A correlation between motivation and test scores on the fitnessgram

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A CORRELATION BETWEEN MOTIVATION AND TEST SCORES ON THE FITNESSGRAM

A Project
Presented to the Faculty of California State University, San Bernardino

In Partial Fulfillment of the Requirements for the Degree Master of Arts in Education: Kinesiology

by Kenya Kristofer Quiros
June 2008
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Date 6/2/08
ABSTRACT

This study involved an in-depth look at motivational factors and interventions associated with performance in physical education. The motivational interventions include a stepped-care approach, the transtheoretical model, stages of readiness for change, goal-setting, tailored and targeted interventions, and progress monitoring. This study examined the relationship between using these motivational models to increase student knowledge and whether using these models would assist students in goal-setting and fitness planning. Results from the literature show that using motivational techniques and proper goal-setting techniques will increase student motivation to reach their individualized fitness goals. Student competence in physical activity was an important determinant in progressing to the next stage of change in the transtheoretical model. The ultimate goal of any physical education program should be to become a high performing program.
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CHAPTER ONE
A PROJECT

Introduction

The purpose of this project was to assist physical education teachers to acquire knowledge and expertise on ways of informing and motivating students at the middle and high school level about the benefits of motivation and exercise on personal health. The information in the project determined whether or not there was a correlation between motivational interventions, improved fitness, and performance. It is imperative for educators to act quickly and efficiently in the delivery of information and physical activities for students.

Physical Education across the country needs to take a giant leap forward when it comes to educating and motivating students to perform well on fitness tests. This will enable students to become more aware of the benefits of personal health and exercise. There is a health crisis among the youth in the United States today that is becoming an epidemic. Dr. Susan Clark (Director of Endocrinology and Diabetes at Children’s Hospital of Orange County) stated, "We are heading for the worst health-care crisis
this country has ever seen. Teenagers and young adults are going to be dying from heart disease." It will be to the detriment of our youth if educators fail to act aggressively toward achieving a higher standard of physical fitness for middle and high school students (Wells, 2004).

Topics that are addressed include information about how physical educators need to investigate students' current status physically and mentally, physical educators need to be able to determine which activities best interest and motivate students to become more active and involved in everyday activities, physical educators need to find out what it is that students expect to achieve in physical education classes, physical educators need to be able to assess the ongoing physical and mental status of students to determine their individual progress which will in turn, further motivate them to remain active, and that there is a need for students to increase the amount of time spent being physically active.

Statement of the Problem

Students today are not educated enough in their own motivational stages of readiness and how to advance to the next stage. Understanding the Transtheoretical Model of Behavior Change would enhance student learning and
motivation by learning which stage a student is in and what effort is needed to advance to the next stage. According to Sullivan (1998), there are five stages of behavior change.

The first stage called the precontemplation stage refers to individuals who do not believe they have a problem and have often constructed defenses that aid in denial of the problem. The second stage is the contemplation stage where individuals acknowledge having a problem and begin to deliberately increase awareness and knowledge related to the problem. The third stage is the preparation stage where before initiating behavior change, individuals should re-evaluate themselves with respect to the problem, develop commitment to change, and construct a detailed plan for change. The fourth stage is the action stage where behavior change is initiated. After at least 6 months in the action stage, the person may move into the fifth stage. The final stage is the maintenance stage where although change is maintained more easily now, some vigilance is still required to avoid slips or setbacks. If and when the change becomes so automatic that there is no possibility of reverting to a former behavior, the goal "Termination" is reached (Sullivan, 1998).
Physical educators need to assist students in becoming aware of their motivational stages and teach them the benefits associated with goal achievement. This will encourage students to work harder to achieve their goals and learn what it takes to get to the maintenance stage for life-long health.

Physical educators may not be doing enough to target students in lower motivational stages. For example, students in the contemplation stage are inactive but thinking about becoming active, therefore, a program for beginners is necessary. Students perform to a higher standard when programs are tailored to their motivational and physical needs. Furthermore, understanding the factors that affect decreases in physical activity might be valuable in designing interventions to increase exercise participation and create positive effects on future physical activity as individuals move toward adulthood (Maddison & Prapavessis, 2006).

Further information will assist teachers with lesson planning, motivation, and test preparation that will address the obesity problem facing children today. This in turn will increase performance on student fitness tests as well as facilitate motivation among students to gain...
knowledge for life-long fitness and health. Castelli (2003, p. 30) states, "Those teachers who focused their instructional goals and expectations beyond performance on the assessment had more successful students." Furthermore, Mellalieu, Hanton, & O'Brien (2006, p. 259) state, "previous studies that have examined goal-setting effects on group behavior have found that setting specific targets can improve performance in practice and competition."

This project was aimed at targeting students' needs by understanding their motivational levels. There is a need to correlate physical education programs according to motivational levels based on the components of the Fitnessgram Test.

Corbin and Pangrazi (2008) report that the Fitnessgram test is a mandated fitness test used to measure the fitness and health status of students in the middle and high school levels. The Fitnessgram assessment and report are intended to provide teachers and parents with accurate information about children's physical fitness. The inherent goal of the Fitnessgram program is to promote regular, enjoyable, physical activity for students so that they can reach and maintain a level of physical fitness that will contribute to good health and well-being. The Fitnessgram helps
teachers determine student needs and guides students in planning personalized physical activity programs.

Significance of the Problem

It is important for all physical educators to understand the need for increased student self-awareness for motivational levels to improve the overall health of their students. There is very little research and literature available about how to motivate students to increase performance on fitness tests and how it relates to an increase in student knowledge of health related issues in physical education. Gehring, (2002) through research has shown that even as childhood obesity has reached what many health experts say are alarming levels, many school districts have decreased physical education class time. It was reported by the Federal Centers for Disease Control and Prevention that a decade ago, 42 percent of high school students attended a daily gym class, today, that number has dropped to 25 percent. Still, a growing number of educators and lawmakers are taking a closer look at physical education programs as they recognize that healthy students learn and perform better academically.

A study by Booth and Chakravarthy (2002) proved that the cost of obesity is on the rise and is due to people
being either sedentary or irregularly physically active.

"The direct costs of health services and supplies for non-institutionalized people with chronic conditions totaled $272.2 billion in 1987. Mortality costs combined with morbidity costs amounted to $234 billion in total indirect costs due to chronic conditions in 1990" (p. 4). Seven out of 10 deaths in the US in 1996 were due to four chronic health conditions consisting of cardiovascular diseases, all cancers, chronic obstructive pulmonary disease, and diabetes. Of the 1.6 million chronic health conditions in the United States, about 15 percent were due to sedentary lifestyle alone. As there are approximately 706,000 deaths in the USA each year that would be prevented by moderate-intensity physical activity that expended 1000 kcal per week.

This project was designed to address these health issues by giving teachers as well as students the tools necessary to improve health and fitness. Teachers will be able to address and understand student motivational levels, assess individual fitness levels, design fitness plans based on goals set by the student, and influence a change in behavior necessary to reach those goals.
Research Questions

1. Can student self-awareness of motivation levels improve overall health?

2. What types of motivational strategies would best improve, fitness levels, and overall student health?

3. What further studies can be done to determine the best approach?

Motivational Interviewing

As for motivational levels helping with fitness and overall health, Carels, et al. (2007) performed a study using motivational interviewing (a therapeutic technique designed to enhance an individual’s motivation to change behaviors and move him or her into action) for individuals who are having difficulties losing weight. They found that motivational interviewing may increase intrinsic motivation for change, thus resulting in more positive behavior change. Effective management of the current obesity epidemic will likely require cost-effective, time-efficient, minimally intrusive treatments.

Furthermore, Carels et al. (2007) demonstrated that a pre-assessment of weight, cardiopulmonary fitness, and nutrition was performed on individuals in their study.
Post-assessment outcomes were compared and showed there was significant pre to post-treatment decreases in body weight, daily caloric intake, and percentage daily energy from fat. In addition, the study by Carels et al. shows that there were significant increases in VO2 max and percentage daily calories from protein. The study has also shown that when clients set motivational goals, they are more likely to adhere to a diet and exercise program.

The need for motivational strategies that will engage, enhance, and benefit all students in physical activity and health is necessary for success. There is also a need to pre-test, mid-test, and post-test students using the Fitnessgram fitness test to determine fitness levels and adherence to a fitness program. The following is a quote from the Fitnessgram website:

(http://www.Fitnessgram.net/faqparents/q2)

Participation in regular physical activity leads to improvements in physical fitness and provides many important health benefits. This is well documented, and has been neatly summarized in widely publicized documents such as the Surgeon General's Report called Physical Activity and Health (U.S. Department of Health and Human Services, 1996).
Health and Human Services, 1996). To quote one point from the "General Conclusions" section of that report: "Physical activity reduces the risk of premature mortality in general, and of coronary artery disease, hypertension, colon cancer, and diabetes mellitus in particular." Physical activity also improves mental health and is important for the health of muscles, bones, and joints. (q. 2)

Physical fitness (an outcome associated with participation in physical activity) also has been shown to be important for health and quality of life. Assessments of physical fitness provide an effective way to evaluate overall physical condition and potential risk for negative health outcomes. Physical fitness is also more easily assessed than physical activity since it does not vary on a day-to-day basis. It is important to note that physical fitness is also influenced by factors that are out of a person's control (for example, genetics). While not everyone can be an elite athlete, most people can achieve healthy levels of fitness by performing the recommended amounts of physical activity.

Our society is becoming increasingly unhealthy by way of life style choices. This project will assist in
addressing ways of changing those behaviors to increase health and motivation in the physical education setting. The information presented will assist in identifying motivational levels and designing a personalized fitness plan for success.

Assumptions and Limitations

The following assumptions were made:

1. Students informed about his or her motivational level will become more motivated.

2. Providing motivational strategies for health and fitness activities based on student needs will promote health.

3. Motivational interventions used by teachers will help motivate students achieve a higher level of health and well-being.

The following limitations were established:

1. There was a lack of intervention studies that combine different theories of motivation to identify the multitude of factors associated with success in a fitness plan; example: studies that combine two or more of the following; targeted and tailored interventions, motivational interviewing, stepped-care approach, readiness
for change model, the transtheoretical model. Most studies apply to a single approach.

2. There was a lack of research regarding students' health and motivational state prior to engaging in a fitness activity.

3. Fallon and Nigg (2005) recognized that "limited research exists that investigates the transtheoretical model constructs and moderator variables associated with stage transition, especially for long-term maintenance" (p. 637).

4. There is a lack of time and resources for the author to conduct authentic research within the educational setting.

Definitions of Important Terms. 1. Motivation: Refers to those personality factors, social variables, and/or cognitions that come into play when a person undertakes a task at which he or she is evaluated, enters into competition with others, or attempts to attain some standard of excellence (Unes and Nation, 1996).

2. Fitnessgram: A national fitness test battery for youth as an assessment developed by The Cooper Institute in response to the needs in
physical education programs for a comprehensive
assessment protocol (The Cooper Institute, 1992).
The Fitnessgram uses health-related criteria
called Healthy Fitness Zones to determine
students’ overall physical fitness and suggest
areas for improvement when appropriate
(http://www.Fitnessgram.net/faqparents/q6).
3. Fitnessgram Test Includes:
   (a) Curl-Ups: Abdominal strength and endurance.
   (b) Trunk Lift (extension) Test: Trunk extensor
   flexibility was measured with the trunk lift
   (extension) test.
   (c) Back Saver Sit and Reach Test: Hamstring
   flexibility was measured with the back saver sit
   and reach test, a variation of the standard sit-
   and-reach test.
   (d) One-mile Walk/Run Test: Cardiorespiratory
   endurance was measured with the one-mile walk/run
   test.
   (e) Body Composition: The skinfold thickness of
   triceps and calf on the right side of the body
   was used to measure body composition (Cooper
   Institute, 1992).
4. Transtheoretical Model of Behavior Change Stages:
   (a) Pre-contemplation Stage: Individuals who are inactive and not thinking about becoming active.
   (b) Contemplation Stage: Individuals who are inactive but are thinking about becoming active.
   (c) Preparation Stage: Individuals who are physically active but not at the recommended levels (30 minutes or more of moderate intensity physical activity on most, preferably all days of the week).
   (d) Action Stage: Individuals who are physically active at the recommended levels but have been active for less than six months.
   (e) Maintenance Stage: Individuals that are physically active at the recommended levels and have been for six or more months.
5. Patient-treatment matching: refers to matching intervention strategies with characteristics of an individual or group.
6. Targeted Message: provides information directed to a certain group, which is typically based on one or more variables, such as stage of motivational readiness.

7. Tailored Message: customized to each individual by deriving the messages based on several variables believed to be important for changing the particular target behavior. For example; provide feedback based on the individual's reported level of self-efficacy (Marcus and Lewis, 2003).

Organization of the Remainder of the Paper

The remainder of this paper was organized with the following chapters. Chapter two contains a literature review of journals articles pertaining to the correlation between fitness test scores, motivation, and overall personal health. Chapter three will discuss the methods used by the author for gathering information and data from peer reviewed research. Chapter four contains the findings of the research. Chapter five contains a summary, conclusion and recommendations.
CHAPTER TWO

REVIEW OF RELATED LITERATURE

In order for students to perform better on fitness tests and in physical education classes, the following important issues need to be addressed. First, physical educators need to investigate students' current status physically and mentally. Second, physical educators need to be able to determine which activities best interest and motivate students to become more active and involved in everyday activities. Third, physical educators need to find out what it is that students expect to achieve in physical education classes. Fourth, physical educators need to be able to assess the ongoing physical and mental status of students to determine their individual progress which will in turn, further motivate them to remain active. Finally, there is a need for students to increase the amount of time spent being physically active.

Purposes for Using Fitness Tests

The purposes for using fitness tests according to Keating and Silverman (2004) are to promote students' participation in physical activity, keep records of students' yearly improvement of health-related fitness, and
to assess or improve teachers' physical activity and fitness instruction. Additionally, Keating and Silverman state that, "Promoting students' involvement in physical activity and maintaining fitness for health and well-being are believed to be the primary objectives for fitness testing" (p. 161). The use of questionnaires, surveys, pre-tests, and assessments prior to embarking on a physical education unit should be done. Similar to a personal trainer at a fitness club, physical educators need to assess the state at which their students are in. It is important to assess students so that proper levels of physical activity will be beneficial to all and not just a few students.

There is a need in physical education for the Fitnessgram to be introduced to students as a pre-test, a mid-test, and then later given as a post-test. The first test is to determine the fitness level of students and then focus or adjust lessons according to those results. Motivational strategies and interventions could then be determined and implemented into a physical education class. The mid-test or second test is to determine improvements in fitness as the school year progresses. The post-test will determine whether goals were met or not. Students should
become aware of their test results and whether they are in the recommended fitness level or not.

Motivational Factors

Given that researchers have performed several studies conducted on the motivational status of subjects before, during, and after exercise, a successful fitness program needs intrinsic motivation by the subject to be present. Whitehead (1998) stated the following about motivation:

Motivation is driven by an innate need for competence and self-determination in dealing with one's surroundings. The intrinsic rewards for the behaviors motivated by this need are satisfying feelings of competence and autonomy, positive emotions such as enjoyment, excitement, and possibly the sensation of flow. An individual's desire to pursue a particular activity depends upon whether his or her feelings of competence, autonomy, and positive affect persist over time. (p. 1)

Furthermore, extrinsic factors such as rewards, coercion, winning, or pleasing others may be detrimental to one's motivation to pursue an activity further. Currently, physical education is a one-size-fits-all program. That is, that one activity is supposed to apply to all levels
when not all students are at the same health and fitness levels.

Studies on the topic of student assessment involved topics such as a stepped-care approach to physical activity (individualized fitness program), students differences in personality, pairing personality with activity, the physical needs of students, individualized assessments, fitness testing, student physical activity motives, and tailoring physical activity for success. Understanding the personality of motivated as well as unmotivated individuals could assist in exercise program prescription for students.

**Stepped-Care Approach and Motivational Readiness**

Carels, et al. (2007) describe a stepped-care approach as an intensive treatment that is used when less intensive treatments fail. This treatment will likely reduce further unnecessary treatment to address a variety of conditions, including weight management. A stepped-care approach increases the emphasis on individualized treatment programs based on an individual’s progress toward treatment goals. Research that has been done on examining a stepped-care approach to weight loss have been encouraging.

Two very important studies have been done on individual motivational treatments to gain knowledge and
insight into an individual’s current state mentally and physically. These studies involve what is called a stepped-care approach and the transtheoretical model about the stages of motivational readiness for change. Bess (2003) and Carels et al. (2007) have demonstrated in similar findings that individual treatment programs based on an individual’s progress using tailored as well as targeted interventions are effective for promoting physical activity and adherence to a set goal or plan. Bess (2003) states that:

A targeted message provides information directed to a certain group, which is typically based on one or more variables, such as stage of motivational readiness. A tailored message is customized to each individual by deriving the messages based on several variables believed to be important for changing the particular target behavior. (p.2).

Combining tailored messages along with targeted messages is beneficial for increasing physical activity behavior.

Being able to recognize the student’s current state of motivational readiness for change is essential in establishing a physical fitness program. These stages include precontemplation, contemplation, preparation, and
action and maintenance. Carels et al. (2007) states the following:

The pre-contemplation stage refers to individuals who are inactive and not thinking about becoming active. The contemplation stage refers to individuals who are inactive but are thinking about becoming active. The preparation stage refers to individuals who are physically active but not at the recommended levels (30 minutes or more of moderate intensity physical activity on most, preferably all days of the week). The action stage refers to individuals who are physically active at the recommended levels but have been active for less than six months. And the maintenance stage refers to individuals that are physically active at the recommended levels and have been for six or more months. (p. 4-5)

Understanding and recognizing where students are along the stages is essential and necessary for success in a physical activity program. "The transtheoretical model is a popular method used to design exercise promotion programs. Research shows that stages and processes of change can be generalized to exercise behavior" (Wadsworth and Hallam 2006). Maddison and Prapavessis (2006) state,
Studies examining the transtheoretical model in adolescents have shown that self-efficacy, decisional balance, and processes of change were the strongest discriminators of exercise stage readiness. In a recent study, Prapavessis, Maddison, and Brading showed that all transtheoretical constructs significantly predicted exercise stage transition. (p. 352)

What makes the model successful is being able to determine the many factors associated with the transtheoretical model which will assist in moving students along in the behavior change stages. An ideal way of assisting students in behavior change is by using goal setting techniques.

Goal Setting

Research done by Gavin (2004), Lochbaum, Bixby, & Wang (2007), and Carels et al. (2007), have demonstrated that the importance of subjects in studies to be successful, competent, and self-motivating leads to an increased level of fitness and motivation to pursue their original goals related to fitness and health. With a stepped-care approach, there is an emphasis placed on individualized treatment programs. Goal setting in a stepped-care program is used to determine necessary treatment. The goals need
to be realistic rather than unattainable. Setting unrealistic goals can be demoralizing and cause a person to halt their activity causing a set back. If a set back such as this occurs, it is necessary for teachers to intervene and have the student re-write their goals. Successful goal-setting is required to motivate students to follow a path, or plan for growth.

The ability to follow this plan will further require constant monitoring and revisions. Research by Lustyk, Widman, Paschane, & Olson, (2004) has demonstrated:

The use of high-intensity activities have led to an increased fitness and overall health whereas manageable low-intensity activities show an increase in self-esteem, boost morale, and increase feelings of success. Therefore a fitness program should utilize low-intensity activities mixed in with an occasional high-intensity activity. This will further increase motivational levels of students and feelings of success and self-worth. (p.128)

Strategies that can be used to facilitate this plan include constant feedback to the student in the form of verbal cues from teachers as well as peers, electronic monitoring, record keeping, daily fitness logs, and self-reflections.
Individualized Activity Plan

Bess (2007), Carels et al. (2007), Lustyk, Widman, Paschane, & Olson (2004), and Bailis et al. (2005), all outline the need for increased frequency, duration, and intensity of an activity to be effective in a physical activity plan. Whitehead (1998) suggests that when attempts to master the challenges of our surroundings are successful, the result is a positive feeling of efficacy which serves to intrinsically motivate further behavior. Therefore, a physical activity plan must be individualized according to individual needs.

In a study by Carels et al. (2007), the use of physical activity logs has demonstrated that subjects increase intrinsic motivation for change, engage in increased physical activity, show positive behavior change, and is an easy way for subjects to self-monitor progress. Another way of self-monitoring for students to become further motivated is the use of the Fitnessgram for pre-testing, goal-setting according to the pre-test results, progress monitoring, and finally post-testing.

Fitnessgram Test Battery

The Fitnessgram test battery is used to measure student achievement in physical education, hence the
importance for students to be motivated and successful not only for the test, but for their overall health as well. The Fitnessgram is the national fitness test battery for youth. The assessment was developed by The Cooper Institute in response to the needs in physical education programs for a comprehensive assessment protocol (The Cooper Institute, 1992). "Today, it is estimated that at least 11,000 schools nationwide are now using a program called the Fitnessgram" (The Cooper Institute, 1992).

Motivation and student achievement are key components to successful learning, therefore, incorporating all fitness components into a physical fitness plan will further motivate students to adhere to a fitness program. The health-related fitness components include cardiorespiratory endurance, abdominal strength and endurance, upper body strength and endurance, flexibility, and body composition.

A quite disturbing finding by Keating and Silverman (2004), was the fact that "the preparation, purposes, and reasons for using nationally available fitness tests suggested that some teachers did not use the tests for the right reasons and students were not well-prepared before taking the tests" (p. 146). Reasons for using the test
would be to evaluate, score, and motivate students. It should be a priority for physical education teachers to inform, motivate, and prepare students for this test to stimulate excitement and enhance student fitness levels.

Motivating students to be in the Fitnessgram’s Healthy Fitness Zones will enhance aerobic capacity, body composition, muscular strength and endurance, and flexibility. Corbin and Pangrazi (2008) report that students should strive to be in the healthy fitness zone, and if they are not, then the teacher should facilitate the steps needed to get there. Being in the healthy fitness zone means that the child has achieved the recommended level of fitness for their age.

**Fitnessgram Test Items**

**Curl-Ups:** Abdominal strength and endurance.

**Trunk Lift (extension) Test:** Trunk extensor flexibility was measured with the trunk lift (extension) test.

**Back Saver Sit and Reach Test:** Hamstring flexibility was measured with the back saver sit and reach test, a variation of the standard sit-and-reach test.

**One-mile Walk/Run Test:** Cardiorespiratory endurance was measured with the one-mile walk/run test.
Body Composition: The skinfold thickness of triceps and calf on the right side of the body was used to measure body composition (Cooper Institute, 1992).

Push-Ups: Upper body strength and endurance.

Students should try to achieve and maintain a health-enhancing level of physical fitness. Students who are able to reach this standard will be able to correctly demonstrate activities designed to improve and maintain muscular strength, endurance, flexibility, cardiorespiratory functioning, and proper body composition. It is very important for teachers to incorporate these five health components of fitness into daily lesson plans for students' benefit. Students will then demonstrate increased motivation on daily tasks when they see and feel the results associated with exercise in physical education classes.

Feedback

Keeping students motivated to perform and reach their goals requires constant feedback. Feedback is vitally important for a successful fitness plan to be accomplished. There are many ways for students to receive feedback. Feedback can be in the form of verbal cues from teachers as well as peers, electronic monitoring (Heart rate monitors,
digital displays, pedometers, etc.), record keeping, tracking daily information in logs, and self-reflections.

Not only does feedback help students remain motivated, it is a way for students to keep track of progress and makes them accountable for their goals and whether they are putting forth enough effort necessary to achieve those goals. Research done by Gehring (2002), Castelli (2003), Keating and Silverman (2004), and Vassiliki et al. (2004), suggest that fitness as well as health play an important role in the success of student achievement. Furthermore, keeping track of fitness related information is a form of feedback that should be done by every individual in a physical education class as part of an intensified, accountable, and individualized educational program plan. This individualized educational program plan could also be in the form of a physical education report card. Gehring (2002) states that, "the fitness report cards are part of a broader, decade-old movement – often called the 'New PE' – that is shaping a philosophy of physical education more focused now than in the past on encouraging healthy lifestyles" (p. 2).

These fitness report cards can be designed by the physical education department and would include the scores
from the Fitnessgram test. The report cards would be individualized and could compare previous test scores to current test scores to monitor progress. Additionally, the report cards would include recommendations as to what could be done to address any deficiencies the student may have. Most importantly, the report cards would be individualized and would not compare students to one another.

**Motivation and Feedback Items**

The following items are ways of tracking and monitoring student progress toward a set of goals. These items could be kept in a physical education notebook. Such items would include a pre-test, a self-assessment, a nutrition log, feedback (teachers, pedometers, heart rate monitoring, timed events, treadmills, weights, etc.), activities that are fun, yet intense, goal-setting (Short-term, Long-term), program plan, student performance logs, post-test, and an individualized physical education report card.

Research done by Gehring (2002), Castelli (2003), Keating and Silverman (2004), and Vassiliki et al. (2004), has shown that when students are taught to assess their own areas of need, they will buy-in to their goals and feelings of self-efficacy, resulting in sustained and even increased...
motivation in physical education as well as outside of the school environment.

Incorporating the transtheoretical model to the physical education curriculum can help students assess their own behavior change. By designing and using a physical education report card, students can gain a better understanding of where they are in relation to the stages of change and where they want to be. Ideally, all students should strive to reach the maintenance stage.

Throughout the literature presented in this chapter, the important factors to consider are for teachers as well as students. Implementing fitness testing in a different manner and more than once a year increases student awareness and motivation to perform at a higher level. Not only does it increase awareness, but it also increases motivation to reach a specific goal. Reaching goals through an individualized activity plan based on fitness scores and feedback will lead to increased health and understanding in physical education. The goal of all physical education teachers and schools should be to become a high performing school in all areas of study.
CHAPTER THREE

METHODS

The intended audience for this project was current and new physical education teachers. The objective for this project was for physical education teachers to gain a better understanding about motivational stages, how to incorporate fitness testing into the physical education program, and the tools required for successful goal planning and implementation.

Related articles were identified using specific search terms such as motivation, Fitnessgram, fitness test scores, middle school fitness testing, physical education and fitness, student motivation, goal setting, fitness program, transtheoretical model, stages of change, exercise readiness, motivational interviewing, and stepped-care approach. Several terms were also combined in the search to limit the amount of articles found and to specify the topic in order to limit findings.

The main resource used was from the CSUSB online library, specifically the Physical Education Index, Sport Psychology, Ebscohost, ERIC, and ILLiad search databases. Most of the studies done involved middle and high school
children ages 12-17. I found 47 articles but had refined my search terms to limit unrelated articles. I refined my search by reading over the title and the abstract to see if the article would be useful. I determined the usefulness of each article by reading the entire article and decided whether or not it related to motivation and fitness in physical education. After that, I printed them out and read them using a highlighter pen to mark important information to be used in the project.

Articles of relevance that were obtained included several on the transtheoretical model and adolescents, fitness report cards, processes of change across exercise stages of change, physical fitness and emotional health, goal-setting and behavior change. 25 articles and one book were used to complete this project.

It took me about two weeks to find all the necessary research related to my topic. Once that was accomplished, I began to read, highlight, and note any other important information contained in each article. This process took about one and a half months, but has been ongoing throughout the writing process. I have been referring back to specific articles to evaluate their reference lists to find other similar studies, tests, age groups, and results.
CHAPTER FOUR

RESULTS

The results presented in this chapter will further substantiate the correlation between motivational interventions, improved fitness, and performance. The results will also show the need for using the transtheoretical model and the stages of behavior change. The findings will include the significance of motivation on performance, the need for students to be competent and knowledgeable in their activity, the difference between high and low-performing schools, and the importance of goal setting in accomplishing a fitness plan.

Transtheoretical Model

The transtheoretical model is an integrative model of behavior change. The model can be used by clinicians, teachers, coaches, students, as well as by athletes to determine stages of readiness for change and motivational levels. Maddison and Propavessis (2006) believe that “the transtheoretical model might be a useful framework for understanding longitudinal exercise behavior in the adolescent population” (p. 351).
Through research, results of studies using the transtheoretical model demonstrate that there are gender differences as well as construct differences. According to Fallon and Nigg (2005),

Results revealed that the men reported greater barriers-efficacy for exercise compared to women. A significant sex difference emerged for the processes of change such that the women reported greater use of behavioral processes and experiential processes compared to men. Furthermore, the statistics indicated that barriers efficacy held the strongest association with stage of change, followed by experiential processes of change and affect temptation. (p. 635)

It is important for teachers to understand these gender differences so that they can address them in the classroom. Being knowledgeable in exercise adherence and stage readiness will enhance motivation in following a fitness plan. This is why it is important for both the teacher and student to understand the stages of behavior change and to become knowledgeable in all aspects of program monitoring.
Additionally, Wadsworth and Hallam (2006) indicate the following:

According to the transtheoretical model and previous data, use of the processes is based on the current stage of change, with the cognitive processes being used more in the earlier stages of change and the behavioral processes are used more in the later stages. The use of the processes should be distinct for each stage so that specific processes can be targeted. Furthermore, only two of the five cognitive processes were statistically significant between adjacent stages. (p. 428)

When using the transtheoretical model, it is important to recognize and establish means of dealing with efficacy issues that will arise. The most effective way of creating a strong sense of efficacy is through mastery experiences. Successes build an increased belief in one's personal efficacy whereas failures undermine it. Teaching to mastery of an activity will lead to further efficacy and successful stage of change advancement.

Motivation and Performance

The role motivation plays on student performance determines whether a student will be successful in
following their fitness plan. Therefore, it is helpful for physical education teachers to use targeted as well as tailored interventions. Using these interventions determines the motivational stage of readiness of the student further assisting them along their individual path.

**Targeted Interventions**

According to Marcus and Lewis, (2003) the difference between a targeted message and a tailored message is that a targeted message provides information directed to a certain group. That information is typically based on one or more variables, such as stage of motivational readiness. A tailored message is one that is customized to each individual by deriving the messages based on several variables believed to be important for changing the particular target behavior.

Based on the findings of Marcus and Lewis (2003), it is evident that positive feedback targeted to a group of individuals can influence the participants' stage of motivation and progression toward goals. The research done by Marcus and Lewis further indicates that 30% of the participants who were in the Contemplation Stage at baseline and 61 percent of participants who were in the Preparation Stage at baseline progressed to the Action
Stage following treatment. Also 31 percent of the participants in the Contemplation Stage at baseline progressed to Preparation following the intervention. Participants in the targeted intervention were more likely to progress one or more stages from baseline to the end of treatment than participants receiving the non-targeted intervention. "Participants who received a greater number of counseling messages were more likely to become physically active than those receiving fewer messages" (Marcus and Lewis, 2003).

The results of this study were successful because Marcus and Lewis replicated previous findings and the intervention used can be modified to apply to other segments of the population such as individuals with chronic physical or psychological conditions. Because this study used community volunteers over a six-week period, further research should be done on students in the educational setting and even a team setting to further validate the reliability of the information to other settings.

Tailored Interventions

Research further indicates that combining a targeted approach such as Marcus and Lewis’ (2003), with a tailored approach leads to success in physical activity behavior.
For example, participants in the intervention group significantly increased the number of minutes of physical activity per week and were more likely to achieve the recommended level of physical activity than the comparison group. Additionally, the increase in physical activity participation was maintained at the 12-month follow-up.

These findings can be used as a tool to help physical education teachers devise activity programs at school to prepare their students for the Prudential Fitness Gram Test. Without targeting specific student groups and tailoring the program to their needs, physical education teachers may not be fully preparing students for all components of the fitness test.

Further findings related to the use of interventions for physical activity include results benefiting people of all ages. The Cooper Institute (1992) reported findings concluding that there are distinct health benefits that can be obtained by including a moderate amount of physical activity. For example, 30 minutes of brisk walking, 15 minutes of running, or 45 minutes of playing volleyball on most, if not all, days of the week provide significant health benefits.
Teacher Use of Fitness Testing

Results of studies conducted by Castelli (2002), as well as Keating and Silverman (2004), found that outcomes associated with the use of fitness testing by preparing and linking performance indicators to grading will enhance students' motivation and accountability. Incorporating fitness test results into the physical education grade is necessary to provide relevance to the outcome of the fitness test and provide information to the individual for setting personal fitness goals.

Additionally, other results by Keating and Silverman (2004) included that most teachers used fitness tests with the majority using nationally available fitness tests. Also, teachers implemented different approaches to prepare students for fitness testing and most teachers informed students verbally about the tests in advance. Teachers use of rewards such as prizes or other was least important when considering testing purposes. Finally, data from the study suggested that fitness testing is merely an isolated part of physical education programs, and demonstrated that results were not frequently used to improve physical activity and instruction.
Still, most of the teachers (78.9%) in the Keating and Silverman (2004) study indicated that their use of fitness tests was related to their physical activity and fitness instruction. Therefore, physical education teachers should make fitness testing components relevant to students' daily activities. There is a need for physical education teachers to make results of the fitness tests relevant to students and tie it in to the physical education grading system.

The results of these studies demonstrate the need for physical education teachers to incorporate fitness testing scores into goal-setting and planning by students in order to enhance motivational levels and give students a clear goal to work for. A study by Puca (2004) found that "the higher the score participants had attained in the first run of the motor-skills task, the higher the goal they set for the second run and the more confident they were in attaining their goal" (p. 129). This result shows the importance of the role of the teacher to teach mastery of a skill to students prior to engaging in an activity. Then after the initial task, motivation to perform above previous abilities is increased. Castelli (2002) also found that "in order for students to be able to reach their
goals, physical education teachers need to teach all state mandated content addressing all performance indicators in order to become a high performing school” (p. 34).

It is important to note that Keating and Silverman (2004) found that “only 29.7% of teachers used test results to determine and modify teaching content and 41.2% of the users employed test results for the assessment of the effectiveness of their physical activity and fitness instruction” (p. 157). In a similar study by Castelli, (2003) the following results were reported:

18 teachers identified different instructional practices as ways in which they attempted to help students attain competence in performance. The writing of individual goals, monitoring progress, personalized instruction, class discussions, and the use of fitness labs and lectures were also commonly identified by the teachers as strategies for helping students with performance. There were no differences in the instructional practices selected but there were differences in the frequency of use of these strategies. (p. 20)

Using fitness test scores by incorporated them into the daily physical education routine can be utilized by the
student to measure further progress toward their original fitness goals.

**Student Competence In Physical Activities**

The need for a student to be competent in a physical activity plays a vital role in their motivation to participate and enjoy an activity. It was reported by Vansteenkiste and Deci (2003), and also substantiated by Reinboth, Duda, & Ntoumanis (2004), that not only is it motivating for a student to perceive themselves to be competent in movement activities, but it is also equally important for the student to gain a higher level of skill along with positive feedback in an activity. Positive feedback can come in many forms, for instance, personal improvements on fitness activities associated with fitness testing, self-critique, positive feedback from a teacher or peer, and constructive criticism.

In the case of the transtheoretical model, Sullivan (1998) noted that a person is more likely to advance to the next stage when there is a gain of awareness about one’s self. When a person experiences the emotions that awareness of a problem may trigger and changing beliefs, attitudes and thoughts constitutes progress. When a person is competent in a given situation, they will demonstrate an
increase in awareness, emotional arousal, self-reevaluation, and increased commitment to make a change.

Differences in High and Low-Performing Schools.

Performance among students varies tremendously, but overall, according to Castelli (2002), a high performing school is one where students met the state mandated criteria requiring students to be competent in two movement forms, take a written test on health-related fitness, participate in physical activity outside of physical education, and meet the age and gender requirements on a fitness test. There were 62 secondary schools in all examined for this particular study. Furthermore, Castelli reported that, "teachers at high performing schools were more compliant than those at low performing schools" (p. 37).

Of the many important findings in the study by Castelli (2002) the most important findings are as follows:

High performing schools had teachers that used a wider variety of teaching methods where those teachers focused their instructional goals and expectations beyond performance on the assessment. Most schools linked the performance indicators to grading, and used rubrics for each activity to grade students.
All high performing schools organized physical education content by two different movement forms, allowing students to sign up for the movement forms of their choice. All four low performing schools did not offer a student choice through official guidance scheduling. Findings show that teachers in the high performing schools taught only state mandated content by addressing all performance indicators in every one of their classes where medium and low performing schools did not. (p. 30-34)

Goal Setting to Achieve A Fitness Plan

Goal setting and motivation go hand in hand. That is, that in order for someone to be motivated, there must be a goal in mind. Findings from several researchers emphasize the importance of goal setting in physical education as well as in any fitness plan. It is important to note that Brisswalter, Collardeau, & Arcelin (2002) determined that "an improvement in physical fitness levels following a training program leads to an improvement in cognitive functioning" (p. 559).

Lustyk et al. (2004) reported "both exercise motives and personality play a role in initiation of and adherence to an exercise program" (p. 125). These results reflect
the need for an individualized educational program in physical education. This can be accomplished through goal setting, which is why students need to be educated in proper goal setting techniques.

Once students learn the proper techniques involved in goal setting, they can then design a physical fitness plan. Based on results by Puca (2004), referring to confidence in goal attainment, participants in post-decisional action phases were more confident in attaining their goals and differed significantly from pre-decisional participants. Post-decisional participants were more confident in attaining their goals yet, did not set higher goals than pre-decisional participants (p. 133).

Similarly, Isen and Reeve (2006), found that “when positive affect participants knew they had an assigned job to do, they indeed did increase their time spent on the work task, even though that meant they would have less time to spend on the interesting task” (p. 317). These results illustrate the importance for students to set goals and follow their physical fitness plan in order to accomplish their desired outcome. When it comes to goal attainment, Lauchbaum et al. (2007), recommends using interventions
that can be applied to goal setting such as a students perceived competence, and personality.

Safrit (1995) identified specific goal setting criteria which leads to increased motivation in the classroom setting:

Goal setting is successful when the teacher sets goals together with students so that their interests are considered and they are committed to the goals. 
Set goals based on student’s past behavior or performance; Set goals that are specific, measurable, and challenging but realistic; Have students write down their goals; Help students understand how they can reach their goals; Provide students with support and feedback about their progress toward their goals; and finally, Give students opportunities to assess their progress toward their goals by providing log sheets for recording exercise activity, doing periodic testing, or offering self-testing opportunities. (pp. 102-103)

It is important to help students understand motivation and to discuss external and internal motivation along with their own characteristics and goals. It is necessary for a student to make a connection from motivation to the goals
they set for themselves. "Goal setting is imperative to student motivation because where there is no vision, there is no purpose and where there is no purpose, there is no stimulation to act" (Springs and Kritsonis, 2008).

The results presented in this chapter show how motivation, using the transtheoretical model, using targeted and tailored interventions, and goal setting can enhance the physical education learning environment. The results also demonstrate the need and purposes for using fitness testing, using a stepped-care approach, providing feedback, and designing an individualized activity plan will benefit all students. Both teachers as well as students should become more aware of the need to understand the stages for behavior change model. The combining of all aspects of interventions should be included in a physical education program. Increasing student knowledge and awareness of motivational factors by combining the stages of readiness with goal setting can determine the level of performance to be either a high or low performing school. The ultimate goal should be for all school physical education programs to become high performing programs.
CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

Summary

It is evident that there is a strong correlation between motivational interventions, improved fitness, and performance. The use of motivational theory, fitness testing, goal setting, individualized activity plans, feedback, can all be used to measure achievement. It is vitally important for students to become more knowledgeable and involved with the importance of fitness and how it relates to personal health and overall well-being.

It is clear that through teacher involvement in student individual stages of motivational readiness that increased competence will lead to increased levels of physical activity. The goal of physical educators should be to maximize all students' levels of physical activity both at the school site and in the community. Applying the transtheoretical model in physical education can assist in maximizing those goals set by the student.

This study involved an in-depth look at motivational factors and interventions associated with performance in physical education. The motivational interventions include
a stepped-care approach, the transtheoretical model, stages of readiness for change, goal-setting, tailored and targeted interventions, and progress monitoring. This study examined the relationship between using these motivational models to increase student knowledge and whether using these models would assist students in goal-setting and fitness planning.

Results from the literature show that using motivational techniques and proper goal-setting techniques will increase student motivation to reach their individualized fitness goals. Student competence in physical activity was an important determinant in progressing to the next stage of change in the transtheoretical model. The ultimate goal of any physical education program should be to become a high performing program.

The fitnessgram test can be used by students to help them in personal fitness program planning, by teachers to determine student needs, and also by parents to understand their child’s needs and fitness level. Furthermore, individual fitness tests and the fitnessgram test batteries are designed to be used in several ways including personal fitness self-testing, personal best testing, institutional
testing, parental reporting, and personal tracking. This is important information that can be used by students to maintain motivation and to track progress. This information will further identify progress as well as identify weaknesses that need extra attention and focus.

Students need to achieve and maintain a health-enhancing level of physical fitness. Students should be able to correctly demonstrate activities designed to improve and maintain muscular strength, endurance, flexibility, cardiorespiratory functioning, and proper body composition.

Physical educators need to be able to adjust lesson plans and activities that will meet the students' needs. Having students set goals, design a fitness plan, record fitness scores, and utilize time for exercise efficiently will create opportunities for students to enhance feelings of success and more importantly, increase motivation to perform at a higher level. Successful students become increasingly intrinsically motivated which is essential for successfully following a fitness program plan and for reaching personal fitness goals.

Finally, research has shown that preparation, purpose, and reasons for physical fitness not only lead to increased
motivation and fitness levels, but will also benefit an individual for life-long health. Overall health and well-being are important factors in determining quality of life and longevity of life.

**Further Research**

Further research could be done on intervention approaches such as those that are targeted and those that are tailored to individuals and groups. Future research could also involve a comprehensive analysis based on test results of the Fitness Gram Test. This study could determine factors that affect performance levels in order to determine where students are in the transtheoretical model and how to help them move to the action or maintenance stages. There could also be studies involving research regarding students' health and motivational state prior to engaging in a fitness activity.

Further research is needed to determine the extent that nationally recommended fitness tests have been accepted by teachers, how tests have been employed by those who have been using them, and whether teachers have been able to accomplish the objectives designed by test developers (Keating and Silverman, 2004). “Despite calls for reform in physical education, few large scale attempts
to make comprehensive and systemic change have included physical education and even fewer attempts have documented that change” (Castelli, 2003).

**Recommendations.** What could be done is pre-test all students on all components of the Fitnessgram test and use the results as baseline fitness for goal setting. Set individualized goals with each student developing short and long-term goals. Use a student interest inventory questionnaire to determine motivational levels and activities that students will enjoy. Set up and develop lesson plans that incorporate those activities as well as incorporating components of the fitness test. Monitor student progress by developing a physical education report card addressing progress and deficiencies. Educate students on effects of diet on personal health. Allow students to assess their own progress. Incorporate fitness testing into the physical education grade. Make students more accountable for their performance. Administer a post-test to determine progress and goal achievement. Use a wide variety of activities to decrease boredom and increase participation. Objectively become a high performing school.
Derry, Aggeloussis, & Petraki (2004) concluded that there are several important benefits of fitness programs. First, increasing children’s physical ability may increase their willingness to become more physically active. Second, children who participate in supervised fitness programs may be able to self-regulate their physical activity levels. Third, the development of positive attitudes toward physical activity and fitness during childhood may affect the level of fitness during adulthood. Derry et al. go on to say that there is strong evidence indicating that school physical education has the founding role in promoting physical activity in youth. Also, the goals of physical education programs are to provide students with opportunities to be active and provide experiences that will help them adopt active lifestyles as adults.

**Applying Theory to Practice**

When applying theory to practice, try to emphasize individual mastery, promote perceptions of choice, promote the intrinsic fun and excitement of exercise, promote a sense of purpose by teaching the value of physical activity to health, optimal function, and quality of life. It is also important to not overemphasize peer comparisons of performance, undermine an intrinsic focus by misusing
extrinsic rewards, or to turn exercise into a bore or a chore.
APPENDIX A

A GUIDE TO MOTIVATE STUDENTS IN

PHYSICAL EDUCATION
Fitnessgram Test Battery

The Fitnessgram test battery is used to measure student achievement in physical education, hence the importance for students to be motivated and successful not only for the test, but for their overall health as well. The Fitnessgram is the national fitness test battery for youth. The assessment was developed by The Cooper Institute in response to the needs in physical education programs for a comprehensive assessment protocol.

Fitnessgram Test Items

Curl-Ups: Abdominal strength and endurance.

Trunk Lift (extension) Test: Trunk extensor flexibility was measured with the trunk lift (extension) test.

Back Saver Sit and Reach Test: Hamstring flexibility was measured with the back saver sit and reach test, a variation of the standard sit-and-reach test.

One-mile Walk/Run Test: Cardiorespiratory endurance was measured with the one-mile walk/run test.

Body Composition: The skinfold thickness of triceps and calf on the right side of the body was used to measure body composition.

Push-Ups: Upper body strength and endurance.

Applying Theory to Practice

When applying theory to practice, try to emphasize individual mastery, promote perceptions of choice, promote the intrinsic fun and excitement of exercise, promote a sense of purpose by teaching the value of physical activity to health, optimal function, and quality of life.

The Fitnessgram test can be used by students to help them in personal fitness program planning and by teachers to determine:

1: student needs

By parents to understand:

2: Their child’s needs and fitness level.

3: Personal fitness self-testing.

4: Personal best testing.

5: Institutional testing.

6: Parental reporting

7: Personal tracking.

The ultimate goal of any physical education program should be to become a high performing program.

FITNESS TESTING AND MOTIVATION IN PHYSICAL EDUCATION PROGRAMS
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