Video Technology and the Subjective Norm, Perceived Behavioral Control, and Attitudes Toward Physical Activity of Middle School Students: Does P.E.TV Make a Difference?

by

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VIDEO TECHNOLOGY AND THE SUBJECTIVE NORM, PERCEIVED BEHAVIORAL CONTROL, AND ATTITUDES TOWARD PHYSICAL ACTIVITY OF MIDDLE-SCHOOL STUDENTS: DOES P.E.TV MAKE A DIFFERENCE?

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(ABSTRACT)

This study examined the effects of Physical Education Television (P.E.TV) on 69 southwest Virginia middle school students' subjective norm, perceived behavioral control, and attitudes toward physical activity. Four intact 8th grade physical education / health classes were selected for the study. The students were randomly assigned to the classes by school administrators at the beginning of the school year. The classes were randomly assigned to treatment and control groups. The treatment group (two 8th grade classes) viewed 10 P.E.TV shows over a period of nine weeks. The control group (two 8th grade classes) had physical education / health class as normal. The same teacher taught all four classes.

A pre-test post-test design was used. All students filled out a pre-test questionnaire at the beginning of the 9 weeks, and a post-test questionnaire at the end of the 9 weeks. The pre and post-test questionnaires included the "Children's Attitudes Toward Physical

Activity" scale to assess the student's attitudes, and questions developed by Fishbein and Ajzen (1980, 1985) to assess subjective norm and perceived behavioral control. The pre-test questionnaire also included the "Weekly Activity Checklist", which was used to categorize students into groups based on their activity level. The first three hypotheses stated that P.E.TV would have a positive influence on the students' subjective norm, perceived behavioral control, and attitudes toward physical activity. These hypotheses were tested using Analysis of Covariance, and rejected at the .05 level of significance. The fourth hypothesis stated that P.E.TV would have more of a positive influence on students categorized as "moderate to low active" than on students categorized as "high active". This attribute-treatment-interaction hypothesis was tested using a two way Analysis of Variance, and was also rejected at the .05. level. Suggestions for future studies are included in the discussion section.

DEDICATION

For my mother, Turid Humblen, who showed me that through long term dedication goals can be reached, and who always supported me in pursuing mine. Mamma, with your strength and excellence you will always be my role-model. Takk for at du alltid er der for meg!

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INTRODUCTION AND REVIEW OF LITERATURE

INTRODUCTION

In the past three decades, researchers have focused on tendencies in the US to be sedentary, and many have recently called for more of an involvement on the part of physical education programs in the quest for lifetime activity for all people (Blair, 1993; Corbin, 1987; Corbin & Pangrazi, 1992; Lee, Carter & Greenockle, 1987; Sallis & McKenzie, 1991; Sallis, Simons-Morton, Stone, Corbin, Epstein, Faucette, Ianotti, Killen, Klesges, Petray, Rowland, & Taylor, 1992b; Simons-Morton, O'Hara, Simons-Morton & Parcel, 1987). Physical education class is a place where potentially all children could be exposed to the joys and benefits of being physically active.

Young children are naturally active (Corbin & Pangrazi, 1992), however, as they reach adolescence, their activity levels decrease dramatically (Sallis et al., 1992b), and their attitudes toward physical activity become more negative (Godin & Shephard, 1986; Sallis & McKenzie, 1991). There is a need for intervention programs that can help prevent the drop in physical activity at the onset of adolescence, and help encourage children to continue to be physically active throughout adulthood. Influencing positive changes in attitudes toward physical activity might be one way to get adolescents to keep their activity levels of childhood, and to continue being active throughout their lives (Ajzen, 1985; Ajzen, & Fishbein, 1980; Ajzen & Madden, 1986).

The incentive to encourage people to maintain high activity levels stem from research linking physical activity with a variety of health benefits (Blair, 1993; Pate & Hohn, 1994; Simons-Morton et al., 1987). Some of the benefits of physical activity are quite remarkable, and involve reduced chances of acquiring, or increased chances of postponing, several of our most serious diseases. Cardiovascular disease alone accounts for more deaths in the United States each year than all other causes of death combined (Levy, Dignan & Shirreffs, 1992). The nation's number-one killer often shows no symptoms, however, the disease starts developing early in life. Forty percent of all children ages 5-8 have at least two risk factors for heart disease, and these risk factors generally persist into adulthood (Hales, 1991). In 1992 the American Heart Association named physical inactivity a major risk factor for cardiovascular disease (American Heart Association, 1992).

Cardiovascular disease is not the only area of health and wellness affected by physical activity. Regular participation in physical activity has also shown the ability to reduce stress, help prevent or control high blood pressure, obesity, and diabetes (other risk factors for cardiovascular disease), reduce the chance of getting certain kinds of cancer (particularly colon, breast, and uterine cancers), help prevent or control osteoporosis, prevent back pain, increase energy level, improve appearance and self concept, and increase feeling of well-being (Levy et al., 1992).

Although the best indicator for disease prevention is physical fitness, physical activity has also shown to be a good indicator, and is also considered to be a precursor to physical fitness (Simons-Morton et al., 1987). However, despite all these health benefits, only about 12 percent of all American adults

participate in moderate to vigorous physical activities on a regular basis (Fahey, Insel & Roth, 1994). A growing number of health and physical education professionals are increasing their efforts to find methods of getting more people physically active (Corbin & Pangrazi, 1992; Sallis et al., 1992b; Simons-Morton et al., 1987; Steinhardt, 1992). Some of their efforts have focused on adolescents.

The main concern of these researchers is not children's fitness levels, since most children are more fit than adults, but the fact that these fitness levels don't automatically carry into adulthood (Sallis & McKenzie, 1991). Since the mid 1960s there has been an increasing belief in society that American children and youth are unfit and not physically active. This belief has in recent years been challenged by researchers in physical education and health (Corbin & Pangrazi, 1992; Sallis et al., 1992b; Simons-Morton et al., 1987). They claim that more American children than previously thought are fit according to criterion-referenced standards of health-related fitness. The concern instead is with activity levels, representing habits, that have more of a potential for carrying over into adulthood than do fitness levels (American Academy of Pediatrics Committees on Sports Medicine and School Health, 1987; American College of Sports Medicine, 1988; Sallis & McKenzie, 1991; US Department of Health and Human Services Public Health Service, 1991).

Although young children are active, the activity levels drop as the children get older. A decline of almost 50% from age 6 to 16 has been reported (Sallis et al., 1992b). The most dramatic drop in activity level occurs when the child enters adolescence, and the decline continues throughout adolescence,

while negative attitudes toward physical activity become more prominent (Godin & Shephard, 1986; Sallis & McKenzie, 1991).

The question many researchers are concerned with is, how do we get adolescents to remain physically active from childhood into adulthood? There may be many different answers to this question, and researchers have called for the development and testing of various forms of interventions that may lead us to possible answers (Sallis et al., 1992b; Schutz, Smoll, Carre & Mosher, 1985). One such new intervention is called P.E.TV (Physical Education Television).

What Is P.E.TV?

P.E.TV (Physical Education Television) is a curriculum-supplement package consisting of a series of 10-12 minute videos and a teachers' support manual for use in physical education and health classes in middle and high school. P.E.TV was developed by Whittle, a communications corporation, in 1993-1994 (P.E.TV, 1994). It is now produced and managed under Channel One Inc. The videos and the manual are designed to supply the physical education teacher with ideas for lesson content and emphasis for an 18-week semester. Enough videos are produced to supply the teacher with a different one for each of the 36 weeks in a school year. The manual is designed to be used over several semesters, even though it is in an 18 week semester format.

P.E.TV is being offered to middle and high schools throughout the United States. Schools that already subscribe to Channel One, a daily classroom news show, receive all the materials free of charge. Schools that do not subscribe to Channel One pay for the cost of the materials, a one-time fee

or $50.00 (this includes 36 videos and 3 copies of the manual). As of August 31, 1994, over 12,000 schools had received P.E.TV, intended for start-up during the 1994-95 school year. A preliminary study of teachers' responses to P.E.TV showed that the number of schools that actually started using P.E.TV in the fall of 1994 was much lower than that (Himberg & Graham, 1994).

P.E.TV is underwritten by Reebok International Ltd. The videos include Reebok's logo at the beginning of each show, and the use of Reebok products are evident throughout the videos. The Teacher's Manual includes several full page advertisements for Reebok. Otherwise the video shows are uninterrupted by "traditional" commercial spots.

The Goals Of P.E.TV's Creators And Sponsors

The creators and sponsors of P.E.TV have stated that they intend the program to influence adolescents' attitudes toward physical activity in a positive way. Scott Helbing, creator and former executive director of P.E.TV, says in the introduction to the Teacher's Manual that "everyone knows that physical fitness is good - but a lot of teens don't think it's any fun and, therefore, not worth the effort. Whatever the reason, we think we can help change their attitudes" (P.E.TV, 1994, p. 3). Also, he says that "the underlying message of P.E.TV is that physical fitness and health can be fun for a lifetime" (P.E.TV, 1994, p. 3). Helbing also points out the ability of television, specifically P.E.TV, to introduce students to "games, skills, sports, and personalities no teacher could ever access" (P.E.TV, 1994, p. 3). Angel Martinez, executive vice president of Reebok International supports

Helbing's statements and says that P.E.TV is "designed to encourage wellness" (P.E.TV, 1994, p. 5).

The goals of P.E.TV's creators relate to psychological determinants of physical activity in adolescents, such as change in attitudes, knowledge of "how" to be more active, and enjoyment of physical activity (Sallis et al., 1992b). They also relate to sociological determinants, such as impact of role models and significant others on adolescent physical activity behavior (Reynolds, Killen, Bryson, Maron, Taylor, Maccoby & Farquhar, 1990; Sallis, Hovell, Hofstetter & Barrington, 1992a; Sallis et al., 1992b). These determinants will be discussed in greater detail in the review of literature.

In attempting to answer the question “Does P.E.TV make a difference?”, it is important to examine the intentions of the creators of P.E.TV. These intentions were clearly communicated to the teachers in the Teacher's Manual (P.E.TV, 1994), and included a desire to change the middle and high schools students' attitudes toward physical activity in a positive direction, to get across the message to the students that physical activity can be "fun for a lifetime" (P.E.TV 1994, p. 3), and to "encourage wellness" (P.E.TV 1994, p. 5).

Purpose Of The Study

In accordance with P.E.TV’s purpose and objectives, the major purpose of this study was to assess the influence of P.E.TV on middle school students' attitudes toward physical activity. In addition, the study also attempted to determine if there were changes in the students’ perceived behavioral control, which relates to students' knowledge of how to be physically active,

and their perceived social pressure (subjective norm) to participate in physical activity.

Research Questions

Based on the goals of the creators of P.E.TV and the review of related literature, the following research questions were formulated:

1. Was P.E.TV effective in influencing students' attitudes toward physical activity? Were attitude scores for students participating in P.E.TV higher than scores obtained by students who did not view the P.E. TV videos?

2. Did P.E.TV influence students' perceived social pressure (subjective norm) toward physical activity in a positive way?

3. Did P.E.TV affect students' perceived behavioral control for physical activity in a positive way?

4. Was there any difference in the effectiveness of P.E.TV on the attitudes toward physical activity of students categorized as “high active” as compared to students categorized as “moderate to low active”?

Justification For The Study

Because of the many benefits associated with physical activity and fitness, and because of child and adolescent activity levels dropping with increased age, researchers in the fields of physical education, health, and psychology have called for the development and investigation of intervention programs that aim for fostering positive attitudes toward physical activity, which eventually may lead to a lifetime of participation in physical activity (Sallis et

al., 1992b; Schutz et al., 1985). P.E.TV's creators claim that P.E.TV is such an intervention program.

In addition, two national surveys of teachers who used P.E.TV in their classes, indicated that the teachers believed that P.E.TV had a positive effect on their students' attitudes toward physical activity (Himberg & Graham, 1994; Himberg & Graham, 1995). The review of related literature, below, supports the notion that television and video technology is an effective medium for targeting young peoples' attitudes toward an issue, a product, or a behavior.

Also, P.E.TV's creators said they aimed at encouraging wellness (P.E.TV, 1994). One of the ways that the program attempted to do this was by introducing music, sport, television/film, and other entertainment celebrities in the shows. These celebrities were shown on P.E.TV participating in, or endorsing, a range of physical activities, presented in ways that make them look new and exciting. The concept of subjective norm relates to the wellness encouragement goal in that celebrities and peers (teenage hosts) are role models that are showing interest in, and encouraging physical activity. The concept of perceived behavioral control relates to the goal of encouraging wellness in that students can get new ideas and knowledge of how to become more physically active.

This study was conducted to determine if P.E.TV was successful at influencing, in a positive direction, students' attitudes toward, and their subjective norm and perceived behavioral control for, physical activity, in a rural middle school in southwestern Virginia, during a nine week period. There have been no previous attempts to examine the influence of P.E.TV on

those for whom the show was intended. This is the first study investigating P.E.TV and its potential effects on students, using their own responses as the data to be analyzed.

Delimitations

Delimitations are factors that the investigator controls, and these factors probably influence the results of the study. Conducting research in the natural school setting is often an imposition on teachers and students, so to make this research project interfere as little as possible, the following delimitations were set.

1. The study was delimited to 9 weeks.
2. The study was delimited to four eight grade physical education classes in a rural middle school in southwestern Virginia.
3. The study was delimited to the showing of one program per week.

Limitations

There are certain limitations that are evident when you are conducting research in the natural school setting. These limitations may contribute to the results of the study. Although this experiment controlled for certain factors, such as using the same teacher for all four classes, other factors were beyond the investigator's control:

1. The four eighth grade classes selected for the study may not represent the total population of eighth graders in the United States.
2. Middle school teachers may vary in the methods they use to deliver P.E.TV to their classes.

3. The teacher in this study may not be typical for middle school P.E. teachers.

4. Factors that are extremely difficult to control for in a field experiment may contribute to possible changes in students' attitudes toward physical activity, their subjective norm, and perceived behavioral control.

Definitions Of Terms

ATPA - Attitudes Toward Physical Activity, an inventory designed to assess attitudes toward physical activity in seven subdomains: social growth, social continuation, health and fitness, vertigo (thrill with risk), aesthetic (beauty and grace), catharsis (release of tension), and ascetic (long and hard training) (Schutz et al., 1985).

CATPA - Children's Attitudes Toward Physical Activity, an inventory designed to assess children's attitudes toward physical activity in seven subdomains: social growth, social continuation, health and fitness, vertigo, aesthetic, catharsis and ascetic (Schutz et al., 1985).

Perceived behavioral control - A person's belief as to how easy or difficult the performance of a behavior is likely to be (Ajzen & Madden, 1986).

P.E.TV - Physical Education Television. A program designed to improve middle and high school students' attitudes toward physical activity, consisting of a weekly 10-12 minute video and an instructor's manual which includes ideas for lessons. The video portion of the program has a young "music television" style, aimed at keeping the attention of adolescents.

Subjective norm - The perceived social pressure to perform a behavior (Ajzen & Madden, 1986).

REVIEW OF LITERATURE

This section reviews the literature related to the issues concerning P.E.TV, and the question of whether or not it is working as intended by the creators. The review is divided into six sections, and will focus on the determinants of physical activity in adolescents; the relationship of attitudes, intent and behavior; Erikson's theory on adolescent development; using media to change affect; mediated instruction in physical education; and the selection of instruments to assess attitudes, subjective norm, perceived behavioral control and physical activity levels.

Determinants Of Physical Activity In Adolescents

P.E.TV's creators intended the program to affect attitudes. Is this an appropriate area on which to focus if the goal is to get adolescents to become more physically active? This section will attempt to answer that question by reviewing related literature examining the determinants of physical activity in adolescents.

The determinants of physical activity are generally divided into four groups: biological and developmental factors; psychological factors; social and cultural factors; and physical environment factors (Sallis et al., 1992b). Factors designated to each of these groups have been studied for a variety of populations, including adolescents.

Studies of gender as a determinant of physical activity in youth, usually considered under the biological and developmental group, have suggested

that boys tend to be more active than girls (Sallis et al., 1992b). However it is unclear and arguable whether this is due to biological and developmental factors or social and cultural factors (Sallis et al., 1992b).

Social and cultural determinants for physical activity include socioeconomic status, ethnicity, and the influence of peers and parents (Sallis et al., 1992b). Although studies have suggested an increased influence of peers during adolescence (Anderssen & Wold, 1992; Wood, 1985), little research has been done examining the effects of role models on adolescents' and children's physical activity levels (Sallis et al. 1992b).

Physical environment factors influencing children and adolescent's activity levels negatively include cold weather, time spent indoors, and schooldays (children are more active on weekends) (Sallis et al. 1992b). Although the effects of television have been studied extensively, no consistent findings have suggested that time spent watching television is related to physical activity levels. This factor is, however related to other predictors, such as time spent outside (Sallis et al., 1992b).

Of the psychological factors, personality characteristics, self-confidence, independence, and knowledge about the benefits of physical activity have not shown to be strong determinants of physical activity in children and youth (Sallis et al. 1992b). Examining the determinant of knowledge about benefits, for example, studies of many health behaviors have found that even though people know they should stop smoking, wear their seat belt, exercise, eat healthy foods etc., they don't (Strouse & Fabes, 1985). Behavioral action does not seem to come from just increasing knowledge. However, for physical activity, "know how", or knowledge of how to be physically active,

perceptions of barriers to physical activity, intentions to exercise, and self-efficacy have been shown to be good predictors of physical activity in adolescents (Ferguson, Yesalis, Pomrehn & Kirkpatrick, 1989; Godin & Shephard, 1986; Greenockle, Lee & Lomax, 1990; Sallis et al., 1992b).

Knowledge of how to be physically active and self-efficacy each relate to the concept of perceived behavioral control (Ajzen & Madden, 1986). P.E.TV introduces many new activities, and encourages youth to find time to be physically active. Perceived behavioral control has been included in the research questions for this study. The concept will be described in more detail below.

Attitudes toward physical activity have received varied support as predictors of physical activity, ranging from weak to good (Desmond, Price, Lock, Smith & Stewart, 1990; Ferguson et al., 1989; Godin & Shephard, 1986; Meyers, Pendergast & DeBacy, 1978; Neale, Sonstroem & Metz, 1970; Smoll, Schutz & Keeney, 1976; Tolson & Chevrette, 1974). However, since the goal of the creators of P.E.TV is to change students' attitudes toward physical activity, the question of whether this occurs becomes the major focus of this study.

Focusing On Attitudes, Intent And Behavior

Improved attitudes toward physical activity have been rated as one of the most, or *the* most important objective in physical education programs (Carre, Mosher & Schutz, 1980, as reported in Schutz et al., 1985). However, two questions arise when thinking about adolescents and attitudes: 1) what are attitudes, and how are they formed or changed?, and 2) does a change in attitudes lead to a change in behavior? The answers to these questions are

not only important in understanding attitudes and change, but the answer to the second question may justify looking at attitudes as an important part of the question "Does P.E.TV make a difference?". Ultimately, what many health and physical education professionals would like to see are more physically active adolescents. And in that respect, looking at attitudes becomes uninteresting unless there is some kind of indication that an attitude change can lead to a change in behavior.

Fishbein and Ajzen (1975) defined attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object" (p.6). In other words, an attitude is affective or evaluative in nature and "may be conceptualized as the amount of affect for or against some object" (Fishbein & Ajzen, 1975, p.11).

There are several theories on how attitudes are formed or changed, they include: cognitive dissonance theory; attribution theory; learning theories; expectancy-value theories; and consistency theories (Fishbein & Ajzen, 1975). Each of the theories attempt to explain how attitudes develop. This review focuses on social learning theory because it seems that this theory is the one that best explains the attributes of P.E.TV, and what P.E.TV is attempting to accomplish.

Social learning theory tries to explain situational influences that control the way people behave, but also their attitudes and beliefs. The theory focuses on a continuous, reciprocal interaction between a person's behavior, thoughts and emotions, and environmental consequences of the behavior or attitude. Thus rewarding consequences increases attitudes and behavior (Zimbardo, Ebbesen & Maslach, 1977).

According to social learning theory, people's attitudes and behaviors are affected by performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977). P.E.TV focuses on two of these areas in their attempt to change students' attitudes toward physical activity: vicarious experience and verbal persuasion. The use of fit and healthy teen-age hosts, sports celebrities, and rock stars, can be categorized as modeling (symbolic) and fits under vicarious experience. The shows contain plenty of verbal persuasion, including suggestions and exhortations. And the programs are geared toward the students' emotional state as well, with the use of music, insinuations of "fun", and beautiful people. In addition, if the teachers follow the program guide and actually have the students participate in many of the suggested activities, the students may also be influenced by their performance accomplishments, including participant modeling, performance exposure, and possibly self-instructed performance.

But do changes in attitudes lead to changes in behavior? Fishbein and Ajzen's "Theory of Reasoned Action" (Fishbein & Ajzen, 1975) attempted to explain the link between attitudes, intent and behavior. This theory claims that attitudes alone are not good predictors of behavior. However, behavioral intent correlates highly with behavior, and the more specific the intent the higher the correlation (Fishbein & Ajzen, 1975). Intent becomes the major link in their model, and considered together with subjective norm, attitudes can predict intent (Fishbein & Ajzen, 1975).

Subjective norms reflect a person's beliefs that certain significant others think he or she should or should not perform the particular behavior. The person may or may not be inclined to defer to the significant other. Fishbein

and Ajzen (1975) explain that "The normative beliefs and motivation to comply lead to normative pressures. The totality of these normative pressures may be termed subjective norm" (Fishbein & Ajzen, 1975, p.16). The "Theory of Reasoned Action" thus suggests that a person's attitudes toward a behavior and his or her perception of the social pressures to comply to the behavior, or "subjective norm" can predict intent, and intent can predict behavior.

The "Theory of Reasoned Action", although supported by research (Fishbein & Ajzen, 1975), has been criticized by many other researchers for being limited because it specifies that the person must be in control of the behavior in question (Fishbein & Ajzen, 1975; Gatch & Kendzierski, 1990). In 1985 Ajzen modified the theory and developed the "Theory of Planned Behavior" (Ajzen, 1985). This theory, although based on the "Theory of Reasoned Action", considers a new factor, an individual's perceived control over the behavior in question. This theory is similar to Bandura's construct of self-efficacy, which, as mentioned earlier is a construct that has proven to be an important factor in the prediction of exercise behavior (Sallis et al., 1992b).

The addition of perceived behavioral control into the equation has been shown to increase the predictability of intentions (Ajzen & Madden, 1986; Schifter & Ajzen, 1985). This process, however, is not one-way. In accordance with social learning theory, there are feed-back loops from intent and behavior which influence attitudes, subjective norm, and perceived behavioral control, as they in turn influence behavior. The process is bi-

directional and interactive (Ajzen, 1985; Bandura, 1977; Fishbein & Ajzen, 1975).

The behaviors in the affective domain are more difficult to classify than behaviors in the cognitive domain. The reason may be because the affective domain deals with feelings and emotions, concepts that are hard to explain and measure. Nevertheless, Krathwohl, Bloom and Masia presented in 1964 an Affective Domain Taxonomy. This taxonomy is categorized in a hierarchical order on the basis of internalization, from lowest to highest (Figure 1).

1.0 Receiving (attending)

1.1 Awareness

1.2 Willingness to receive

1.3 Controlled or selected attention

2.0 Responding

2.1 Acquiescence in responding

2.2 Willingness to respond

2.3 Satisfaction in response

3.0 Valuing

3.1 Acceptance of a value

3.2 Preference of a value

3.3 Commitment (conviction)

4.0 Organization

4.1 Conceptualization of a value

4.2 Organization of a value system

5.0 Characterization by a value or value complex

5.1 Generalized set

5.2 Characterization

Figure 1. Affective Domain Taxonomy. From Krathwohl, Bloom & Masia, 1964, p.95.

Krathwohl et al. (1964) gave examples of educational objectives for each step in the hierarchy. Changing attitudes toward physical activity fits in the third step, "Valuing". One of the examples of an educational objective for step 3.1, "Acceptance of a value", is ""Desires to attain optimum health" (Krathwohl et al., 1964). Although this example may be somewhat on the side of changing attitudes toward the enjoyment of physical activity, it may be on the same level. Level 3.3, " Commitment", may represent the level where we see an attitude change into intent or actual behavior, in this case participating in physical activity on a regular basis..

In physical education the affective domain has two major categories of concern: interest and motivation, and attitudes and values (Singer & Dick, 1974). A number of physical educators have deemed the affective domain an extremely relevant area for focus of objectives in physical education when the ultimate goal is a lifetime of participation in physical activity (Pate & Hohn, 1994; Singer & Dick, 1974). The theory is that if students feel good about activities they participate in, they will be more likely to perform these activities on their own time.

Erikson's Theory On Adolescent Development

P.E.TV is attempting to influence adolescents attitudes toward physical activity through video technology, using a format that appeals to this age group, as well as role models that the teenagers can relate to. What do we know about adolescent development that can suggest that P.E.TV will be successful in its efforts, and will this effort appeal to all adolescents? This

section will attempt to answer these questions by examining Erikson's theory on adolescent development.

Developmental psychologist Erik Erikson may be one of the theorists who has contributed most to our understanding of adolescent development Adolescence, which is derived from the Latin verb *adolescere,* means to grow up. This period in life represents the transition from childhood to adulthood. In Western societies adolescence has long been considered by many psychologists and educators a period representing challenges of many kinds.

Erikson (1968) said adolescence is the time in life when it is most important for further development that the self is defined. In other words, this period is critical in the resolution of the life cycle crisis of identity (Erikson, 1968). Erikson focused a great deal of his work on the formation of identity, or definition of self. This was the emphasis of one of his most popular books; Identity: youth and crisis (Erikson, 1968).

Erikson (1968), in his psychosocial theory, proposed eight stages of development through which each individual must pass in their lifetime. Each of the stages have a crisis period for emotional and social development. A person's ability to resolve the crisis in each stage determines a positive or negative outcome, which affects ego development (Miller, 1993). The ego represents the mind's connection to reality, and it performs the activities of perception, memory, logical thought, and problem solving (Miller, 1993). Crisis is not "an impending sense of catastrophe", but rather a "necessary turning point, a crucial moment when development must have one way or another, marshaling sources of growth, recovery, and further differentiation" (Erikson, 1968, p.6).

Erikson's first stage, which represents the first 18 months of life, focuses on trust versus mistrust. During stage two, age 18 months to 3 years, a person must resolve the conflict of autonomy versus shame. Stage three, 3-6 years, focuses on initiative versus guilt. During stage four, the conflict to be resolved is industry versus inferiority. This stage lasts approximately from age 6 or 7 to age 11 or 12. Young adolescents may be in this stage. Stage five, representing the crisis of identity versus role confusion, is the stage of adolescence, lasting from age 11 or 12 to age 18. The three adult stages of development are intimacy versus isolation (young adulthood), generativity versus stagnation (middle adulthood) and ego identity versus despair (older adulthood) (Miller, 1993).

During adolescence, the body's physiology changes rapidly, and in addition to the new feelings and sexual urges an adolescent experiences, she feels pressure form society to make certain choices and take stands to issues that before did not concern her. Forming her new identity, the adolescent draws from her experiences in the earlier stages of development.

The positive resolution of the adolescent stage is identity achievement. Three other states of this stage are *moratorium*, *foreclosure* and *identity diffusion* (Leadbeater & Dionne, 1981). A young person who experiences *moratorium*, is in an identity crisis, which means he is struggling with life decisions, and not making long term commitments. An individual who is labeled in *foreclosure* has not yet experienced an identity crisis, but she has decided on occupation, ideology, religion, politics, etc. based on what she has learned from her family. A person who is experiencing *identity diffusion* may or may not have experienced identity crisis, but he is not committed to

any ideology or occupation (Leadbeater & Dionne, 1981). The state of identity diffusion is one outcome of this stage that Erikson warned we would want to try to prevent (Erikson, 1968).

When a person has resolved the conflict of identity and role confusion, she possesses an identity. She has a "conscious sense of individual uniqueness" and a sense of "solidarity with a group's ideals" (Erikson, 1968, p.208). On the other hand if her identity is diffused, she is unsure of her worth as a human being. This can happen as a result of many things, including a feeling of inadequacy because of socioeconomic status of parents, ethnic or cultural background, or an tendency to over identify with role models or heroes (Erikson, 1968).

P.E.TV uses "heroes" in the form of teen role models and celebrities in their shows. Rock stars, sports stars and other teen celebrities appear as guests on the shows, and in addition, P.E.TV seems to have tried to make teen role models out of the hosts of the shows, Matt, Jose, Valarie, and Dani. These teens are beautiful, fit, healthy, and "cool" looking, not your idea of the average teenager going through puberty. They look and act more like TV or movie stars. P.E.TV seems to be trying to hold them up as positive examples of what regular physical activity can lead to, without actually saying so. Is this dangerous? Could this possibly lead adolescents watching these shows to a state of identity diffusion?

There is more than one way to answer this question. On one hand, according to social learning theory, one way to affect changes in attitudes and behavior is through the use of positive role models. Physical appearance matters to most adolescents (Godin & Shephard, 1986). Valarie, Matt, Jose,

and Dani are positive role models regarding health and physical appearance. It seems clear that the producers of P.E.TV chose these young people based on these factors. On the other hand, will this make certain students apathetic or reject the messages of the program? Adolescents watching the shows may over-identify with the role models, and feel they can never measure up, and thus act indifferent to the whole program. If this happens, chances are these students will not change their attitudes about the message, being more physically active, and the program will not work for them.

Researchers have looked at the issue of television influencing adolescents' attitudes and behavior. Many studies have focused on the process of constructing social reality, and for adolescents it seems that two of the major influences in this process are television and peers (Peterson & Peters, 1983). Bronfenbrenner (1979) also emphasized the interconnection among experiences in different social institutions when adolescents develop their conceptions of social reality.

But how real and accurate is television's portrayal of "reality"? Adolescents do not perceive television images as "objective reality". They define what they see as real based on confirmation from social referents, such as peers, their belief systems, issues that are important to them in their developmental stage, and how much attention they pay to the television show they are watching (Peterson & Peters, 1983). In other words, peers, among other factors, play an important role in helping adolescents decide what is real and important in the shows that they watch. Adolescents' thoughts, feelings and behaviors are shaped by their peers to a large degree (Anderssen & Wold, 1992; Peterson & Peters, 1983; Wood, 1985). For this

study, the concept of subjective norm represents a measure of just how adolescents perceive that their peers rate the importance of physical activity.

Television serves as an important tool for the delivery of adult role models. Many adolescents do not spend a lot of time with adults, so television provides a unique experience for them (Peterson & Peters, 1983). This may also be true for role models concerning healthy behaviors. In this sense P.E.TV may provide a unique experience for adolescents to see adults and teens participate in healthful behaviors, especially physical activities.

Using Media To Change Affect

With its up-beat style, and use of healthy looking teen role models, P.E.TV represents an effort of using media to change affect, in a classroom setting. The use of visual media in a learning environment has been studied intensely by communication and education researchers, and the focus has been on the visual media of the day: film, television, video, laser disk and computers (Kozma, 1991; Saettler, 1968). Because P.E.TV is delivered to the students by the use of video, this section presents a review of the related literature on the use of television in the classroom.

Television has traditionally been used as a means of delivering visual material. This has included distance learning classrooms by satellite, closed circuit classroom viewing, as well as shows which were aired on the Public Broadcasting System and directly sent for classroom use (De Vaney, 1994).

Most of the research examining the effectiveness of mediated instruction in the classroom has focused on the cognitive domain (Kozma, 1991). However, cognitive gains, or specifically, increased knowledge about health

and wellness, does not seem to change people's health behaviors (Sallis et al., 1992b), so this review will focus on the use of media to change affect. The main goal of the creators of P.E.TV is to influence adolescents attitudes about physical activity in a positive way (P.E.TV, 1994). And although knowledge of health and fitness issues are an important part of the program, the main focus and intent is reportedly to influence the students' affective domain.

Research on media being used to change affect looks for the most part at television and its impact on children and adolescents. It seems to be widely accepted, at least in the advertising industry, that television influences children's and adolescents' affect. Companies spend billions of dollars each year on targeting these groups through television commercials. But aside from the "obvious", there is also researched evidence of television affecting children and adolescents. Much of this research deals with cognitive development, however a great deal of research has focused on the affective domain.

According to Fishbein's Theory of Reasoned Action (Fishbein & Ajzen, 1975), and Ajzen's Theory of Planned Behavior (Ajzen, 1985), influencing affect is the focus in the belief-attitudes-intent-behavior chain. Many studies have looked at television as a behavior model. In the 1970s there was a push from various consumer and children's action groups to study the various effects television had on children and adolescents (Ploghoft & Anderson, 1981). These studies revealed that children and adolescents are influenced by television, and especially by commercials (Bryant & Anderson, 1983; Palmer & Dorr, 1980). Specifically, effects on children and adolescents were shown both in favorable attitudes toward a product, and in intent to obtain a product

(Atkin, 1978; Goldberg, 1978; Gorn & Goldberg, 1977; Palmer & Dorr, 1980). Other areas that television seems to influence include adolescents' social processes (Van Hoose, 1980), children and adolescents' aggression (Williams, 1979; Worchel, 1976; Wurtzel, 1977), stereotyping of gender roles (Davidson, 1979; O'Bryant & Coder-Boltz, 1978), and anti-social and prosocial behavior (Hoffman, 1979; Sprafkin & Rubinstein, 1979; Tannenbaum, 1976).

Television's influence on adolescents' affective domain may also be enhanced by other factors. According to Erikson's (1968) theory of adolescent development peers have a great potential for influencing each other during this stage of identity formation. P.E.TV's use of teenage hosts may be an important focus when asking the question "Does P.E.TV make a difference?".

One study, focusing on the question of peer influence, looked at the effects of peer pressure and prosocial/antisocial television content on children's prosocial behavior (Tannenbaum, 1976). Three viewing situations were presented to the children, these were: no television, violent television content, and prosocial television content. Four variations of peer influence were tested for each viewing situation: no peers in the room, peers present but silent, peers encouraging prosocial behavior, and peers encouraging antisocial behavior. The findings indicated that the highest level of influence on prosocial behavior occurred in the group of children watching the prosocial TV program with peers encouraging the prosocial response (Tannenbaum, 1976).

Other studies have supported the findings that television models have an impact on children's prosocial behavior (Hoffman, 1979). In looking at the effects P.E.TV has on attitudes, it is important to analyze both the effect of the

show itself, and the contributing factors of influence from peers, in the adolescents' groups, and as role models on the show. In addition, the students' perceived subjective norm, what they feel their peers think about the messages of P.E.TV, should be studied.

Of the studies that have focused on the effects of commercials on children and adolescents' attitudes and behaviors, those examining health behaviors are particularly of interest to this study. Goldberg (1978) found that children who watched commercials for high sugar foods were more likely to desire those foods than were children who watched pro-nutrition public service announcements. The most effective influence on the children who chose the healthier foods was an animated program called "Junk Food". Researchers have called for the reduction of anti-health messages such as those related to nutrition, exercise, violence, sexuality, and general wellness on television (Leary, 1979; Price, 1978).

Other studies have focused on the use of television for affective education. Van Hoose (1978) surveyed teachers about their opinions of the practical value of an instructional television show aimed at helping present, and open up discussion about social, emotional and physical problem for 8-10 year-old children. The majority of the teachers in the study responded positively (Van Hoose, 1978).

Another study looked at the effects of a television series titled "Feeling Free", programs designed to attempt to positively affect children's attitudes toward handicapped people. The teachers would lead the discussions after the children viewed the programs. The results of the study showed that "Feeling Free" had a positive effect on the children's attitudes toward

handicapped people and their capabilities, their skills, and their ability to feel. The children's attitudes toward having handicapped children as friends also improved (Storye, 1979).

Affective learning gains from the use of television in the classroom were also studied by Will and Hotvedt (1977). They investigated junior high-school students' cognitive and affective learning from a parenting education television series. The results revealed gains in knowledge, however the affective learning gains were more substantial than the cognitive gains (Will & Hotvedt, 1977).

Why has television been successful in influencing affect? Bandura (1977) suggested that television is so powerful because it captures and holds the attention of the audience by using rapid movements, visual complexity and sound effects. Bandura's social learning theory provided the basis for his schematic model for the Reactive Theory of Television Viewing. He stated that "Models presented in televised form are so effective in capturing attention that viewers learn much of what they see without requiring any special incentives to do so" (Bandura, 1977, p.25). Bandura's Reactive Theory of Television Viewing has shaped the way television has been used in educational settings (Bryant & Anderson, 1983).

The results of the research on the influence of television and commercials on children and adolescents have spurred a heated debate on the issue of television and commercials in the schools. One project that has been the focus of this debate for the last four years is P.E.TV's big sister, Channel One. Although there are many important differences between Channel One

and P.E.TV, it seems worthwhile to look at some of the elements of Channel One, and why this production has been so criticized.

The goal of Channel One is, according to it's producers, to increase middle and high-school students' knowledge of current events, nationally and globally (De Vaney, 1994). A number of theses, dissertations, articles and a few books have been written about Channel One, and the focus seems to be the presence and role of the commercials in the 10-12 minute news casts, as well as the effects of Channel One on the students' knowledge of current events (Barry, 1994; De Vaney, 1994; Knupfer & Hayes, 1994; Maurice, 1994; Muffoletto, 1994; Tiene, 1993).

The presence of commercials in the Channel One programs has made some researchers question whether the true goal of Channel One is to increase the students' knowledge of current events, or to sell commercial spots (Barry, 1994; De Vaney, 1994). Channel One has been directly criticized by parents, teachers, and administrators for delivering a target audience to the advertisers, making millions of dollars in the process. This concern caused New York and California to ban the program from their schools when the program first started (Barry, 1994; De Vaney, 1994; Maurice, 1994; Muffoletto, 1994; Tiene, 1993). Nevertheless, in one Midwest survey, students appeared to enjoy Channel One, and teachers reported feeling positive about Channel One's presentation of current events. However, the increase in students' knowledge about current events was only 8% in this study (Tiene, 1993).

P.E.TV differs from Channel One in two major ways. First of all, the goal of P.E.TV is, as previously mentioned, to influence the students' affective domain, namely their attitudes toward physical activity. Channel One

focuses on knowledge (although many would argue they focus on the affective domain through the commercials). Secondly, P.E.TV does not have commercial spots, although the sponsor, Reebok, presents it's logo at the beginning of the show, and Reebok products are present throughout the shows. Whether or not this will present a controversy for P.E.TV as well remains to be seen. Two surveys of 80 user teachers during P.E.TV's first and second seasons revealed that the teachers in the study were not concerned with the presence of the Reebok logo and products (Himberg & Graham, 1994; Himberg & Graham, 1995).

Physical Education, Mediated Instruction, And The Affective Domain

The use of mediated instruction in physical education to influence the affective domain has been very limited. For the most part, the material developed aimed at the affective domain has been in the area of health, not physical education. The use of mediated instruction in physical education has focused mainly on the psychomotor and cognitive domains.

In the psychomotor domain, quantitative and qualitative analyses of motor performance has been made easier over the last decades with the use of video and computer technology (Gensemer, 1985). Generally, teachers and coaches have used film and video of students and players to analyze and teach motor skills. In the areas of sport science, film, video, computers, and other electronic equipment have been used as tools for observing and analyzing movement. These technologies have moved many of the measurement and evaluation questions away from subjective hunches and estimations to more objective and accurate analyses (Gensemer, 1985). In the

field of biomechanics, film, video, and the use of computers has enabled more accurate analyses of the efficiency of movement.

Mediated instruction has also been used for the purpose of cognitive development. Especially health and fitness related topics in physical education have been taught in part by the use of film, video, and computers.

In physical education teacher education the use of video technology has become very popular. Today, video taping of lessons by future teachers in physical education is an important part of the preservice education at many universities, including Virginia Tech. Videotaping of lessons makes it possible and convenient for students to analyze, reflect and self evaluate their teaching (Kelly, Walkley & Tarrant, 1988; O'Sullivan, Stroot, Tannehill & Chien, 1989). This approach has also been used by continuing education services for teachers, such as the American Master Teacher Program (Graham, 1992). The latest developments of mediated instruction in physical education teacher education is the use of interactive video technology (Kelly et al., 1988; O'Sullivan et al., 1989).

In physical education, especially in the middle and high schools, developments in the use of mediated instruction include extended use of computer and multi-media technology in the gym (Mohnsen, 1995). The technology assisted instruction include software that teaches fitness concepts, anatomy and physiology, cognitive skills and health issues (Mohnsen, 1995). Although some of these programs and developments relate to the affective domain, it seems that they are not focusing on affect, but rather on the cognitive and psychomotor domains.

P.E.TV is unique in the sense that it may be one of the only programs developed for middle- and high-school students that focuses mainly on influencing the students' affect toward physical activity. Although the behavioral domains interact, and programs geared toward one specific domain can influence another, it is unique for a program in secondary physical education to claim that the main goal is to influence the affective domain. This reflects a philosophy of physical education that focuses on instilling in students a desire to become physically active for a lifetime. This is done by developing positive attitudes toward physical activity, as well as teaching the skills and knowledge needed for a lifetime of physical activity (Pate & Hohn, 1994).

The goals of P.E.TV's creators fit in nicely with the National Association of Sport and Physical Education's description of desired outcomes of quality physical education programs, with the end result being the "physically educated person" (NASPE, 1990). Although it has been criticized for being too broad and trying to include too many objectives (Steinhardt, 1992), this document is the closest the physical education profession has come to agreeing on curriculum content. It describes a physically educated person as one who:

- "Has learned the skills necessary to perform a variety of physical activities."
- "Does participate regularly in physical activity."
- "Is physically fit."
- "Knows the implications of and the benefits from involvement in physical activities."

• "Values physical activity and its contributions to a healthful lifestyle." (NASPE, 1990, p. 1-2)

P.E.TV addresses these concerns and goals by promoting the teaching of skills, as well as addressing issues such as those concerning adolescents' tendency to decreased participation in physical activities (Pate & Hohn, 1994). However, P.E.TV's focus in the effort to promote physical activity for a lifetime is attempting to improve adolescents' attitudes toward physical activity, knowledge of how to be physically active (perceived behavioral control), and portraying physical activity as a desirable behavior for adolescents (subjective norm).

Selection Of Instruments To Assess Attitudes, Subjective Norm, Perceived Behavioral Control, And Activity Levels

To attempt to answer the question if P.E.TV makes a difference in subjective norm, perceived behavioral control and attitudes toward physical activity for adolescents, the following instruments were chosen. The revised Children's Attitudes Toward Physical Activity (CATPA) inventory (Schutz, Smoll, Carre and Mosher, 1985) was chosen to assess attitudes. Questions from the Theory of Reasoned Action (Fishbein & Ajzen, 1980) and Theory of Planned Behavior (Ajzen, 1985) were chosen to assess subjective norm and perceived behavioral control. And to assess students' physical activity levels, for the purpose of categorizing them as "moderate to low active" and "high active" for an attribute-treatment-interaction analysis, the Weekly Activity Checklist was chosen (Sallis, Condon, Goggin, Roby, Kolody & Alcaraz, 1993).

Assessing attitudes with the CATPA. Schutz and coworker's (1985) revised Children's Attitudes Toward Physical Activity (CATPA) inventory was used to measure the students' attitudes toward physical activity. The inventory is based on Kenyon's (1968) Attitudes Toward Physical Activity (ATPA) and Simon and Smoll's (1974) CATPA inventories. The revised CATPA (Schutz et al., 1985) assesses children and adolescents' attitudes toward seven physical activity subdomains; social growth, social continuation, health and fitness, vertigo, aesthetic, catharsis and ascetic. The inventory uses statements, to which children are asked to indicate how they feel. There are five word pairs per statement, one negative and one positive word in each, and the scale for each pair goes from one to five, with five representing the positive word in the pair.

The CATPA inventory has shown to be reliable with respect to internal consistency, with Hoyt reliability of .8 and .9 (Schutz & Smoll, 1977; Schutz, Smoll & Wood, 1981). The revised CATPA inventory, with exception of the health and fitness subdomain, possesses high test-retest reliability (Smoll & Schutz, 1983) with mean reliability coefficients of .71 and .67. The "health and fitness" subdomain has a much lower test-retest reliability coefficient (.2 for males and .54 for females) (Smoll & Schutz, 1983). High ceiling effects, and the subdomain's division into two factors, "value" and "enjoyment", which gives each only 2 and 3 respective word-pairs, are the two main reasons for the low reliability coefficient of this subdomain. Schutz et al. (1985) suggested that more word pairs be added to this subdomain to combat this problem. For this study, based on Ajzen's (1985) work, 5 word pairs were added to the "health and fitness" subdomain of Schutz et al.'s (1985) revised CATPA,

making a total of 5 word-pairs in both the "value" and "enjoyment" groups (Appendix A). Despite the good reliability and validity reports of the revised CATPA, Schutz et al. (1985) warn that it is not suitable for assessment of individual changes in attitudes, but is well suited for assessment of groups.

The inventory has also been shown to possess high construct validity through research with both the ATPA and the CATPA (Schutz et al., 1985). However, the ability of the CATPA alone to predict behavior is moderate (Meyers, Pendergast & DeBacy, 1978; Smoll, Schutz & Keeney, 1976). According to Ajzen's (1985) Theory of Planned Behavior, attitude inventories need to be coupled with subjective norm and perceived behavioral control to be able to predict intent and behavior.

Assessing subjective norm and perceived behavioral control. The theories of Reasoned Action (Fishbein & Ajzen, 1980) and Planned Behavior (Ajzen, 1985) include standard questions for how to measure the concepts of subjective norm and perceived behavioral control. These questions are similar to the CATPA questions, where bi-polar word pairs are used, however a 7-point scale is used instead of CATPA's 5-point scale. Reliability and validity of the questions have been shown satisfactory in a number of studies (Ajzen, 1985; Ajzen & Madden, 1986; Fishbein & Ajzen, 1980; Gatch & Kendzierski, 1990).

Assessing physical activity levels. To be able to categorize the students into the groups "high active", and "moderate to low active" for the attribute-treatment-interaction analysis, some form of measurement of physical activity level was required. Measuring physical activity habits is not an easy task, and especially not in children and younger adolescents (Sallis, Condon,

Goggin, Roby, Kolody & Alcaraz, 1993). Although dozens of methods have been developed for this purpose, a "gold standard" is yet to be discovered (Blair, 1984; La Porte, Montoye & Caspersen, 1985; Saris, 1986). The problems encountered are similar to those in dietary assessment in the sense that you are trying to get a valid and reliable estimate of habitual behaviors that are not necessarily consistent from day to day (Blair, 1984).

Five major criteria have been developed to evaluate the potential of the various methods of assessing physical activity levels (La Porte et al., 1985). These criteria are:

- The instrument or method should be valid, it should measure what it was intended to measure.
- The instrument or method should be reliable, it should be consistent in the results of measurements under the same circumstances.
- The instrument or method should be accurate. If it is reliable and valid this criterion is fulfilled.
- The instrument or method should be practical. This concern includes cost and effort required of both researchers or administrators and participants of the study.
- The instrument or method should be non reactive. A participants behavior should not be affected by the measurement methods.

How these criteria are addressed depends on the type of study. For example, methods that are deemed non reactive and practical in small clinical studies may be inappropriate in large epidemiological studies (Blair, 1984).

The different methods that have been developed for assessment of habitual physical activity include calorimetry, job classification, physiological markers, behavioral observation, mechanical and electronic monitoring, dietary measures, and surveys (Blair, 1984; La Porte et al., 1985).

Based on a review of the available methods of assessing physical activity, a self-administered seven day recall questionnaire, the "Weekly Activity Checklist" (Sallis et al, 1993), was chosen for this study. The factors influencing this decision included the other reviewed methods' high cost, impracticality, demands on the participants, and the element of time. The benefits of recall surveys include practicality, non reactivity in participants, simplicity, ease of use, and low cost.

A number of studies have produced support for the use of self-report seven-day recall methods in children and adolescents (Blair, 1984; Wallace, McKenzie & Nader, 1985). The "Weekly Activity Checklist" has been deemed a reliable and valid instrument for recording children's physical activity levels (Sallis et al., 1993).

Self-administered seven-day recall questionnaires generally ask the participants to list or check off all their physical activities in the last week. These are usually categorized into groups of light, medium and heavy activities. Metabolic equivalent values (METS) are assigned to each group. Generally light activities are assigned a value of 3 METS, moderate activities 5 METS and heavy activities 9 METS (Sallis et al., 1993). Some variation is found in the met values assigned to each type of activities, and certain surveys are more specific than others. Blair (1984), for example includes four

categories, and the assigned METS vary slightly from Sallis and coworkers (1993).

Summary

P.E.TV is currently in over 13,000 middle and high schools all over the United States. Is this curriculum supplement material one possible answer to the concerns of decreased participation in physical activity in adolescence? Based on the reviewed literature concerning the determinants of physical activity in adolescents, Erikson's theory on adolescent development, the relationship of attitudes, intent and behavior, and using media to change affect, it seems that P.E.TV could have potential for affecting students' subjective norm, perceived behavioral control, and attitudes toward physical activity. Researchers have called for studies looking at "the efficacy of specific intervention methods that may be applied in multiple settings" (Sallis et al., 1992b, p. 254). This study represents such an effort.

Chapter 2

METHODOLOGY

The introduction and review of literature have attempted to make a case for investigating the effect of P.E.TV on middle school students' attitudes toward physical activity, their subjective norm and perceived behavioral control. This chapter explains the process through which the research questions were answered. It includes the hypotheses that were tested, a description of the participants, the instruments used, the research procedures, and methods of analysis of the data.

Hypotheses

Based upon the literature reviewed in Chapter One, the following hypotheses were developed:

Hypothesis 1: P.E. TV will have a positive influence on students' attitudes towards physical activity.

Hypothesis 2: P.E.TV will have a positive influence on students' subjective norm for physical activity.

Hypothesis 3: P.E.TV will have a positive influence on students' perceived behavioral control for physical activity.

Hypothesis 4: P.E.TV will have more of a positive influence on the attitudes toward physical activity of students categorized as "moderate to low active" than on students categorized as "high active".

Participants

Four, intact, eight-grade physical education / health classes from a middle school in southwest Virginia were chosen for this study. This middle school was chosen because the department of health and physical education at the university already had a relationship with the health and physical education teachers at the school, because it was within an hour drive from the university, and because the school had not previously used P.E.TV. Neither the teacher, nor the students, involved in the study had any previous experience with the program. The four classes were chosen because of the age level of the students, and the fact that they were all taught by the same physical education / health teacher. Physical education / health was a mandatory subject for all students in all four groups. The four classes consisted of a total of 36 males and 38 females.

All students, except special needs students requiring an aide, were randomly assigned to the physical education / health classes by the school's guidance personnel before the school year started. This was done by entering codes for the different subjects for each student into a computer, and the computer randomly placed the students into health / physical education classes. Thus, the students were not assigned to classes based on choice, talent, interest in the subject, or attitude toward the subject.

Students participating in the study were required to return a consent form signed by their parent or legal guardian. The consent form included a brief description of the purpose of the study, participation involvement, privacy issues, instructions for how to withdraw from the study, contacts at the University, and a consent statement (Appendix E). The students also had

to sign a consent form explaining the purpose of the study, their involvement, privacy issues, instructions for how to withdraw from the study, contacts at the University, and a consent statement (Appendix E). Due to the nature of the study, the students' ability to withdraw from the study was represented by refusal to complete the questionnaires. All students in the treatment group viewed P.E.TV. Of the 74 students (total) enrolled in the four classes, 71 students returned both informed consent forms, and participated in the study. Two of the participating students did not complete their post-test questionnaires, and were dropped from the study. This left 69 students for the final analysis.

Instruments

Assessing attitudes. Schutz and coworkers' (1985) revised Children's Attitudes Toward Physical Activity (CATPA) inventory was used to measure the students' attitudes toward physical activity (Appendix A). Based on Schutz and coworkers' (1985) suggestion, 5 word pairs were added to the "health and fitness" subdomain of the revised CATPA, making a total of 5 word-pairs in both the "value" and "enjoyment" groups (Appendix A). These word pairs were taken from Ajzen's (1985) work. The instrument was otherwise not altered, and used in its entire form.

The CATPA was scored by adding the points for each word pair in a subdomain (minimum 1 point per word pair, maximum 5 points), and totaling the sums for each subdomain to arrive at a score for attitude. There were 40 questions in all. The maximum score on the CATPA was 200, and the minimum score was 40. On the 5-point scale a score between 81 and 159

indicated a neutral attitude toward physical activity, a score between 160 and 200 points indicated a positive attitude toward physical activity, and a score between 40 and 80 indicated a negative attitude toward physical activity (Patterson & Faucette, 1990; Schutz et al., 1985).

Assessing subjective norm and perceived behavioral control. Questions from the theories of Reasoned Action (Ajzen & Fishbein, 1980) and Planned Behavior (Ajzen, 1985) were used to measure the concepts of subjective norm (Appendix B) and perceived behavioral control (Appendix C). For this study, instead of the original 7-point scale, a 5-point scale was used in order to keep the scale for subjective norm and perceived behavioral control consistent with the CATPA so as not to confuse the participants.

The measure for subjective norm was obtained by multiplying the scores on the two subjective norm questions (Ajzen, 1985; Gatch & Kendzierski, 1990) (Appendix B). Each of the two questions had a maximum score of five, and a minimum score of 1, and thus the maximum score for subjective norm was 25 (5x5), and the minimum score was 1 (1x1).

The measure for perceived behavioral control was obtained by adding the scores for the five perceived behavioral control questions (Ajzen, 1985; Gatch & Kendzierski, 1990) (Appendix C). Each of the questions had a maximum score of five, and thus the maximum score for perceived behavioral control was 25 (5+5+5+5+5), and the minimum score was 5 (1+1+1+1+1).

Assessing physical activity levels. To be able to categorize the students into the groups “high active”, and “moderate to low active” for the attribute-treatment-interaction analysis, the "Weekly Activity Checklist" was used

(Appendix D). It was administered to the participants in the control and treatment groups before P.E.TV was shown to the treatment group, according to proper procedure for attribute-treatment-interaction studies (Pedhazur & Schmelkin, 1991).

The instrument asked that participants put a check for each kind of physical activity in which they participated 15 minutes or more in the last week. The students filled out the questionnaires, and were asked to mark one of the boxes on the front page, indicating if the amount of physical activities they did this week was normal, more than usual, or less than usual. This information was wanted in case any of the participants were on the borderline as far as the categories "high active" and "moderate to low active". The students' recorded activities were assigned metabolic equivalent (MET) values, by the researcher, based on Brooks & Fahey's (1987) list of METS for physical activities (Table 1). Light activities were assigned a value of 3 METS, moderate activities 5 METS, and heavy activities 9 METS. This corresponded with Sallis and coworkers' (1993) recommendations.

Students were categorized by the researcher into the two groups, "high active", and "moderate to low active", based on the total score of METS for the week. Each activity check on the sheet was multiplied by the MET value for the activity, and the MET values were added for a total MET score for the week (see Table 1 for MET values for each activity). A student who received a total MET score of 25 or less was categorized as "moderate to low active", and a student who received a total MET score above 25 was categorized as "high active". Three students had MET scores close to the cut-off mark (24-26). These students' indication on the questionnaire of whether or not this was a

normal week for them for physical activity, was used to help place them in the appropriate category. For example, a student who reported playing basketball 3 times during the week for at least 15 minutes at a time (MET value for the activity = 5, score for this activity for the week was 15), and walking 3 times during the week for at least 15 minutes at a time (MET value for the activity = 3, score for this activity for the week was 9), received a total activity score of 24 METS for the week, and was categorized as "moderate to low active" because he indicated on the questionnaire that this was a normal week for him. Less questionable, a student who reported walking 5 times during the week for at least 15 minutes at a time (MET value for the activity = 3, score for this activity for the week was 15), jogging 2 times during the week for at least 15 minutes at a time (MET value for the activity = 9, score for this activity for the week was 18), and bicycling 5 times during the week for at least 15 minutes (MET value for the activity = 5, score for this activity for the week was 25), received a total activity score of 58 METS for the week (15+18+25), and was categorized as "high active". The two groups "high active" and "moderate to low active" corresponded with Kusinitz & Fine's (1990) categories for activity levels.

Table 1. Weekly Activity Checklist activities and assigned MET values

ACTIVITY	METS	ACTIVITY	METS
walking	3	jumping rope	9
running/jogging	9	soccer	5
playing tag	5	skateboarding/skating	5
dancing	5	swimming laps	5
hiking/climbing	5	bicycling	5
baseball/softball	3	tennis/badminton	5
basketball	5	aerobic dance	5
volleyball	3	water skiing	3
football	5	golf	3
frisbee/kickball	5	other	3-9

The instruments were piloted in August, 1995 by a population similar to the one used in the study. The pilot group consisted of 40 students in the sixth grade. The piloting of the questionnaires was done to ensure clarity, understanding, and middle-school students' ability to respond. The piloting also provided an estimate of time and effort needed to complete the questionnaires.

Data Collection Procedures

Pre P.E.TV questionnaire. Before P.E.TV was shown to the treatment group, at the beginning of the 9 week period, the pre-treatment questionnaire (CATPA, subjective norm, and perceived behavioral control questions, and

the Weekly Activity Checklist) (Appendix A, B, C, and D) was administered by the investigator to the treatment and control groups.

The investigator distributed the questionnaire during health class, and read the standard instructions to the classes (Sallis et al., 1993, and Schutz et al., 1985) (Appendix A). The investigator told the students to put a secret code on the questionnaire. The code consisted of the student's mother's first name and the last three digits of the student's phone number.

The codes were necessary to provide privacy for the participants, and encouraged honest responses to the various questions. In addition the codes were used to match the pre- and post-questionnaires. No effort was made to identify individuals, as only the means of the whole groups, or the sub groups ("high active" and "moderate to low active"), and not individual scores, were used for the data analyses.

At the time of administration of the questionnaires, the students were told that the responses did not represent right or wrong answers, that the responses would be tabulated and analyzed by groups, that no attempt would be made to identify individuals and their responses, and that the responses in no way would affect their grades in the class. This message was given orally before the administration of the questionnaires. Each student filled out the questionnaire and returned it to the investigator.

The reason for administering the Weekly Activity Checklist before the treatment was because it was used in the Attribute Treatment Interaction analysis. The attribute, in this case the physical activity level of the students, needed to be measured before the treatment was introduced, to ensure that the treatment would not affect the attribute (Pedhazur & Schmelkin, 1991).

Viewing of videotapes: Treatment group. Ten P.E.TV shows were shown to the treatment groups once a week for a period of 9 weeks, with the exception of one week when two shows were shown to catch up because of snow days (Table 2). The shows, which last 10-12 minutes each, were shown during health class by the health / physical education teacher with the exception of one time when it was shown during physical education, and one time it was shown by a substitute teacher. The P.E.TV Instructor's Manual was given to the teacher for him to use as he pleased. He was told to show the video during class, and to do the same activities and act the same way (i.e. encourage discussion by the students) with both of the treatment groups regarding issues related to P.E.TV.

The 10 P.E.TV shows used for the study were the first 10 shows of P.E.TV's second-semester series (Table 2). These shows were chosen because, according to the P.E.TV producers, they were better than the first semester series. The third and fourth semester series were not yet ready at the time the study was planned. The shows were shown as intended, in order, to simulate how they are shown by teachers in schools around the country (Table 2).

Table 2. P.E.TV shows used, dates shown, and person showing the video tape.

P.E.TV show #	Date shown	Shown by
Semester 2, show # 1	Oct. 19, 1995	Teacher, during health
Semester 2, show # 2	Oct. 25, 1995	Teacher, during health
Semester 2, show # 3	Nov. 2, 1995	Teacher, during health
Semester 2, show # 4	Nov. 9, 1995	Teacher, during physical education
Semester 2, show # 5	Nov. 16, 1995	Teacher, during health
Semester 2, show # 6	Nov. 21, 1995	Teacher, during health
Semester 2, show # 7	Nov. 28, 1995	Teacher, during health
Semester 2, show # 8	Dec. 5, 1995	Substitute teacher, during health
Semester 2, show # 9	Dec. 5, 1995	Substitute teacher, during health
Semester 2, show # 10	Dec. 8, 1995	Teacher, during health

Control group. To control for the teacher's actions during health and physical education class, and their potential effect on the students' attitudes, perceived behavioral control and subjective norm, the teacher was told to treat the treatment and control groups the same as far as any activity not relating directly to the P.E.TV shows, for all of the physical education and health classes during the 9 week long study. No other attempt was made to control any of the actions of the teacher during the physical education and health classes during the 9 weeks.

Fidelity of treatment (showing P.E.TV and keeping the other content the same) was ensured by the investigator observing one treatment and one control group each week, and taking notes to compare the content of the two

classes (Appendix C). The investigator also checked each week with the teacher to confirm that the videos were shown in both treatment groups, and that the health and physical education classes otherwise were kept the same for the treatment and control groups.

Post P.E.TV questionnaire. The post-treatment questionnaire (CATPA, subjective norm, and perceived behavioral control questions) (Appendix A) was administered to the treatment and control groups after 9 weeks using the same protocol as for the administration of the pre-test. Each student filled out the questionnaire and returned it to the investigator.

After the study was completed, a copy of the videotape containing the 10 P.E.TV shows was donated to the middle-school library so the students in the control group could have the opportunity to see the P.E.TV shows if they wished. Also a copy of the results of the study was given to the middle-school administration office so that all the participants in the study could have access to the findings.

Research Design

The design of this study was a pre-post experiment with a treatment and a control group, each consisting of two eighth-grade classes. The four classes were randomly assigned to treatment and control groups: each class, marked by their numbered period, was pulled out of a hat and assigned to groups in the order: treatment, control, treatment, control. The treatment groups consisted of a total of 37 students, 16 males, and 21 females. The control group consisted of a total of 32 students, 17 males, and 15 females. The classes were kept intact the way they were assigned by the middle school. P.E.TV is

normally shown in intact physical education classes. This particular middle school assigns all students, except special needs students requiring an aide, to the physical education / health classes at random, using a computer, and codes for the different subjects. The students were not assigned to classes based on choice, talent, interest in the subject, or attitude toward the subject.

Method of Analysis

Main effects were considered for attitudes toward physical activity, subjective norm for physical activity, and perceived behavioral control of physical activity. An analysis of Covariance (ANCOVA) was used to analyze this data. Post-test means, adjusted for the covariate (the pre-test), were compared using the Statistical Procedures for Social Sciences (SPSS) 6.1 for Microsoft Windows®. In addition, interactions with physical activity levels was considered for attitudes toward physical activity. This attribute-treatment-interaction analysis was run using a two way Analysis of Variance on Statview® 4.0. The level of significance for all the analyses was set at .05.

Chapter 3

RESULTS AND DISCUSSION

This study was conducted in a rural middle-school in southwest Virginia in the fall of 1995. Of the 74 students (total) enrolled in the four classes, 71 students returned both informed consent forms, and participated in the study. Two of the participating students did not complete their post-test questionnaires, and were dropped from the study. This left 69 students for the final analysis. The total number of students in the treatment group was 37 (two intact classes), and the total number in the control group was 32 students (two intact classes). In the treatment group, 18 students were categorized as "moderate to low active", and 19 students were categorized as "high active" based on their recorded activities on the Weekly Activity Checklist. In the control group, 18 students were categorized as "moderate to low active", and 14 students were categorized as "high active" based on their recorded activities on the Weekly Activity Checklist (Table 3).

Table 3. Number of students in treatment and control groups categorized as "moderate to low active" and "high active".

Group	**n**	**"moderate to low active"**	**"high active"**
Treatment	37	18	19
Control	32	18	14

The following sections show the results of the statistical analyses and answers to the research hypotheses. This chapter ends with a discussion of the results of the study.

RESULTS OF THE STUDY

Total scores from the pre- and post-test questionnaires (CATPA, subjective norm, and perceived behavioral control questions) were analyzed using Statistical Procedures For Social Sciences (SPSS) 6.1 for Microsoft Windows. Hypotheses 1, 2, and 3 were tested using Analysis of Covariance (ANCOVA). The pre-test was used as the covariate in all three instances. The ANCOVA compares the post-test means of the treatment and control groups, adjusting these means for the pre-test means. Hypothesis 4, the Attribute Treatment Interaction (ATI), was tested using simple linear regression analysis. The results of the data analysis for each of the four hypotheses are summarized below.

Hypothesis 1: P.E. TV will have a positive influence on students' attitudes towards physical activity.

The pre-test means for the treatment and control groups were almost identical. The treatment group mean for the CATPA was 159.08, with a standard deviation of 19.86, and the control group mean for the CATPA was 159. 03, with a standard deviation of 18.50. Students who saw P.E.TV averaged 162.54, with a standard deviation of 20.80, for the CATPA post-test, and

students who did not see P.E.TV averaged 167.56, with a standard deviation of 15.93, for the CATPA post-test (Table 4). In other words, the control group's attitudes toward physical activity, according to the CATPA, improved more than the treatment group's attitudes, although the difference was not statistically significant.

Mean scores from the CATPA for both treatment and control groups were subjected to an ANCOVA, using the pre-test as the covariate and the post-test as the dependent variable. The analysis was adjusted for unequal cell size. There was no statistically significant difference in the adjusted means between the treatment and control groups for the CATPA ($F_{2,66} = 1.481$, $p = .228$). Thus the first hypothesis was rejected at the .05 level.

Table 4. Means, standard deviations, and ranges, for pre- and post-test CATPA scores for treatments and control groups.

Group		**Pre-test CATPA scores**			**Post-test CATPA scores**		
	n	Mean	SD	Range	Mean	SD	Range
T	37	159.081	19.862	109-195	162.540	20.803	117-200
C	32	159.031	18.497	96-187	167.562	15.935	141-200

SPSS 6.1 for MS Windows®.

Hypothesis 2: P.E.TV will have a positive influence on students' subjective norm for physical activity.

The pre-test means for the treatment group for subjective norm was 17.35, with a standard deviation of 6.71, and the control group pre-test mean for subjective norm was 16.78, with a standard deviation of 6.68. Students who saw P.E.TV averaged 15.38 for the subjective norm post-test, with a standard deviation of 6.52, and students who did not see P.E.TV averaged 17.88 for the subjective norm post-test, with a standard deviation of 6.04 (Table 5). In other words, the control group's subjective norm for physical activity, improved more than the treatment group's subjective norm, although the difference was not statistically significant.

Mean scores for subjective norm for both treatment and control groups were subjected to an ANCOVA, using the pre-test as the covariate and the post-test as the dependent variable. The analysis was adjusted for unequal cell size. There was no statistically significant difference in the adjusted means between the treatment and control group for subjective norm ($\underline{F}_{2,66} = 3.682$, $\underline{p} = .059$). Thus the second hypothesis was rejected at the .05 level.

Table 5. Means, standard deviations, and ranges, for pre- and post-test subjective norm, for treatment and control groups.

Group		Pre-test Subjective Norm			Post-test Subjective Norm		
	n	Mean	SD	Range	Mean	SD	Range
T	37	17.351	6.713	4-25	15.378	6.525	3-25
C	32	16.781	6.680	3-25	17.875	6.036	6-25

SPSS 6.1 for MS Windows®.

Hypothesis 3: P.E.TV will have a positive influence on students' perceived behavioral control for physical activity.

The pre-test means for the treatment group for perceived behavioral control was 21.08, with a standard deviation of 3.81, and the control group pre-test mean for perceived behavioral control was 20.34, with a standard deviation of 3.45. Students who saw P.E.TV averaged 21.30 for the perceived behavioral control post-test, with a standard deviation of 3.44, and students who did not see P.E.TV averaged 19.93 for the perceived behavioral control post-test, with a standard deviation of 3.50 (Table 6). In other words, the treatment group's perceived behavioral control for physical activity, improved more than the control group's perceived behavioral control, although the difference was not statistically significant.

Mean scores from the questions about perceived behavioral control for both treatment and control groups were subjected to an ANCOVA, using the pre-test as the covariate and the post-test as the dependent variable. The

analysis was adjusted for unequal cell size. There was no statistically significant difference in the adjusted means between the treatment and control group for perceived behavioral control ($\underline{F}_{2,66} = 1.89$, $\underline{p} = .174$). Thus the third hypothesis was rejected at the .05 level.

Table 6. Means, standard deviations, and ranges, for pre- and post-test perceived behavioral control (PBC), for treatment and control groups.

Group		**Pre-test PBC**			**Post-test PBC**		
	n	Mean	SD	Range	Mean	SD	Range
T	37	21.081	3.810	9-25	21.297	3.439	11-25
C	32	20.343	3.451	13-25	19.937	3.500	14-25

SPSS 6.1 for MS Windows®.

Hypothesis 4: P.E.TV will have more of a positive influence on the attitudes toward physical activity of students categorized as "moderate to low active" than on students categorized as "high active".

The mean difference score for the "high active" treatment group for the CATPA was 4.65, with a standard deviation of 18.52. The raw attitude scores for this group ranged from 109-193 on the pre-test, and from 123-199 on the post-test. The mean difference score for the "high active" control group for the CATPA was 14.64, with a standard deviation of 31.03. The raw attitude scores for this group ranged from 96-181 on the pre-test, and from 141-200 on the post-test. The mean difference score for the "moderate to low active"

treatment group for the CATPA was 2.06, with a standard deviation of 17.55. The raw attitude scores for this group ranged from 115-195 on the pre-test, and from 117-200 on the post-test. The mean difference score for the "moderate to low active" control group for the CATPA was 3.78, with a standard deviation of 14.02. The raw attitude scores for this group ranged from 137-187 on the pre-test, and from 144-182 on the post-test. (The mean difference scores and standard deviations are reported in Table 7).

Mean difference scores from the pre and post-test CATPA were calculated for the "high active" treatment group, "moderate to low active" treatment group, "high active" control group, and "moderate to low active" control group using Microsoft Excel 5.0. The difference scores were subjected to a two way ANOVA using Statview 4.0. The analysis was adjusted for unequal cell sizes. The analysis showed no statistically significant interaction between activity level and CATPA difference scores ($F_{3,65}$ = .691, p= .4088). Thus the fourth hypothesis was rejected at the .05 level.

Table 7. Means and standard deviations for CATPA difference scores for treatment and control groups, “high” and “moderate to low” activity levels.

Group	Activity Level	n	Mean	SD
T	Mod-Low	17	2.059	17.548
T	High	20	4.650	18.520
C	Mod-Low	18	3.778	14.019
C	High	14	14.643	31.035

Statview® 4.0

The pre-test mean for the "high active" treatment group for the CATPA was 163.05, with a standard deviation of 20.15. The pre-test mean for the "high active" control group for the CATPA was 153.57, with a standard deviation of 21.46. The post-test mean for the "high active" treatment group was 167.70, with a standard deviation of 20.88, and the post-test mean for the "high active" control group was 168.21, with a standard deviation of 18.63. Students in the "moderate to low active" group who saw P.E.TV averaged 154.41 for the pre-test, with a standard deviation of 19.05, and students in the "moderate to low active" group who did not see P.E.TV averaged 163.28 for the pre-test, with a standard deviation of 15.10. The "moderate to low active" treatment group averaged 156.47 on the post-test, with a standard deviation of 19.58, while the "moderate to low activity" control group averaged 167.06, with a standard deviation of 14.03 (Table 8).

Table 8. Means and standard deviations for the pre- and post-test CATPA scores, for treatment and control groups, for “high” and “moderate to low” activity levels.

Group	**Activity level**		**Pre-test CATPA**		**Post-test CATPA**	
		n	**Mean**	**SD**	**Mean**	**SD**
T	Mod-Low	17	154.412	19.046	156.470	19.580
T	High	20	163.050	20.148	167.700	20.883
C	Mod-Low	18	163.278	15.103	167.056	14.031
C	High	14	153.571	21.461	168.214	18.635

SPSS 6.1 for MS Windows®.

Summary Of The Results

This chapter presented the results of the data analysis answering the question "Does P.E.TV make a difference?" regarding attitudes toward physical activity, subjective norm and perceived behavioral control for this particular population. The results of this study cannot be generalized beyond this population.

The analysis indicated that there was no statistically significant differences in attitudes toward physical activity, subjective norm for physical activity, and perceived behavioral control for physical activity between the students who saw, and those who didn't see P.E.TV. In addition, no statistically significant interactions were found in the analysis of "high active" and "moderate to low active" students and their attitudes toward physical activity. Thus, all four hypotheses were rejected. In other words, for this population, for these constructs, watching P.E.TV for nine weeks made no difference.

DISCUSSION

One of P.E.TV's major goals is to influence students' attitudes toward physical activity (P.E.TV, 1994). Two national surveys of teachers who used P.E.TV indicated that the teachers think the videotapes have a positive effect on students' attitudes toward physical activity (Himberg & Graham, 1994; Himberg & Graham, 1995). However, this study, the first examining P.E.TV's effects on students, did not find that P.E.TV made a difference in attitudes toward physical activity for these students. Does that mean that P.E.TV does

not make a difference for other students in other places? Are the teachers wrong in their assertions that P.E.TV does influence attitudes? And examining attitudes as well as the results concerning subjective norm and perceived behavioral control, is the interpretation of the reviewed literature concerning the determinants of physical activity in adolescents, Erikson's theory on adolescent development, the relationship of attitudes, intent and behavior, and using media to change affect a faulty interpretation?

The results of this study contradict the beliefs of many of the teachers who use P.E.TV, as well as the above interpretations of the related literature, which support the notion that P.E.TV should have made a difference. However, we cannot generalize the results of this study to the entire population of adolescents, or even eighth graders. We need to keep the context and culture of this particular population in mind when we discuss the results of this study. Thus it may be appropriate to discuss some factors that could have contributed to the results of this study.

Several issues may have influenced the results of this experiment for this population. They include ceiling effects for attitude scores and high activity levels in the population, the method of program delivery, students' attention to the show, and the length of the study. In addition, there may be a question of whether P.E.TV really is focused on affecting attitudes.

The means for the CATPA and the perceived behavioral control were high on the pre-test for both the treatment and control groups. The CATPA pre-test means for treatment and control were almost identical, 159.08 and 159.03 respectively. This score on the CATPA represents a positive attitude toward physical activity. With the means already being high, it would be

more difficult to show an improvement in attitudes. The increase would also not be as desirable as if the attitudes were low to start with. Perceived behavioral control scores were also high on the pre-test for both groups. And the fact that the post test showed almost no change for either group, may have been due to the ceiling effect. In addition, the Weekly Activity Checklist analysis showed that half the students in this population reported being very active. This fits well with the high attitudes and high perceived behavioral control for physical activity for these students, there should be a high correlation (Ajzen, 1985; Fishbein & Ajzen, 1980). It is possible that these students as a group have not yet reached the point in adolescence where the physical activity levels drop. Similar findings were reported in a companion study of seventh graders' attitudes toward physical activity (Roussell, 1996). Future studies may want to look at older students.

This study was an examination of the effect of the video-technology alone on the students' subjective norm, perceived behavioral control, and attitudes toward physical activity. The teacher was able to use the Teachers' Manual and incorporate P.E.TV's ideas into the lessons. He chose not to do so. The teacher did not refer to P.E.TV during health / physical education class other than introducing the video shows. This made the study into one examining the effects of the P.E.TV shows by themselves. It could be possible that other methods of using P.E.TV are more effective. This is indicated by the teachers reporting that students' attitudes toward physical activity improved due to P.E.TV (Himberg & Graham, 1994). These teachers may have used the videos and the Teachers' Manual differently, and incorporated P.E.TV into their existing health / physical education curriculum.

Also, as discussed in the review of literature, according to social learning theory, people's attitudes and behaviors are affected by performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977). The P.E.TV shows focus on three of these areas in their attempt to change students' attitudes toward physical activity: vicarious experience, verbal persuasion, and emotional arousal. However, if the teachers in addition to showing the videotapes follow the program guide and have the students participate in many of the suggested activities, the students may also be influenced by their performance accomplishments. Future studies may want to examine the effects of various methods of incorporating P.E.TV into the curriculum.

While observing the classes as they watched P.E.TV, it was noted that some of the students did not pay attention to the show while it was playing. These students appeared often to be the same ones. They would talk and whisper amongst each other during the show, how much and how often depended on how much attention the teacher gave to their behavior (see field notes, Appendix F). This lack of attention to the videotapes for some of the students may be related to Erikson's (1968) construct of identity diffusion. Erikson (1968) warned that identity diffusion can be the result of over-identification with role models. Valarie, Matt, Jose, and Dani, the hosts of P.E.TV, are positive role models regarding health and physical appearance, an issue that matters to most adolescents (Godin & Shephard, 1986). But did certain students over-identify with the role models? Did some of the students get the feeling that they can never measure up, and thus act indifferently to the whole program? If this were the case, it may be part of the

explanation why certain students' attitudes toward, and subjective norm and perceived behavioral control for physical activity did not improve. Future studies may want to use student interviews to explore these questions.

This study took place over a period of 9 weeks. This may not be enough time to see a difference in scores for subjective norm, perceived behavioral control and attitudes toward physical activity. Also, because this study used a pre-test--post-test design, the pre-test may have influenced the students' responses on the post-test because of the short time period. Future studies may want to look at the effects of P.E.TV over a longer period of time.

Finally, although the P.E.TV shows were produced with the intention of improving attitudes toward physical activity, the 10-12 minute shows are mostly filled with information and talking. The music, slick camera moves, and “cool” style are present, and may affect attitudes. However, the hosts of the show, and the celebrities visiting the different programs, spend their time for the most part giving information about physical activity and health. As mentioned earlier, it is possible that P.E.TV makes more of a difference for attitudes, perceived behavioral control, and subjective norm if the program is integrated into the physical education and health curriculum. This study provided evidence that showing the P.E.TV programs without relating them to the rest of the curriculum does not make a difference.

Conclusion And Summary Of Recommendation For Future Studies

This study was the first to examine whether or not P.E.TV makes a difference in students' subjective norm, perceived behavioral control, and attitudes toward physical activity. Although the study found that for this

population P.E.TV did not make a difference, there are indications that different results can be obtained under other circumstances. Future studies might examine older adolescent populations, the effects of various methods of incorporating P.E.TV into the curriculum, and exposure to the treatment for a longer period. In addition, future studies could include student interviews to shed light on questions rising from this study as well as new questions generated.

REFERENCES

Ajzen, I. (1985) From intentions to actions: A theory of planned behavior. In Kuhl & Beckman (Eds.) Action control: From cognition to behavior (pp. 11-39). Heidelberg: Springer.

Ajzen, I. & Fishbein, M. (1980) Understanding attitudes and predicting behavior. Englewood Cliffs, NJ: Prentice Hall.

Ajzen, I & Madden, T. (1986) Prediction of goal directed behavior: Attitudes, intentions, and perceived behavioral control. Journal of Experimental Social Psychology, 22, 453-474.

American Academy of Pediatrics Committees on Sports Medicine and School Health. (1987). Physical fitness and the schools. Pediatrics, 80, 449-450.

American College of Spots Medicine (1988). Physical fitness in children and youth. Medicine and Science in Sports and Exercise, 20, 422-423.

American Heart Association (1992). Heart and stroke facts. Dallas, TX: American Heart Association.

Anderssen, N. & Wold, B. (1992) Parental and peer influences on leisure-time physical activity in young adolescents. Research Quarterly of Exercise and Sports, 63(4), 341-348.

Atkin, C. (1978). Effects of drug commercials on young viewers. Journal of Communication, 28(4), 71-79.

Bandura, A. (1977). Social Learning Theory. Englewood Cliffs, NJ: Prentice Hall.

Barry, A. (1994). Advertising and Channel One: Controversial partnership of business and education. In De Vaney, A.(Ed.) Watching Channel One. Albany, NY: State University of New York Press.

Blair, S. (1984). How to assess exercise habits and physical fitness. In N. Miller, J. Mataracco, S. Weiss & J. Herd (Eds.) Behavioral health: A handbook of health enhancement and disease prevention, (p. 424-477), New York, NY: Wiley.

Blair, S. (1993). Physical activity, physical fitness, and health. Research Quarterly for Exercise and Sport, 64(4), 365-376.

Bronfenbrenner, U. (1979). The ecology of human development, Cambridge, MA: Harvard University Press.

Brooks, G & Fahey, T. (1987) Fundamentals of human performance, New York, NY: Macmillan Publishing Company.

Bryant, J. & Anderson, D. (Eds.) (1983). Children's understanding of television. New York, NY: Academic Press, Inc.

Corbin, C. (1987). Youth fitness, exercise and health: There is much to be done. Research Quarterly for Exercise and Sport, 58(4), 308-314.

Corbin, C & Pangrazi, R. (1992). Are American children and youth fit? Research Quarterly for Exercise and Sport, 63(2), 96-106.

Davidson, E. (1979). The effects of television cartoons on sex-role stereotyping in young girls. Child Development, 50(2), 597-600.

De Vaney, A. (1994). Reading the ads: The Bacchanalian adolescence. In De Vaney, A.(Ed.) Watching Channel One. Albany, NY: State University of New York Press.

Desmond, S., Price, J., Lock, R., Smith, D. & Stewart, P. (1990). Urban black and white adolescents' physical fitness status and perceptions of exercise. Journal of School Health, 60, 220-226.

Erikson, E. (1968). Identity, youth, and crisis. New York, NY: W. W. Norton & Company.

Fahey, T., Insel, P., & Roth, W. (1994). Fit & Well: Core concepts and labs in physical fitness and wellness. Mountain View, CA: Mayfield Publishing.

Ferguson, K., Yesalis, C, Pomrehn, P & Kirkpatrick, M. (1989). Attitudes, knowledge, and beliefs as predictors of exercise intent and behavior in school children. Journal of School Health, 59, 112-115.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior. Reading, MA: Addison-Wesley Publishing Co.

Gatch, C. & Kendzierski, D. (1990). Predicting exercise intentions: The theory of planned behavior. Research Quarterly, 61(1), 100-102.

Gensemer, R. (1985). Physical education: Perspectives, inquiry, applications. Philadelphia, PA: Saunders College Publishing.

Godin, G. & Shephard, R. (1986). Psychosocial factors influencing intentions to exercise of young students from grades 7 to 9. Research Quarterly for Exercise and Sport, 57, 41-52.

Goldberg, M. (1978). TV messages for snack and breakfast foods: Do they influence children's preferences? Journal of Consumer Research, 5(2), 73-81.

Gorn, G. & Goldberg, M. (1977). The impact of television advertising on children from low income families. Journal of Consumer Research, 4(2), 86-88.

Graham, G., Holt / Hale, S. & Parker, M. (1994). Children Moving, (3rd ed.). Mountain View, CA: Mayfield Publishing.

Graham, G. (1992). Teaching children physical education: Becoming a master teacher. Champaign, IL: Human Kinetics.

Greenockle, K., Lee, A. & Lomax, R. (1990). The relationship between selected student characteristics and activity patterns in a required physical education class. Research Quarterly for Exercise and Sport, 61, 59-69.

Hales, D. (1991). Your Health, Redwood City, CA: Benjamin Cummings Publishing Co.

Hellison, D. (1987). Dreaming the possible dream: The rise and triumph of physical education. In J. Masengale (Ed.) Trends toward the future in physical education, (137-151). Champaign, IL: Human Kinetics.

Himberg, C. & Graham, G. (1994). Teachers' initial responses to P.E.TV. Unpublished research report.

Himberg, C. & Graham, G. (1995). Teachers' responses to P.E.TV. Unpublished research report.

Hoffman, M. (1979). Identification and Imitation in children. Paper presented at the Biennial Meeting of the Society for Research in Child Development (San Francisco, CA, March 15-18, 1979). (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 174).

Kelly, L., Walkley, J. & Tarrant, M. (1988). Developing an interactive video disk application. Journal of Physical Education, Recreation, and Dance, 59, 22-26.

Kenyon, G. (1968). Six scales for assessing attitudes toward physical activity. Research Quarterly for Exercise and Sport, 39, 566-574.

Knupfer, N. & Hayes, P. (1994). The effects of the channel one broadcast on students' knowledge of current events. In De Vaney, A.(Ed.) Watching Channel One. Albany, NY: State University of New York Press.

Kozma, R. (1991). Learning with media. Review of Educational Research, 61(2), 179-211.

Krathwohl, D., Bloom, B. & Masia, B. (1964). Taxonomy of educational objectives: The classification of educational goals, Handbook II, Affective domain. New York: David McKay Company Inc.

Kusinitz, I. & Fine, M. (1991). Your Guide to Getting Fit, (2nd ed.). Mountain View, CA: Mayfield Publishing.

La Porte, R., Montoye, H. & Caspersen, C. (1985). Assessment of physical activity in epidemiologic research: Problems and prospects. Public Health Reports, 100(2), 131-146.

Leadbeater, B. & Dionne, J. (1981). The adolescent's use of formal operational thinking in solving problems related to identity resolution. Adolescence, 16(61), 111-121.

Leary, J. (1979). Television: The anti-wellness tool. Health Education, 10(5), 16-18.

Lee, A., Carter, J. & Greenockle, K..(1987). Children and fitness: A pedagogical perspective. Research Quarterly for Exercise and Sport, 58(4), 321-325.

Levy, M., Dignan, M. & Shirreffs, J. (1992). Life and Health: Targeting Wellness, New York: McGraw-Hill, Inc.

Maurice, R. (1994). Two rhetorics of cynicism in debates over Channel One: Two riders in a barren landscape. In De Vaney, A.(Ed.) Watching Channel One. Albany, NY: State University of New York Press.

Meyers, C., Pendergast, D. & DeBacy, D (1978). Interrelationships involving selected physical fitness variables and attitude toward physical activity in elementary school children. In F. Landry & W. Orban (Eds.), Sports Medicine: Electrocardiography and hypertension and other aspects of exercise (p.305-312). Miami, FL: Symposia Specialists.

Miller, P. (1993). Theories of developmental psychology. New York, NY: W. H. Freeman and Company.

Mohnsen, B. (1995). Using technology in physical education. Teaching High School Physical Education, 1(2), 1-8..

Muffoletto, R. (1994). Drawing the line: Questions of ethics, power and symbols in state policy and the Whittle concept. In De Vaney, A.(Ed.) Watching Channel One. Albany, NY: State University of New York Press.

National Association for Sport and Physical Education (1990). Definition of the physically educated person: Outcomes of quality physical education programs. Report of the Physical Education Outcomes Committee to the Association Delegate Assembly. Reston, VA: AAHPERD.

Neale, D., Sonstroem, R. & Metz, I. (1970). Physical fitness, self esteem, and attitudes toward physical activity. Research Quarterly, 40, 743-749.

O'Bryant, S. & Coder-Boltz, C. (1978). The effects of television on children's stereotyping of women's work role. Journal of Vocational Behavior, 12(2), 233-243.

O'Sullivan, M., Stroot, S. Tannehill, D., & Chien, C. (1989). Interactive video technology in teacher education. Journal of Teacher Education, 40(4), 20-25.

Palmer, E. & Dorr, A. (Eds.) (1980). Children and the faces of television: Teaching, violence, selling. San Diego, CA: Academic Press Inc.

Pate, R. & Hohn, R. (1994). Health and fitness through physical education. Champaign, IL: Human Kinetics.

Patterson, P. & Faucette, N. (1990). Attitudes toward physical activity of fourth and fifth grade boys and girls. Research Quarterly for Exercise and Sport, 61(4), 415-418.

Pedhazur, E. & Schmelkin, L. (1991). Measurement, design, and analysis: An integrated approach. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Peterson, G. & Peters, P. (1983). Adolescents' construction of social reality: The impact of television and peers. Youth and Society, 15(1), 67-85.

P.E.TV Teacher's Manual (1994). Available from Channel One, 333 Main St., Knoxville, TN 37902.

Ploghoft, M. & Anderson, J. (Eds.) (1981). Education for the television age. Athens, OH: The Cooperative Center for Social Science Education.

Price, J. (1978). Television - Health education or mental pollution? Health Education, 9, 24-26.

Reynolds, K., Killen, J., Bryson, S., Maron, D., Taylor, C., Maccoby, N. & Farquhar, J. (1990). Psychosocial predictors of physical activity in adolescents. Preventive Medicine, 19, 541-551.

Roussell, J. (1996). Adapting television cultivation theory variables to determine the effects of P.E.TV on middle school viewers' attitudes toward physical activity. Unpublished dissertation.

Saettler, P. (1968). A history of instructional technology. New York, NY: McGraw-Hill.

Sallis, J., Condon, S., Goggin, K., Roby, J., Kolody, B. & Alcaraz, J. (1993). The development of self-administered physical activity surveys for 4th grade students. Research Quarterly for Exercise and sport, 64(1), 25-31.

Sallis, J., Hovell, M., Hofstetter, R. & Barrington, E. (1992a). Explanation of vigorous physical activity during two years using social learning variables. Social Science and Medicine, 34(1), 25-32.

Sallis, J. & McKenzie, T. (1991). Physical education's role in public health. Research Quarterly for Exercise and Sport, 62, 124-137.

Sallis, J., Simons-Morton, B., Stone, E., Corbin, C., Epstein, L., Faucette, N., Ianotti, R., Killen, J., Klesges, R., Petray, C., Rowland, T & Taylor, W. (1992b). Determinants of physical activity and interventions in youth. Medicine and Science in Sports and Exercise, 24(6), S248-S257.

Saris, W. (1986). Habitual physical activity in children: methodology and findings in health and disease. Medicine and Science in Sports and Exercise, 18(3), 253-262.

Schifter, D. & Ajzen, I. (1985). Intention, perceived control, and weight loss: An application of the theory of planned behavior. Journal of Personality and Social Psychology, 49, 843-851.

Schutz, R. & Smoll, F. (1977). Equivalence of two inventories for assessing attitudes toward physical activity. Psychological Reports, 40, 1031-1034.

Schutz, R., Smoll, F., Carre, F. & Mosher, R. (1985). Inventories and norms for children's attitudes toward physical activity. Research Quarterly for Exercise and Sport, 56(3), 256-265.

Schutz, R., Smoll, F. & Wood, T. (1981). A psychometric analysis of an inventory for assessing children's attitudes toward physical activity. Journal of Sport Psychology, 4, 321-344.

Simon, J. & Smoll, F. (1974). An instrument for assessing children's attitudes toward physical activity. Research Quarterly for Exercise and Sport, 45, 407-415.

Simons-Morton, B., O'Hara, N., Simons-Morton, D. & Parcel, G. (1987). Children and fitness: A public health perspective. Research Quarterly for Exercise and Sport, 58(4), 295-302.

Singer, R. & Dick, W. (1974). Teaching physical education: A systems approach. Boston, MA: Houghton Mifflin Co.

Smoll, F., Schutz, R. & Keeney, J. (1976). Relationships among children's attitudes, involvement, and proficiency in physical activities. Research Quarterly for Exercise and Sport, 47, 797-803.

Sprafkin, J. & Rubinstein, E. (1979). Children's television viewing habits and prosocial behavior: A field correctional study. Journal of broadcasting, 23(3), 265-276.

Steinhardt, M. (1992). Physical education. In P. Jackson (Ed.) Handbook of Research on Curriculum. New York, NY: Macmillan.

Storye, K. (1979). The effects of the television series "Feeling Free" on children's attitudes toward handicapped people. Harvard University. (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 403).

Strouse, J. & Fabes, R. (1985) Formal versus informal sources of sex education: Competing forces in the sexual socialization of adolescents. Adolescence, 20(78), 251-263.

Tannenbaum, B. (1976). Effects of peer pressure and prosocial/antisocial television content on children's prosocial behavior. (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 166).

Tiene, D. (1993). Exploring the effectiveness of the Channel One school telecasts. Educational Technology, 33(5), 36-42.

Tolson, H. & Chevrette, J. (1974). Changes in attitudes toward physical activity as a result of individualized exercise prescription. Journal of Psychology, 87, 203-207.

U. S. Department of Health and Human Services Public Health Service. (1991). Healthy People 200: national health promotion and disease prevention objectives. Available from: US Government Printing Office, Washington, DC: (DHHS Pub. No. [PHS] 91-50213).

Van Hoose, J. (1978). TV: The effective "aide" for affective education. Phi Delta Kappan, 59(10), 674-675.

Van Hoose, J. (1980). The Impact of television usage on emerging adolescents. High School Journal, 63(6), 239-243.

Wallace, J., McKenzie, T. & Nader, P. (1985). Observed vs. recalled exercise behavior: A validation of a seven day exercise recall for boys 11 to 13 years old. Research Quarterly for Exercise and sport, 56(2), 161-165.

Will, E. & Hotvedt, M. (1977). Parenting education through television: An evaluation of the Middle Road Traveler series for Adolescents. Baylor College of Medicine, Houston, TX. (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 413).

Williams, T. (1979). The impact of television: A natural experiment involving three communities. Paper presented at the Annual Meeting of the International Communication Association (Philadelphia, PA, May 1-5, 1979). (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 102).

Wood, R. (1985). Factors influencing adolescent motivation: Implications for physical education and sport. The Physical Educator, 42(3), 109-114.

Worchel, S. (1976) The effects of commercial interruption of violent and nonviolent films on viewers' subsequent aggression. Journal of Experimental Social Psychology, 12(2), 220-232.

Wurtzel, A. (1977). Research: Television violence and aggressive behavior. ETC.: A review of general semantics, 34(2), 212-225. (From Television's impact on children and adolescents: A special interest resource guide in education, 1981, Phoenix, AZ: Orynx Press, Abstract No. 145).

Zimbardo, P., Ebbesen, E., & Maslach, C. (1977). Influencing attitudes and changing behavior. Reading, ME: Addison-Wesley Publishing Co.

APPENDIX A

CATPA Administration Instructions

This questionnaire is designed to find out how you feel about physical activity. Physical activities are games, sports, and dance, for example tag, soccer, hockey, ballet, and roller blading.

Each of you has a booklet. Do not open it yet. Please listen carefully to the instructions. (Refer to visual aid).

At the top of each page in your booklet there is a box, and in the box there is an idea. Down below the box are five different pairs of words. You will be marking these word pairs to show how you feel about the idea. This is not a test, so there are no right or wrong answers. Read the idea in the box, for example, REFEREE. Now go down to the first pair of words - Good-Bad. How do you feel about Referees? If you think they are very good, you put a check here (mark at the end of the scale by good), or if you think that they are very bad, you would put a check here (mark at the end of the scale by bad). If you think that Referees are pretty good, but not super good you would put a check here (indicate). Or if you thought that Referees were sort of bad but not really bad you would put a check here (indicate). If you think that Referees are neither good nor bad (i.e. a neutral feeling) then put a check in the middle. If you do not understand the idea in the box, put a check in the "I don't understand box" on the middle of the page. Then go to the next page. If you understand the idea in the box, but not the word pair, leave the word pair blank, and go on to the next word pair. Do you have any questions?

It is important that you remember several things. First of all put your check in the middle of the space, not on top of the dots. Second, there are five word pairs on each page, so how many checks will you have on each page? (5) There is only one exception, one of the questions has 10 word pairs.

When I tell you to begin, go through the booklet page by page. Read the idea in the box at the top of the page and fill in how you feel about all of the word pairs before you go on to the next page. Don't go back to a page after you have finished it; and don't try to remember how you answered the other pages. Think about each word pair by itself. As you go through the booklet, go fairly quickly, don't worry or think too long about any word pair. Mark the first thing that comes to your mind, but don't be careless. Remember the idea in the box at the top of each page is a new idea, so think only about that idea. When you are all finished, put down your pencil and go back through the booklet to make sure you haven't left anything out by mistake. After you have finished checking, turn your booklet over, and wait until everyone is finished. If you have any questions, raise your hand, and I will come around and help you. You may begin.

SAMPLE QUESTION

How do you feel about the idea in the box?

REFEREES

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ] and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

ATTITUDES TOWARD PHYSICAL ACTIVITY, SUBJECTIVE NORM AND PERCEIVED BEHAVIORAL CONTROL

MALE [ ]

FEMALE [ ]

YOUR SECRET PERSONAL CODE:

(This code will be used to match your answers on the two questionnaires. The code is used to make sure your identity is kept secret. We are not interested in finding out who you are, and we will not attempt to do so.)

MOTHER'S FIRST NAME: _____

LAST THREE DIGITS OF YOUR TELEPHONE NUMBER: ____ ____ ____

How do you feel about the idea in the box?

Taking part in physical activities which give you a chance to meet new people.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities which give you a chance to be with your friends.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities to make your health better and get your body in better condition

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**harmful**	: : : :	**beneficial**
4.	**wise**	: : : :	**foolish**
5.	**healthy**	: : : :	**unhealthy**
6.	**punishing**	: : : :	**rewarding**
7.	**boring**	: : : :	**exciting**
8.	**not pleasant**	: : : :	**pleasant**
9.	**nice**	: : : :	**awful**
10.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities that could be dangerous because you move very fast and must change direction quickly.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities which have beautiful and graceful movements.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities to reduce stress or to get away from problems you might have.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

How do you feel about the idea in the box?

Taking part in physical activities that have long and hard practices. To spend time in practice you need to give up other things you like to do.

Always think about the idea in the box.
If you do not understand this idea, mark this box [ ]
and go to the next page.

1.	**good**	: : : :	**bad**
2.	**of no use**	: : : :	**useful**
3.	**not pleasant**	: : : :	**pleasant**
4.	**nice**	: : : :	**awful**
5.	**happy**	: : : :	**sad**

APPENDIX B

SUBJECTIVE NORM

FOR THE NEXT 2 QUESTIONS, THERE IS ONLY ONE WORD PAIR. PUT A CHECK ON THE POINT OF THE SCALE THAT BEST DESCRIBES HOW YOU FEEL ABOUT THE IDEA IN THE BOX.

Most people who are important to me would approve/disapprove of my participating in physical activities regularly.

disapprove _____ : _____ : _____ : _____ : _____ **approve**

I am likely to do what people, who are important to me, think I should do.

not at all _____ : _____ : _____ : _____ : _____ **very much**

APPENDIX C

PERCEIVED BEHAVIORAL CONTROL

FOR THE NEXT 5 QUESTIONS, THERE IS ONLY ONE WORD PAIR. PUT A CHECK ON THE POINT OF THE SCALE THAT BEST DESCRIBES HOW YOU FEEL ABOUT THE IDEA IN THE BOX.

How much control do you have over whether or not you participate regularly in physical activities?

very little _____ : _____ : _____ : _____ : _____ **full control**

For me to participate regularly in physical activities is:

difficult _____ : _____ : _____ : _____ : _____ **easy**

If I wanted to, I could easily participate regularly in physical activities.

very likely _____ : _____ : _____ : _____ : _____ **very unlikely**

It's mostly up to me whether or not I participate regularly in physical activities.

false _____ : _____ : _____ : _____ : _____ **true**

There is very little I can do to make sure I participate regularly in physical activities.

agree _____ : _____ : _____ : _____ : _____ **disagree**

APPENDIX D

WEEKLY ACTIVITY CHECKLIST

MALE [ ]

FEMALE [ ]

YOUR SECRET PERSONAL CODE:
(This code will be used to match your answers on the two questionnaires. The code is used to make sure your identity is kept secret. We are not interested in finding out who you are, and we will not attempt to do so.)

MOTHER'S FIRST NAME: _____

LAST THREE DIGITS OF YOUR TELEPHONE NUMBER: ____ ___ ___

On the next page is a list of physical activities. Think about those activities that you did in the last week.

- For each activity that you did 15 minutes or more at one time, write down the number of times you did this before and after school (Monday - Friday).

- Then write the number of times you did the activity for 15 minutes or more on the weekend (Saturday and Sunday).

REMEMBER, ONLY INCLUDE THE ACTIVITIES THAT YOU DID LAST WEEK.

Please check one box:

This was a normal week for me. **[ ]**

I was more active this week than I usually am. **[ ]**

I was less active this week than I usually am. **[ ]**

ACTIVITY	Before or after school (Mon - Fri)	Weekends (Sat & Sun)
walking		
running/jogging		
playing tag		
dancing		
hiking/climbing		
baseball/softball		
basketball		
volleyball		
football		
frisbee/kickball		
jumping rope		
soccer		
skateboarding/skating		
swimming laps		
bicycling		
tennis/badminton		
aerobic dance		
water skiing		
golf		
Other:		

APPENDIX E

INFORMED CONSENT FOR PARENTS/LEGAL GUARDIANS

P.E.TV's (Physical Education Television) Influence on Students' Attitudes Toward Physical Activity
Investigators: Cathrine Himberg and Dr. George Graham

Dear Parents/ Legal Guardians:

The Purpose of this Research
We are conducting a research project which has been designed to find out if P.E.TV can influence students' attitudes toward physical activity. Your child may be viewing 10, twelve minute long P.E.TV shows during the next 10 weeks in health class. All four eighth grade classes will be participating in this study (roughly 100 students).

Procedures
Your child's participation in this project involves answering two brief written questionnaires during health class, concerning his/her physical activity levels, attitudes toward physical activity, and television viewing habits. Total involvement should take roughly 15 to 20 minutes per questionnaire. One questionnaire will be given to your child at the beginning and one at the end of the ten weeks.

Risks
Participating in this study will involve no personal risk to your child, and his/her responses will have no bearing on his/her grades. Your child's identity will not be known to us.

Benefits of this Project
By participating in this study, your child will help us find out if P.E.TV is successful at influencing students' attitudes toward physical activity. After the study is completed a copy of the results will be available at the school's main office for your review. If you have any questions concerning the results, you may contact us.

Privacy
We will not ask for your child's name, his/her identity will not be known to us. No name will appear on the form or in the researcher's notes. Your child's responses will be included and analyzed within a group. Your child will be asked to include a code on both questionnaires, this code will be known only to him/her.

Freedom to Withdraw
You may withdraw your child from answering the questionnaires at anytime and for any reason. To withdraw, contact the investigators: Dr. George Graham (231-7545) or Cathrine Himberg (231-9400).

Approval of Research
This research project has been approved, as required, by the Institutional Review Board for Research Involving Human Subjects at Virginia Polytechnic Institute and State University, by the Montgomery County Superintendent's Office, by Auburn School, and by your child's health/physical education teacher.

If you have any questions about this informed consent or this research, contact one of the investigators or E. R. Stout, Chair IRB, Research Division (231-9359).

Permission
I have read and understand the informed consent and the conditions of this project. I have had all my questions answered. I hereby voluntarily agree to allow my child: _____ to participate in this project. If I allow my child to participate, I may withdraw him/her at anytime without penalty.

_____ _____
Signature of Parent or Legal Guardian Date

Thank you for your cooperation in helping us with our research. Please sign both copies and have your child return one to his/her health/physical education teacher tomorrow. Keep the other copy for your records.

INFORMED CONSENT FOR STUDENTS

P.E.TV's (Physical Education Television) Influence on Students' Attitudes Toward Physical Activity
Investigators: Cathrine Himberg and Dr. George Graham

Dear Student:

During the next 10 weeks you may be watching a television program called P.E.TV once a week during health class. We are trying to find out if the show has an influence on students' attitudes toward physical activity. To do so we are asking you to fill out two questionnaires during health class. One will be at the beginning of the ten week period, and the other at the end of the ten week period. These questionnaires will ask about how physically active you are, what your attitudes toward physical activity are, and how much and what type of television you watch.

If you don't get to see P.E.TV during the next 10 weeks, you will be able to do so after the ten weeks.

We will not ask for your name, you will be completely anonymous. We will ask you to make up a code, so that your two questionnaires can be matched. This code will be your secret.

You have the right not to participate in the study, and can withdraw at anytime by telling your health / physical education teacher or one of us. Your participating or not participating in this study will have no influence on your grades.

Permission
I have read and understand what you want me to do for this study, and my right to withdraw at any time. I voluntarily agree to participate.

_____ _____
Signature of Student Date

Thank you for helping us with our research.

APPENDIX F

FIELD NOTES

October 19, 1995

I administered the questionnaires to all four classes. It took 30 minutes of the class period. In the treatment groups the students watched the first P.E.TV show the last 12 minutes of class. The teacher did not talk about P.E.TV other than just introducing the show. The students were attentive and seemed to enjoy the show. The teacher sat at his desk and did paperwork during the program. In the control groups the students worked independently answering questions in their health books the last 15 minutes of class, while the teacher did paperwork.

October 25, 1995

Both control and treatment groups did mime and skits, the focus was on body language. The teacher directed the activities. The treatment groups watched P.E.TV at the end of class. The teacher did not talk about P.E.TV other than just introducing the show. The kids were fairly attentive, some seemed bored and were talking during the show. The teacher did paperwork at his desk during the show. The control groups spent the extra 12 minutes on the skits, with the teacher still directing the play.

November 2, 1995

The students in both the control and treatment groups worked independently answering questions in their health books the first 10 minutes of class. The teacher did paperwork. The teacher then asked students

questions from the readings, and talked with the students about anatomy the rest of the class in the control group. In the treatment group the students watched P.E.TV the last 12 minutes of class. The teacher did not talk about P.E.TV other than just introducing the show. Most of he students seemed interested in the show, although some looked bored, and were whispering to each other now and then.

November 9, 1995

Today the students watched P.E.TV during P.E. Both the control and treatment groups worked on basketball skills. They ran laps dribbling the balls, then they stretched, and did push-ups and sit-ups. The teacher demonstrated basketball skill stations, and divided the students into groups. The student worked at the stations for the rest of the class period in the control group. In the treatment group the students watched P.E.TV the last 12 minutes of class. The teacher did not talk about P.E.TV other than just introducing the show. Some of the students were obviously upset that they didn't get to continue the basketball drills. Most of the students were attentive while the tape was played, but some seemed anxious to move around. The teacher did paperwork during the show.

November 16, 1995

The teacher started class in both the control and treatment groups with giving the students back exams from last health class. He spent 10 minutes talking about the test and answering questions related to the test. The next 10 minutes was spent discussing questions that were asked by one of the student

teachers. Then the teacher talked to the students about their history project, and divided the students into groups. The students in the control group spent the rest of the class period working on the history project in their groups. In the treatment group the students worked on their history project until the end of class when they watched P.E.TV the last 12 minutes. The teacher did not talk about P.E.TV other than just introducing the show. During the show the teacher did paperwork. Most of the students seemed interested in the show, but a few seemed bored and did not seem to pay attention.

November 21, 1995

The students in the control group worked on their history project in their groups the whole class period. The students in the treatment group worked on their history project in their groups until the last 12 minutes of class when they watched P.E.TV. The teacher did not talk about P.E.TV other than just introducing the show. Most of the students were attentive during the show, but some were talking softly to each other, seemingly about things unrelated to P.E.TV. The teacher did paperwork during the show.

November 28, 1995

In both the treatment and control groups the teacher talked to the students about their history project the first ten minutes of class. Then he talked about their reading assignment. The students in the control group spent the rest of the class period working on answering questions in their health books. In the treatment group the students worked on answering questions in their health books until the end of class when they watched

P.E.TV the last 12 minutes. The teacher did not talk about P.E.TV other than just introducing the show. The students seemed attentive, no one talked during the show. The teacher did paperwork while P.E.TV was showing.

December 5, 1995

I was unable to observe the classes today, but I spoke with the teacher after school and he told me that all four classes had had a substitute teacher. The control group had watched an information video unrelated to physical activity, and the treatment group had watched two P.E.TV shows. The substitute teacher had not talked with the students about the video or the P.E.TV shows.

December 8, 1995

Because school was delayed due to snow, I administered the post-test to only three of the four groups today, to both control groups and one of the treatment groups. In both of the control groups I administered the questionnaire at the beginning of class, it took about 10 minutes. The students spent the rest of the class time working on answering questions in their health book.

The treatment group watched the last P.E.TV show before I administered the questionnaire. The teacher did not talk about P.E.TV other than just introducing the show. The students seemed restless and inattentive today. The teacher did paperwork while the show was playing, and kept hushing the students. It took the students in the treatment group about 10 minutes to

finish the questionnaire. The treatment group spent the rest of the class period working on answering questions in their health book.

I instructed the teacher on how to administer the questionnaire (he had seen me do it seven times) and he administered the questionnaire to the other treatment group on December 11 (I was on the airplane to Norway). When I later spoke to him, he told me that he had shown the last P.E.TV show to the other treatment group before he administered the questionnaire, and the rest of the class period the students had worked on answering questions in their health book. He told me he did not talk about P.E.TV other than just introducing the show.

VITA

Cathrine Himberg, born December 30, 1965, in Bergen, Norway, came to the United States in 1985 to go to college. She received a Bachelor of Arts in Communications from East Carolina University, and a Master of Arts in Exercise Physiology from California State University, Chico.

She has worked as a physical education teacher at the elementary and secondary levels in Norway and the US. At the college level she has taught physical education teacher education classes, health, as well as fitness and activity classes. She has organized wellness fairs, written book chapters concerning wellness issues, presented at professional conferences, and continues to enjoy teaching people of all ages about the benefits of a physically active lifestyle. She continues to do freelance television reporting for Norwegian national television, emphasizing wellness and sports. She has two children, Joakim, age 7 years, and Stian, age 8 months. Cathrine and her husband, Dr. John Roussell, enjoy working together, both in the academic and professional television arenas.