tests of physical fitness (i.e., FITNESSGRAM®) to their scores of academic performance (i.e., California Standard Tests [CST]). Analysis of variance (ANOVA) was conducted to compare the student's CST and FITNESSGRAM® scores. The results indicated that the students who scored high on the FITNESSGRAM® had statistically significantly greater scores on the CST, $F(6,371198)=3090.0, r^2=.05$. Although the study did not include a causal component, a positive relationship was found between physical fitness and academic performance. In a similar study, Castelli and Williams (2007) investigated the relationship between physical fitness and academic performance in the State of Illinois.

This study involved third- and fifth-grade students from 11 different schools and compared the students' FITNESSGRAM® scores with the Illinois standardized assessments for mathematics and reading. A moderate-positive relationship ($r=.42$) between physical fitness and academic performance was confirmed.

Tremblay et al. (2000) examined the relationship between children's physical activity and academic performance. A large sample ($N = 6,923$) of Grade 6 Canadian students completed a questionnaire about their physical-activity patterns. The children's responses were correlated with the scores of their academic tests of mathematics and reading. The results of this study did not indicate a relationship between physical activity and academic performance. There was a weak negative statistically significant association between the students' self-report on physical activity when correlated with mathematics ($-.01$) and reading ($-.02$). These relationships are close to zero, but statistically significant due to a large sample size.

Although the studies examining the relationship between physical fitness and academic achievement are difficult to compare because they employ different methods of assessment, there is a trend indicating that physical activity and physical fitness enhance academic achievement. At the very least, physical activity does not appear to inhibit or detract from academic performance even when time spent on academic tasks were decreased.

The Physical-Fitness-Test Debate

Although the benefits of physical activity are well documented, many people are choosing to be inactive. It is estimated that less than 50% of adults and only 33% of children participate in the recommended level of physical activity (U.S. Department of

Health and Human Services [USDHHS], 2007). One approach to increasing physical activity in children is through an effective physical-education program. Physical-fitness testing has long been a part of physical education and has the primary purpose of promoting physical activity. Even though physical-fitness tests are administered regularly, their role in physical education has been questioned. The practices of physical-fitness testing in the schools have been challenged because if the goal of physical-fitness testing is to promote physical activity, then it has been suggested that educators should be assessing physical activity rather than physical fitness. The problem, however, is in measuring physical activity. Physical activity is a behavior and difficult to assess whereas physical fitness is a quality that has valid and reliable assessments that are practical in a school setting. If physical-fitness tests are going to be used to promote physical activity, it is important to examine the relationship between physical activity and physical fitness and the methods through which these variables are assessed.

Relationship Between Physical Activity and Physical Fitness

A positive relationship between physical activity and physical fitness has been well established in adults (USDHHS, 1996); however, the relationship in children is less clear. There are primarily two reasons why this relationship has been difficult to evaluate. First, children's activity patterns are sporadic and unpredictable. Bailey et al. (1995) conducted an observational study of the nature of children's physical-activity habits. They observed children's exercise patterns to involve short, vigorous, intermittent bouts of activity with long rest periods between exercise bouts. These exercise patterns are different from adults in that adults engage in continuous activity as opposed to the unpredictable exercise patterns of children. Because physical activity patterns are

typically intermittent and irregular, children's participation in physical activity may not result in an improvement in aerobic fitness (Bailey et al.). Second, measurement techniques used to assess physical activity and physical fitness has varied. Because various assessments have been used to measure both physical activity and physical fitness, comparisons between studies have been difficult.

Several studies (Denker et al., 2006; Le Masurier & Corbin, 2006; Michaud, Cauderay, Narring, & Schutz, 2002; Pate, Dowda, & Ross, 1990) have attempted to examine the relationship between physical activity and physical fitness. Studies have indicated a low to moderate positive relationship; however, this relationship is difficult to assess because the studies used to compare this relationship have employed a variety of methods to examine variables.

For example, Pate et al. (1990) used a nationally representative sample (N=2,352) of third- and fourth-grade children in the United States to compare physical activity and health-related fitness. Parent- and teacher-report questionnaires were used to assess physical activity and the 1.6-km run test and skinfold thickness measures were used to evaluate physical fitness. Twenty of the 28 physical activity variables were statistically significantly correlated with physical fitness at a low to moderate level. Half of the statistically significant correlations were low ($r < .10$) and the other half were moderate ($.10 < r < .33$).

Michaud et al. (2002) examined 233 Swiss adolescents (11 to 15 years) to assess the relationship between physical activity and aerobic fitness. A direct method (i.e., pedometers) was used to assess physical activity, whereas the endurance shuttle run was

used to test aerobic fitness. The relationship was statistically significant and moderate ($r=.30$).

Denker et al. (2006) tested pre-adolescent children (8 to 11 years; $N=477$) to investigate the relationship between various levels of physical activity and physical fitness. Accelerometers were used to assess physical activity, and maximal oxygen consumption on a bicycle ergometer was used to determine aerobic fitness. Metabolic equivalents (METs) were used to describe intensity with moderate intensity being time spent between three and six METs and vigorous intensity being time spent above six METs. A moderate relationship ($r=.23$) was found between moderate daily physical activity and aerobic fitness. A slightly stronger relationship ($r=.32$ for boys; $r=.30$ for girls) was found between vigorous physical activity and aerobic fitness. No relationship was observed between moderate physical activity and aerobic fitness.

Le Masurier and Corbin (2006) examined the relationship between physical activity and aerobic fitness among children ages 12 to 14 years ($N=223$). They used pedometers to assess physical activity and the Progressive Aerobic Cardiovascular Endurance Run (PACER) test to measure aerobic fitness. They found a moderate and statistically significant ($r=.35$) relationship.

For the previous four studies, they all examined the relationship between physical activity and physical fitness among pre-adolescents and adolescents but used different assessments. Two of the studies used pedometers to assess physical activity. All four of the studies used different measures of aerobic capacity although only one of those studies directly measured maximal oxygen consumption. None of the studies included measures of muscular strength and endurance or flexibility and only one of the studies included

body composition in addition to a cardiovascular assessment. The correlation coefficients were low to moderate ($r=.10$ to $.35$). The evidence suggests that there is a relationship between physical activity and fitness in children and adolescence but the association is low to moderate. More research on the relationship between physical activity and physical fitness is needed so the association between the two variables may be more clearly understood. Specifically, more consistency in the assessments used is needed so accurate comparisons can be made.

Assessments of Physical Activity and Physical Fitness

Several different assessment tools have been used to measure physical activity. Report methods, such as self-, parent-, and teacher-reports, are most appropriate in an educational setting because they are inexpensive and easy to administer; however, these report methods, when used with children, have reliability and validity issues (Welk & Wood, 2000). Whereas self-report methods are valid for adults, they are not as valid for children who have difficulty accurately recalling and recording their activity. Observational methods are more reliable with children but are time consuming and difficult to use with a large number of children (Denker et al., 2006; Sirard & Pate, 2001). More objective measures of physical activity include pedometers, heart-rate monitors, and accelerometers. Although these devices may provide more direct measures of physical activity, all of them do not consider intensity level and often do not record certain activities (e.g., cycling, rowing; Denker et al., 2006; Michaud et al., 2002). Various physical-activity assessment tools have been presented but they all have limitations as it is difficult to measure the behavior of physical activity. As a result, physical-fitness assessments have been administered more commonly in the schools.

A laboratory setting is the most accurate way to assess physical fitness but is not very practical in an educational setting (Harris & Cale, 2006). More practical methods include the various field tests used to evaluate the different components of physical fitness. Since the 1980s, the shift in emphasis from skill-related to health-related components has been beneficial; however, the emphasis on various components of fitness has changed, the assessments of those components also have changed. These changes have made it difficult to compare the empirical evidence relative to physical fitness and physical activity. If physical-fitness testing is going to occur in the schools, it is important to examine the various tests so the appropriate assessments can be implemented.

Health-Related-Fitness Instruction

The practice of physical-fitness testing has been questioned; however, fitness testing can be a valuable assessment if administered correctly (Pate, 1989). If the physical-fitness tests are to be meaningful, health-related-fitness instruction is essential. In order for students to understand the value of a physically-active lifestyle, the physical-education curriculum should include instructions about the benefits of physical activity and how to apply it to their lifestyles (Masterson & Walkuski, 2003). Physical-fitness testing has little value if the teachers simply administer the tests without educating the students about health-related fitness and the role of physical activity in a healthy lifestyle (Keating & Silverman, 2004a). Students are more likely to engage in physical activity if they understand the value of a physically-active lifestyle (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997).

Although research is limited, three studies examined the relationship between health-related-fitness instruction and physical-activity behaviors (Dale & Corbin, 2000;

Dale et al., 1998; Pearman et al., 1997). Pearman et al. compared alumni from two different colleges. The treatment group (College A) took a required course on health knowledge, attitudes, and behaviors. The control group (College B) was not required to take either a health or a physical education course. A stratified random sample of 2,000 college alumni were sent a survey asking them to respond to questions regarding health-related knowledge, attitude, and behavior. The participant responses were compared for both college attended (College A and College B) and gender. Data based on college attended indicated that College A alumni had greater knowledge and more positive attitudes about health-related fitness and had healthier behaviors than the alumni from College B. The most noticeable differences for gender were that the women had a greater knowledge of dietary fat percentage and the men were more likely to participate in vigorous sports and activities. The results suggest that health-related-fitness instruction appear to positively affect health-related knowledge, attitudes, and behavior.

Two studies (Dale & Corbin, 2000; Dale et al., 1998) investigated the effects a conceptual physical education (CPE) program had on physical activity. As described by Dale and Corbin (2000), “The objective of CPE programs is to promote among each student competence and a positive attitude toward activity and exercise that will encourage students to adopt a physically active way of life” (p. 61). The CPE curriculum is intended to have both classroom instruction and laboratory-type activity sessions in the gymnasium.

Project Active Teens is a longitudinal investigation of a CPE program at a large urban high school. Dale et al. (1998) examined high-school students’ participation in physical activity to investigate if the proportion of students meeting the national physical

activity goals (USDHHS, 1996) differed between two different physical-education programs. The treatment group consisted of students in the CPE program and the comparison group included students in the traditional physical education (TPE) program. The CPE program consisted of receiving one day a week of classroom instruction on health-related fitness, one day a week participating in laboratory-type fitness activities in the gymnasium, and 3 days a week participating in traditional sports-based activities. A questionnaire about physical activity was used to assess physical-activity level. Students were considered to be active if they participated in moderate (≥ 5 days, ≥ 30 minutes per day) and vigorous (≥ 3 days, ≥ 20 minutes per day) activity and participated in strength and flexibility activities (≥ 3 days). Students were considered to be sedentary if they reported zero days of moderate and vigorous activity. The results indicated that the CPE students met more of the physical-activity guidelines than the TPE students. Additionally, female students in the CPE program were less likely to be sedentary than the females from the TPE program.

Dale and Corbin (2000) investigated the graduates from the Project Active Teen high school. The two groups compared were alumni who were in the CPE program when they were in 9th grade (the CPE group) and alumni who had attended the same high school but had transferred to the school after the 9th grade and, therefore, had not participated in the CPE program (the TPE group). Participants completed a mailed questionnaire asking them about their physical-activity habits. The physical-activity guidelines for students were the same as in the Dale et al. (1998) study. When the alumni from the CPE and TPE groups were compared for moderate, vigorous, and strength activity, the results were not statistically significant for the moderate and the strength

activities; however, for vigorous activity, the CPE men were statistically significantly more vigorously active with the effect size that is in the large range (effect size = .74). When the alumni from the two groups were compared for sedentary behavior, the differences were not statistically significant when compared with each other but when compared with the national sample (USDHHS, 1996) both the men (effect size = .55) and the women (effect size = .55) from the CPE group were statistically significantly less sedentary than the alumni from the TPE group.

The two studies involving Project Active Teen appear to indicate that health-related-fitness instruction, even though it occurred only 2 days a week, is beneficial to promoting positive behaviors in physical activity. An investigation into health-related-fitness instruction and how it relates to physical-fitness testing may provide a better understanding of this association and how test administration practices can be improved.

Physical-Fitness Testing

The research on physical-fitness testing in the schools is limited. A majority of fitness-testing research has focused on validating the individual fitness tests, but little research has been conducted on entire fitness-test batteries and how they are implemented in the schools. The limited research on school-based-fitness testing has included studies about motivation, student and teacher attitudes, and teacher uses of physical-fitness testing.

Student Motivation

Because the primary purpose of physical-fitness testing is to motivate students to be physically active, Whitehead and Corbin (1991) examined external feedback effects on intrinsic motivation. The study included 105 seventh- and eighth-grade students who

were randomly assigned to one of three treatments groups: positive feedback, negative feedback, or absence of feedback. After the students completed a modified version of the Intrinsic Motivation Inventory (IMI), they performed the Illinois Agility Run. Upon completing the fitness test, the students in the positive and negative feedback groups received feedback and then completed the post-IMI. The results of a one-way multivariate analysis of variance (MANOVA) revealed a statistically significant multivariate effect for positive feedback $F(8,196) = 11.47$.

The students receiving positive feedback had increased intrinsic motivation to be physically active, whereas students receiving the negative feedback treatment had a decrease in motivation. The results suggest that student motivation to be physically active may be affected by feedback statements provided during fitness testing indicating that information presented to the student during fitness testing may influence a student's intrinsic motivation to be physically active. A limitation of the study was that the fitness test chosen was a test of motor performance rather than a health-related physical-fitness test. Additionally, the study failed to include a test battery and instead only included one single fitness test limiting the ability to generalize the results to other fitness tests. It is important to understand what motivates students to be physically active and how they respond to feedback during physical-fitness testing. More research is needed on student motivation of physical-fitness testing in the schools.

Student Attitudes

Student attitudes toward physical-fitness testing can determine how much effort they put into the assessment. A negative attitude or failure to put forth effort on an

assessment can lead to inaccurate results. Two studies have examined student attitudes toward fitness testing (Flohr & Williams, 1997; Hopple & Graham, 1995).

Flohr and Williams (1997) examined a physical-education curriculum and its effects on student knowledge of physical fitness and their attitudes toward physical-fitness testing. The study included an intact physical-education class (N=51) taught by one physical-education specialist from the State of Virginia. The investigators observed the physical-education class sessions and conducted interviews with the teacher and 17 of the students who were selected through purposive sampling. The teacher was asked questions about her physical-fitness philosophy and approach toward the physical-fitness curriculum. Student interviews focused on responses relating to thoughts and perceptions about physical education and physical-fitness testing. Interview responses were categorized to identify emerging themes. All students performed physical-fitness tests (i.e., curl-ups, push-ups, mile-run, and sit and reach) and took the Children's Physical Fitness Attitude Inventory (CPFAI). A correlational analysis (i.e., Pearson Product-moment Correlation Coefficient) was conducted to examine the relationship between the physical fitness and the attitude scores revealing a statistically significant relationship for three of the four fitness tests. The CPFAI had a statistically significant moderate negative relationship to the mile-run ($r = -.68$) and moderate positive statistically significant relationship with push-ups ($r = .53$) and curl-ups ($r = .58$). The correlation between the sit and reach and attitude was not statistically significant. A statistically significant relationship existed between students' attitudes and physical-fitness testing. The students who scored well on the physical-fitness tests had more favorable attitudes.

Flohr and Williams (1997) obtained qualitative data from the observation field notes that provided information about the physical-education environment and teaching techniques employed. Results of the teacher interview indicated that the teacher considered physical fitness to be an important component of the physical-education curriculum and made an effort to integrate physical fitness into class activities. The student responses revealed an unclear understanding of the role physical-fitness development played in the daily physical-education curriculum. Although the teacher expressed the fact that she incorporated physical fitness in the total physical-education curriculum, the students had a difficult time making that connection. For example, they only related physical-fitness development to specific fitness activities conducted on “Fabulous Fitness Friday.” The students expressed an enjoyment for the games and activities played during physical education but disliked running and stretching activities the most. The students were unclear as to how the daily games and activities contributed to their physical-fitness development suggesting a lack of instruction on helping students make that connection.

Although this study included a small sample with only one class involved, the results indicate that physical-education teachers failed to help students to make a connection between all physical-education activities and how they contribute to their physical fitness. The study emphasized the importance of incorporating physical fitness into all facets of the physical-education curriculum in order for students to understand the many ways physical fitness can be improved and the benefits of an active lifestyle. Physical-fitness testing is one way in which teachers can help education students about physical fitness and the importance of a physically-active lifestyle.

In another study used to investigate children's attitudes and knowledge about physical-fitness testing, Hopple and Graham (1995) studied fourth- and fifth-grade students from two schools located in a large Southeastern state. Both schools had physical-education specialists at the schools where physical-fitness testing was performed two times a year. Health-related-fitness instruction specifically was conducted at one of the schools where students' test results were provided in conjunction with goal-setting instruction on personal fitness. The second school provided minimal health-related-fitness instruction and did not provide computerized test results to the students; however, the students were encouraged to be physically active outside of school hours.

The study attempted three goals. First, to determine what students knew about physical-fitness testing and why they took the tests. Second, to investigate what the students thought about the tests and what they liked and disliked about them. Finally, to examine the differences of understanding and feeling toward the test between students who performed well and those who did not perform well on the tests. Three data sources were used to answer the research questions: interviews, written quizzes, and supplementary materials. The semistructured interviews helped identify the emerging themes. The written quizzes were short, five-question paper-and-pencil assessments used to test the students' knowledge on physical-fitness testing. The supplementary materials were provided by the physical-education specialists and included items that could provide a more complete understanding of the students' knowledge of physical-fitness testing (e.g., homework pages, unit plans, and fitness scores). The responses were analyzed to identify emerging themes consistent with the interview themes.

The three emerging themes from the study were students' understanding, test dodging, and opinions for change. Few students understood why they took the one-mile run, and their views on why they took the mile-run test did not match the teachers' reasons for administration. The results from both schools for the written quizzes and supplementary materials revealed that the students had little if any understanding of why they performed the one-mile-run tests. Even when students were able to identify correctly on the written quiz that the mile-run was a test of endurance, they were not able to demonstrate understanding of this concept during the interview. Students tried to "dodge" the test because they disliked taking the test and viewed it as a painful and negative experience. Although some students reported liking the test, many students said that they wanted to change the test to make it more fun. Suggestions for change included making the test to be more like a game, eliminate timing the test to take away the pressure of taking the test, and decrease the distance run.

Based on the results from this study, Hopple and Graham (1995) concluded that fourth- and fifth-grade students from one region in the United States had little or no understanding of why they performed the mile-run and thought the test was an uncomfortable and negative experience. Although this study is often referred to in physical-fitness-testing articles, there are several limitations to the study. First, the participants of the study were from one geographic area in the United States. Although the sample size was sufficient (n=370), the ability to generalize the results to other populations is limited. Second, the data analysis was missing. Some of the student interview responses were listed, but the results from the quizzes, one-mile run, and comparisons between schools (the third research question) were not included. The third

research question was to compare responses between students who performed well and those who did not, but minimal data were presented to answer this question. Finally, the study wanted to investigate student knowledge and feelings about fitness testing but only one fitness test was included in the study. Only the one-mile run was studied, whereas other fitness tests were excluded from the analysis. If the intent of the study was to investigate students' knowledge and feelings about fitness testing, more than just one fitness test should be included in the study. This study is unique because it is the only one to date that examines children's knowledge and perceptions about physical-fitness testing and a more complete investigation is needed.

Although research investigating students' attitudes toward physical-fitness testing is limited, the results of these two studies indicate that the students do not particularly enjoy taking the physical-fitness tests and that many cannot identify why they are performing the tests. More effort is needed to help students understand why they are performing the fitness tests and how they relate to their health-related physical fitness.

Teacher Attitudes

Research of physical-fitness testing practices in the schools is lacking. In the 1990s, no studies were conducted on either the preparation of preservice teachers or on teacher's physical-fitness-testing practices in the school. Since 2000, a few studies have been conducted in this area, mostly by Keating and colleagues. In examining teachers' uses of physical-fitness testing in the schools, it is important to note that teachers typically make the curricular decisions about their physical-education program and how they incorporate health-related fitness knowledge into physical-fitness testing. In order to

enhance teachers' fitness-testing knowledge and skills, proper teacher training is required so they may be prepared adequately to administer physical-fitness tests correctly.

Teachers' attitudes toward physical-fitness testing can influence how they incorporate fitness education into their curriculum and how they use fitness assessments in their classes. Two studies have examined teachers' attitudes toward physical-fitness testing. Keating et al. (2002) examined preservice teachers (N=613) at 10 state universities to investigate their attitudes toward fitness testing and the influencing factors of those attitudes. Because preservice teachers will have the responsibility of administering physical-fitness tests in the future, the researchers wanted to examine preservice teachers' level of preparedness for administering physical-fitness tests and their attitudes toward the tests. It has been suggested that preservice teachers are not prepared adequately to administer fitness tests (McKenzie & Sallis, 1996), which may influence their attitudes toward the tests.

The instrument used for the study was designed to measure attitudes toward fitness testing by assessing affective and cognitive components of the tests. The instrument had been validated previously for preservice teachers (Keating et al., 2001). Demographic variables (i.e., gender, age, years in program, professional organization membership, and previous experience with fitness tests) were examined and a 7-point Likert scale was used to measure the affective (enjoyment) and cognitive (importance and usefulness) components of attitude. Fourteen faculty members from 10 state universities administered the attitude surveys in their classes. Multivariate Analysis of Variance (MANOVA) was used to investigate differences in preservice-teacher attitudes among demographic variables, between gender and age, and between fitness-testing experiences.

The preservice teachers' attitudes toward fitness testing in the schools were only slightly positive. The overall attitude ($M=4.80$; $SD=1.02$), affective component ($M=4.78$; $SD=1.26$), and cognitive component ($M=4.82$; $SD=1.03$) all had a large standard deviation (>1.00) indicating large variability in the responses. The factor of experience was statistically significant as those who had an enjoyable previous experience with fitness testing had a more positive overall attitude toward the assessments ($M=5.12$; $SD=0.95$) than those who did not enjoy their previous experience ($M=3.89$; $SD=1.00$). Additionally, Wilks lambda (.40) indicated a moderate effect (.29) between preservice teachers' previous experience and attitude. Factors relating to professional preparation, such as year in the physical-education teacher-education program and professional association membership, were not statistically significant.

Although most participants (77.0%) remembered performing fitness tests when they were in school, they did not view the tests as important or useful. Many factors did not relate to fitness-test attitudes (i.e., test type, gender, professional organization membership, age); however, positive attitudes toward fitness testing were the result when the participant had a positive experience. The physical-education teacher-education programs did not appear to relate to fitness-testing attitudes because the attitudes were similar to the preservice teachers regardless of year in the program. Positive testing experiences appeared to promote positive attitudes suggesting that positive attitudes can be fostered.

In a similar study, Ferguson et al. (2007) examined California physical-education teachers' use of fitness testing in the schools. The previously validated Physical Education Teacher Attitude Toward Fitness Test Scale (PETAFTS; Keating &

Silverman, 2004a) was used to examine 323 secondary physical-education teachers attitude toward the state-mandated physical-fitness test. ANOVAs and MANOVAs were used to investigate the differences in teacher attitude among the variables analyzed. The results indicated that, on a 7-point Likert scale (1=strongly disagree; 7=strongly agree), physical-education-teachers' attitudes toward the FITNESSGRAM were only slightly positive ($M=4.44$; $SD=1.15$). The attitude scores of the cognitive ($M=4.53$; $SD=1.18$) and affective ($M=4.35$; $SD=1.25$) domains were similar but only slightly positive. The standard deviations were large suggesting high variability of the responses. Overall attitude toward fitness testing, as influenced by demographic variables, were not statistically significant for age but were statistically significant for gender and ethnicity. Male participants had a statistically significant higher positive attitude toward fitness testing than the female participants $F(1, 233)=5.41$, $\eta^2=.02$ (a small effect); Hispanic Americans had a statistically significant higher positive attitude than the other ethnic groups, $F(2, 290)=6.24$, $\eta^2=.04$ (a small effect). Influence on professional-related variables on overall attitude was not statistically significant for professional organization membership or years of teaching, but they were statistically significant differences for class size and grade level taught. Teachers with smaller class sizes had a more positive attitude than the teachers with larger class sizes, $F(2, 237)=4.00$, $\eta^2=.03$ (a small effect); high-school teachers had a more positive attitude than middle-school teachers, $F(1, 237)=4.69$, $\eta^2=.02$ (a small effect).

The teachers' attitudes toward fitness testing were only slightly positive and suggest that the teachers were mostly indifferent toward the tests. These results are similar to data collected with preservice teachers (Keating et al., 2002) that also indicated

a slightly positive attitude toward fitness testing ($M=4.80$; $SD=1.02$). Because teacher attitudes toward physical-fitness testing may affect how they approach the testing process, an understanding is needed in order to improve health-related-fitness instruction and its connection to fitness assessment

Uses of Physical-Fitness Tests in the Schools

Fitness testing has been a large part of physical-education programs since the 1950s with the original purpose of improving children's fitness. Through various changes in fitness testing, the present focus is to motivate children to be physically active and to improve their health-related fitness (The Cooper Institute, 2007). The use of fitness testing in the schools, however, has been studied minimally. Research has failed to examine whether or not fitness testing has been successful in motivating children to be physically active.

Of the few studies that have been conducted on fitness testing, the focus has been on the children, and the research on teachers has been minimal. It is important to study teachers' use of fitness testing in the schools because teachers often determine how fitness tests will be implemented. Research in this area may help to bridge the gap between health-related-fitness instruction and school-based physical-fitness testing.

Keating and Silverman (2004b) examined physical-education teachers' use of physical-fitness tests in the schools. The study included a convenience sample of 324 physical-education teachers kindergarten through 12th grade (K-12). The reliability and validity of the data were established from which a survey was used to collect data for the study. Cronbach's coefficient alpha determined the internal consistency ($\alpha=.80$ to $.92$), and the content validity was established by a panel of 10 experts in the field of physical

education. The discriminant validity was statistically significant but low ($r=.18$), and the convergent validity was statistically significant and moderate ($r=.70$).

The results of the study indicate that most teachers (83%) reported administering physical-fitness tests on a regular basis with the norm-referenced President's Challenge test being the most frequently administered (40.3%) test battery. Since 1987, the criterion-referenced approach to fitness testing has been recommended over norm-referenced testing (Freedson, 2000); however, in this study, it was the criterion-referenced tests that were administered least frequently (FITNESSGRAM® = 19.4%; Youth Fitness Test = .9%).

Proper test preparation is critical to effective test administration (Harris & Cale, 2006). The results indicated that most teachers (91.5%) reported doing something to help the students prepare for the tests; however, 8.5% of the teachers reported doing nothing to prepare the students for the tests. The most common response (82.7%) for fitness-test preparation was "I tell my students about the tests before the students take it." Other items asking teachers about test preparations referred to time spent in and out of class preparing for the tests, but the items did not examine specific test-preparation strategies.

The respondents were asked to rate their purposes for administering fitness tests using a 7-point rating scale (1= not important; 7=very important). The highest total mean ($M=5.65$; $SD = 1.25$) was "To let students assess their own fitness areas of need." Items relating to motivating students to develop regular physical-activity habits were rated high. Those items included "To foster my students' habitual involvement in physical activity" ($M=5.32$; $SD=1.29$) and "To motivate students to participate in physical activity on a regular basis" ($M=5.22$; $SD= 1.48$). For the items relating to purposes of using fitness

tests, five items related to the cognitive domain and scored in the high to moderate range. Because the primary purpose of fitness testing is to motivate students to adopt a physically-active lifestyle (The Cooper Institute, 2007) and because fitness testing is most effective when an educational role is employed (Harris & Cale, 2006), items relating to these domains may have been higher.

The respondents were asked to identify their uses of students' fitness-test results on a 7-point rating scale (1=never; 7=always). The most frequent response was "I give my students a report of their performance on fitness tests" (M=5.66; SD=1.65). The least frequent responses related to fitness instruction and applications to increase physical activity. The results indicated that the teachers were more likely to provide test results to the students with minimal information regarding test interpretation. If the students are to understand their fitness-test-administration results, it is imperative that the students be educated about health-related fitness so they effectively may formulate a plan to improve performance (Harris & Cale, 2006). The use of fitness testing needs to be related to fitness instruction, and this study indicated a disconnect between fitness testing and fitness instruction. By examining how teachers educate students about physical-fitness testing before and after the tests, a better understanding of how teachers can bridge the gap between fitness testing and fitness instruction can be made.

Summary

Promoting physical activity is the primary purpose of physical-fitness testing. Although the benefits of physical activity are well documented, whether or not fitness testing can help promote physical activity has been debated. Proper test administration involves instructing students about health-related fitness and the benefits and value of a

physically-active lifestyle. When fitness tests are administered without fitness instruction, it is difficult for the students to make a connection between fitness tests and health-related fitness. When fitness instruction is absent, the tests have little meaning. It is important for teachers to help students bridge the gap between physical-fitness testing and health-related fitness so they may learn the benefit and value of a physically-active lifestyle and the behavior may be adopted.

Minimal research on physical-fitness-test-administration practices in the schools exists. A majority of physical-fitness-testing research has focused on fitness-test validation, and few studies have examined how school-based fitness tests are administered. In order to gain a better understanding of physical-fitness test-administration practices, it is important to examine physical-education teachers' test-administration practices; specifically, how the teachers' educate students before and after the tests are administered. By identifying teachers' testing practices and ways to improve tests administration practices, the goal of physical-fitness testing, to promote physical activity, can be achieved.

CHAPTER III

METHODOLOGY

Because the primary goal of physical-fitness testing is to promote physical activity, it is important that physical-fitness tests are administered in conjunction with health-related-fitness instruction so this goal may be accomplished. When health-related-fitness instruction is incorporated into the physical-education curriculum, students are more likely to understand the benefits of a physically-active lifestyle and adopt the healthy behavior (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997). The purpose of this study was to examine teachers' physical-fitness-test-administration practices, specifically, how physical-education teachers help the students to develop a cognitive understanding of the health-related physical-fitness components before and after test administration.

The methodology used to study physical-education teachers' physical-fitness-test-administration practices is described in this chapter. This chapter includes the following: research design, sample, protection of human subjects, researcher's qualifications, pilot study, procedures, and data analysis.

Research Design

A qualitative research design was used to describe physical-education teachers' practices of physical-fitness-test administration. The type of qualitative research that I used was a *basic* or *generic qualitative study* (Merriam, 1998). Merriam described *basic* or *generic qualitative studies* as being used to "seek to discover and understand a phenomenon, a process, or the perspectives and worldviews of the people involved" (p. 11). In education, qualitative research primarily involves exploration of a phenomenon,

process or the perspectives in order to gain better knowledge and understanding of what is being studied (Merriam) so the researcher may conduct an in-depth and detailed examination of the issues (Patton, 1990).

Some of the reasons for choosing qualitative research design are explained by Creswell (1998) as being used to answer *how* and *what* questions, to explore the topic, and to present a detailed view of the topics. My reasons for choosing a qualitative design are consistent with Creswell's description. First, qualitative research asks questions starting with *how* or *what*. The questions in this research study were asked to discover *how* physical-fitness tests are administered. Second, the topic of physical-fitness testing needs to be investigated because, as described by Creswell, "The variables cannot be easily identified, theories are not available to explain behavior of participants or their population of study, and theories need to be developed" (p. 17). Minimal research has explored physical-education-teachers' physical-fitness-test-administration practices; therefore, this study was conducted to examine these practices. Finally, a detailed view of the topic needs to be explored to investigate an in-depth view of physical-education teachers' physical-fitness-test practices. I interviewed 10 physical-education teachers in order carry out this in-depth investigation. By interviewing the participants, I was able to obtain a more detailed view of physical-education teachers' testing practices. This qualitative approach is more appropriate than using methods obtained through a quantitative design.

Interviews were used as the data-collection technique to investigate how physical-education teachers incorporated physical-fitness testing into the physical-education curriculum. I specifically explored how physical-education teachers help students to

develop a cognitive understanding about the health-related physical-fitness components before and after physical-fitness testing.

Sample

A purposeful sample of physical-education teachers was used for the study. The study included 10 physical-education teachers from 10 different schools in Central California. Both middle-school ($n = 5$) and high-school ($n = 5$) teachers participated in the study. All of the participants are Caucasian. Each of the participants has been identified by a number and a pseudonym with the middle-school teachers being numbers 1 through 5 and the high-school teachers being numbers 6 through 10 (Table 2).

Table 2
Numbers and Pseudonyms Assigned
to the Participants

Teacher	Pseudonym
1	Mr. Adams
2	Ms. Brown
3	Mr. Cooper
4	Mr. Davis
5	Ms. Evans
6	Ms. Foster
7	Mr. Grant
8	Ms. Hart
9	Mr. Ives
10	Mr. Jones

The participants were identified through membership in the California Association for Health, Physical Education, Recreation and Dance (CAHPERD), school web sites, or through personal contacts of the researcher (see Procedures for the details of the recruitment of teachers). The physical-education teachers were sent a letter via regular or electronic mail (Appendix A) asking them to participate in an interview about their physical-fitness-test-administration practices. Criteria for participating in the study required that the participants were employed currently as a physical-education teacher at

a middle or high school and have administered the California Physical Fitness Test (CaPFT). Because I am a college instructor in a teacher preparation program, former students of mine were excluded from participating in the study.

The teachers' ages varied with most of the teachers being experienced educators who had been teaching for more than 10 years. Only two of the participants had been teaching for less than 10 years (Table 3). Additionally, the participants had administered the CaPFT more than 10 times with only one participant having administered the test less than 5 times (Table 3).

Table 3
Frequency and Percent for Teachers' Age, Years of Teaching Experience, and Number of Times the Teachers Had Administered the CaPFT

Variable	<i>f</i>	%
Teachers' Age		
26-30	1	10
31-39	3	30
40-49	2	20
50-59	3	30
>59	1	10
Years Teaching Experience		
1-4	1	10
5-9	1	10
10-19	3	30
20+	5	50
Number of Times Administered CaPFT		
1-4	1	10
5-9	0	0
10-19	4	40
20+	5	50

The participants taught at 10 different schools in Central California. The schools represented three different counties and eight different school districts. Three of the teachers were from high schools within the same district but the rest of the teachers taught in different districts. Table 4 identifies the grades taught and the school sizes for each of the teachers' schools.

Table 4
Grades Taught and School Sizes for
Each of the Participants' Schools

Teacher	Grades Taught at School	School Size
1	6-7	small
2	6-7	large
3	6-7	small
4	7,8	large
5	7,8	large
6	9-12	large
7	9-12	large
8	9-12	small
9	9-12	small
10	9-12	large

small school = <300 students per grade
large school = 300+ students per grade

Class sizes varied from 17 to 62 students with three of the high-school teachers having especially large classes of 45 to 62 students. All of the teachers reported teaching physical education daily with the length of the classes ranging from 45 to 56 minutes. The middle-school teachers reported that, although testing was required only for the seventh graders, all grades were tested at their school, whereas the ninth graders were the only students tested by the high-school teachers. Only one teacher reported having assistance with test administration where paraprofessionals were hired when the class size exceeded 32 students. Physical-fitness tests other than the CaPFT were conducted by three of the middle-school teachers, and none of the high-school teachers administered other physical-fitness tests.

Protection of Human Subjects

Because the research study used human subjects as research participants, approval from the Institutional Review Board at the University of San Francisco was obtained. The research was governed by the ethical principles and standards as set out by the American Psychological Association (2002).

All participants were informed of the purpose of the study during the recruitment process and signed a consent form to participate (Appendix B). I was forthcoming about the expectations of the study and informed the participants of their right to withdraw from the study at any time. The participants were assured that their anonymity would be protected and guaranteed. Each participant was assigned a pseudonym. The interviews were recorded digitally and transcribed with data being stored in electric files that were password protected and accessible only by the researcher.

The Researcher's Qualifications

I have 18 years of experience teaching physical education in higher education. Currently employed at a state university in a large state, I teach a variety of pedagogy courses that primarily consist of students studying to become physical-education or elementary-school teachers. Having earned a master's degree in exercise physiology, combined with currently teaching pedagogy classes, I am interested in physical-fitness testing.

I became interested in physical-fitness-testing practices while teaching physical-education-pedagogy courses. A concern for improving proper teacher training for effective physical-fitness-test-administration practices developed. Because physical-fitness testing is a mandated-standardized test in the State of California, I began to consider the effectiveness of physical-fitness-test administration. Through co-presenting a variety of workshops on physical-fitness-test-administration practices, I discovered that teachers were trained minimally to administer the state-mandated-standardized-fitness tests and questioned if the tests were being administered in a way consistent with their intended purpose to promote a physically-active lifestyle. Furthermore, it is essential that

test administration is integrated with the physical-education curriculum that includes health-related-fitness instruction (Keating & Silverman, 2004a; Naughton, Carlson, & Greene, 2006; Pate, 1989). Therefore, I am interested in exploring how physical-education teachers implement physical-fitness testing into their curriculum so that the students can understand and learn about the health-related benefits of a physically-active lifestyle.

Pilot Study

A pilot study was conducted with a convenience sample of two physical-education teachers. The pilot study allowed me to become familiar with the interview protocol. Following the pilot study, the interview protocol was modified to improve interview effectiveness.

Procedures

Upon receiving permission to conduct the study from the University of San Francisco's Institutional Review Board, potential participants for the study were identified. I asked CAHPERD to provide a list of middle-school and high-school physical-education teachers from the Central Valley that included the geographical area between Sacramento and Fresno. Mailing labels of 79 potential participants were provided by CAHPERD and were used to send letters to the teachers inviting them to participate in the study (Appendix A). Criteria to participate in the study included that the participants be employed currently as a physical-education teacher at a middle or high school and have administered the CaPFT. Eight people responded to the letters from which only three met the criteria to participate in the study. In order to increase the sample size, physical-education teachers from within the Central Valley were identified

through school web sites and personal contacts. Excluded from the study were former students and individuals I knew personally. Seven physical-education teachers were identified and contacted via electronic mail and invited to participate in the study (Appendix A). All seven of the teachers agreed to participate in the study.

Interviews were scheduled at the school site of each of the 10 participants. Because the interviews were conducted at the schools, permission from the principals was obtained (Appendix C). When I arrived at the school site for the interview, the participants signed the consent form and completed a demographic information sheet (Appendix D). All interviews were recorded digitally with permission of the participant. The interview protocol (Appendix E) guided me through the interview process to help ensure consistency from interview-to-interview. The interview protocol included interview instructions, questions to be asked, and a space to take notes on participant responses (Creswell, 2002).

The instrument for the study included a 45-minute individual interview using open-ended questions to examine physical-fitness test-administration practices. I investigated how physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components. Through the interview questions, I asked the physical-education teachers to describe how they conduct the tests, prepare the students for the tests, and how the test results are reported and interpreted to the students. Because instruction on health-related physical-fitness components helps promote physical activity (Dale & Corbin, 2000; Dale, Corbin, & Cuddihy, 1998; Pearman et al., 1997), I specifically asked the teachers to describe how they educate their students about the health-related physical-fitness components before and after physical-

fitness-test administration. To help answer the research questions, open-ended questions were asked with probes used to obtain additional information when the responses were incomplete or vague (Creswell, 2002).

Following each interview, I transcribed the digital recordings. Once the interviews were transcribed they were sent via electronic mail to the participants to verify the accuracy of their responses. All of the participants confirmed that their responses were accurate. Upon confirmation of the accuracy of the transcriptions, the data were analyzed.

Data Analysis

The research questions provided the basis for the data analysis that include the following:

1. How do physical-education teachers describe their physical-fitness-test-administration practices?
2. How do physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components?
3. Prior to physical-fitness testing, to what extent do physical-education teachers develop their students' cognitive understanding about the health-related physical-fitness components?
4. After physical-fitness testing, to what extent do physical-education teachers interpret test results to their students?

Analysis of the data occurred in the following three steps: organizing the data, describing the data, and summarizing the data (Creswell, 2002). To organize the data, the transcripts were coded (Appendix F) using a marginal coding technique (Creswell; Miles & Huberman, 1994). The right-hand margins included clarifying or reflective comments,

and the left-hand margins included codes consistent with the research questions (e.g., PC = practices; COG = cognitive; PE = pretest education; PO = posttest interpretation). This coding technique helped organize the data so that the transcripts could be segmented and labeled for the next step in the analysis process (Creswell).

Once the data were organized, they were described using a cross-case analysis (Miles & Huberman, 1994). A cross-case analysis is helpful in that it can help deepen the understanding and explanation of the data by examining multiple cases to identify recurring themes. Identification of these themes was accomplished by using a meta-matrix that are, according to Miles and Huberman, “Master charts assembling descriptive data from each of several cases in a standard form” (p. 178). Once the data were entered into the matrix (Appendix G), they were partitioned and clustered into the variables consistent with the research questions. This process of describing the data helped to refine, summarize, and reduce the data into a more manageable format.

The final step of the analysis involved summarizing the data by identifying common themes of the data. Data summary tables (Appendix H) were used to help refine, summarize, and reduce the data so the common themes could be recognized.

Triangulation of the data was conducted to ensure reliability of the coding procedures. I had a colleague who has extensive knowledge in the area of physical-fitness testing review the data to verify accuracy in the coding and analysis procedures of the study. She was able to confirm that the emergent themes reflected the data presented.

CHAPTER IV

RESULTS

The purpose of this study was to examine physical-education teachers' physical-fitness-test-administration practices. Ten physical-education teachers from five middle schools and five high schools in Central California participated in the study to explore how physical-education teachers helped their students develop a cognitive understanding of the health-related-physical-fitness components relative to physical-fitness testing. I interviewed the participants to gain an understanding of how the teachers administered physical-fitness tests, how the teachers prepared the students for the tests, and how the test results were reported and interpreted to the students. Throughout this chapter, physical-education teachers (T1 to T10) are identified in the text by a pseudonym (Chapter 3, Table 2). The participants of the study include five middle-school teachers (T1 to T5) and five high-school teachers (T6 to T10). This chapter presents the findings of the study and includes the setting, how the research questions were addressed, and additional findings. The emergent themes are presented as they relate to each of these areas.

Setting

The study was conducted at 10 public schools at both the middle (n=5) and secondary (n=5) levels in suburban and rural areas of Central California. The study occurred over a 3-month period in the Winter of 2008-2009 as the teachers were beginning to prepare for physical-fitness testing. This qualitative study allowed me to conduct an in-depth study of physical-education teachers' physical-fitness-testing practices through one-on-one interviews that occurred at the teachers' school site. Each

of the interviews were transcribed verbatim and contributed to the study's findings. Excerpts from the interview transcripts are provided that support the findings of the study.

Research Question 1

How do physical-education teachers describe their physical-fitness-test-administration practices? The first research question is concerned with how the teachers described administering the physical-fitness tests. Three themes emerged from this question. The first theme described the teachers' test-administration methods. The second theme identified student involvement during test administration. The third theme examined if the teachers included the California Physical Fitness Test (CaPFT) scores in students' grades.

Test-Administration Methods

The physical-education teachers were asked questions about their methods of test administration. The CaPFT includes six categories with a total of 13 individual fitness tests (Chapter 1, Table 1). For four of the six test categories, there is more than one test that can be administered with only one test required per test category. During the interviews, the teachers were asked to identify which test they administered and then describe how it was administered. The teachers administered the tests to the students in various ways: individually (I), in small groups of 2 to 6 students (S), in large groups (L), in large groups where the students were matched with a partner and half the class tested at a time (LH), in large groups where all the students tested at the same time (LA), and when multiple methods were used to test the students (M). In Table 5 is found which tests

the teachers chose to administer for each of the test categories and the methods in which they used to test the students.

Table 5
Tests the Teachers Chose to Administer for the CaPFT and Method of Administration

Fitness Tests	<i>f</i>	%	Teachers									
			1	2	3	4	5	6	7	8	9	10
Aerobic Capacity												
PACER	2	20	LH	LH								
One-Mile Run	10	100	LH	LA	LA	LT	LA	LH	M	LA	L	LH
Walk Test	0	0										
Body Composition												
Skinfold Measure	0	0										
BMI	9	90	I ^a	I		I ^a	I ^a	I ^a	I ^a	I	I ^a	I ^a
BIA	1	10			I							
Abdominal Strength												
Curl-Up	10	100	S	S	I	S	S	S	L	I	LH	L
Trunk Strength												
Trunk Lift	10	100	S	I	I	I	I	I	S	I	I	I
Upper Body Strength												
90° Push-Up	10	100	LA	I	I	S	S	S	L	I	S	LH
Modified Pull-Up	0	0										
Flexed-Arm Hang	0	0										
Flexibility												
Sit & Reach	8	80	I	S	I	I	I	I		I		I
Shoulder Stretch	3	30		LA						I		I

^aMeasured height and weight but did not calculate BMI.

I = test was administered individually

S = test was administered in small groups (2 to 6 students)

L = test was administered in large groups (7+ students)

LH = students are put in pairs with half the students tested at a time

LA = all the students were tested at the same time

M = multiple testing methods were used

There is little variation in the tests the teachers chose to administer in the categories where there is more than one option. For upper-body strength, all the teachers administered the push-up test. All but one teacher administered Body Mass Index (BMI) for body composition. None of the teachers chose to administer skinfold measurement even though it is the recommended test for body composition (The Cooper Institute, 2007). The reasons teachers gave for not administering skinfold measurement included

that it was too time consuming and that they were not comfortable touching the students. Male teachers in particular expressed a concern about conducting skinfold measurement on female students. For aerobic capacity, all of the teachers administered the one-mile run with two of the teachers (T1, T2) also conducting the PACER (Progressive Cardiovascular Endurance Run) test. The back-saver sit and reach was the test most frequently administered (80%) for flexibility with one of the teachers (T2) conducting both of the tests for that category.

Although there was little variation in the tests chosen to be administered, there was more variability for the methods in which the teachers chose to conduct the tests. For upper-body strength, the push-up test was administered individually, in small groups, and in large groups. Individual and small-group administration was most frequent for the curl-up and the trunk lift. Most of the teachers administered the aerobic capacity tests in large groups but presented a variety of ways in which the students were tested. For body composition and flexibility, all of the teachers administered the tests individually with the exception of one teacher (T2) administering the back-saver sit and reach and the shoulder stretch in small and large groups, respectively.

Student Involvement During Test Administration

To determine what the students were doing during test administration, I asked the participants questions about student assistance and student activity during testing. The participants described how the students were involved in test administration (Table 6).

Most of the teachers (80%) had the students help to some extent with test administration. Student involvement mostly included counting and watching for form breaks. None of the teachers had the students completely responsible for test

administration. The teachers appeared to be careful about monitoring the students to ensure accuracy of the test results. The students typically were more involved with the practice tests than they were with the tests that were to be reported to the state.

Table 6
Teacher Responses About Student Involvement in CaPFT Administration

Teacher	Student Involvement	Summary of Responses
1	Y	The students are very involved in test administration. The students watch the FITNESSGRAM® training digital video disc so they know how to do the tests. The students watch for form breaks while the teacher monitors the class.
2	Y	The students help with counting.
3	N	The students help with the quarterly tests but not for the test that will be reported to the state.
4	Y	The students help with the curl-up and push-up tests (watch for form breaks and count). They train the more responsible students to help with test administration.
5	Y	The students are involved for all the tests except for the sit and reach. They are involved by watching for form breaks and counting. There are also student monitors that help with testing (especially the curl-up and push-up tests).
6	Y	The students are most involved with the mile run. Sometimes will let the students help with the trunk lift. For the curl-up and push-up tests the students help count.
7	Y	The students help measure for the trunk lift test. Upperclassmen in the class will help with some of the tests. The teacher trains them about the test protocol but the students are never 100% responsible for test administration. The teacher over sees all the students during the tests.
8	N	The students are not involved in testing due to confidentiality.
9	Y	The students help with some of the tests. They are involved with counting or watching for form breaks for the curl-up test.
10	Y	The students help record, count, and watch for form breaks for some of the tests but mostly the teacher administers the test while the students wait for their turn.

Y = the students were involved in test administration

N = the students were not involved in test administration

The teachers reported that they more closely monitored the tests that were to be reported to the State than the practice tests. Mr. Adams (T1) stated, “The fourth quarter test, because I have to make sure that it is accurate, I have to cut it way down to where there

are much more manageable groups.” Two teachers (T3 and T8) did not have the students involved with test administration. Mr. Cooper (T3) let the students help with the quarterly tests but wanted to “have complete control” of the test that would be reported to the State. Ms. Hart (T8) said that she did not allow the students to assist with test administration for confidentiality reasons. She explained, “They already talk enough as it is, ‘Hey, you only did five push-ups.’ So I don’t want them administering (the tests) because then they would really know what everyone is getting.”

Because some of the tests require individual administration, the teachers were asked to describe what the students were doing while others were being tested. Based on the data, the teachers’ responses were categorized by the following: all students were involved in testing (A), the students were doing another activity during testing (O), or students not being tested were inactive (W). Table 7 provides a summary of teacher responses regarding student activity during testing.

The responses related to student activity during testing varied. The teachers chose different ways to occupy the students while the CaPFT was administered. Because some of the tests need to be administered individually, several of the teachers expressed frustration on what to do with the students who were not being tested. Managing the students during testing was difficult and was especially a concern among the teachers with large class sizes. The three teachers with the largest classes (T6, T7, and T10) found it difficult to administer the tests accurately while managing their large classes. Ms. Foster (T6) said, “I let them play basketball or else they get themselves in trouble.” But Ms. Jones (T10) managed her students during testing by having them sit and wait when they were not being tested. She stated,

If you have some responsible kids, you can have them on the other half of the gym playing some basketball games. But lately, the past few years, they're too loud. They'll be slamming the ball down, and they're being disruptive; so I make them sit and be still. They have to stay in their spot, and I go row to row.

Mr. Grant (T7) explained that he would like to have a substitute teacher on testing days who could watch his classes while he administered the tests. He said, "I would be more than happy if they'd bring in a sub and I could do it, no problem. But I have 60 kids." Mr. Davis (T4), a middle-school teacher, described how the teachers worked together to help each other with testing. He explained,

Sometimes we'll do different tests that are easier to watch, and we'll kind of have one person doing the test, and we'll have the others out playing soccer in the field. Since all four of us are testing at the same time doing different tests, sometimes one test is easier to watch than others, so we'll help supervise the other class. But that is always the biggest challenge.

Table 7
Teacher Responses About Student Activity During Administration of the CaPFT

Teacher	Student Activity	Summary of Responses
1	A	Involves all the students in testing because "I do not have the facilities for kids to be doing something else."
2	O	Has paraprofessionals who supervise the other students while the teacher conducts the test.
3	O	Students not involved in testing are doing a written assignment in the classroom.
4	O, N	Students not testing are involved in another activity. During the mile run, they rest.
5	A, O	Students are involved with testing for all of the tests except flexibility (sit and reach). For flexibility, there are only 2 boxes so the rest of the students are doing another activity (e.g., jump roping) while they wait.
6	O, N	For the tests that require the students to wait for their turn, the students are either doing another activity or they sit and wait.
7	N	Students not testing sit on the bleachers until it is their turn.
8	O	Students not testing are involved in another activity (e.g., basketball, team handball).
9	O	Students not testing are involved in another activity.
10	N	Students not testing are required to sit and wait quietly.

A = all students were involved in testing

O = students were doing another activity during testing

N = students were inactive while others are being tested.

The teachers involved the students in test administration in various ways. Several of the teachers expressed frustration in trying to manage the class while only a few students were being tested. This was especially a concern for the teachers with large classes.

Grading and Test Scores

During the interviews, the teachers described grading practices relative to fitness testing. The participants were asked to describe if and how fitness tests were included in students' grades (Table 8).

Table 8
Teacher Responses About Fitness-Test Scores Being Included in Students' Grades?

Teacher	Student Grades	Summary of Responses
1	Y	PFT are a small part of the student's grades because they help motivate the students. Does not like grading on fitness and prefers grading on improvement.
2	Y	The students are graded on improvement. Even if they are not in the Healthy Fitness Zone, if they improve, it helps their grade. Emphasized constantly improving their fitness scores.
3	Y	Their fitness scores are 8% of their grade so they know "that there is value in it."
4	Y	Other fitness tests are a part of their grade but the CaPFT is not.
5	Y	Other fitness tests are a part of their grade but the CaPFT is not.
6	N	The CaPFT is not a part of their grade "but if they don't do it, I take points off and they know that." Most students are not motivated to do well on the tests. Some are motivated by grades.
7	N	Has found it to be difficult to motivate the students even when they are told it is part of their grade.
8	Y	The whole test battery is not a part of their grade but the one-mile run is a part of their grade.
9	N	The CaPFT is not a part of their grades. He said that his students were motivated mostly by grades.
10	Y	Some aspects of the CaPFT is included in their grade but not the entire test.

Y = fitness test scores were included in the students' grades

N = fitness test scores were not included in the students' grades

Many of the teachers (70%) included some aspect of fitness testing in the students' grades with all of the middle-school teachers grading students to some extent on

fitness testing. Most of the teachers also expressed grading to be very motivating for the students. Mr. Adams (T1), a middle-school teacher, said, “It’s not a big part of their grade, but we want to motivate them to get toward (their goal).” Mr. Davis (T4) and Ms. Evans (T5) teach at middle schools where the teachers administer fitness tests other than the CaPFT, and their programs are focused on fitness that include an award system based on test scores and improvement. The system involves students earning different color shirts or shorts to show their fitness achievements. Mr. Davis (T4) stated,

They keep working on it to see if they can improve and try to see if they can earn that shirt. They’ll push themselves, and they’ll want to retest and retest to try to see if they can earn that next shirt. They’re really motivated in that way.

Mr. Davis (T4) expressed the idea that fitness testing needs to be tied to the students grades so it will be taken seriously when he said,

When there was no grade associated to it, we were just doing this test and off it goes and who cares. There’s really no reward system or motivation for the kids to do well. All it does is reflect upon the school, which I always thought was a weakness of the state testing. There’s basically no reason except the teacher saying you’ve got to do this and do the best you can. You’re not going to associate a grade with it.

When describing her program, where awards are given for fitness achievement, Ms. Evans (T5) explained, “It’s a highly motivational program. We’ve seen a lot of success with it. We try to get kids to buy into the physical fitness aspect ... I would say about 90% of them buy into it.”

All the middle-school teachers explained grading on fitness testing, but the responses from the high-school teachers were varied. Two of the teachers (T6, T7) who did not include fitness testing as part of the students’ grades also did not find their students to be motivated by grades. Mr. Grant (T7) expressed, “They just refuse to run. As much as we go through it and I take points off, they could care less.” Ms. Foster (T6)

stated that some were motivated by grades, “You talk to them about it being part of their grade. You talk to them about extra credit, some will work harder,” but most will not. She explained further,

We can be out there running, or walking, and I’ll be like, “Come on, let’s go.” “I don’t feel like it today.” “But it’s your grade.” “That’s okay, I’ll just fail, I’ll take another quarter.” I don’t know if it’s the freshman year. I talk to so many parents who are like, “This is not my daughter. This is not my son. They have changed so much. I don’t know what’s going on. I don’t know what to do.” I don’t know if it’s being Freshmen and going into high school and just that whole coming to age thing, the hormones, or if they’re just trying to be cool and act like they don’t care. Or if they’re just so lazy, they really don’t care. I know that there are plenty of those. Your average student, they [sic] don’t care if they overachieve in PE. They might overachieve in some classes, but they certainly don’t try in PE.

Two other high-school teachers (T8, T9) indicated that they thought their students were mostly motivated by grades. Ms. Hart (T8), who includes only the one-mile run in the students’ grades, said that

I was thinking of making it a little more a part of their grades, maybe more for motivation. A lot of kids are hooked on that grade. They don’t even realize that running an 8-minute mile is good. Except, if they see they got a 20 out of 20, they think then, “Oh, I did good.” They are so focused on the grade so I’m thinking that they might be a little more willing to work harder if they realize it can help their grade.

Mr. Ives (T9), who does not grade students on fitness testing, described students as being motivated by grades when he stated, “The first thing they ask, ‘Is it worth any credits? Extra credit?’ I say, ‘No’. They say, ‘Well then, why should we do it?’” Many of the teachers described grading to be very motivating for students and included at least some aspect of their fitness scores into their grades.

Research Question 2

How do physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components? The second research

question examined how the teachers are educating students about fitness concepts. If the purpose of physical-fitness testing is to help students develop an active lifestyle, how are the teachers helping the students to develop a cognitive understanding of the health-related-fitness components? Three themes emerged from this question. First, the teachers were asked to identify whether or not a classroom was available for them to use. Second, the teachers were asked to describe their health-related-fitness instruction. Third, the teachers were asked to explain how they instructed students about the Healthy Fitness Zones (HFZ).

Classroom Availability

I asked the participants if they had access to a classroom. If a classroom was available for the teachers to use, they might be more likely to provide in-depth instructions about fitness testing and the health-related-fitness components. The teachers' responses regarding classroom availability are given in Table 9.

Only the middle-school teachers (80%) had access to a classroom. Three teachers (T1, T2, and T5) described using the classroom to give instruction. Access to a classroom, however, did not guarantee that the teachers would use it to provide formal instruction. Mr. Cooper (T3) has a classroom but has an activity-based program that does not allow very much time for instruction. None of the high-school teachers had access to a classroom, but two teachers (T7, T9) expressed a desire to have one so they could conduct more formal, in-depth discussions about fitness and health. Mr. Grant (T7) described instruction as being “nothing in-depth because we don't have a classroom.”

When asked if he had access to a classroom, Mr. Ives (T9) responded,

No, not really because everything is occupied. We have the wrestling and weight rooms, but they aren't conducive to anything. If I had time and I found something

I could use, I would love to. Kids are into watching something. Something I could show them. I would like to do it, but I don't have the money or the facilities to do it.

Table 9
Teacher Responses About Classroom Availability for Instruction

Teacher	Classroom Availability	Summary of Responses
1	Y	Instruction occurred both in the classroom and out on the field. Most of the physical-fitness testing also occurs in the classroom (no desks).
2	Y	Does give formal instruction and conducts the instruction in the classroom or cafeteria.
3	Y	Does not offer very much instruction because they have an activity-based program. Most of the physical-fitness testing occurs in the classroom (they do not have a gymnasium).
4	N	Does not conduct formal, in-depth discussions. When instruction is given it is while they are sitting on the gym floor in their lines.
5	Y	Uses the classroom to give instruction.
6	N	Does not conduct formal, in-depth discussions.
7	N	Asked for a classroom but was not given one because there were none available. Would like to have a classroom to give health-related-fitness instruction. Does not conduct in-depth discussions because they do not have a classroom.
8	N	Does not conduct formal, in-depth discussions.
9	N	Does not have access to a classroom because there are none available. Would like to have a classroom for instruction.
10	N	Does not conduct formal, in-depth discussions.

Y = yes, a classroom was available for the teacher to use

N = no, a classroom was not available for the teacher to use

Access to a classroom did not ensure that it would be used to provide instruction to the students, but most of the middle-school teachers who did have access to a classroom used it for instruction. High-school teachers who did not have access to a classroom expressed the desire to have one.

Health-Related-Fitness Instruction

The teachers were asked to explain how they conducted health-related-fitness instruction. Table 10 identifies how the teachers described the health-related-fitness instruction they provided to their students.

Table 10
Teacher Responses About Health-Related-Fitness Instruction Provided to the Students

Teacher	Instruction	Summary of Responses
1	Y	The students are tested on health-related fitness. Explains how each of the fitness tests relates to the fitness components. Instruction occurs both formally in the classroom and informally out on the field.
2	Y	Gives specific health-related-fitness instruction. The components of fitness are talked about in relationship mostly with fitness activities, but she also tries to relate the components to sport activities. In eighth grade, they do a report on the components of fitness.
3	N	Health-related-fitness instruction is given sporadically “here and there” but not at a specific time. When instruction occurs, it is mostly given in relationship to cardiovascular endurance and not as much with other components. Would like to spend one day a week on instruction but does not want to take away from the time students spend being active.
4	N	Spends a minimal amount of time on health-related-fitness instruction. Might give occasional instruction, but typically the instruction is informal and unplanned.
5	Y	Gives specific formal instruction on health-related fitness. Talks mostly about cardiovascular fitness. Gives written tests on fitness.
6	N	Gives some instruction about health-related fitness. Incorporates some of the components (mostly cardiovascular fitness) into different games and activities.
7	N	Gives some instruction about health-related fitness but “nothing in-depth.” Explained that health-related-fitness instruction used to be a part of the curriculum but is no longer.
8	N	Gives some instruction on health-related fitness and why they are important to health. Tries to relate some of the components to activities that they do.
9	N	Health-related-fitness instruction is unplanned and sporadic.
10	N	Tries to incorporated health-related-fitness instruction and how the components relate to the different tests. Explained that health-related-fitness instruction used to be a part of the curriculum but is no longer.

Y = yes, the teacher gave specific health-related-fitness instruction

N = no, the teacher did not give specific health-related-fitness instruction

Three middle-school teachers (T1, T2, and T5) described giving specific health-related-fitness instruction. All three teachers had access to a classroom and described explaining to the students why the health-related-fitness components are important and how they relate to the physical-fitness tests. Ms. Evans (T5) said,

I feel it's important for kids to understand why we do what we do. So they understand that cardiovascularly we're trying to get our heart rate up and into that target heart rate zone for a certain length of time. And they understand that we're working on muscular strength when we're working in the weight room and doing push-ups.

Ms. Brown (T2) described the importance of helping students make connections between the health-related-fitness components and the tests. She explained to the students that "each test has a reason that it's important to your health and well-being for your lifetime, not just while you're in seventh grade taking the test for the State." Two teachers (T1, T3) said that the students were given a written test on health-related-fitness components.

Mr. Adams (T1) stated,

I don't just tell them, they have to know why. They have a test on the components of fitness. What are they? What tests can we do for them? What can we do? And so they know, I hope, by testing, they know the reasons for them.

Whereas another teacher (T3) described wanting to spend one day a week on instruction but did not want to reduce their activity time. Mr. Cooper (T3) said,

There should be one day a week that should be a health day, but if you're taking away an activity period to have a sit down cognitive discussion about the health and how it connects, then you're not getting that activity time.

None of the high-school teachers described giving specific health-related instruction that was presented in a planned, formal manner but they all reported incorporating instruction to some extent into their lessons. Ms. Hart (T8) said, "I try to explain those things to them, like why running is important. Why cardiovascular fitness is important. I try to explain those kinds of things. Why flexibility is important." Mr. Grant (T7) stated, "Yes, we talk about the components of fitness." Ms. Jones (T10) confirmed, "We try to incorporate (health-related-fitness instruction) after warm-ups and we have a little talk ... We try to incorporate that in our plan."

The amount of instruction on health-related-fitness instruction varied among the teachers. The middle-school teachers were more likely to spend time on specific health-related instruction; however, all the teachers made some effort to incorporate the instruction into their lessons.

Knowledge of the Healthy Fitness Zones (HFZ)

The teachers were asked to describe the instructed they provided their students about the HFZ. The CaPFT is a criterion-referenced test that places students in a “Healthy” or “Unhealthy” category. The participants were asked to describe student knowledge about the HFZ (Table 11).

Table 11

Teacher Responses About the Students’ Knowledge of the Healthy Fitness Zones (HFZ)		
Teacher	HFZ Knowledge	Summary of Responses
1	Y	They chart their scores so they know their goals.
2	Y	They have a chart with their score circled if it is in the HFZ.
3	Y	The students know most of the HFZ.
4	Y	Goes over the HFZ with the students but does not like to place too much emphasis on it otherwise the students will only try to achieve a passing score.
5	Y	Goes over the HFZ with the students so they know their goal.
6	Y	Posts the HFZ on the wall in the gymnasium so they can see what they need to get to pass. Most students will stop once they achieve a passing score.
7	Y	Tells the students the HFZ so they know the passing scores. Most students will stop once they achieve a passing score.
8	Y	Shows the students the chart with the HFZ. Through the year, reminds students of their goals.
9	N	The students do not know the HFZ because the teacher did not know them.
10	Y	The students are told the HFZ so they have a goal to reach.

Y = yes, the students knew the HFZ

N = no, the students do not know the HFZ

One teacher (T9) did not tell the students the HFZ because he did not know what they were; however, most of the teachers (90%) reported telling the students the HFZ and that their students knew what scores they need to get to be in the HFZ. Ms. Brown (T2)

said, “I keep a chart, ‘Look, you’ve improved.’ I circle it if they are in the fitness zone. The kids know what the fitness zone is; at least I hope they know, we keep repeating it.” Ms. Hart (T8) explained to the students, “This is the HFZ. This is where you need to be. This is what is healthy for you, to be in this zone.” Ms. Foster (T6) stated that she tapes the HFZ chart on the gym wall by the testing stations for the students to see.

Some of the teachers expressed the importance of having a goal. Ms. Jones (T10) said that the students are told their HFZ, and “We try to give them a goal to reach.” Ms. Hart (T8) stated, “I remind them that this is what it is for the girls this age and for the boys this age. ‘This is what you should be aiming for.’”

Although most of the teachers thought it was important for the students to know the HFZ, they did express frustration about the students only striving to achieve a passing score. The teachers described students stopping once they reached the HFZ even if they could do more. Mr. Davis (T4) explained,

We always had listings of what the passing scores were, but we didn’t like to broadcast that ahead of time because they’ll always go to the test. They’ll always go just to here instead of going to the next level.

Ms. Foster (T6) said, “Something that I’ve seen in administering the test is that they know once they get to a certain point and they pass they just stop instead of trying to do their best.” It appeared that most of the students knew the HFZ for the tests; however, a problem with the students knowing what a passing score was that it kept the students from trying to exceed it.

Research Question 3

Prior to physical-fitness testing, to what extent do physical-education teachers develop their students’ cognitive understanding about the health-related-fitness

components? The third research question is concerned with instructions provided to the students before the CaPFT was administered. Three themes emerged from this question. The first theme identified how the students practice the test protocols. The second theme described instructions the students receive about the test purposes. The third theme examined any changes the teachers make in the curriculum in preparation for the test.

Practicing Test Protocol

The teachers were asked to describe how they prepared the students for the test. Because some of the tests in the CaPFT include specific test protocols, the teachers were asked to describe how the students practiced the protocols in preparation for the test (Table 12).

All of the teachers described including at least some practice of test protocols. A majority of the teachers (60%) provided *some* practice for the tests (S), whereas the rest of the teachers reported *extensive* practice of test protocols (E). The middle-school teachers were more likely to have their students practice extensively. Mr. Adams (T1) stated, “We practice the form all the time. They’re always doing the form so they’re used to it. So when we go to testing, they’re used to doing the test.” Ms. Brown (T2) said, “We go over the protocols (before the pretest) and as we are going through the year.”

The teachers reported having the students run the mile at least once a week and performing curl-ups and push-ups in daily warm-ups. The curl-ups and push-ups were practiced regularly but not always to the test protocols. Mr. Grant (T7) explained that while they are practicing for the test, “They are not doing push-ups according to the test protocols. I give them 30 seconds to do as many as they can.” Many teachers described having the students perform the activities but used variation of the exercise to help train

the students. Ms. Jones (T10) stated, “Our daily warm-ups are geared toward preparing them for fitness testing.”

Table 12
Teacher Responses About Student Practice of CaPFT Protocols

Teacher	Student Practice	Summary of Responses
1	E	Practices test protocols “all the time.” The students watch the training DVD so they understand what the tests are supposed to look like and so they know the form corrections.
2	E	They review the test protocols throughout the year. They do the curl-up, push-up, and stretching (flexibility) are part of the warm-ups every day. They run the mile once a week.
3	E	Practice the test protocols regularly throughout the year. Run the mile once a week and practice the curl-up and push-up tests weekly. Finds the students to be familiar with the tests from fifth grade (but not administered correctly).
4	S	Do not practice the test protocols very often because they spend so much time on other fitness tests (the Presidential Physical Fitness Test). They will practice the curl-ups and push-ups a couple of times before test day.
5	S	Sporadic practice of test protocols. Do not practice very often because they focus on other fitness tests. Most students remember the test from fifth grade (although not administered correctly).
6	S	Run the mile weekly but only practice the test protocols about three times before the test. Work on push-ups and curl-ups daily in warm-ups but usually not with the test protocol. They remember the tests from middle school.
7	S	Run the mile weekly and practices the push-ups and curl-ups several times. Do push-ups and curl-ups daily in warm-ups but usually not with the test protocol.
8	E	Practice the push-ups and curl-up protocol daily during warm-ups. Run the mile weekly.
9	S	Do push-ups and curl-ups daily in warm-ups but usually not with the test protocol.
10	S	Run two days per week. Practices push-ups and curl-ups daily in warm-ups but usually not with the test protocols.

E = students practiced test protocols extensively

S = students practiced test protocols somewhat

Instruction About the Purposes of the Test

The participants were asked to describe what instructions they give their students about the purpose of the test. A summary of the participants' responses regarding instruction about the test purposes is provided in Table 13.

Table 13

How the Teachers Described Instruction to the Students About the CaPFT Purposes	
Teacher	Summary of Responses
1	Tells students about how health-related fitness components relate to the tests and how they are important to health (e.g., prevention of injuries).
2	Tells students about health-related fitness and how they relate to health. Describes that "each test has a reason that it's important to your health and well-being for your lifetime, not just while you're in seventh grade taking the test for the State."
3	Starts in the beginning of the year. Explains the importance of testing and goal setting.
4	Discusses the HFZ. Tells the students about improving fitness to help decrease the incidence of obesity. "We don't do a lot of discussion on that."
5	"I tell them the purpose is for them to see where they are fitness wise." Talks about testing to see what their fitness levels are so they know what areas they need to improve.
6	Talk about the health-related-fitness components and why it's important to be healthy.
7	Was not sure he understood the purpose of the test but did talk about fitness.
8	Relates the tests to health and fitness: "They're trying to figure out how healthy or unhealthy as a whole the kids in California are." Also said, "I don't go into detail about that."
9	Explains that the tests are to measure their physical fitness. "What they're doing is trying to find out how fit you are in comparison to everyone else in the state."
10	Talks to the students about improving their fitness level. Also tells the students that, "we're being measured against other schools."

The teachers gave various responses as to what they told their students about the purposes of the test. Three of the teachers (T1, T2, and T6) specifically addressed the health-related-fitness components when discussing the purposes of the test. The importance of health and physical fitness was identified by most of the teachers. Mr. Adams (T1) discussed core strength and said, "If you have it you can prevent injuries."

Ms. Hart (T8) explained to the students that “They’re trying to figure out how healthy or unhealthy you are.” Two of the teachers (T4 and T8) discussed the increase in obesity rates. Mr. Davis (T4) explained, “We talk about the prevalence of childhood obesity and why we are trying to improve your fitness level.” Ms. Hart (T8) described how she explained to the students that the State is “trying to figure out how healthy or unhealthy as a whole the kids in California are. That’s important because, as you know, obesity is on the rise and we’re trying to get rid of that.” Ms. Brown (T2) was the only teacher who specifically identified the importance of lifetime fitness when she described telling the students that “each test has a reason that it’s important to your health and well-being for your lifetime.”

When the teachers were asked to describe instructions to the students about the purposes of the test, none of the responses included explanations about motivating the students to be physically active, the intended purpose of the test. The teachers were asked the following question: “Do you think physical-fitness testing helps motivate the students to be physically active?” Table 14 presents the teachers’ responses.

The participants clearly did not think that physical-fitness testing helps motivate the students to be physically active. A few of the teachers responded that they thought it might be motivating for some of the students, but for a majority of them it was not. The teachers identified activities they thought were more motivating to the students, for example, the Governor’s Fitness Challenge and the Family Fitness Challenge. A high-school teacher (T8) found certain activities taught during physical-education class to motivate more physical activity outside of school than the fitness tests. Ms. Hart (T8) explained,

I don't think it helps. Looking at the kids that [sic] I have, I don't think that it motivates them to do anything outside of school. It motivates some of them to do well outside of the test because of their competitive nature. I've found that when I introduce tennis, a lot of kids that [sic] are very negative about tennis and think it's dumb, but then they get playing and understand the game. I've actually had numerous kids who where like, "I'm going to join the tennis team." You don't get those things from the FITNESSGRAM. You don't get, "I did 20 push-ups because I did really bad [sic] my freshman year on the FITNESSGRAM." I think that with some of the things they understand the importance if I explain the importance to them. Then they might think they should do some of them one their own. But that's a select group of kids.

Table 14
Teacher Responses to the Question: "Does Physical-Fitness Testing Help Motivate the Students to be Physically Active?"

Teacher	Answer	Summary of Responses
1	N	Did not think the tests motivated the students to be physically active but did mention other programs that he thought were more motivating for the student (e.g., Family Fitness Challenge; Governor's Challenge).
2	U	"I'm not sure. I really don't know."
3	N	"Absolutely not."
4	N	"I haven't seen that."
5	U	"I don't have an answer for that because I really don't know." Wasn't sure the tests helped the students to be more physically active but mentioned the Governors Fitness Challenge and thought that might be more motivating.
6	N	"I would say, with my experiences with Freshmen students, No."
7	N	"Here? No. Junior high, possibly. But here? No." Thought that the competitive students might be more motivated by the test but not most of the students.
8	N	"I don't think it helps." The more competitive kids might be motivated but not a majority of them. Teaching other activities (e.g., tennis) helps motivate them more.
9	N	"No, I really don't (think so)."
10	Y/N	It might motivate some kids but not a majority of them.

Y = yes
N = no
U = unsure

Responses about the purposes of the test varied but most of the teachers included a discussion about physical fitness and health. A few of the teachers included a discussion of the health-related-fitness components in their responses. None of the

teachers' responses, however, described instruction about promoting lifetime physical activity that is the intended purpose of the FITNESSGRAM® test battery.

Curricular Changes Prior to the Test

The participants were asked if they changed their curriculum prior to the test. I wanted to examine if teachers altered the curriculum before the CaPFT was administered. The teachers' responses are presented in Table 15.

Table 15
Teacher Responses About Curricular Changes Prior to Administering the CaPFT

Teacher	Curricular Changes	Summary of Responses
1	N	Might increase some of the fitness activities before the Test but mostly incorporates fitness throughout the year.
2	N	Incorporates fitness throughout the year.
3	N	Tries to incorporate fitness throughout the year and not just right before the test.
4	N	Incorporates fitness (Presidential Physical Fitness Test) throughout the year.
5	N	Incorporates fitness throughout the year.
6	N	The program is mostly sports-based and that the fitness component is lacking. Fitness activities are a part of the warm-up.
7	N	The program is mostly sports-based. Students are not that interested in fitness, "Besides push-ups if you add time, they just refuse to do it." Fitness activities are a part of the warm-up.
8	Y	"It depends on the class." If a class is weak in an area (e.g., push-ups), they will spend more time working on that area. As they get closer to the test date they will do more fitness activities to improve in those areas.
9	N	The program is mostly sports-based and that the fitness component is a minimal part of the curriculum.
10	Y	Spends more time on fitness activities (e.g., push-ups) as they get closer to the test date. "Our daily warm-ups are geared toward preparing them for fitness testing."

Y = yes, the teacher changed the curriculum prior to test administration

N = no, the teacher did not change the curriculum prior to test administration

Most of the teachers (80%) responded that they did not alter their curriculum prior to test day. All of the middle-school teachers described incorporating fitness throughout

the year and did not alter the curriculum, although one teacher thought he might increase fitness activities a little bit prior to the test. Mr. Adams (T1) stated,

I don't know if I alter the curriculum. I just think it's part of (the curriculum). I pretty much do it all year. There may be a little bit more. We will run a little bit more just to build up (endurance) as it gets closer to test day.

Two of the high-school teachers (T8 and T10) thought they did increase fitness activities in preparation for the test. Ms. Hart (T8) said,

It depends on the class. This year, my second period class is really good at doing push-ups when we do them on a daily basis. Not very many of them are on their knees. I have guys that [sic] can probably do 50 push-ups, but they do them on their knees while we do them because they just don't care. For some reason, second period is doing really well with push-ups, so I probably won't work any more on them. I have another class, fifth period, where probably half of them can only do four. So with that class, I'll probably work a little more with them and even one-on-one instead of just observing with their partners. Just to work a little more specifically with those students in that class periods that I know are struggling with them. Back in October, I wasn't working on it as much but now that it's closer, it's one of those things. It depends how *they're* doing. It's not like I think about it. I kind of just do it. With second period, I won't even think about it. But with fifth period, I'll make sure I work with the kids that [sic] I think might not pass.

Ms. Jones (T10) explained that she did alter the curriculum prior to the test but that fitness activities were incorporated throughout the school year especially during the warm-ups. She stated, "Our daily warm-ups are geared toward preparing for fitness testing." Two teachers (T6 and T7), both high-school teachers, have mostly sports-based programs that did not place a large emphasis on fitness development although they tried to incorporate fitness activities into the warm-up.

Most of the teachers did not report that they altered the curriculum prior to administering the CaPFT. All of the middle-school teachers responded that they did not alter the curriculum because fitness was incorporated throughout the year. Two high-school teachers reported altering the curriculum in preparation for the test, and two other

high-school teachers described their curriculum as being mostly sports-based but tried to incorporate fitness activities into the daily warm-up.

Research Question 4

After physical-fitness testing, to what extent do physical-education teachers interpret test results to their students? The fourth research question is concerned with examining how the teachers explained the test result to the students. Three themes emerged from this question. The first theme identified who receives the test results (i.e., students, parents). The second theme addressed how the test results are explained to the students. The third theme examined if the teachers alter the curriculum after test administration.

Who Receives the Test Results?

This theme identified who receives the test results once the tests are administered. The participants were asked to describe if the students and parents received the test results. The teachers' responses regarding who received the test results are provided in Table 16.

Only half of the teachers reported giving the test results to the students. The middle-school teachers were more likely to give the students the test results than the high-school teachers. The responses indicated that the students received the results either verbally or by seeing them on their fitness charts. Two middle-school teachers described displaying the scores on a graph for the students to see to help increase understanding of the test results. Mr. Adams (T1) said, "You write it in a chart and it doesn't mean much, but you put it in a graph, and they really start to understand what is going on." Mr. Cooper (T3) also explained that he mostly gave the students the scores verbally but that

he also tried “to put them on an Excel program and onto a graph so they can visually see if they’re going up, or down, and see how they compare to everyone else.”

Table 16
Teacher Responses About Who Receives the CaPFT Results

Teacher	Received Results	Summary of Responses
1	Y	<i>Students:</i> They see their test results in their fitness charts. They also graph their test results.
2	Y	<i>Parents:</i> The district sends the fitness scores home to the parents.
	Y	<i>Students:</i> The fitness scores are charted throughout the year. CaPFT results are given verbally.
3	N	<i>Parents:</i> The school bought forms to send home to the parents, but they never used them.
	Y	<i>Students:</i> Receive the scores verbally. Sometimes see scores on a graph.
4	S	<i>Parents:</i> If they come to the parent-teacher conference, see the results on the computer.
	S	<i>Students:</i> They usually do not receive the results; if they do, they receive them verbally.
5	U	<i>Parents:</i> Was not sure but thought they were sent home to the parents.
	S	<i>Students:</i> If they receive the results, they receive them verbally.
6	U	<i>Parents:</i> The scores are in the students’ cumulative folders but was not sure if they were sent home.
	N	<i>Students:</i> Do not receive the results from the teacher.
7	Y	<i>Parents:</i> The district sends the results home. (Knew this because a parent complained because her daughter did not pass 5 out of 6 tests and was going to have to take another year of physical education).
	N	<i>Students:</i> Do not receive the results from the teacher.
8	U	<i>Parents:</i> Did not know if the parents received the results.
	Y	<i>Students:</i> They receive the scores verbally; shows them the HFZ charts and where they need to be for each test.
9	U	<i>Parents:</i> Did not know if the district sent the results to the parents.
	N	<i>Students:</i> Did not receive test results.
10	N	<i>Parents:</i> Did not receive test results.
	Y	<i>Students:</i> They receive the scores verbally.
	U	<i>Parents:</i> Was not sure if the test results went home to the parents

Y = yes, the students or parents received the test results

N = no, the students or parents did not receive the test results

S = sometimes the students or parents received the test results

U = the teachers were unsure if the students or parents received the test results

The responses were more varied for whether or not the parents received the test scores. Half of the teachers were unsure whether or not the parent received the results. Ms. Jones (T10) stated, “I think the district just sends them home to the parents, but you would have to ask our department chair about that.” When asked if the parents received the test results, Mr. Grant (T7) replied that

I don't know. I don't think so because a couple of people that I had in class last year said that they passed but then found out that they failed when they got to school the next year because they were signed up for another PE class. They said, “I didn't sign up for a PE class.”

Ms. Brown (T2) said that forms had been purchased but never used. She explained, “Years ago when the FITNESSGRAM® was started, the superintendent bought us all the forms that we needed if we used the FITNESSGRAM® to just print out and send home to parents. We never took advantage of it.”

For the parents who did receive the results, they were most often sent home through the district. Mr. Adams (T1) stated, “Formally the district right now, they send something home that tells the parents what the fitness scores are.” One teacher (T3) reported giving the parents fitness scores if they came to the parent-teacher conference. Mr. Cooper said, “When we have parent-teacher conferences they do come to us and speak to a physical educator and we do present them with fitness scores and where they're at fitness-wise.” He also explained that not a lot of teachers come to the parent-teacher conference, “Well, I see the ones that come which is not a large percentage.”

The teachers' responses varied on who received the test results. If students received the tests results, they were given to the students verbally. If the parents received the test scores, they were sent by the district although many teachers did not know if the parents received results of the test.

Explanation of Test Results

The teachers were asked to describe how the test results were explained to the students. Table 17 provides a summary of the teachers' responses regarding the explanation of test results given to the students.

Table 17
Teacher Responses About The Explanation of CaPFT Results Given to the Students

Teacher	Explained Results	Summary of Responses
1	S	The students keep fitness logs. They have a pretty good idea of what their scores are because they spend so much time on it through out the year.
2	S	Gives instruction throughout the year, but no individual explanation of test results is given. Any explanation is given to the class as a whole.
3	N	No explanation is given as to how they can improve the fitness components.
4	N	No explanation is given of the CaPFT. They focus on the Presidential Physical Fitness Test.
5	S	Has a discussion with them based on their test results and how they did.
6	N	The test results are not explained to the students.
7	N	The test results are not explained to the students. Will talk to the students individually who have a weight problem to try to encourage them to be active.
8	S	If they do not pass, will talk to them about how to improve in those components. Will not give feedback about their weight.
9	N	Does not explain test results because they are not given to the students.
10	S	Minimal explanation of individual test results.

S = the teacher explained the test results to the students somewhat

N = the teachers did not give an explanation of the test results to the students

The teachers reported giving somewhat of an explanation of the test results to the students (S) or no explanation of test results to the students (N). A complete explanation of test results would involve specific individual instruction. None of the teachers described giving a complete explanation of test results to the students. Half of the teachers reported that they gave no explanation of test results to the student with the other half responding that they gave somewhat of an explanation to the students about the test

results. Ms. Brown (T2) responded, “It’s not on an individual basis as it is part of the general class time.” Mr. Grant (T7), a high-school teacher, will talk to the students when he is measuring their height and weight. He explained,

One comes up at a time. I weight them, get their height, and then I talk to them personally. I say, “You know what? You want to know where you’re at right now?” If it’s someone with a real medical issue, I’ll talk to them. I never get on the heavy people. I encourage them to walk. There’s no way they’re going to run. I try to get them to walk at a pace that is comfortable and try to challenge them to lose weight each week or each month. They take it pretty good [sic]. But that’s one test I do personally, the BMI.

Ms. Hart (T8) said that she does not like to discuss weight with the students. She stated, “The one I stay away from is the height and weight. It’s hard because you want to say something but how do you say that to a 13- or 14-year-old kid.”

An explanation of test results would help give the test meaning; however, none of the teachers provided an in-depth explanation of the test results. Several of the teachers provided no explanation of test results to the students. A majority (60%) of the teachers offered somewhat of an explanation of the tests results.

Curriculum Changes After Test Administration

The teachers were asked to describe if any changes were made in the curriculum after the tests were administered. I wanted to examine if the teachers altered their curriculum after test administration. The teachers’ responses are presented in Table 18.

Less than half of the teachers (40%) described altering the curriculum after test administration. The middle-school teachers (3 out of the 5) were more likely to change the curriculum. Only one high-school teacher reported altering the curriculum after test administration. All of the teachers who described changing their curriculum identified

specific areas that the students needed to improve. Ms. Brown (T2) described incorporating more activities to improve upper-body strength. She stated,

Inevitably, it's almost always strength that is the issue. So every year we're trying to incorporate more strength-type games. We've gone to a lot of workshops where we're working on the upper body. They have upper-body hockey games and just different things to do.

Table 18
Teacher Responses About Curricular Changes After Administering the CaPFT

Teacher	Curricular Changes	Summary of Responses
1	N	Reported that he does not alter the curriculum. Does find upper-body strength has been low so continually working to improve that area.
2	Y	Upper-body strength has been low so actively sought out ways to improve that area. Has gone to workshops to learn more ways to improve upper-body strength.
3	N	Does not alter the curriculum. "My curriculum is pretty rigid right now."
4	Y	Aerobic capacity and upper-body strength have been low so he increased the amount of time the students spend running and doing push-ups.
5	Y	Flexibility has been low so she tries to include more stretching in the warm-ups.
6	N	Does not alter the curriculum.
7	N	Does not alter the curriculum. The students are mostly interested in sport activities and "refuse" to do more fitness activities.
8	N	Does not alter the curriculum. Once the tests are done, she is ready to "move onto the next thing."
9	N	Does not alter the curriculum because he does not know how they did (did not know the HFZ and whether or not they passed).
10	Y	The department talks about the test scores and tries to improve in the areas where they are weaker. Aerobic capacity had been low so they increased their running.

Y = yes, the teacher changed the curriculum after test administration

N = no, the teacher did not change the curriculum after test administration

Mr. Davis (T4) identified two areas, aerobic capacity and upper-body strength, that needed to be improved:

We found we were scoring quite low in our aerobic capacity so we upped our running. Our daily running has been increased this whole year, and we're really trying to step up that level. Another thing, our upper-body strength was not doing well so we really had to up our push-ups. Every trimester we're trying to increase

the number of push-ups we do every day as part of our warm-ups. It's 10, 15, and next trimester it will be 20 push-ups every day as just part of the standard warm-up procedure.

Ms. Evans (T5) described flexibility as their weakest component. She said, "The stretching, the flexibility, is the one I said before that I feel is the weakest. So I try to incorporate that more into what I do." Ms. Jones (T10), a high-school teacher, responded that the department works together to try to identify areas that are weaker and work to improve those areas. She stated,

We'll talk about it as a department. We'll talk about our scores. Last year we saw that we needed to improve our running score because it had gone down from the year before so we focused on the run. So recently we have all been trying to run a lot.

For the teachers who responded that they did not alter the curriculum after test administration, one middle-school teacher (T3) said, "My curriculum is pretty rigid right now." The high-school teachers were less likely than the middle-school teachers to change the curriculum with 4 of the 5 responding that they did not alter the curriculum.

Mr. Grant (T7) stated, "Besides push-ups, if you add time, they just refuse to do it. They just won't do it. You can explain all the principles of weight training, about becoming stronger and healthier, and most don't care." Ms. Hart (T8) explained,

I think the testing process itself takes a long time because there's only me doing it for my classes. I think when it's done I'm like, Okay, let's move on to the next thing. We still do the stretching and flexibility every day. We still do the push-ups and sit-ups every day. Usually after the testing, about every other week, we'll still do partner up push-ups and sit-ups. But honestly, I don't think I've ever been like, "This class was terrible with push-ups so we're going to keep working on them."

More than half of the teachers (60%) did not alter the curriculum. Of the teachers who changed the curriculum, they all identified specific areas that the students typically scored low on and needed to improve.

In their responses, the teachers expressed frustration about how the State reports the test results back to the students. The tests are conducted in the Spring but the teachers do not receive the test results back until the following year, making it difficult for the teachers to present the results in a timely manner. Ms. Brown (T2) stated regarding the timing of the test results, “I do not understand the whole system.” Mr. Davis (T4) also explained,

We don't get the test results here in a manner that we can present it [sic] to the students in time. It never comes in. As a matter of fact, the first test results we see are the day back to school the next year, which is pointless. We assume they get sent home to the parents but that's the best we can do.

Mr. Ives (T9) said that for his high-school students, Freshmen's bodies are still changing. He stated, “The tests they take their freshmen year determines what's going to happen their sophomore year and who knows what happens in between that time.” The teachers indicated that if they received the test results in a timelier manner, they would be able to do a better job of presenting the results to the students.

A majority of the teachers responded that they did not alter the curriculum after test administration. Changes in the curriculum that did occur were based on areas the teachers found to be weak and worked to increase fitness activities in those areas.

Additional Findings

This section presents additional findings of the study that included teacher training for CaPFT administration, incorrect test administration practices, and teacher attitudes. As the teachers described test administration practices, it became apparent that teacher training was lacking and that there were several test administration errors by the teachers. Additionally, themes emerged relating to teacher attitudes about the CaPFT. Although the purpose of the study did not include an investigation of teacher training,

test-administration techniques, or teacher attitudes, through the process of interviewing the participants, themes emerged relating to these three areas.

Teacher Training

Teacher training for physical-fitness-test administration varied. The amount of training received is identified as being *extensive* (multiple training sessions), *moderate* (recent workshop or conference training), *minimal* (school or district site training), or *absent* (no training was given). Table 19 provides a summary about teacher training for physical-fitness-test administration.

The middle-school teachers had the most training (extensive or moderate), which included voluntary training obtained outside of the school setting (i.e., workshops, conferences). Seven of the 10 teachers received minimal or no training on how to administer the California Physical Fitness Test (CaPFT). Those who received minimal training attended an in-service when the test was first mandated in 1998 and have not received training since that initial training session. Some teachers reported receiving a book or a pamphlet on test administration practices although no formal training was given. Two of these teachers (T6 and T8) did not receive the written information until after they had been teaching for several years.

Three teachers (T5, T7, and T10) described receiving training when the test was first mandated by the State. Mr. Grant (T7) explained,

When they [sic] first came out with it, we were all called into a room at a local high school, and they told us how you needed to administer the test. They showed the appropriate push-up, the appropriate sit-up, gave us the strips, gave us the cadence with the pace tape. Gave us the preferred test for sit and reach or shoulder stretch. They pretty much went through the entire test. They told us how to write it down and the documentation of it.

Table 19
Teacher Responses About Training for Physical-Fitness-Test Administration

Teacher	Teacher Training	Summary of Responses
1	extensive	Received voluntary training at California Middle School Workshop, California Association for Health, Physical Education, Recreation, and Dance (CAHPERD) conference training, and through the Physical Education and Health Project.
2	moderate	Received voluntary training at a CAHPERD conference.
3	moderate	Received training at a national conference.
4	absent	Learned from a book given by the district and by what was learned in undergraduate program.
5	minimal	Training was received at the school site when the test was mandated.
6	absent	Learned about test administration from her undergraduate program and from her colleagues. Received a pamphlet on test administration 3 years after she started teaching.
7	minimal	Training was received at the school site when the test was mandated.
8	absent	When she first started teaching, a colleague briefly told her what to do. Within the last year was given a book by the district describing correct test protocols.
9	absent	Learned about test administration in a book. This year was given more information about the test.
10	minimal	Training was received at the school site when the test was mandated.

extensive = multiple training sessions

moderate = recent workshop or conference training

minimal = school- or district-level training

absent = no training was given

The teachers also discussed lack of training. Mr. Davis (T4), when asked about the CaPFT training, he answered,

Just the book that is given out by the State. I looked over that on my own to come up with the fitness-test practices and obviously what I received when I was going through school way back when. Since then, there hasn't been any help by administration with the test other than what we have to gain on our own.

Ms. Foster (T6) explained that she “was given a pamphlet...And actually my first pamphlet, this is my eighth year of teaching, my first pamphlet that I received was 2 or 3 years ago.” Ms. Hart described her lack of training,

I wouldn't necessarily say I was given any instruction here when I got here to start teaching. The other guy that [sic] teaches PE here, he kind of helped, "This is how we do it here, let me know if you have any questions." That type of thing. It was mainly whatever I had in college that prepared me. But nothing exact of, "You have to do it this way." I was given a book from the District that shows examples of what the sit-ups are supposed to look like. It explains how each thing is supposed to be administered. But (I was given) no formal instruction.

The teachers received little or no training to administer the physical-fitness tests by the schools. The teachers who were trained obtained voluntary training through conferences and workshops. All the teachers reported receiving written materials (e.g., book, pamphlet) describing the CaPFT protocols.

Incorrect Test Administration

As the teachers described test administration practices, some of the interviews included teachers explaining how the students performed certain tests. Discussions regarding test performance were not planned but occurred at different times during some of the interviews. As test practices were discussed, several of the teachers described administering tests incorrectly. The CaPFT is a standardized test and includes specific test protocols for each of the tests. Table 20 presents instances where teachers described administering tests incorrectly.

As the teachers responded about their test administration practices, it became apparent that half of the teachers described administering one or more test incorrectly. For one of the teachers (T4), three different administration errors were described. There were nine different instances where tests were explained as being performed in ways other than the test protocols. The trunk lift was administered incorrectly most frequently where four teachers described the students as "looking up" while they performed the test. Mr. Ives (T9) said, "Sometimes I draw little eyeballs on the wall." Ms. Jones (T10)

explained how the students performed the trunk lift when she stated, “They know they are supposed to lift and look at a target with their chin up.” Two of the teachers (T4 and T10) described holding the feet during the curl-up test. The test protocol states that the feet should be “unanchored” (The Cooper Institute, p. 42). Ms. Jones (T10) described having a “Person at the feet, holding the feet down,” and Mr. Davis (T4) said, “We’ll have students holding feet” during the curl-up test. Two teachers (T1 and T7) described administering a test differently than required by the test protocol because they thought it was a better way of administering the test. Mr. Adams (T1) administered the back-saver sit and reach with a different hand position. He explained,

They ask that you have one hand over the other. I have problems with that because for myself or anyone else now you are trying to estimate where that back hand is. How accurate is that? I think if you put both hands next to each other you’re still getting the same thing and the kids seem to be able to understand that better. Just from my experience. They always have one arm slipping, but if you tell them to put thumbs together or thumbnails together they know that, and they can feel that better, they can feel one slipping. I haven’t seen differences.

Table 20

Teacher Descriptions of Test Administration Errors

Teacher	Test	Administration Error
1	S & R	Chooses to administer it differently than the test protocol because he thinks it is a better way. He has them put their hands next to each other rather than one on top of the other.
4	CU	Students hold each others feet
	S & R	Incorrect leg position (bent leg flat)
	TL	Students are looking up
7	CU	Chooses to administer it differently than the test protocol because he thinks it is a better way. He has them touch their heels rather than sliding across the strip.
	TL	Students are looking up
9	TL	Students are looking up
10	CU	Students hold each others feet
	TL	Students are looking up

S & R = Back-Saver Sit and Reach

CU = curl-up

TL = trunk lift

Mr. Grant (T7) described administering the curl-up differently because he did not like the test protocol and stated,

The curl-ups again are a joke with that strip that moves and sliding your fingers past the strip. You have to have a partner on each side. It's not practical to do it. Kids don't want to be by a person's butt. What I do, I use their heels. They've got to be in the reclining position. They have to slide up and get their fingers past their heels. We have a gap where the strip should be in between like they show you. I go with the pace of the tape.

During the interviews, several teachers described administration errors while the students performed the tests. The interview protocol did not include asking the teachers to explain how the students performed each of the tests, but as the teachers were discussing test-administration practices, their responses included several testing errors with the trunk lift being administered incorrectly the most frequently.

Teacher Attitudes

Throughout the interviews, themes emerged regarding the teacher attitudes toward physical-fitness tests. To examine their attitudes about physical-fitness testing, the teachers were asked if they would continue to conduct the tests if they were not mandated by the State. The teachers' responses are presented in Table 21.

Most of the teachers (80%) responded that they would continue to conduct physical-fitness testing even if it was not mandated by the State. All of the middle-school teachers would continue to conduct the tests, but two high-school teachers (T6 and T7) would not. The two teachers who said they would not conduct physical-fitness testing had an unfavorable attitude toward the CaPFT. Ms. Foster (T6) explained why she would not continue to conduct the tests,

It feels like it's a waste of time. The kids don't really care and [for] the majority it's something that's like, "We need to do it, we need to do it." You talk about fitness testing, and the kids are like, "Uhhh."

Mr. Grant (T7) referred to CaPFT negatively and said that he would not continue to conduct the test but explained that he would continue to do the other things for fitness.

He stated,

But if some of them wanted to know how many push-ups they could do or something like that, I might make up some kind of a challenge: Who has the best in the class for this or that? But as far as the regular test, I just don't see any value in it if the students don't put forth their best effort. And as a group, we can't regulate it. I would be more than happy if they'd bring in a sub and I could do it, no problem. But I have 60 kids.

Table 21
Teacher Responses to the Question: "Would the Teachers Continuing to Conduct Physical-Fitness Tests?"

Teacher	Answer	Summary of Responses
1	Y	"Yes, absolutely. I did fitness testing before they had the FITNESSGRAM®, and I think it is important."
2	Y	"Oh yes, no doubt. It's a part of the curriculum. Two-fifths of it is fitness so you've got to be really covering that."
3	Y	Would continue to conduct fitness testing but would probably use the Presidential Physical Fitness Test.
4	Y	Would continue to do fitness testing (the Presidential Physical Fitness Test) but said, "No, I would not do the State Test."
5	Y	Might do some of the tests from the FITNESSGRAM® but not the whole test battery.
6	N	Would not continue to conduct physical-fitness tests "because it feels like it's a waste of time."
7	N	"No. Would I continue to do other things? Absolutely."
8	Y	Would probably continue to conduct the tests.
9	Y	"I think I would use their tests, but I would do them more often." Thinks they should be administered every year.
10	Y	Would probably conduct all the tests except the curl-up test. "We would try to find a better way to do it."

Y = yes

N = no

Most of the teachers explained that they would continue to administer physical-fitness tests to their students but not the FITNESSGRAM® test battery required by the State. The teachers said that they would conduct portions of the test or another test

battery. Mr. Cooper (T3) answered that he would continue to conduct physical-fitness tests but was not sure whether or not he would conduct the CaPFT. He explained,

I don't know. I grew up in the Presidential fitness award era, and when I went through my undergrad and teacher development days, it was Presidential fitness. And then I got into the FITNESSGRAM®, and I like the concepts sometimes. But personally, I like the Presidential because it's on a bigger scale and you can compare yourself to more kids in your age bracket across the country.

Mr. Davis (T4), who had a negative attitude toward the CaPFT, said, "I'm not a big fan of the state testing to be perfectly honest. I much prefer the Presidential now that I've gotten used to it." He explained that he thinks the Presidential Physical Fitness Test is more practical than the CaPFT because you can do the tests anywhere and stated,

The thing is you have to have the CD player right there to run the test. With the Presidential, there's no need for any other outside apparatus to run your test. How often can I really truly practice the state testing? It's really hard to run that. I can only go so far from an electrical outlet unless I'm constantly plugging batteries in constantly. There's no way. So you can't really practice them on a regular basis.

Mr. Ives (T9) had a positive attitude about the test and thought it should be administered more often. He thought the students should be tested every year. He explained,

By the time they leave high school, they would have their fitness history of fifth grade through their sophomore year. I would like to see it done more regularly. So there's a record. The kids have a record for everything, reading, writing, everything. But when it comes to PE, it's a hit-and-miss type deal.

Not all of the teachers liked the FITNESSGRAM® test battery but liked fitness tests in general because they helped the students to realize their fitness level. Ms. Hart said,

I think for a lot of kids it makes them realize how weak or low they are on a lot of things. They might of thought they were in pretty good shape or pretty healthy but then they do these things and they realize they didn't pass very many.

Two high-school teachers clearly had a negative attitude toward the CaPFT and stated that they would not continue to conduct the tests if they were not mandated by the State. Most teachers, however, said that they would continue to administer physical-

fitness tests although they would not choose to administer all of the tests in the FITNESSGRAM® test battery.

Summary

Physical-education teachers were asked to describe their physical-fitness test-administration practices. Ten teachers were interviewed to investigate how physical-education teachers helped their students develop a cognitive understanding of the health-related-physical-fitness components relative to fitness testing. Themes emerged for each of the four research questions. Additional findings also were presented.

Research question one asked, how do physical-education teachers describe their physical-fitness-test- administration practices? Research question two asked, how do physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components? Research question three asked, prior to physical-fitness testing, to what extent do physical-education teachers develop their students' cognitive understanding about the health-related physical-fitness components? Research question four asked, after physical-fitness testing, to what extent do physical-education teachers interpret test results to their students? A summary of the results for each research question is found in Table 22.

Additional findings of the study included the following: first, the teachers received minimal training to conduct the CaPFT; second, during the interviews, the teachers described several test-administration errors; third, most of the teachers did not have a positive attitude about the CaPFT and would not continue to conduct the test if it was not mandated by the State of California.

Table 22
Summary of the Results for Each Research Question

Research Question	Summary of the Results
1	The teachers chose similar tests to administer but varied the methods they used to conduct the tests. Most of the teachers had the students involved in test administration by having the students count and watch for form breaks. Most of the teachers found grading to very motivating and included fitness testing into the students' grades.
2	The teachers who had access to a classroom were more likely to conduct in-depth instruction about health-related fitness. The teachers reported that the students received instruction about the Healthy Fitness Zones (HFZ) and knew the score they needed to get to be in the HFZ.
3	All of the teachers had the students practice the test protocols. The teachers gave various instructions about the purposes of the CaPFT, but none of the teachers reported discussing with their students that the purpose of the test was to promote a physically-active lifestyle. Most of the teachers reported that they did not alter the curriculum prior to test administration.
4	Only half of the teachers reported giving the students their test results after test administration. If an explanation of the test results was given, the explanation was typically brief. Half of the teachers reported altering the curriculum after test administration to improve areas where the students had scored low.

CHAPTER V
SUMMARY, LIMITATIONS, DISCUSSION, RECOMMENDATIONS,
AND CONCLUSIONS

Physical-fitness testing is mandated by the State of California, and the California Physical Fitness Test (CaPFT) is used to test all public school students in grades five, seven, and nine (California Department of Education, 2007). The CaPFT is a criterion-referenced test based on the FITNESSGRAM® test battery to assess the student's health-related-physical fitness. As a standardized test, the CaPFT requires accurate and consistent test administration by the teachers if the test is to be a valuable assessment of physical fitness.

The primary purpose of the FITNESSGRAM® is to motivate students to be physically active (The Cooper Institute, 2007). A physically-active lifestyle is important for many reasons, such as, decreasing the risk for certain diseases (e.g., cardiovascular disease, diabetes, obesity), improving cardiovascular and muscular fitness, and reducing stress (Roberts, 2000; Rowland & Freedson, 1994; U.S. Department of Health and Human Services [USDHHS], 2007). If the goal of promoting physical activity is to be met, physical-fitness testing needs to be used in conjunction with health-related-fitness instruction. When health-related-fitness instruction is included in the physical-education curriculum, students are more likely to understand the benefits of a physically-active lifestyle and adopt the healthy behavior (Dale & Corbin, 2000; Dale, Corbin, & Cuddihy, 1998; Pearman et al., 1997).

The purpose of this study was to examine teachers' test-administration practices of the CaPFT. Specifically, this study investigated how physical-education teachers

assisted the students to develop a cognitive understanding of the health-related physical-fitness components before and after test administration. Ten physical-education teachers from Central California participated in the study. Five middle-school and five high-school teachers were interviewed about their administration practices of the CaPFT. The participants also were asked to describe how they educated their students before and after administering the CaPFT to examine how the teachers helped the students to develop a cognitive understanding of the health-related physical-fitness components. This chapter includes the following: summary of the results, limitations, discussion, recommendations for practice, recommendations for future research, and conclusions.

Summary of the Results

Three themes emerged from each of the four research questions and from the additional findings of the study. The research questions include the following:

1. How do physical-education teachers describe their physical-fitness-test-administration practices?
2. How do physical-education teachers help their students develop a cognitive understanding of the health-related physical-fitness components?
3. Prior to physical-fitness testing, to what extent do physical-education teachers develop their students' cognitive understanding about the health-related physical-fitness components?
4. After physical-fitness testing, to what extent do physical-education teachers interpret test results to their students?

In Table 23, I identified the themes that emerged from the data analysis for the four research questions.

The teachers described how they administered the CaPFT. There was little variation in the tests the teachers chose to administer, but the methods the teachers used to conduct the tests differed. The tests were administered individually, in small groups, and in large groups. Most of the teachers had the students involved in test administration to some extent that mostly included counting and watching for form breaks. The teachers expressed frustration about managing the class during test administration, especially for those with large class sizes. The teachers described various ways to occupy the students that included having them involved in other games or activities or by having them sit and wait for their turn. All of the middle-school teachers included fitness testing into the students' grades and found grades to be very motivating. Responses about grading and fitness testing for the high-school teachers varied.

Table 23
Emergent Themes for the Research Questions

Research Question	Themes
1	Test-administration methods Student involvement during test administration Inclusion of fitness-test scores in students' grades
2	Classroom availability Instruction about health-related fitness Explanation to the students about the Healthy Fitness Zones
3	Practice of CaPFT protocols Instructions about the test purposes Changes in the curriculum before test administration
4	Who received the test results Explanation of test results Changes in the curriculum after test administration

An investigation was conducted of how the teachers aided their students in developing a cognitive understanding of the health-related physical-fitness components. None of the high-school teachers had a classroom available for them to use and indicated that they did not give specific health-related instruction to the students. Four of the

middle-school teachers had access to a classroom with three of those teachers reporting that they used it in order to provide specific instruction about health-related fitness. The teachers who had access to a classroom were the teachers who offered specific health-related-fitness instruction to their students. The teachers were asked to describe their students' knowledge of the Healthy Fitness Zones (HFZ). All but one of the teachers reported that their students had knowledge of the HFZ but found that the students only strived to reach the HFZ and did not try to exceed it.

The participants explained the instructions they gave to their students about the CaPFT prior to the test. All of the teachers reported practicing for the CaPFT at least somewhat. The middle-school teachers were more likely to provide extensive practice of test protocols. For instructions about the purposes of the tests, the participants' responses varied. Most of the teachers reported describing the importance of physical fitness and health, but only three of the teachers specifically addressed the health-related-fitness components. None of the teachers' instructions to the students about the test purposes included explanations about motivating them to be physically active, the intended purpose of the test. Most of the teachers reported that they did not change the curriculum prior to test administration. The middle-school teachers, who were less likely to alter the curriculum, said they did not change the curriculum prior to administering the CaPFT because fitness instruction was already a large part of their curriculum.

The teachers were asked to describe how they explained and interpreted the test results after the CaPFT was administered. Many of the teachers were unsure as to whether or not the parents received the test scores. Only half of the teachers reported giving the test results to the students with the middle-school teachers being more likely to

provide test scores to the students. For the teachers who did give the test results to the students, the explanation of the results was brief. None of the teachers described giving complete, individualized instruction of test results to the students. After the CaPFT was administered, less than half of the teachers described altering the curriculum based on the test results. For the teachers who did alter the curriculum after administering the CaPFT, the changes were made to increase the areas where the students had scored low.

Additional findings of the study include the following: lack of teacher training for test administration, incorrect test administration, and teacher attitudes. Most of the teachers received minimal or no training to administer the CaPFT. Of the teachers who did receive training, the training was obtained voluntarily and outside of the school setting (i.e., workshops, conferences). All of the teachers reported receiving written materials about CaPFT protocols and procedures. Several test-administration errors were described by the teachers during the interviews. The test most frequently administered incorrectly was the trunk lift. Teachers' attitudes about physical-fitness testing varied with several teachers reporting a negative attitude toward the test. Although most of the teachers reported that they would continue to conduct physical-fitness tests if they were not mandated by the State, they did not think they would continue to administer all of the tests in the FITNESSGRAM® test battery.

Limitations

There are several limitations to the proposed study. First, the sample size of the study was small, with 10 teachers participating in the study. Second, the geographical area where the participants teach is a weakness of the study. All of the participants teach physical education within a small geographical area in the Central Valley of California.

This area of California is predominantly rural and suburban so it is possible that participants from other areas of the state (e.g., urban) may yield different results. The small sample size and limited geographical area from which the participants teach indicates that the findings of the study cannot be generalized to all physical-education teachers. Although generalizability is not a primary concern of qualitative research (Miles & Huberman, 1994), it is important to understand how the results relate and apply to other physical educators. Third, the self-selection of the participants is a limitation because the motivation of the participants and nonparticipants are unknown. Finally, because this is a qualitative study, there is an inherent risk of researcher bias. Although the researcher took steps to prevent biases, the data were interpreted by the researcher, who is limited by her experiences and biases in interpreting the data.

Discussion

With the purpose of physical-fitness testing being to promote students to be physically-active, this study investigated how teacher practices of physical-fitness testing might help accomplish this goal. The purpose of this study was to examine physical-education teachers' physical-fitness test-administration practices and how they helped their students develop a cognitive understanding of the health-related physical-fitness components relative to physical-fitness testing. This section includes a discussion of the study. Important findings of the study are discussed as they relate to each of the four research questions and to the additional findings.

Research Question 1

The CaPFT is based on the FITNESSGRAM® test battery that includes six test categories with a total of 13 individual tests (Chapter 1, Table 1). The teachers have

choices for the tests they administer for four of the six test categories. In the categories where there are choices, there was little variation in the tests the teachers chose to administer. For aerobic capacity, all of the teachers chose to administer the one-mile run test. Only two teachers administered the PACER test, but it was administered in addition to the one-mile run. The PACER test is the recommended test for aerobic capacity in the FITNESSGRAM®. The tests was first published in 1982 (Leger & Lambert, 1982) and revised in 1988 (Leger, Mercier, Gadoury, & Lambert, 1988) and is a relatively new assessment of aerobic capacity. The PACER test involves running across a 20-meter distance for as long as possible. As the test progresses, the time the student has to complete a lap gets shorter. The students are scored on the number of laps completed. Reasons why the PACER test is the recommended test for aerobic capacity is because it increases the likelihood that the students will have a positive experience performing the test, pacing skills are learned, and the students are rewarded for running the longest (The Cooper Institute, 2007). The teachers may not be administering the PACER test because they are not familiar with the test. Run tests have been used in physical-education for many years, but the PACER test is a relatively new test so the teachers may not be comfortable using it as an assessment of aerobic capacity.

For body composition, one of the teachers chose to conduct Bioelectrical Impedance Analysis (BIA) with the remaining teachers measuring Body Mass Index (BMI). None of the teachers reported that they conducted skinfold measurement. Male teachers especially appeared to be reluctant to measure skinfold because it involves “touching students.” Skinfold measurement is time consuming and requires the test administrator to practice the test protocol in order to conduct the test accurately. The BIA

method requires careful attention to the student's hydration as it is an estimate of the body's resistance to current flow (The Cooper Institute, 2007). Because it is difficult to regulate the students' hydration levels to the extent needed for accurate results, the BIA is not recommended in most testing situations (American College of Sports Medicine, 2000). BMI is an estimate of body fatness based on a person's height relative to their weight (American College of Sports Medicine) and is much easier to administer because it only requires a measurement of height and weight; however, in order to determine the actual BMI, simple calculations must be performed. Many of the teachers did not calculate BMI to determine if the students were in the HFZ. When the teachers report the scores to the State, they are only required to enter in the height and weight; therefore, many of the teachers did not calculate the students' BMI. They simply entered in the height and weight and moved on to the next test without determining if the student was in the HFZ or not. Many of the teachers failed to give the students feedback about this test. It is important that the test results are explained to the students so they can develop a cognitive understanding about body composition and how it relates to the test results. It also must be noted that, although BMI is a test option for body composition, it is not a measure of body composition but simply an estimate of body fatness based on height relative to weight. Even though BMI is not a measure of body composition, it is a commonly used to assess obesity because BMI is highly correlated with body fat (Wang & Beydoun, 2007).

When giving students their test results for body composition, it is important to provide a thorough explanation and how their results relate to their health because

childhood and adolescence are an ideal time to develop healthy habits (Wang & Beydoun, 2007).

Children who practice healthy habits (e.g., proper nutrition, regular physical exercise) are more likely to continue the habits into adulthood (Dennison, Straus, Mellits, & Charney, 1988; Raitakan et al., 1994; Twisk, Kemper, & Van Mechelen, 2000; Wang & Beydoun). When students understand how the behaviors relate to their health, they are more likely to adopt the healthy behaviors (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997).

The curl-up and the trunk lift tests are required for all of the students in the abdominal strength and trunk strength categories, respectively. For upper-body strength, all of the teachers reported administering the push-up test instead of one of the other two tests in that category: the modified pull-up or the flexed-arm hang. In the FITNESSGRAM® test battery, the 90° push-up is the recommended test for upper-body strength (The Cooper Institute, 2007). An advantage of the push-up test is that it requires little or no equipment to conduct the test. Equipment is needed to conduct the modified pull-ups and flexed-arm hang. Not all of the schools have pull-up bars to administer the modified pull-up and flexed-arm hang; therefore, the pull-up test appears to be a more practical test choice for the teachers.

For flexibility, the back-saver sit and reach test was administered the most frequently with only a few teachers choosing to administer the shoulder stretch. It is not clear why the teachers chose the back-saver sit and reach instead of the shoulder stretch. The back-saver sit and reach requires equipment and individual administration unlike the shoulder stretch that does not require equipment and can be administered in large groups.

It is possible the teachers are administering the back-saver sit and reach because it is a test they are more familiar with administering.

Teachers have choices as to which test they are going to administer, but there was little variation for the tests they chose to administer. All of the teachers administered the one-mile run and push-up tests for the aerobic capacity and upper-body strength categories, respectively. All but one teacher administered the BMI for body composition. Most of the teachers chose to administer the back-saver sit and reach for flexibility. Even though there were other tests for the teachers to choose from, the teachers tended to choose certain tests to administer. The teachers always chose to administer the tests that were more familiar to them, and for all but one of the test categories, the teachers preferred to conduct the tests that were easier to administer. Because the teachers expressed concern over the amount of time it took to administer the tests, they chose the tests that required less equipment and could be administered in large groups. This was not the case, however, for flexibility where the teachers chose to administer the back-saver sit and reach instead of the shoulder stretch. It is possible the teachers chose the back-saver sit and reach simply because it is a more familiar test. Sit and reach tests have commonly been a part of fitness-test batteries, and therefore, a test the teachers would be more familiar with administering than other flexibility tests.

The FITNESSGRAM® recommends tests for three of the test categories. The PACER test is recommended for aerobic capacity, skinfold measurement is recommended for body composition, and the 90° push-up test is recommended for upper-body strength (The Cooper Institute, 2007). The push-up test was the only recommended test that was administered the most frequently. Only two of the teachers reported

administering the PACER test, and none of the teachers indicated that they conducted skinfold measurement. This study did not investigate why the teachers chose to administer certain tests. It would seem as though the teachers would choose tests that were easier to administer but this was not the case for flexibility where the teachers chose to administer the back-saver sit and reach more frequently than the shoulder stretch. Instead, it appeared that familiarity with the tests was more of a determining factor for the tests the teachers chose. Perhaps if the teachers received training for test administration, they would be more comfortable to administer the recommended tests, such as, the PACER test and skinfold measurement.

The teachers described various methods for administering the tests. The tests were administered individually, in small groups, or in large groups. The tests for aerobic capacity were mostly administered in large groups, whereas all of the other tests primarily were administered individually or in small groups. Because many of the tests needed to be administered individually or in small groups, the teachers expressed frustration about what to do with the rest of the class while they administered the CaPFT. Class management was especially a concern for the teachers with large class sizes. The teachers described managing the rest of the students in various ways during testing. Some teachers had the students involved in another activity during testing whereas other teachers had the students sit and wait for their turn. Effective physical education involves providing the students with a lesson that is well planned and involves students being active a majority of class time (Kovar, Combs, Campbell, Napper-Owen, & Worrell, 2009). The CaPFT requires individual-test administration that requires the students to sit and wait for their turn, contradicting effective physical-education teaching practices, and

is especially a problem for teachers with large classes. Several of the teachers had class sizes over 50 students. Having to manage so many students while only being able to test a few students at a time is reason for concern. If teachers are required to conduct tests that primarily involve individual and small-group administration, the State must provide the teachers with logical solutions for managing their classes during testing.

The practice of using fitness-test scores as part of the students' grades or toward earning awards has been discouraged if too much emphasis is placed on the product (e.g., scores) rather than on the process (e.g., improvement) of fitness (Harris & Cale, 1997; 2006). The teachers were asked if the students' grades were included in their CaPFT scores. Most of the teachers responded that fitness-test scores were included to some extent in the students' grades and described that students were more motivated to perform well if the fitness scores were included in their grades. Even though research (Harris & Cale) has not supported this practice, the teachers reported these methods to be very motivating for the students.

Research Question 2

The teachers were asked to describe how they helped their students to develop a cognitive understanding of the health-related physical-fitness components. Physical fitness lacks value if teachers fail to educate the students about health-related fitness (Keating & Silverman, 2004a). Flohr and Williams (1997) examined the effects the physical-education curriculum had on student knowledge of physical fitness and attitudes toward physical-fitness testing. The results indicated that the physical-education teacher failed to make a connection between the activities performed during physical-education class and physical fitness leading to a negative attitude toward physical-fitness tests.

Perhaps if the students were educated about how physical fitness relates to fitness activities and physical-fitness testing, the students would have a more positive attitude toward physical-fitness testing and promote a physically-active lifestyle. If students understand the value of a physically-active lifestyle, they are more likely to engage in the healthy behavior (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997). Not only is physical activity important for decreasing risk for disease, studies have indicated that students who are more physically active perform better academically (Kahn, 2002). Studies have indicated that students are more likely to perform well academically when they are physically active and have a high level of physical fitness (California Department of Education, 2005; Castelli & Williams, 2007).

The teachers were asked if they had a classroom available for them to conduct instruction. None of the high-school teachers had a classroom available for them to use. Four middle-school teachers had access to a classroom, and three said they used the classroom to conduct instruction, but one did not. The teachers also were asked to describe the instruction they provided about health-related fitness. If the teachers did not have access to a classroom, they reported that they did not give specific health-related instruction. For those teachers, the only instruction given to the students about health-related fitness was unplanned and given in small increments from time to time. Only the teachers who had a classroom available, conducted planned, in-depth instruction about health-related fitness. Even though all the teachers made some effort to incorporate health-related instruction, it appeared that access to a classroom increased the likelihood that the teachers would provide planned, specific health-related instruction to the students.

If physical-fitness tests are to be a valuable assessment, they must be accompanied by health-related-fitness instruction. Physical-fitness tests have little meaning when they are administered simply to obtain a score and when the teachers fail to educate the students about health-related fitness and the importance of a physically-active lifestyle (Keating & Silverman, 2004a). Studies are limited on the relationship between health-related-fitness instruction and physical activity; however, three studies (Dale & Corbin, 2000; Dale et al., 1998; Pearman et al., 1997) have examined the relationship between health-related-fitness instruction and physical activity. These studies all indicated that, when health-related-fitness instruction is provided, a physically-active lifestyle is more likely to be adopted. If the purpose of physical-fitness testing, to promote a physically-active lifestyle, is to be accomplished, it is imperative that teachers provide health-related instruction to their students and how it relates to physical-fitness testing. When health-related-fitness instruction is provided, the students are more likely to understand the benefits of physical fitness and adopt the behavior (Dale & Corbin; Dale et al.; Pearman et al.).

Research Question 3

To examine more specifically the instructions the students received before test administration, the teachers were asked to describe how the students were prepared for the tests. The CaPFT includes specific test protocols that are important for students to practice prior to test administration (Harris & Cale, 2006; The Cooper Institute, 2007). All of the participants responded that the students had some practice for test protocols prior to the test. This is consistent with the Harris and Cale study that found most of the teachers studied reported helping the students to prepare for the tests. The one-mile run,

BMI, trunk lift, and back-saver sit and reach have specific test protocols but do not require practice for the test itself. The curl-up and push-up tests, however, do have specific test protocols that require a considerable amount of practice for the students to become familiar with the cadence required for the tests. The teachers reported having the students practice the curl-up and push-up tests most often. Even though the test protocols were not always practiced frequently, the teachers appeared to have the students perform fitness activities (e.g., push-ups, curl-ups) during the warm-ups to help train for the CaPFT. Most of the teachers described having the students do variations of push-ups and curl-ups during the daily warm-ups to prepare for the CaPFT. Doing push-ups and curl-ups on a regular basis should increase physical fitness in those areas, thereby improving the students' test scores in these areas. Performing the test protocols daily could improve the test scores, but it is possible the teachers had the students perform variations of push-ups and curl-ups to make the exercises more interesting.

Because the purpose of the CaPFT is to promote physical activity, the teachers were asked to describe the instruction they gave their students about the test purposes. The teachers' responses varied, with most of them including a discussion about the importance of health and physical fitness. Only three of the teachers specifically addressed the health-related physical-fitness components when discussing the test purposes. When the teachers described the instruction given to the students about the test purposes, none of the teachers included discussions about the tests motivating the students to be physically active. When the participants specifically were asked if they thought the test motivated the students to be physically active, a few of the teachers responded that they thought it might be motivating for some of the students, but the

teachers did not think they were motivating for most, if any, of the students. Whitehead and Corbin (1991) examined the relationship between external feedback statements during testing and intrinsic motivation to be physically active. The study indicated that students were more intrinsically motivated to be physically active when they received positive feedback statements during physical-fitness testing. If the purpose of the tests is to motivate students to be physically active, it is important to consider how the tests are administered. When teachers have a good attitude about the tests and present them in a positive way, the students are more likely to adopt a physically-active lifestyle.

Even though the purpose of the FITNESSGRAM® is to encourage students to be physically active, the teachers clearly did not think that it accomplished that goal. If the teachers receive more training about physical-fitness-test administration, they would better understand the purposes of the tests. When the teachers have a better understanding of the tests, they will be more equipped to educate the students, increasing the likelihood that a physically-active lifestyle will be adopted.

Research Question 4

The teachers were asked to describe how the test results were interpreted to the students. If the students have the opportunity to learn from the tests and how they related to physical fitness, an investigation of how the test results are given to the students is important. The State collects the test results and reports them on the Internet. It is the teachers' responsibility to provide the students with their individual test results. The teachers are mandated by the State to give the test results to the students after completing the CaPFT (Education Code Section 60800). Only half of the teachers reported giving the test results to the students. Two high-school teachers reported telling the students their

test results. The CaPFT results for high-school students are especially important because it can impact their class schedule. Ninth-grade students who pass five of the six test categories may be exempt from a second year of physical education (Education Code Section 51241). When the students do not receive their test results, it may be difficult to plan their tenth grade class schedule because they do not know if they will be required to take a second year of physical education.

If the teachers are not giving the test results to the students, an explanation of the test results is absent as well. When the students do not know the test results, it is impossible for them to understand how the tests relate to their own fitness. Several of the teachers reported that they were frustrated by the system because they did not receive the test result until the next year; however, if the teachers are conducting the tests, why do they need to wait to receive the test results? If they are the ones administering the tests, they should be able to determine the test results immediately by looking up the scores on a HFZ chart to determine if the students passed or not. The only test that requires an additional step is the BMI because that needs to be calculated before looking it up on the HFZ chart. Most of the teachers reported that their students knew their HFZ. Perhaps the students could be more involved by looking up their scores and learning how to read the HFZ charts. The teachers should be able to give the students their scores immediately. It is not necessary for them to have to wait to receive the test results from the district.

By providing the results to the students and explaining what the results mean can help increase the students' cognitive understanding of health-related fitness and how it relates to the CaPFT (Harris & Cale, 2006). Unfortunately, the teachers are not giving the students specific instruction about their test results. Half of the teachers described giving

the students some explanation of the results, but the other half gave no explanation to the students about their test scores. One teacher did not even know what the HFZ were so he simply administered the tests with absolutely no feedback given to the students. If the students are going to understand the health-related fitness components and how they relate to their person fitness, the results need to be explained more completely. Only then will the goal of physical-fitness testing, to promote a physically-active lifestyle, be accomplished (Harris & Cale; Pate, 1991).

The physical-education curriculum can play a vital role in promoting physical activity among students (Kahn, 2002; Naughton, Carlson, & Greene, 2006). I wanted to investigate if changes occurred in the physical-education curriculum before and after CaPFT administration. Prior to test administration, the teachers were asked to describe if they altered the curriculum in preparation for the test. Most of the teachers said that they did not change the curriculum before administering the test. The middle-school teachers in particular stated that they already incorporated fitness into their curriculum so they did not include more fitness instruction prior to administering the test. Two of the high-school teachers described incorporating more fitness activities into the warm-up in preparation for the test, especially in areas they thought were weaker for the students. After the tests, less than half of the teachers said they altered the curriculum based on the test results. Physical-fitness testing should be used as a stratification tool to educate students and improve the areas of fitness that need to be improved. Instead, a majority of the teachers tested the students but paid little attention to the results. For most of the teachers, the CaPFT was conducted simply to complete the State requirement. Little if anything was done with the results to educate the students or increase fitness activities in

areas that were weaker. Only one of the high-school teachers reported altering the curriculum after the CaPFT. The middle-school teachers were more likely to change the curriculum to improve specific areas.

Additional Findings

An additional finding of the study was that teachers received little training for administering the CaPFT. If the State expects the teachers to conduct a standardized test, it should ensure that the teachers are trained so the tests may be administered in a standardized way. The teachers who had received the most training for physical-fitness-test administration sought out training on their own through conferences and workshops. A few of the teachers received training when the test was first mandated in 1998 but have not received training since that time. The teachers all reported receiving written information about test protocols and procedures, but it was apparent that most of the teachers did not read the materials very carefully. The lack of teacher training and knowledge of proper test protocols was evident during the interviews as half of the teachers described administering tests incorrectly. Examining test-administration errors was not a purpose of the study; but during the interviews the teachers' comments indicated that they were in error in administering the tests, and it is very possible that more errors exist but were not mentioned. The FITNESSGRAM is a standardized test that requires for it to be administered in a standardized way; therefore, it is imperative that the teachers receive training on how to administer the tests correctly so the incidence of CaPFT test-administration errors can be reduced and the reliability and validity of the tests can be increased (The Cooper Institute, 2007).

Another finding of the study related to the teachers' attitudes about physical-fitness testing. Several teachers described unfavorable attitudes toward the CaPFT. Most of the participants expressed negative opinions about one or more of the individual tests with the CaPFT battery. When the teachers were asked if they would continue to conduct the tests if they were not mandated by the State, most of the teachers said they would continue to conduct physical-fitness tests, but they would not continue to conduct all of the tests in the CaPFT battery. Ferguson, Keating, Bridges, Guan, and Chen (2007) and Keating, Silverman, and Kulinna (2002) found that teachers' attitudes toward physical-fitness tests were only slightly positive. Perhaps if the teachers were better trained in physical-fitness-test administration and how the tests relate to health-related fitness, their attitude about the tests might be improved. Teacher attitudes about physical-fitness testing can influence how they approach the testing process. If teachers value fitness testing, they are more likely to present the tests in a positive way. Physical-fitness-test training could help the teachers to be more familiar with the tests making them more likely to present the tests in a positive way.

Several of the teachers said they preferred the Presidential Physical Fitness Test. Keating and Silverman (2004b) studied fitness testing practices of a national sample and found the Presidential Physical Fitness Test to be administered the most frequently. Although the philosophy of physical-fitness testing has shifted away from norm-referenced tests (e.g., Presidential Physical Fitness Tests) that compare students to each other, several of the teachers said that they liked the fact that the tests were norm-referenced. They reported that the students liked seeing how they compared with other students and that it was motivating for them. Additionally, the teachers considered a

disadvantage of the CaPFT to be that it was a criterion-referenced test. Many of the teachers reported that the students would only try to pass the test and did not try to get their highest maximum score. The students would simply stop once they reach the HFZ and did not try to achieve beyond it. The teachers reported various methods for motivating students to do their best but had difficulty motivating the students to achieve beyond a passing score. Positive feedback statements given during testing can be motivating for the students (Whitehead & Corbin, 1991). The teachers in my study did think that students were motivated when they were able to compare their scores with other students and try to achieve a higher percentile ranking.

This study examined physical-fitness-testing practices and how the teachers educated the students about health-related fitness. By studying how teachers conduct the CaPFT, a better understanding of physical-fitness-testing practices in the schools can help improve the value and usefulness of physical-fitness tests.

Recommendations for Practice

This section includes recommendations for practice for the State, districts, schools, and teachers. Most of the tests in the CaPFT battery require individual administration. A recommendation for the State of California is to consider how public school teachers realistically can conduct the tests during their classes when several tests require individual administration. Individual test administration is especially a concern for teachers with large class sizes. During the interviews, the teachers expressed frustration over being able to conduct tests that require individual administration when they have class sizes with up to 60 students. A solution might include providing substitute teachers on test days while the teacher administers the tests or designating

individuals in each district to administer the tests to all of the students. Another recommendation for the State is to make sure the schools are in compliance with the State mandates. The teachers are administering the CaPFT, but there appears to be little consistency in the manner by which the tests are administered. The State mandates that teachers inform the students of their test scores, but half of the teachers in this study were not giving the students their test results. It is important for the State to hold the schools accountable for the tests if it going to be considered a meaningful and useful assessment.

A recommendation for the districts is to provide training for the teachers to ensure proper test administration. During the interviews, it was clear that the teachers did not receive training to administer the tests unless they chose to seek out training voluntarily by attending conferences or workshops. The CaPFT requires specific test protocols, and if it is going to be administered in a standardized way, it is important that the teachers are trained in proper test administration. Another recommendation for the districts is to improve communication with the schools and teachers about test administration. The teachers need to be informed about testing procedures. There appears to be a lack of communication between the districts and the teachers. This study did not investigate how the teachers received information about the CaPFT, but most of the teachers described having minimal knowledge about test-administration procedures and requirements. It is imperative that the districts make certain the teachers have the necessary information about testing procedures so they can administer the tests in a manner in which they are intended to be conducted.

Recommendations for the schools include supporting the teachers in test administration. There are several ways the schools can support the teachers so they can

effectively administer the CaPFT. First, the schools could give the teachers a classroom to use. The study indicated that teachers were more likely to conduct planned, in-depth health-related-fitness instruction if a classroom was available for them to use. Students receiving health-related instruction can increase their understanding of the benefits of being physically active and how it relates to fitness testing. When students receive instruction, they are more likely to adopt a physically-active lifestyle, the intended purpose of the CaPFT. Second, the schools could provide the teachers with assistance for test administration. All of the teachers reported administering the tests by themselves. Because most of the tests require individual or small-group administration, the teachers described difficulty in managing the rest of the class while only a few students were tested. The schools need to consider logical solutions to help the teachers administer the tests, such as providing qualified assistants to help with the class or with test administration. Third, the schools can support the teachers by helping the teachers obtain test-administration training through in-services and workshops. When the teachers are trained and informed about physical-fitness testing, it is more likely the teachers will have a positive attitude about the tests.

For the teachers, a recommendation for practice is to seek training actively about proper fitness-test administration. The CaPFT includes specific test protocols that require test administrators to be trained properly. CaPFT training workshops are available through various organizations and can be valuable for learning how to administer the tests correctly. Because many of the teachers described being underinformed about testing procedures, it is important that the teachers take an active role in obtaining information about testing procedures. Becoming a member of a professional organization

can be an effective way to stay informed in the discipline of physical education. The participants of the study who described recent involvement in professional organizations were the teachers who had received the most training for CaPFT administration. There appeared to be a positive relationship between membership in a professional organization and receiving training for physical-fitness-test administration.

Another recommendation for the teachers is to provide the students with the test results. The State of California mandates that the teachers give the students their test scores after the test is conducted (Education Code Section 60800). Half of the teachers reported that they did not provide the students with their test results. Whitehead and Corbin (1997) examined student motivation and found that the students who receive feedback during the tests were more likely to be physically active. For the tests to be meaningful, it is important that students receive feedback about their test performance. The teachers' reason for not giving the students their test results was because they reported that they did not receive the scores from the State until the next year. If the teachers are conducting the tests and entering the scores on a data sheet, they should be able to provide the students with the test results. Not only is it important for the teachers to inform the students of their test scores, but in order to help the students make the connection between their test results and health-related fitness, it is imperative that the teachers provide specific health-related-fitness instruction. By offering planned, in-depth instruction about health-related fitness, the students can better understand the importance of physical fitness and how it relates to their health. The teachers with access to a classroom were more likely to offer in-depth instruction to their students, but because classroom space is often limited, perhaps instruction can occur in the gymnasium while

the students are sitting on the bleachers. With instruction, students should make the connection between physical-fitness tests and health-related fitness, and then it is more likely the students will have a more positive attitude toward the tests and engage in a physically-active lifestyle (Flohr & Williams, 1997).

Although the State is responsible for legislation regarding fitness testing and physical education requirements, implementation of the laws is the responsibility of the districts, schools, and teachers. Educating the students about physical fitness occurs at all levels. The schools, teachers, and parents need to be proactive in providing opportunities for the students to learn about fitness in order to promote a physically-active lifestyle. These opportunities can occur as an ongoing program throughout the school year, or as a special community event (e.g., Family Fitness Night). There are many ways to promote physical activity, but the schools, teachers, and parents need to play an active role in educating the students about fitness and encouraging the healthy behavior.

Recommendations for Future Research

A majority of the research about physical-fitness testing has focused on the individual tests of physical fitness but is limited to test-administration practices in the schools. Physical-fitness testing is a common practice and deserves more attention by researchers.

The CaPFT includes 13 individual tests of which the teachers are only required to conduct 6 tests, one for each test category; therefore, the teachers have choices in most of the test categories. Future research could examine the tests teachers choose to administer most frequently and *why* they choose to conduct those tests. This study indicated that there are certain tests the teachers chose to administer but an investigation into *why* the

teachers chose to administer certain tests could help increase the understanding about the teachers' practices of physical-fitness-test administration.

This study indicated that teacher training for proper test administration was lacking and that the teachers' comments indicated that test-administration errors had occurred. Perhaps if the teachers were better trained on proper test-administration techniques, the frequency of errors would decrease so the tests could be administered in a more standardized way. An investigation of the relationship between teacher training and test-administration is needed.

Future research examining teacher and student attitudes could provide important information about test-administration practices. Previous research indicates that teachers and students have a neutral or negative attitude toward fitness testing. An investigation of *why* teachers and students have the attitudes that they do would be important to understand so that test-administration policy and procedures could be improved. Additionally, my study indicated that teachers with a negative attitude toward the CaPFT also described their students as having a negative attitude. An examination into the relationship between teacher and student attitudes could increase the understanding about how teachers' attitudes influence students' attitudes.

This study included middle- and high-school physical-education teachers. The CaPFT is also mandated for public school fifth-grade students meaning that elementary-school teachers are administering the CaPFT. Elementary-school teachers are a different population than physical-educations teachers and typically are not trained in physical-fitness testing. The results of physical-education teachers' test practices cannot be

generalized to elementary-school teachers, and therefore, it would be important to examine elementary-school teachers' physical-fitness-test-administration training.

Studying physical-fitness-test-administration practices in the schools is important because it can provide valuable information for improving testing procedures at the State, district, school, and teacher levels. Research in this area can be helpful in improving the physical-fitness-testing procedures that are currently in place so that testing can become a more valuable and useful assessment.

Conclusions

The purpose of this study was to investigate physical-education teachers' practices of administering the CaPFT. Specifically, this study examined how teachers educated students about the health-related fitness components and how they relate to physical-fitness testing. Physical-fitness testing is mandated by the State of California with the purpose of motivating public school students to be physically active. If this goal is to be accomplished, it is important that teachers provide health-related-fitness instruction in conjunction with physical-fitness testing to increase student understanding. Unfortunately, most of the physical-education teachers in this study provided little or no instruction on health-related fitness. In fact, half of the teachers failed to give the test results to the students. Perhaps, if the teachers were provided with more training in physical-fitness-test administration and how to incorporate health-related-fitness instruction into the curriculum, the physical-education teachers could provide more effective test administration, instruction of health-related fitness, and interpretation of test results to the students. When effective test administration, instruction of health-related fitness, and interpretation of test results to the students occurs, physical-fitness testing

may be a valuable assessment leading students to be more likely to adopt a physically-active lifestyle.

REFERENCES

- American College of Sports Medicine. (2000). *Guideline for Exercise Testing and Prescription* (6th ed.). Philadelphia: Lippincott Williams and Wilkins.
- American Psychological Association. (2002). *Ethical Principles and Code of Conduct*. Retrieved March 3, 2007, from <http://www.apa.org/ethics/cod2002.html>.
- Anderson, P. M., & Butcher, K. F. (2006). Childhood obesity: Trends and potential causes. *Future of Children, 16*, 19-45.
- Bailey, R. C., Olson, J., Pepper, S. L., Porszasz, J., Barstow, T. L., & Cooper, D. M. (1995). The level and tempo of children's physical activities: An observation study. *Medicine and Science in Sports and Exercise, 27*, 1033-1041.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Social cognitive theory. In R. Vasta (Ed.), *Annals of child development. Vol. 6. Six theories of child development* (pp. 1-60). Greenwich, CT: JAI Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.
- Biddle, S., Gorely, T., & Stensel, D. J. (2004). Health-enhancing physical activity and sedentary behaviour in children and adolescents. *Journal of Sports Sciences, 22*, 679-701.
- Blair, S. N., Clark, D. G., Cureton, K. J., & Powell, K. E. (1989). Exercise and fitness in childhood: Implications for a lifetime of health. In C. V. Gisolfi & D. R. Lamb (Eds.), *Perspectives in Exercise Science and Sports Medicine* (pp. 401-430). New York: McGraw-Hill.
- Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *Journal of Sports Sciences, 19*, 915-929.
- Butts, F., Heitman, R., & Gilley, W. (1995). The relationship between fitness test scores and activity among fourth grade students. *Education, 115*, 506-508.
- Cale, L., & Harris, J. (2002). National fitness testing for children: Issues, concerns and alternatives. *The British Journal of Teaching Physical Education, 33*, 32-34.
- California Department of Education. (2005). *A study of the relationship between physical fitness and academic achievement in California using 2004 test results*. Retrieved March 3, 2005, from <http://www.cde.ca.gov/ta/tg/pf/documents/2004pftresults.doc>

- California Department of Education. (2007). *Spring 2007 physical fitness test (PFT) preparation manual*. Retrieved March 30, 2007, from <http://www.cde.ca.gov/ta/tg/pf/documents/prepmanual07.pdf>
- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports, 100*, 126-131.
- Castelli, D. M., Hillman, C. H., Buck, S. M., & Erwin, H. E. (2007). Physical fitness and academic achievement in third- and fifth-grade students. *Journal of Sport & Exercise Psychology, 29*, 239-252.
- Castelli, D. M., & Williams, L. (2007). Health-related fitness and physical education teachers' content knowledge. *Journal of Teaching in Physical Education, 26*, 3-19.
- Connaughton, D., & Poor, L. (2000). Assessing and promoting physical fitness in the school setting. *Strategies, 13*, 8-12, 29.
- Corbin, C. B., & Pangrazi, R. P. (1992). Are American children and youth fit? *Research Quarterly for Exercise and Sport, 63*, 96-106.
- Corbin, C. B., Pangrazi, R. P., & Franks, B. D. (2000). *Definitions: Health, fitness, and physical activity*. Washington DC: President's Council on Physical Fitness and Sports. (ERIC Document Reproduction Service No. ED470696)
- Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill Prentice Hall.
- 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*, 61-68.
- Dale, D., Corbin, C. B., & Cuddihy, T. F. (1998). Can conceptual physical education promote physically active lifestyles? *Pediatric Exercise Science, 10*, 97-109.
- Dencker, M., Thorsson, O., Karlsson, M. K., Linden, C., Svensson, J., Wollmer, P., et al. (2006). Daily physical activity and its relation to aerobic fitness in children aged 8-11 years. *European Journal of Applied Physiology, 96*, 587-592.
- Dennison, B. A., Straus, J. H., Mellits, E. D., & Charney, E (1988). Childhood physical fitness tests: Predictor of adult physical activity levels? *Pediatrics, 82*, 324-330.

- Derri, V., Aggeloussis, N., & Petraki, C. (2004). Health-related fitness and nutritional practices: Can they be enhanced in upper elementary school students? *Physical Educator*, *61*, 35-44.
- Dwyer, T., Sallis, J., Blizzard, L., Lazarus, R., & Dean, K. (2001). Relation of academic performance to physical activity and fitness in children. *Pediatric Exercise Science*, *13*, 225-237.
- Education Code Section 51241. (2007). *Student exemptions from high school physical education courses*. Retrieved May 16, 2009, from <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=edc&group=51001-5200&file=51240-51246>
- Education Code Section 60800. (1998). *California physical fitness testing*. Retrieved June 25, 2007, from <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=edc&group=60001-61000&file=60800>
- Etnier, J. L., Salazar, W., Landers, D. M., Petruzzello, S. J., Han, M., & Nowell, P. (1997). The influence of physical fitness and exercise upon cognitive functioning: A meta-analysis. *Journal of Sport & Exercise Psychology*, *19*, 249-277.
- Ferguson, R. H., Keating, X. D., Bridges, D. M., Guan, J., & Chen, L. (2007). California Secondary School Physical Education Teachers' Attitudes Toward the Mandated Use of the Fitnessgram. *Journal of Teaching Physical Education*, *26*, 161-176.
- Flohr, J. A., & Williams, J. A. (1997). Rural fourth graders' perceptions of physical fitness and fitness testing. *Physical Educator*, *54*, 78-87.
- Fox, K., & Biddle, S. (1986). Health related fitness testing in schools: Introduction and problems of interpretation. *Bulletin of Physical Education*, *22*, 54-64.
- Freedson, P. S., Cureton, K. J., & Heath, G. W. (2000). Status of field-based fitness testing in children and youth. *Preventive Medicine*, *31*, S77-S85.
- Groner, J. A., Jashi, M., & Bauer, J. A. (2006). Pediatric precursors of adult cardiovascular disease: Noninvasive assessment of early vascular changes in children and adolescents. *Pediatrics*, *118*, 1683-1691.
- Harris, J., & Cale, L. (2006). A review of children's fitness testing. *European Physical Education Review*, *12*, 201-225.
- Hill, G., & Miller, T. A. (1997). A comparison of peer and teacher assessment of students' physical fitness performance. *Physical Educator*, *54*, 40.
- Hopple, C., & Graham, G. (1995). What children think, feel, and know about physical fitness testing. *Journal of Teaching Physical Education*, *14*, 408-417.

- Kahn, E. B., Ramsey, L. T., Brownson, R. C., Heath, G. W., Howze, E. H., Powell, K. E., et al. (2002). The effectiveness of interventions to increase physical activity. *American Journal of Preventive Medicine*, 22, 73-95.
- Keating, X. D. (2003). The current often implemented fitness tests in Physical Education Programs: Problems and future directions. *Quest*, 55, 141-160.
- Keating, X. D., & Silverman, S. (2004a). Physical education teacher attitudes toward fitness test scale: Development and validation. *Journal of Teaching Physical Education*, 23, 143-161.
- Keating, X. D., & Silverman, S. (2004b). Teachers' use of fitness tests in school-based physical education programs. *Measurement in Physical Education and Exercise Science*, 8, 145-165.
- Keating, X. D., Silverman, S., & Kulinna, P. A. (2001). The development of an instrument measuring preservice physical education teacher attitudes toward fitness tests in schools. *Measurement in Physical Education and Exercise Science*, 5, 219-242.
- Keating, X. D., Silverman, S., & Kulinna, P. A. (2002). Preservice physical education teacher attitudes toward fitness tests and the factors influencing their attitudes. *Journal of Teaching Physical Education*, 21, 193-207.
- Kemper, H. C. G., & Van Mechelen, W. (1996). Physical fitness testing of children: A European perspective. *Pediatric Exercise Science*, 8, 201-214.
- Kovar, S. K., Combs, C. A., Campbell, K., Napper-Owen, G., & Worrell, V. J. (2009). *Elementary classroom teachers as movement educators*. New York: Mc Graw Hill.
- Kraus, H., & Hirschland, R. P. (1954). Minimum muscular fitness test in school children. *Research Quarterly*, 25, 178-187.
- Le Masurier, G. C., & Corbin, C. B. (2006). Step counts among middle school students vary with aerobic fitness level. *Research Quarterly for Exercise and Sport*, 77, 14-22.
- Lee, S. M., Burgeson, C. R., Fulton, J. E., & Spain, C. G. (2007). Physical education and activity: Results from the School Health Policies and Programs Study 2006. *Journal of School Health*, 77, 435-463.
- Leger, L.A., & Lambert, J. (1982). A maximal 20-m shuttle run test to predict VO₂max. *European Journal of Applied Physiology*, 49, 1-12.
- Leger, L.A., Mercier, D., Gadoury, C., & Lambert, J. (1988). The multistage 20 metre shuttle run test for aerobic fitness. *Journal of Sport Sciences*, 6, 93-101.

- Masterson, C., & Walkuski, J. J. (2004). Critical elements and cues [Fitnessgram Part 1]. *Strategies, 18*, 35-38.
- McAuley, E., & Blissmer, B. (2000). Self-efficacy determinants and consequences of physical activity. *Exercise and Sport Science Reviews, 28*, 85-88.
- McKenzie, T. L., & Sallis, J. F. (1996). Physical activity, fitness, and health-related physical education. In S. J. Silverman & C. D. Ennis (Eds.), *Student learning in physical education: Applying research to enhance instruction* (pp. 223-246). Champaign, IL: Human Kinetics.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass Publishers.
- Michaud, P., Cauderay, M., Narring, F., & Schutz, Y. (2002). Assessment of physical activity with a pedometer and its relationship with VO₂max among adolescents in Switzerland. *Soz Präventivmed, 47*, 107-115.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Morrow, J. R. Jr. (2005). Are American children and youth fit? It's time we learned. *Research Quarterly for Exercise and Sport, 76*, 377-388.
- Motl, R. W. (2007). Chapter 2: Theoretical models for understanding physical activity behavior among children and adolescents – Social Cognitive Theory and Self-Determination Theory. *Journal of Teaching Physical Education, 26*, 350-357.
- Naughton, G. A., Carlson, J. S., & Greene, D. A. (2006). A challenge to fitness testing in primary schools. *Journal of Science and Medicine in Sport, 9*, 40-45.
- Ortega, F. B., Ruiz, J. R., Castillo, M. J., & Sjostrom, M. (2008). Physical fitness in childhood and adolescence: a powerful marker of health. *International Journal of Obesity, 32*, 1-11.
- Pangrazi, R. P., & Corbin, C. B. (1993). Physical fitness: Questions teachers ask. *Journal of Physical Education, Recreation & Dance, 64*, 14-19.
- Pate, R. R. (1989). The case for large-scale physical fitness testing in American youth. *Pediatric Exercise Science, 1*, 290-294.
- Pate, R. R. (1991). Health-related measures of children's physical fitness. *Journal of School Health, 61*, 231-233.
- Pate, R. R., Dowda, M., & Ross, J. G. (1990). Association between physical activity and physical fitness in American children. *Sports Medicine, 144*, 1123-1129.

- Pate, R. R., & Shephard, M. D. (1989). Characteristics of physical fitness in youth. In C. V. Gisolfi & D. R. Lamb (Eds.), *Perspectives in Exercise Science and Sports Medicine* (pp. 1-31). New York: McGraw-Hill.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: SAGE Publications, Inc.
- Pearman, S. N., Valois, R. F., Sargent, R. G., Saunders, R. P., Drane, J. W., & Magnusson, P. (1997). The impact of a required college health and physical education course on the health status of alumni. *Journal of the American College of Health*, 46, 77-85.
- Physical Education Association. (1988). Health-related fitness testing and monitoring in schools. *British Journal of Physical Education*, 19, 194-195.
- Piko, B. F., & Keresztes, N. (2006). Physical activity, psychosocial health, and life goals among youth. *Journal of Community Health*, 31, 136-145.
- Plowman, S. A., Sterling, C. L., Corbin, C. B., Meredith, M. D., Welk, G. J., & Morrow, J. R. Jr. (2006). The history of FITNESSGRAM. *Journal of Physical Activity & Health*, 3, S5-S20.
- Raitakan, O. T., Porkka, K., Taimela, S., Telama, R., Raasanen, L., & Vikari, J. S. (1994). Effects of persistent physical activity and inactivity on coronary risk factors in children and young adults: The Cardiovascular Risk in Young Finns Study. *American Journal of Epidemiology*, 140, 195-205.
- Rice, M. H., & Howell, C. C. (2000). Measurement of physical activity, exercise, and physical fitness in children: Issues and concerns. *Journal of Pediatric Nursing*, 15, 148-156.
- Roberts, S. O. (2000). The role of physical activity in the prevention and treatment of childhood obesity. *Pediatric Nursing*, 26, 33-43.
- Rowland, T. W., & Freedson, P. S. (1994). Physical activity, fitness and health in children: A close look. *Pediatrics*, 93, 669-672.
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise*, 32, 963-975.
- Salmon, J., Booth, M. L., Phongsavan, P., Murphy, N., & Timperio, A. (2007). Promoting physical activity participation among children and adolescents. *Epidemiologic Reviews*, 29, 144-159.
- Seefeldt, V., & Vogel, P. (1989). Physical fitness testing of children: A 30-year history of misguided efforts? *Pediatric Exercise Science*, 1, 295-302.

- Sibley, B. A., & Etnier, J. L. (2003). The relationship between physical activity and cognition in children: A meta-analysis. *Pediatric Exercise Science, 15*, 243-256.
- Sirard, J. R., & Pate, R. R. (2001). Physical activity assessment in children and adolescents. *Sports Medicine, 31*, 439-454.
- Shephard, R. J. (1997). Curricular physical activity and academic performance. *Pediatric Exercise Science, 9*, 113-126.
- Shephard, R. J., Lavallee, H., Volle, M., LaBarre, R., & Beaucage, C. (1994). Academic skills and required physical education: The Trios Rivieres experience. *CAHPERJ Research Supplemental, 1* (1), 1-12.
- Steinbeck, K. S. (2001). The importance of physical activity in the prevention of overweight and obesity in childhood: A review and an opinion. *Obesity Reviews, 2*, 117-130.
- Stone, E. J., McKenzie, T. L., Welk, G. J., & Booth, M. L. (1998). Effects of physical activity interventions in youth: Review and synthesis. *American Journal of Preventive Medicine, 15*, 298-315.
- The Cooper Institute. (2007). *FITNESSGRAM/ACTIVITYGRAM test administration manual*. (4th ed.) Champaign, IL: Human Kinetics.
- Thomas, K. T. (2004). Riding to the rescue while holding on by a thread: Physical activity in the schools. *Quest, 56*, 150-170.
- Tremblay, M. S., Inman, J. W., & Willms, J. D. (2000). The relationship between physical activity, self-esteem, and academic achievement in 12-year-old children. *Pediatric Exercise Science, 12*, 312-323.
- Twisk, J. W. R., Kemper, H. C. G., & Van Mechelen, W. (2000). Tracking of activity and fitness and the relationship with cardiovascular disease risk factors. *Medicine and Science in Sports and Exercise, 32*, 1455-1461.
- U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- U.S. Department of Health and Human Services. (2007). *Physical activity and good nutrition: Essential elements to prevent chronic diseases and obesity*. Retrieved January 6, 2008, from <http://www.hsca.com/membersonly/USDHHSlink.htm>

- Wang, Y., & Beydoun, M. A. (2007). The obesity epidemic in the United States – Gender, age socioeconomic, racial/ethnic, and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiologic Reviews*, 29, 6-28.
- Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174, 801-809.
- Welk, G. J., & Wood, K. (2000). Physical activity assessments in physical education: A practical review of instruments and their use in the curriculum. *Journal of Physical Education, Recreation & Dance*, 71, 30-40.
- Whitehead, J. R., & Corbin, C. B. (1991). Youth fitness testing: The effect of percentile-based evaluative feedback on intrinsic motivation. *Research Quarterly for Exercise and Sport*, 62, 225-231.
- Whitehead, J. R., Pemberton, C. L., & Corbin, C. B. (1990). Perspectives on the physical fitness testing of children: The case for a realistic educational approach. *Pediatric Exercise Science*, 2, 111-123.

APPENDIXES

APPENDIX A

Invitation to Participate

November 2008

Dear _____,

You are invited to participate in a research project that I will conduct this year. The research will be used for the purposes of writing a doctoral dissertation at the University of San Francisco's School of Education. Other ways this research might be used is in conference presentations or published professional journal articles.

Through this project, I am interested in exploring physical-education teachers' physical-fitness test administration practices. Physical-fitness testing is mandated in the State of California but how they are being administered in the schools has been researched minimally. I would like to investigate how physical-education teachers administer the California Physical Fitness Test in the schools.

Given my focus, I am requesting your help and permission to interview you one time about you physical-fitness test administration practices. The interviews will be about one hour in length and will be conducted at your school site. I would like to record the interview with your permission. I guarantee that your anonymity will be protected. After the interview is transcribed, it will be stored in an electric file that will be password protected and accessible only by the researcher. You may withdraw from the project at any time, should that prove necessary.

Sincerely,

Susan Eastham

APPENDIX B

Participant's Letter of Consent

UNIVERSITY OF SAN FRANCISCO

CONSENT TO BE A RESEARCH SUBJECT

Purpose and Background

Ms. Susan Eastham, a graduate student at the School of Education at the University of San Francisco, is doing a study on California physical-education teachers' physical-fitness-test practices. Because there is the lack of research on physical-fitness-testing practices in the schools, and the need to promote children to be physically active, the researcher is interesting in exploring physical-education teachers' physical-fitness-test practices.

I am being asked to participate in the study because I am a physical-education teacher and I have conducted physical-fitness tests.

Procedures

If I agree to be a participant in this study, the following will happen:

1. I will complete a short questionnaire giving basic information about me, including age, gender, race, and information about my educational background.
2. I will agree to meet with the researcher for one interview to discuss my physical-fitness-test practices.
3. I will agree to review the analysis of my interview for accuracy of interpretation of my information.

Risks and/or Discomforts

1. It is possible that some of the questions about my physical-fitness-test-administration practices may make me feel uncomfortable or anxious, but I am free to decline to answer any questions I do not wish to answer or stop participation at any time.
2. Participation in research may mean loss of confidentiality. Study records will be kept as confidential as possible. No individual identities will be used in any reports or publications resulting from the study. Study information will be coded and kept in locked files at all times. Only the researcher will have access to the files.

3. Because the time required for my participation may be one hour, I may become tired or bored.

Benefits

There will be no direct benefit for me from participating in this study. The anticipated benefit of this study is a better understanding of physical-education teachers' physical-fitness-test practices.

Costs/Financial Considerations

There will be no financial costs to me as a result of taking part in this study.

Payment/Reimbursement

I will not receive payment for participating in this study.

Questions

I have talked with Ms. Susan Eastham about this study and have had my questions answered. If I have further questions about the study, I may call her.

If I have any questions or comments about participation in this study, I should first talk with Ms. Eastham. If for some reason I do not wish to do this, I may contact the IRBPHS, which is concerned with protection of volunteers in research projects. I may reach the IRBPHS office by calling 415-422-6091 and leaving a voicemail message, by e-mailing IRBPHS@usfca.edu, or by writing to the IRBPHS, Department of Psychology, University of San Francisco, 2130 Fulton St. San Francisco, CA 94117-1080.

Consent

I have been given a copy of the "Research Subject's Bill of Rights," and I have been given a copy of this consent form to keep.

PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study, or to withdraw from it at any point. My decision as to whether or not to participate in this study will have no influence on my present or future employment status.

My signature below indicates that I agree to participate in this study.

Participant's Signature

Date of Signature

Signature of Person Obtaining Consent

Date of Signature

APPENDIX C

Principal's Letter of Consent

(Date)

Dear (principal's name),

My name is Susan Eastham and I am currently a doctoral candidate in the School of Education at the University of San Francisco. As part of the degree requirements, I am doing a study on physical fitness testing practices in the schools. (Teacher's name) has expressed an interest in participating in my study.

Through this project, I am interested in exploring physical-education teachers' physical-fitness test-administration practices. Physical-fitness testing is mandated in the State of California but how they are being administered in the schools has been researched minimally. I would like to investigate how physical-education teachers administer the California Physical Fitness Test in the schools.

Participation in this study is entirely voluntary and results will be kept confidential and anonymous. Your signature on the enclosed consent letter indicates that you acknowledge and authorize the research that is to be conducted with the permission of the physical education teacher on school grounds. Please sign the letter and return it in the pre-addressed, stamped envelope.

Sincerely,

Susan Eastham

Consent

My signature below indicates that I acknowledge and authorize Susan Eastham to interview (teacher's name) about their physical fitness test practices. I give permission for this interview to be conducted on school grounds. Please sign this letter and return it in the pre-addressed, stamped, envelope.

Signature: _____

Date: _____

APPENDIX D

Demographic Questionnaire

Physical-Education Teacher Demographic Information

Please fill in your contact information below

Name: _____ Date: _____

Home Address: _____

Home phone: _____ Cell: _____ email: _____

School at which you currently teach: _____

School District and location (city): _____

Place a check mark next to the option that best indicates your answer

Indicate your gender. Male Female

Indicate your age category 21-25 26-30 31-39 40-49 50-59 >60

Indicate your ethnicity

Indicate your years of teaching experience 1-2 years

3-5 years

5-10 years

10-20 years

20+ years

Grade level you currently teach Elementary

Middle school

High school

Which of the following best describes your teaching position?

Classroom Teacher

Physical Education Specialist

Other, please specify _____

APPENDIX E

Interview Protocol

Interview Protocol

PROJECT: California Physical-Education Teachers' Physical-Fitness-Test
Administration Practices

Time of Interview:

Date:

Place:

Interviewee:

Position:

DESCRIBE THE PROJECT

a) *Study purpose* – The purpose of this study is to examine physical-education teachers' physical-fitness-test-administration practices.

b) *Data being collected* – I will ask you a variety of questions related to your test administration practices. Please answer the questions openly and honestly. Your responses will be recorded.

c) *What will be done with the data to protect the confidentiality* – After the interview the recording will be transcribed. I will send you the transcription of the interview for you to verify that your answers are accurate.

d) *Interview length* – This interview should be approximately one hour.

SIGN THE CONSENT FORM

“I have your permission to record the interview so I will now be turning on the recorder.”

TURN ON THE RECORDER

QUESTIONS:

1.) **Tell me about your teaching position here at (name of school).**

- How many years of teaching experience do you have?
- What grades do you teach?
- How big are your classes (e.g., number of students per class)?
- How long are your class periods?
- How often do the students have physical education class (e.g., daily)?

2.) Tell me about your experiences in administering the California PFT.

- What training did you receive in California PFT administration? (e.g., How were you prepared to administer the California PFT?)
- How many times have you administered the California PFT?
- How many times a year do administer the California PFT?
- Do the students practice testing protocols prior to test day? If so, how often?
- Does anyone assist you in test administration? (e.g., administrators, teacher's aides, parents, etc.)
- Are the students involved in test administration? If so, how?

3.) Tell me how the students are prepared for physical-fitness testing.

- Prior to physical-fitness testing, what do you tell the students about the tests? For example, do you discuss the purposes of tests?
- Prior to physical-fitness testing, do the students receive specific information or instruction about health-related physical fitness (i.e., cardiovascular endurance, muscular strength and endurance, flexibility, and body composition). Please explain.
 - How is this instruction conducted (e.g., classroom instruction, during physical education lessons)?
 - How much time is spent on this instruction?
- Prior to physical-fitness testing, do you alter the curriculum to accommodate the tests? For example, do you spend more time on developing any of the physical fitness components prior to test day? (e.g., cardiovascular endurance, abdominal strength, etc.)

4.) Tell me about the procedures you use in reporting and interpreting test results to the students.

- Who receives the test results? (e.g., students, parents)
- Through what means are the test results given? (e.g., verbally, in writing)
- Are the test results interpreted or explained to the students? If so, how?
- How do the students respond to the test results?
- After physical-fitness testing, is the physical-education curriculum ever modified based on the test results? (e.g., If a large percentage of the students score low on upper body strength do you incorporate upper body strength development in successive physical-education lessons?)

5.) Do you think physical fitness testing helps motivate students to be more physically active?**6.) Would you continue to conduct physical-fitness tests if they were not mandated by the state? Why or why not?**

THANK YOU

APPENDIX F

Coding Sheet

CODING SHEET

D (DESCR = descriptive information)

YRT = years of teaching experience

GRT = grades currently teaching

CS = class size

CL = class length

GRA = grades tested

XAD = number of times the teacher has administered the test

XYR = number of times the tests are administered per year

AST = assistance in test administration

OTHT = other tests administered

TR = teacher training to administer the CaPFT

PC = test practices (Research Question #1)

AC = aerobic capacity

BC = body composition

ABS = abdominal strength

TS = trunk strength

UBS = upper body strength

FLX = flexibility

OST = what the students are doing when others are being tested

STUD = student involvement in test administration

GR = is fitness testing part of their grade?

COG = cognitive (Research Question #2)

ACL = access to classroom

HRIN = health-related-fitness instruction

HFZ = knowledge of healthy fitness zone

PE = before test administration (Research Question #3)

PTC = Do the students practice test protocols? How are they prepared for the tests?

PUR = What are the students' told about the test purposes?

CURRB = altering the curriculum prior to test administration

PO = after test administration (Research Question #4)

WHO = Who receives the test results?

HOW = how the test results are given (e.g., verbal, written)

SUBM = how the results are submitted (e.g., Scantron)

EXPL = explanation given to students regarding test results

RESP = how the students respond to the test results

CURRA = altering the curriculum after test administration

M (Miscellaneous or Additional Findings)

PTMOT = Does physical-fitness testing motivate the students to be physically active?

CONT = Would you continue to administer the CaPFT if it was not mandated?

ISS = issues with testing

STATT = student attitudes

TATT = teacher attitudes

STMOT = student motivation (e.g., only trying to get to HFT; awards)

OCURR = overall curriculum

APPENDIX G

Meta-Matrix

Partially-Ordered Meta-Matrix

	PC	COG	PE	PO
Interviewee 1				
Interviewee 2				
Interviewee 3				
Interviewee 4				
Interviewee 5				
Interviewee 6				
Interviewee 7				
Interviewee 8				
Interviewee 9				
Interviewee 10				
Interviewee 11				
Interviewee 12				

Revised from Miles & Huberman, 1994

APPENDIX H

Data Summary Table

Data Summary Table

Variables	Responses
PC	
COG	
PE	
PO	

Revised from Miles & Huberman, 1994