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1998

THE RELATIONSHIP OF PHYSICAL ACTIVITY TO SELF-CONCEPT
AND PERCEIVED STRESS IN ADOLESCENT FEMALES

BY

ANNE C. DINEEN

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
PSYCHOLOGY

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Abstract

Three major hypotheses regarding physical activity, stress and self-concept in adolescent females were tested using 214 high school students as subjects. These hypotheses generated four predictions: 1) Females who are more physically active will report that experienced stressful events are less upsetting than will females participating in less activity; 2) Females who are more physically active will have higher physical ability self-concept scores than those females who are less physically active; and 3) Certain factors such as age and physical ability self-concept are more likely to result in girls' participation in physical activity; 4) Certain factors such as age and physical ability are more likely to result in girls' participation in strenuous physical activity. It was found that more physically active females did not differ from those who were less active on reactions to stressful events. Adolescents' general inexperience with major life stresses and managing emotion may decrease the chances of deriving any benefit from exercise. However, there was a significant relationship between amount of physical activity and certain aspects of self-concept, with more active females having higher self-concept scores in the areas of physical ability, math and general school. This relationship between physical activity and academics may be due to their achievement orientation or to identity formation through participation in academic and physical activities. It was also learned from the present study that the factors of physical ability self-concept, age and GPA are the most important in understanding adolescent females' participation in greater amounts of physical activity. Younger females with higher GPAs and more certainty about their physical ability skills were found to engage in more activity than their peers. These findings challenge the stereotype of the "dumb jock," a stereotype not supported by the research. Analysis of

the factors contributing to females' participation in strenuous activity revealed that younger females with greater physical ability self-concept and confidence with regard to their opposite sex relations engaged in strenuous exercise. This finding regarding the comfort with male relations speaks to the issue of society's gender roles, with adolescent females possibly restricting their interests in strenuous activity out of fear of defying society's expectations or being viewed as unattractive. The significant relationship between physical ability self-concept and participation in physical activity provides support for the multidimensional approach to self-concept. The study's limitations include generalizability only to similar samples, use of statistics analyzing relationship vs. cause and effect in addition to difficulty with adolescent self-report. The results of the present study should be considered as simply a small part of the larger body of knowledge in the area. It is hoped that the study has initiated more questions that might be answered through further investigation.

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The Relationship of Physical Activity to Self-Concept and Perceived Stress in Adolescent Females

CHAPTER I

Introduction

Statement of the Problem

Today's society seems to place much more emphasis than ever before on the multitude of benefits resulting from healthy behavior and the damaging impact of unhealthy behaviors. Issues such as driving while intoxicated, use of seatbelts, the effects of alcohol on the developing fetus, wearing bike helmets, smoking, and decreasing fat intake have received significant attention in the past dozen years. Since the 1970s' "running craze," when large numbers of Americans were taking to the streets in order to improve their health, general physical activity has become an issue emphasized for healthy living. An active lifestyle, according to physicians and researchers, improves physiological functioning, psychological well being and fitness. Raising fitness levels has become a national goal as professionals grow concerned over the sedentary habits and sluggish fitness levels of America's schoolchildren (Castrone, 1991; Centers for Disease Control, 1985).

In July of 1996 the United States Surgeon General issued a statement about the health risks of physical inactivity (1996a). He reported that burning as few as 150 calories per day through such activities as walking the dog or gardening can significantly reduce the risk of heart disease. His statement highlighted the important connection between human behavior and health outcomes. The Surgeon General's statements were issued at the conclusion of the 1995-1996 academic year when 2,240,461 high school females participated on sports teams, an eight-fold increase from participation in 1971 (Women's Sports Foundation, 1995).

Aside from the physiological benefits derived from activity, there appear to be significant psychological benefits not identified by the Surgeon General. Biddle (1993)

has noted that " . . . it is now recognised that some forms of physical activity can enhance psychological well-being and reduce the risk of some health problems, both physical and mental" (Biddle, 1993, p. 200). Physical activity has been associated with improvements in self-concept (Taylor, Sallis, & Needle, 1985) and perceived stress (Norris, Carroll, & Cochrane, 1990; Brandon, Loftin, & Curry, 1991; Alanda, Sutton, Jacobson, & Quirk, 1996). The majority of research in this area has used adult males as subjects, resulting in a significant gap in our knowledge of the adolescent female experience.

Although the physiological implications of physical activity are important in the lives of female adolescents, this study examines the relationship between activity and mental health issues, in particular stress and the multiple subdomains of self-concept. Traditionally, females have been discouraged from participation in activities or work outside of their socially constructed gender role. Once relegated only to childrearing and other types of caretaking professions such as teaching and nursing, females today have access to a much wider range of options, including law, medicine, engineering and even professional sports. In the past two years, we have been witness to the induction of women into professional basketball leagues (Women's National Basketball Association and American Basketball Association) as well as participation on the first ever women's Olympic ice hockey team. Given the increase in adolescent female participation in sports at the high school level, it behooves the profession of school psychology to investigate this important area of research so that intervention, consultation and education with teachers, parents, and students can improve. With a deeper level of understanding the complexities of adolescent behavior and health, professionals might work to enhance positive outcomes, and with greater clarity of adolescent needs young people can be served in a more realistic manner. When there is elaboration of the issues impacting adolescents, improving their quality of life is an obtainable goal.

It was Bronfenbrenner (1979) who theorized that human development is ecological in nature and involves the integration of different systems in which a person lives. "A child's microsystems may be interrelated. What occurs in the school may affect what happens in the family, and vice versa" (Lerner, 1986, p. 27). Thus, when there are discussions about making change in the lives of our young people, it is important to remember that the interconnectedness of human lives will enable quality of life improvements for adolescents to affect quality of life for all. Schools, community groups, families, and work places are all linked, and so change in one system will impact the other connected systems. Although the present project analyzes but one aspect of issues pertinent to adolescent female functioning, we must keep in mind the importance of having a better understanding of this population for their sake and for the sake of the many people and systems affected by adolescent functioning.

Justification for the Study

With the recent surge in young females' participation in sport activity over the past two decades, their inclusion in studies analyzing the significance of physical activity is critical. It has been widely accepted that the physical health benefits of such activity for people in general, are numerous. The impact of physical activity on mental health is also an important area of investigation and one that has received ample attention. For example, with regard to physical activity and stress, a meta-analytic review by Crews and Landers (1987) found the average effect size estimate to be .48, indicating reduced stress reactions for those who are active compared to the inactive. However, because much of the data in this research area ". . . are almost exclusively on adults, conclusions about children must be more tentative" (Biddle, 1993, p. 203). Brown (1982), too, noted the paucity of research on young populations. Given that conclusions regarding physical activity have been drawn from the experiences of adults

and that the number of physically active females is on the rise, a study using only young females as subjects appears to be a timely and important endeavor.

Prior research in the area of stress has focused on the total amount of stress experienced or the total number of stressful events experienced in one's lifetime, rather than emphasizing the importance of subjective experience of life events as positive or negative, intense or insignificant. This study will take subjective experience of the events into consideration. The vast majority of self-concept literature has focused on self-concept as a general construct, rather than one that is multidimensional in nature, despite that the multidimensional approach seems a more accurate and accepted approach (Marsh, 1990; Sonstroem & Marsh, 1989). This study will analyze all domains of self-concept, but will target physical ability in particular, as it is a strong predictor of participation in vigorous physical activity and is positively related to general self-concept (Sonstroem, 1978). Rather than investigate all of the potential aspects of mental health related to physical activity, the study will target stress and multidimensional self-concept because of their significance in the lives of adolescents who are moving into adulthood with certain beliefs about themselves which will serve to guide the manner in which they handle the increased stresses that oftentimes come with age. In order to better understand the basis for this study, "The relationship of physical activity to self-concept and perceived stress in adolescent females," an overview of the significant literature is necessary.

CHAPTER II

Background Theory and Research

Stress

Stress, like many constructs in the field of psychology, has been investigated for years and yet continues to have multiple definitions and ways of being measured. Three particularly well known models for understanding stress include general adaptation syndrome (GAS), life change and life transaction. The first of these models was the work of Seyle, one of the seminal investigators in the area of stress. He identified three stages (alarm, resistance, exhaustion) of physical reaction to stress (Seyle, 1956). Decades later, this idea of a biological component to stress persists, as it is still viewed as ". . . essentially a biological concept concerned with a living being adapting itself to the circumstances of living" (Oakeshott, 1973, p. 17). For children, the circumstances of living involve a wide spectrum of stressors, such as jealousy of siblings, separation from parents, and incest (Brenner, 1984). Selye (1974) noted the similarity in the biological stress response to this array of experiences, with less severe responses to less traumatic experiences. The second stress model was formed by Holmes and Holmes (1970), who argued that both large and small changes in a person's life affect experienced stress. Even the desirability or undesirability of the event was insignificant, as both increased stress levels. Finally, the transaction model proposes that stress is a result of both external events of the milieu and the internal experiences and responses of the individual (Lazarus, 1969). Thus, this model more than the others includes the person's perception of the situation.

Just as varied definitions and models of stress exist , there are also many specialized areas of stress research, including work on such issues as stress and migraines (Gannon, Haynes, Cuevas, & Chavez, 1987), Type A personality (Friedman & Rosenman, 1974), stress and child abuse (Egeland, Jacobvitz, & Sroufe, 1988),

marital stress (Gottman & Levenson, 1992) coping strategies for stress (Suls & Fletcher, 1985) and the impact of stress on academics (DuBois, Felner, Brand, Adan, & Evans, 1992). In the sections that follow, these particular areas of research will be reviewed to provide a broad conceptualization of the field: youth stress, measuring stress and the relationship between stress and physical activity.

Youth Stress. While some authors have argued for the inclusion of commonly occurring events in stress scales, such as receiving special education services in stress scales (Chandler, 1981), many others purport that it is the rarely occurring events that cause the greatest amount of stress for young people. In their study of children's worries, Lewis, Siegel and Lewis (1984) found that children deemed most worrisome those events that occurred most infrequently, except being sick and not spending time with mom/dad. Two-thirds of the situations rated as "pretty bad" or worse by children were those involving parents. In their study, children rated themselves not only on how tired, sad or worried they felt but also on how much they liked themselves. Being female and being more tired, more sad, more worried, and liking oneself more infrequently were all associated with feeling bad about the events experienced or anticipated. Compas (1987) also highlighted the significance of the stress reactivity and depression link for adolescent females, as those individuals with depressive vulnerabilities oftentimes interpret events differently than individuals without such vulnerabilities. It appears that adolescent females tend to be influenced by both stressful events that affect others, such as illness of family member, and events that affect self-esteem, such as academic failure; while males generally respond to those stressful events that directly affect them (Leadbeater, Blatt, & Quinlan, 1995).

Youngs, Rathge, Mullis and Mullis (1990) found that as adolescents experienced increasing numbers of stressful events, both positive and negative, their self-esteem decreased. It was also found that as the number of negative life events

experienced increased, self esteem decreased. Additionally, positive life events also impacted self-esteem in a negative direction, although the authors stated that " . . . this correlation was very small and its statistical significance may be due, in part, to our large sample size" (Youngs et al., 1990, p. 337). Perceived intensity of an event's impact on an adolescent's life apparently does not allow for improved prediction of self-esteem, although the authors were rather hesitant about the validity of this finding given certain technical issues and the possibility that adolescents fail to remember the true impact of an event.

Although stress is an important consideration for the daily functioning of young people, ". . . research examining the effects of stressful life events during adolescence has lagged far behind similar research with adult populations" (Compas, Slavin, Wagner, & Vannatta, 1986, p. 205). However, one longitudinal study by Groer, Thomas and Schoffner (1992) unveiled interesting findings, as adolescent stress changes over time were investigated. The authors found a significant increase in stress scores from freshman to senior year in high school, with three of the top stressors being hassling with parents, hassling with siblings and making new friends. Freshmen also found appearance changes and problems with size to be stressors, while seniors noted starting a new job and problems with dating. The female stress level was higher than for males during both years. When life events were categorized as interpersonal issues (e.g., family issues, new experiences), females indicated greater degrees of stress than males. Groer et al. (1992) identified changes in coping strategies with time, discovering that during their freshman year females engaged in more active distractions (e.g., exercise, walking) than males, though by senior year active distractions for the females were replaced by more passive ones (e.g., smoking, substance use).

Dealing with stress may require not only effective coping strategies for adolescents, but strong supportive attachments with parents rather than friends, as

such attachments have been found to ease the effects of stress (Greenberg, Siegel, & Leitch, 1983), an intriguing finding given the developmentally appropriate preference for friends over family at this age. The female adolescents in the Compas et al. (1986) study, although reporting more total life and negative events than males, had a significant amount of social support. Stressors that involved parent or family distress were associated with a wider range of symptoms for subjects than events such as illness, sexuality, personal autonomy or relocation, which were not correlated with dysfunction. Distinguishing between the multiple levels of stressful experiences has not always been accomplished due to the measurement techniques available, as evidenced by the work of Sandler and Block (1979), who investigated stress and adjustment problems. They concluded that those children who experienced the most stress in the past year were also rated by their teachers and parents as having adjustment problems. However, they did not distinguish among the levels of stressors (e.g., fighting with parents vs. loss of a family member) to provide more refinement of how children's life experiences might relate to school functioning.

Along with research on gender differences in the experience of stress, and the relationship between stress and social support and adjustment, socioeconomic status (SES) and stress has also been investigated. Brown, Powell and Earls (1989) criticized Coddington's (1972) research which had concluded that children from the lowest SES group have greater difficulty coping with stressors than children from higher SES backgrounds. In their study, Brown et.al. found a strong association between stress level and psychiatric problems. "Unexpected were the results showing that the influence of higher social class, intact homes, the absence of a family member with a mental illness, and good social adjustment were not candidates for protective factors" (Brown et al., 1989, p. 149).

Finally, with regard to adolescents in particular, Swearingen and Cohen (1985a) sought to determine the role of negative life events in an adolescent's

maladjustment. They found that negative events were predictive of psychological distress and that positive events were weakly related to distress, in contrast to prior research that showed support for the buffering effects of positive experiences. In another study, the same researchers analyzed different methods for determining stress levels and found that adolescents' self reports and psychologists' reports of an event's desirability were equally predictive of problems experienced by the adolescent (Swearingen & Cohen, 1985b), indicating adolescents' reliability in honestly reporting the impact of life events. Other researchers have concluded that " . . . adolescents, particularly older ones, are more accurately assessed by self-report measures" (Williams & Uchiyama, 1989, p. 96). Finally, Newcomb, Huba and Bentler (1981) pointed out that adolescent stress has been measured by the selection of life events that are more likely to occur during that age and to then analyze the scale with use of adult scoring methods. It is important to evaluate and use scoring alternatives to assess adolescent stress, rather than simply adopting a method used for adults (Newcomb et al., 1981; Mullis, Youngs, Mullis, & Rathge, 1993).

Measuring Stress. Holmes and Rahe (1967) were pioneers in the field of stress research, adding much to the literature on the connection between stress and illness. Their social readjustment rating scale included 43 life events to be checked off as experienced or not experienced by the subject. "As defined, social readjustment measures the intensity and length of time necessary to accommodate to a life event, regardless of the desirability of this event" (Holmes & Rahe, 1967, p. 213). Their scale was really the first attempt at measuring this construct of stress for adults. Using their work as a base, Coddington (1972) was the first to develop stress scales for adolescents (Williams & Uchiyama, 1989). His scales have tended to be the most commonly-used stress measure for children of various ages. "The underlying assumption of Coddington's scales is that both negative and positive events require readjustment and are therefore stressful, that is, life change per se, rather than the

desirability of life experiences, is predictive of physical and mental health criteria" (Swearingen & Cohen, 1985a, p. 1046).

Unlike Coddington (1972) who argued that all events, both positive and negative, had detrimental effects, other researchers (Zautra & Reich, 1983) have concluded from their analysis of the research on life events and quality of life that positive events tend to influence positive affective states, while negative events influence only negative affective states. It is these negative events that are much more responsible for mental health problems (Zautra & Reich 1983) and for adolescents' lowered sense of well-being (Greenberg et al., 1983). Likewise, Swearingen and Cohen (1985a) purported that some adult stress research has found that positive events may actually serve as moderators of the negative events. In other words, "positive life experiences may provide a 'breather' from negative experiences, sustain individuals' coping efforts, and restore depleted psychological resources" (Swearingen & Cohen, 1985a, p. 1046). Given such research on the unique influence of these different types of experiences, Newcomb et al. (1981) argued for the inclusion of separate indexes for positive and negative experiences.

Other significant considerations for measuring stress have been discussed. Some authors have noted the challenge in clearly distinguishing among such variables as stress, physical illness, and mental illness given their degree of association (Williams & Uchiyama, 1989; Mueller, Edwards, & Yarvis, 1977). A second consideration regarding stress assessment in adolescents was identified by Williams and Uchiyama (1989), who argued that simply summarizing information from a life events scale is a source of controversy; just as Cohen, Burt and Bjorck (1987) stated: ". . . for young adolescents an omnibus scale of life events cannot, by itself, provide an adequate index of life stress" (Cohen et al., 1987, p. 591). A third point questions the accuracy of recalling events throughout an entire lifetime, as measures covering more than a year's time tend to be less reliable (Williams & Uchiyama, 1989).

A final consideration with regard to stress measurement is the desirability of particular life events. Mueller et al. (1977) discovered that regardless of the weighting of events, it was the undesirable events (as noted by the respondent) that correlated most highly with psychiatric symptomatology (psychological status). Desirable events were either unrelated or very weakly related to psychological status. "Although the life change unit score (Holmes & Rahe, 1967) has been the most widely- used life events measure to date, it appears to have serious inadequacies in that it ignores the desirability-undesirability dimension" (Mueller et al., 1977, p. 316). This traditional model of a normative standard of stress that identified just how stressful particular events were for all people was challenged by a new model that encouraged subjective interpretation of events (Williams & Uchiyama, 1989). Desirability became a significant issue in these scales given the vagueness in early scales, where events could be either positive or negative. Two major ways to measure desirability include first, the subjective approach, where each subject determines the desirability and second, the expert approach, where professionals assign the desirability ratings. It is unclear which method is better (Mueller et al., 1977). It appears from studies using the desirability approach that the undesirable life events more highly correlate with stress measures than desirable life events or total life change scores (Compas et al., 1986; Gad & Johnson, 1980; Johnson, 1986).

Not all researchers view major life events or even the impact of major life events as most critical when measuring stress. In fact, some have argued that day-to-day events and minor experiences of daily life may actually contribute the most to stress (Lazarus, 1980; Lazarus & Cohen, 1977). Kanner, Coyne, Schafer and Lazarus (1981) found that measures of such "hassles" and "uplifts" were better predictors of psychopathology than measures of major life events. The researchers questioned the use of the life events scales, which were initiated in stress research with the work of Holmes and Rahe (1967), who hypothesized that experiencing

difficult life events greatly increased one's chances of being physically ill. However, a significant body of research supporting their hypothesis did not exist. In fact Rabkin and Streuning (1976) discovered that .12 was the average relationship between such life events and health, certainly an argument for the importance of considering those day-to-day events that are "hassles" or "uplifts" as a way to more fully tap the human experience of stress. Such hassles of living have also been more predictive of childhood maladjustment than major life events which occur with less frequency (Compas, 1987). A hassles and uplifts scale, however, is infrequently used for adolescents and so generally the more traditional measures are used.

One of the most widely used scales assessing adolescent stress is the Adolescent Life Change Event Scale (ALCES) initially constructed by Yeaworth, York, Hussey, Ingle & Goodwin in the 1970s and then modified in 1980. The scale is based on the theory that individuals adjust to all types of events, both positive and negative, and that particular events are more stress-inducing than others (i.e. parents divorcing vs. starting a job). Adolescents completing this scale are given a Life Rank Unit Score ranging from 98 for death of parent to 26 for sibling getting married for each event experienced in the past year. This scale is well constructed and is considered an excellent measure of adolescent stress when there is interest in investigating stress induced by major life events.

Stress and Physical Activity. Research on the multiple benefits of physical exercise is voluminous and cuts across a number of different areas including improved ability to manage stress and emotions (Keller, 1980; Folkins & Amsterdam, 1977; Norris et al., 1990), increased physical adaptation (Sinyor, Schwartz, Peronnet, Brisson, & Amsterdam, 1983), lower scores on perceived stress and depression, lower resting heart rate (Lamb, 1984; Norris et al., 1990), enhanced self-esteem and lower anxious and depressive symptoms (Ledwidge, 1980; Folkins & Sime, 1981; Tucker, 1983) as well as lower mortality rates (Paffenbarger, Hyde, Wing, Lee,

Jung, & Kampert, 1993). Stress has been found to encourage feelings of helplessness (Seligman, 1975) while regular exercise oftentimes enhances feelings of mastery (Ransford, 1982). One common question asked by researchers is whether or not physical exercise serves as a buffer against the negative impact of stress. Two pairs of researchers investigated this question of whether exercise dampens stress impact in adolescent females, a noteworthy endeavor given that very few studies have been done solely on females or on children (Crews & Landers, 1987). These authors found an interaction between stress and exercise with regard to physical illness, where frequent exercisers did not increase their rates of illness with an increase in stress, while the illness rates of infrequent exercisers rose with an increase in stress (Brown & Siegel, 1988; Brown & Lawton, 1986). The negative impact of stress on physical health seems to be reduced for those adolescent females engaging in vigorous exercise (Brown & Siegel, 1988; Brown & Lawton, 1986). It may be “. . . that individuals who exercise regularly perceive life changes as less psychologically stressful than those who do not exercise routinely” (Brown & Lawton, 1986, p. 130).

Likewise, Tucker, Cole and Friedman (1986) investigated this same question regarding stress and exercise in adults, concluding that those who were more fit tended to have less distress in their lives than did those who were unfit. “It was concluded that physical fitness may fortify the body against the demands of life and provide increased strength and hardiness. Physical fitness may act as a buffer against stress” (Tucker et al., 1986, p. 955). It is important to note that fitness is not necessarily solely the result of physical activity, but is also related to genetics. Indeed, “. . . only repeated exercise of sufficient intensity and duration will improve” (van Dooren, deGeus, & Orlebeke, 1988, p. 303) fitness levels.

Brandon, Loftin and Curry (1991) attempted to avoid some pitfalls of previous research on stress and fitness such as the use of just one type of stressor, definitional problems of aerobic fitness as noted by van Doornen et al. (1988), and the reliance on

self-report of physical activity habits or assignment to aerobic fitness programs vs. measuring oxygen consumption during maximal and submaximal exercise exertion. Many researchers have found that aerobically fit individuals show reduced responses to psychosocial stressors (Brandon et al., 1991; Crews & Landers, 1987; Imm, 1990), to exertion (Skrinar, Ingram, & Pandolf, 1983) and to perceived stress (Aldana et al., 1996). Others have found that trained and untrained people have different responses to psychosocial stress, with trained people recovering faster from stressors (Sinyor et al., 1983; Sinyor, Golden, Steiner, & Seraganian, 1986; Keller & Seraganian, 1984; Hollander & Seraganian, 1984; Cox, Evans, & Jamieson, 1979). In addition, Perkins, Dubbert, Martin, Faulstich and Harris (1986) found that aerobically trained male hypertensives responded with significantly lower diastolic blood pressure increases and systolic blood pressure increases during a stress situation than their aerobically untrained counterparts. Likewise, others have concluded that the bodies of unfit young adults tend to be more responsive to emotionally charged films (Cantor, Zillman, & Day, 1978), which might result in significant blood pressure changes compared with their fit counterparts.

Although some studies have shown no such benefits from activity/aerobic fitness (Kagan & Berg, 1987; Roskies, Oseasohn, Hanley, Collu, Martin, & Smilga, 1986; Zimmerman & Fulton, 1981), the majority of studies indicating otherwise have encouraged the formation of hypotheses explaining how such benefits may arise. It has been postulated in a meta-analytic review of the literature by Crews and Landers (1987), that exercise may serve as a strategy for coping with stress, may decrease the body's amount of time spent in stress, or may allow the body to respond more efficiently during stress. "Recently the attention has shifted towards a possible beneficial effect of regular physical exercise on sympathetic activation" (van Doornen et al., 1988, p. 303). In general, it seems that those who are fit have bodies that recover more quickly from the effects of stress (Sinyor, et al., 1983) whether due to

the body's enhanced ability to tolerate intense physical changes in response to the environment or to some of the psychological benefits that physically fit individuals may receive as the result of long-term commitment to physical activity.

Tucker et al. (1986) hypothesized that physical fitness may allow strength and hardiness to protect the body from the weathering effects of stress, while the unfit may have weakened defenses and reduced coping ability, resulting in higher stress levels. Interestingly, Tucker et al. (1986) discovered that individuals in occupations requiring physical exertion, thus possibly leading to greater fitness, reported less stress than those in management, administration and sales types of positions. Those individuals with more physical output at work were found to be more fit than low output workers. Sinyor et al. (1983) theorized, using prior research, that the lowered anxiety scores of trained subjects may be caused by their perception of their lowered heart rate post stress. Aldana et al. (1996) hypothesized that the high stress subjects may have no time for leisure activity or that leisure activity is more available to those low in stress. Nieman (1990) has provided evidence that improved cardiovascular fitness has the effect of reducing the amount of blood catecholamines, lipids and hormones associated with stress, which may permit more efficient stress management and reduce perceived stress.

It could be that unfit individuals become particularly insensitive to an increase in their own arousal because they experience it so frequently - every time they engage in even minimally strenuous behavior, such as climbing stairs. They may have learned to discount this arousal and to consider it as a 'normal' rather than an 'arousal' state. It is also possible that people in low fitness possess more fat per body weight than those who are in better shape. Conceivably the presence of fatty tissue in the interoceptive system reduces the accuracy of feedback from cardiorespiratory changes (Cantor et al., 1978, p. 129).

Physical Activity

Physical activity has been defined as movement of the body by use of the skeletal muscles that ultimately results in energy expenditure (Caspersen, Powell, & Christenson, 1985). It is generally accepted that highly intensive movement of the body is associated with fitness (LaPorte, Dearwater, Cauley, Slemenda, & Cook, 1985), despite aerobic fitness and physical activity being separate and distinct. Simply acquiring information about a person's activity level will not provide accurate estimations of fitness level, as there are many other important factors. Fitness enables individuals to complete daily tasks with alertness (President's Council on Physical Fitness and Sports, 1971) and involves improved aerobic power, joint flexibility, body composition, strength and endurance of skeletal muscles (American College of Sports Medicine, 1988). "Physical fitness is important throughout life to develop and maintain functional capability to meet the demands of living and to promote optimal health" (American College of Sports Medicine, 1988, p. 422). An inactive lifestyle, in fact, has been identified as a health risk factor, as are smoking and poor eating habits (Fletcher, Blair, Blumentahal, Caspersen, Chaitmman, Epstein, Falls, Sivarajan Froelicher, Frolicher, & Pina, 1992).

Although the terms "physical activity" and "exercise" are oftentimes used interchangeably, they actually have different meanings. The major difference between them is that exercise, rather than being any activity at all, is activity that is purposive and consciously engaged in by the participant (Caspersen et al., 1985). Participation in either, however, can result in improved fitness. The prevailing research on physical activity has found it to have multiple benefits including reduced stress levels and increased well-being. Also, "Movement activities provide opportunities for children to learn to feel confident about their abilities" (Biddle, 1991, p. 467).

The U.S. government's Healthy People 2000 project (U.S. Department of Health and Human Services, 1991) emphasizes activity and fitness for young people. Tools to measure fitness, including The Prudential Fitnessgram (Cooper Institute for Aerobic Research, 1992), Physical Best (American Alliance for Health, Physical Education, Recreation and Dance, 1988) and The President's Challenge (President's Council on Physical Fitness and Sports, 1987) have helped in the documentation of fitness levels for American youth and ultimately to guide people toward improved health. "In addition, these organizations have received cooperation and assistance at various times by the President's Council on Physical Fitness and Sports and by departments of the federal government such as Health and Human Services and the Centers for Disease Control and Prevention" (Cooper Institute of Aerobic Research, 1994, p. vii).

Research on children's activity levels has been steadily accumulating, but only a small amount has focused on the psychological or behavioral implications of their participation in physical activity (Biddle, 1993) despite the many possible benefits (American College of Sports Medicine, 1988). Powell, Spain, Christenson and Mollenkamp (1986) identified reasons why physical fitness goals for children may be difficult to achieve at the school level, including the schools' emphasis on academic rigor, decreasing school funds and a lack of shower facilities. The authors also noted that it is not just vigorous activity which leads to health benefits, but lower intensity activities as well. The American College of Sports Medicine (1988) recommended that children participate in vigorous exercise 20-30 minutes per day and that schools should promote and encourage active participation outside of class. Both males and females become more sedentary with age, but females do so at an earlier age (McKenzie, Sallis, Nader, Broyles, & Nelson, 1992). In the sections that follow, particular areas of research on physical activity will be reviewed to provide a broad conceptualization of the field: participation statistics, measuring physical activity,

general outcomes of activity, psychological outcomes of activity, and physical activity and self-concept.

Participation Statistics. The effort at encouraging America's youth to increase activity and fitness levels commenced with John F. Kennedy's creation of the President's Council on Physical Fitness (Brown & Siegel, 1988). In 1980 a reaffirmation of this commitment came from a government report recommending that all American schoolchildren between the ages of 10 and 17 participate in physical fitness activities (U.S. Department of Health and Human Services, 1980). The 1990 national health objectives included 11 that targeted physical fitness and exercise. Documentation of the health benefits attributed to physical activity has both increased and improved (U.S. Department of Health and Human Services, 1989). However, despite national urgings at keeping our youth active, the reality at the local level is that physical education and sport teams are sometimes the first school activities deemed unnecessary, as did the state of Massachusetts on November 18, 1996 with the recommendation by Governor Weld that all physical education requirements be terminated.

Even with some physical activities being cut for school aged youth, participation has been on the rise. The Women's Sports Foundation (1995) reported that the number of females participating in high school sports has significantly increased since 1971. In 1971 there were 294,015 female participants, with 2,240,461 participants in 1994-1995, approximately an eight-fold increase. The most popular sports for female participants include basketball, track and field, volleyball, softball (fast pitch), soccer, tennis, cross country, swimming and diving, field hockey and softball (slow pitch). In 1971, one in 27 girls participated in high school sports while in 1994 that figure was one in three. For boys, the participation figure has remained constant at one in two, or 3,554,429 total participants, as determined by the Women's Sport Foundation. There is a wide range of reasons why

females participate in sports or activities, including weight control, to achieve health goals and for pleasure (Puretz, Hass, & Meltzer, 1996). Over half of the sample of females 14 to 81 years of age reported that they had been exercising regularly for over five years, with 90% exercising more than three days per week (Puretz et al., 1996). Hypercompetitiveness has not been shown to be a factor in female sports participation, while it has been implicated in male participation (Ryckman & Hamel, 1995). Interdependence as a motivational reason for participation also differentiated the males from females, with females identifying this as a reason for joining, along with other reasons common to both males and females such as personal satisfaction and self-image (Ebbeck, Gibbons, Loken-Dahle, 1995).

Faucette, Sallis, McKenzie, Alcaraz, Kolody and Nugent (1995) found that although there were no significant differences between boys and girls on overall amount of activity, girls tended to select low intensity activities, while boys chose medium intensity ones. In contrast, Kirshnit, Ham and Richards (1989) reported that boys spent more time in sports. Although both males and females decrease activity with age, females do so at a significantly greater rate than males (Sallis, Condon, Goggin, Roby, Kolody, & Alcaraz, 1993; Vaughter, Sach, & Vozzola, 1994). From grades six through ten, Butcher (1985) found primary participation to decline with age. During their first year of high school, approximately 30.6% of girls participate in sports. This percentage drops to 17.3% by their senior year (U.S. Department of Health: Youth Risk Behavior Survey, 1990). It is possible that such a trend may continue into adulthood. Leaman (1984) wrote about the challenge for the adolescent female who commits herself to sport participation in this society which tells her that aggression and competitiveness are desirable traits in our males, not our females. Females, rather than viewing all sports as possible areas of interest, may choose not to participate in those sports deemed masculine. Along with a decrease in sport participation with age for females, Engel (1994) found that there was a greater

decrease in masculine sports (e.g., karate, basketball) with age than in neutral (e.g., swimming, skiing) or feminine sports (e.g., dance, gymnastics). Garton and Pratt (1987), too, found that adolescents tended to participate in gender stereotyped activities viewed as acceptable for their sex. Engel's (1994) results indicated that the participation decrease was greater for older girls in co-education vs. single-sex education settings. Finally, with regard to these issues, Butcher (1989) discovered that the relationship between sports participation and sex role orientation remains fairly constant throughout the adolescent years. One explanation is that "... a masculine sex role orientation and sports participation involve the same characteristics, both of which are developed at a young age" (Butcher, 1989, p. 591). Research has indicated that girls with the highest self-esteem are those with higher masculine orientations (Butcher, 1989; Cate & Sugawara, 1986), females in athletics tend to have more masculine orientations than nonathletes (Marsh & Jackson, 1986; Cate & Sugawara, 1986) and that nonathletic females with feminine sex role orientations tend to have the lowest self-esteem of athletes and nonathletes (Hall, Durbin, & Progen, 1986).

Measuring Physical Activity. "The physical activity questionnaire is the most practical and widely-used approach for the assessment of physical activity in epidemiological research" (Washburn & Montoye, 1986, p. 563). In their article, the researchers assessed the quality of several physical activity measures, noting that the majority of measures have been used with white, middle-aged men, so the use of many measures with female adolescents may be questionable. They also challenged the applicability of such instruments for measurement of inactive people, as the majority of research has centered on those who are active. Like Washburn and Montoye (1986), Laporte, Montoye and Casperson (1985) identified surveys as the most efficient and practical approach to measuring physical activity levels on a large-scale basis. Other authors, however, have noted the difficulty in getting accurate accounts of

physical activity from people (LaPorte, Black-Sandler, & Cauley, et al., 1983; Sallis, Haskell, Wood, et al., 1985). One meta-analysis noted the inconsistency in the type of exercise program employed and thus the lack of standard information on duration and length of programs (Doan & Scherman, 1987). It has also been argued that when " . . . researching participation in physical activity, all types of participation should be examined and researchers should attempt to standardize participation measures so that comparisons between studies can be made" (Browne, 1983, p. 764).

Caspersen et al. (1985) recommended subdividing levels of physical activity by either intensity (light, moderate, heavy) or by category (sleep, occupation, conditioning, household). These authors argued that gathering data in these particular domains would allow for comparisons across studies, just as the American College of Sports Medicine (1988) argued that such comparisons would be facilitated by the adoption of a clear and consistent approach to fitness testing. Jacobs, Ainsworth, Hartman and Leon (1993) evaluated ten commonly-used physical activity questionnaires (e.g., Minnesota Leisure Time, Lipid Research Clinics, Godin Leisure Time, Baecke Physical Activity and Seven Day Recall), concluding that the length of the questionnaire is not nearly as important as the logic of the questions asked. They also noted that the majority of questionnaires used in the United States tend to inquire about heavy intensity as opposed to mild or occupational activities.

General Outcomes of Activity. Over twenty years ago, an association between general good health and several health-related behaviors (e.g., physical activity, being average weight and never smoking) was found (Belloc & Breslow, 1972). Since that time physical activity has been associated with reduced recidivism rates for juvenile offenders (Collingwood & Engelsgerd, 1977), improvement of depression (Doynes, Chambless, & Beutler, 1983; Stephens, 1988), reduction in anxiety (Stephens, Edwards, Moses, & Mathews, 1989) and academic success (Women's Sports

Foundation, 1995; Snyder, 1985; Snyder & Spreitzer, 1990). Wingard, Berkman and Brand (1982) discovered that five health-related behaviors were associated with lower rates of mortality. These five were never smoking, regular physical activity, low alcohol consumption, being of average weight and sleeping seven to eight hours per night. Most recently, the U.S. Surgeon General (1996a) warned that 60% of Americans do not exercise regularly and that 25% do not exercise at all, habits which contribute to a number of diseases and to obesity. Health-sedentary habits have a devastating impact on health and quality of life (U.S. Surgeon General, 1996b).

Women who exercise weigh less, have lower levels of blood sugar, cholesterol, triglycerides and lower blood pressure than nonexercising women. They also reported being happier, more energy and feel that they are in excellent health more often than the sedentary females. The exercising women also missed fewer days of work. For adolescents, it seems that participation in school and voluntary clubs, possibly sports teams, may serve to protect them from risk behaviors (Jessor, 1991). The author also categorized sedentariness as a risky lifestyle the outcome of which was lowered fitness.

Although the majority of findings have linked physical activity with positive outcomes, other studies have challenged the notion that such activity is a panacea for solving a multitude of problems. Many researchers have concluded that participation in sports for young people is the ideal opportunity to build one's self-image, to participate socially and to begin building character. Rees, Howell and Miracle (1990) challenge this notion and Spreitzer (1994) also argues that there is very little evidence to support the notion, that sports build character in young people. Spreitzer (1994) also found that participation in athletics was a weak predictor of future alcohol use and level of self-esteem. Russell, Epstein, and Erikson (1983), in their study on how exercise might serve as an effective alternative coping strategy to smoking, found that exercise did not inhibit stress. And finally, although The National

Institute of Mental Health (NIMH) has issued consensus statements including the view that emotional benefits for children are derived from exercise. However, this view has been offered despite the dearth of evidence supporting this claim (Morgan & Goldston, 1987).

Psychological Outcomes of Activity. Taylor et al. (1985) reviewed the literature on the relationship of physical activity and exercise to mental health. The authors identified some general findings: a) Physical activity and exercise have been associated with improvements in self-concept and confidence in children and adolescents; b) Physical activity and exercise may contribute to changes in stress response and coronary-prone (Type A) behavior; and c) Physical activity and exercise seem to improve mild-to-moderate depressive symptoms. The psychological, academic and vocational benefits that can result from participation are oftentimes denied to females, as they are discouraged from participating in physical activity (Nielsen, 1983).

Moses, Steptoe, Mathews and Edwards (1989) designed a study to investigate the psychological effects of exercise. The researchers discovered that there were psychological benefits for those subjects in a moderately difficult training program, while those in the high difficulty program did not acquire such positive outcomes. They hypothesized that the high intensity group may have found the program to be too demanding, while there was more enjoyment for the moderate intensity group. Similarly, Dubois (1986) found that children in competitive and instructional classes wanted to improve their skills, play fairly, have fun and use good sportsmanship. Winning by breaking the rules was the thirteenth most important reason for participating. In considering the results of this study as well as other studies on children in competitive sport, it appears that children have similar goals for their participation in activity, regardless of the sport intensity.

Self-concept

The earliest interest in self-concept began with the work of William James (1890/1983), who viewed the construct as a product of both the individual's abilities and actual accomplishments. His formula, although including a behavioral component, failed to consider the importance of environmental factors on human behavior. James' early conceptualization served as the basis for our view of self-concept as a unitary dimension. More recent research, however, indicates that measuring self-esteem, which differs from self-concept in that it is the evaluation of one's conceptualization of the self, may be much more complex than simply deriving a global self-esteem score (Sonstroem & Morgan, 1989 ; Fox, 1989), although some researchers continue to argue for use of such a score (Poole & Evans, 1989). The use of more refined aspects of self-esteem rather than an overall score has been an idea in existence for several decades (Crary, 1969). "There is now support for a multidimensional and hierarchical model of self-esteem. This suggests that self-esteem is made up of different components (e.g., increasingly specific, differentiated and transient)" (Biddle, 1993, p. 206), including a physical component (Fox, 1989). There is even research indicating clear differentiation of self-concepts for multiple academic areas (Marsh, 1992) and that particular self-concept areas (e.g., social) become increasingly differentiated with age (Byrne & Shavelson, 1996). With regard to measuring the physical self-concept, a multidimensional approach may also be best (Marsh & Redmayne, 1994; Marsh, 1993).

Self-concept as multidimensional in nature germinated from the work of Shavelson, Hubner and Stanton (1976) who suggested that self-concept is hierarchically ordered and arranged as a triangle with general self-concept at the apex and more specific self-concepts below. This approach to self-concept is accepted today, particularly given the empirical evidence indicating that it is a more precise and accurate representation of the self. Besides the multifaceted approach having more

solid empirical backing, other advantages include that multiple components provide more information and specificity of a person's inner belief structure and that changes in self-concept can be noted when there is a more narrow area of focus. Use of the multidimensional approach allows for distinguishing more accurately between types of people, such as those with psychological problems. In their study Schweitzer, Seth-Smith and Callan (1992) found that teenagers with adjustment problems could be distinguished from teenagers without such difficulties in specific aspects of self-concept including emotional, parent relations and general self-esteem. As expected, these teenagers could not be distinguished based on mathematics or physical ability self-esteem. In another study, talented and regular swimmers completed cognitive, social, physical, swimming and general self-esteem scales (Vallerand, Pelletier, & Gagne, 1991). The most significant difference between the two groups was in the area of swimming competence, with talented swimmers scoring higher than regular swimmers. A smaller, though significant, difference was found between the groups on physical competence, with talented swimmers scoring higher than regular swimmers. The findings from this study provide support for both a multidimensional and hierarchical model of self-concept. Talented regular students have also been distinguished on the cognitive self-esteem domain (Vallerand et al., 1991; Pyryt & Mendaglio, 1994), while these students were not significantly different on domains of physical or social, indicating good specificity and the importance of using multidimensional self-concept measures.

Demo (1992) detailed this construct of self-concept and how it changes throughout the course of a life. He highlights the fact that self-concept is both a structure and a process, while also simultaneously stable and dynamic. In viewing self-concept as a structure, he notes that it is widely accepted that self-concept is similar to a personality characteristic in that it is a stable trait that remains constant across situations. While some view feelings about self as more of a structure, others

recognize its ability to change. Burke (1980) has even referred to the self-image as the "current working copy" of identity, thus highlighting the dynamic nature of this construct. Self-image has been viewed as an individual's feelings about self for the moment vs. self-concept which is possibly the more enduring feelings about the self (Turner, 1968).

"Self-concept, like other dimensions of personality, is a function of interacting biological, developmental, and social processes across the life course. It is acquired through patterns of interaction with others and is modified as children and adults develop new cognitive and intellectual capabilities and confront new social demands and processes" (Demo, 1992, p. 307). Demo's review of the literature on self-concept enabled him to conclude that self-concept tends to increase from childhood through adolescence. One possible explanation for this improvement in self-concept was offered by McCarthy and Hoge (1982) who hypothesized that given the increased independence and mobility of adolescents, there is opportunity to select preferred activities and roles that are self-fulfilling or considered areas of success. Rather than being a period of emotional turmoil and dramatic individuation, as commonly believed, adolescence may actually be a stable period of development, complete with ego functioning (Greenberg et al., 1983). During this period inadequate self-concept may have life-compromising outcomes (Jessor, 1991) and may be tied to quality of attachment to parents, which under high stress conditions may buffer the effects on self-esteem (Greenberg et al., 1983). For elementary aged children, it has been shown that parent relations self-concept domain serves as a good predictor of global life satisfaction (Terry & Huebner, 1995).

Self-concept and Physical Activity. Browne and Francis (1993) concluded that positive outcomes such as higher self-esteem and popularity with peers may accompany nontraditional sports participation. They also found that these benefits can result even from participation in sports devalued by adults, such as skateboarding.

Williams and McGee (1991) noted that the " . . . diversity of involvement in leisure-time pursuits is important for self perceived strengths"(Williams & McGee, 1991, p. 335). It seems that it is the more serious commitment to activity that serves to impact self-esteem, rather than one single day of activity (Iso-Ahola, LaVerde, & Graefe, 1988). There is some evidence that it is females feeling poorly about their appearance and body who are the ones to participate in exercise (Cash, Novy & Grant, 1994).

Scott and Myers (1988) investigated what effect physical training has on adolescents' self-evaluations. With regard to self-evaluations, it was found that self-esteem was positively correlated with self-efficacy and body image, though there was no significant change in self-esteem throughout the 24 weeks of the physical training program. The treatment group, however, was found to significantly increase their physical self-efficacy over time in comparison with the non-treatment group. With regard to fitness, it was found that the treatment group evidenced more significant improvements than the non-treatment group in cardiovascular fitness only, with no differences in agility improvement or hamstring flexibility.

One researcher found that subjects began to talk more positively about themselves after participation in physical activity classes (Imm, 1990). The subjects' fourth area of greatest improvement was in self-concept for those participating in the program. Other research, too, has found positive outcomes from physical activity programs, including outcomes for children (Martinez, Cheffers, & Zaichowsky, 1978) and adolescents (Collingwood, Reynolds, Kohl, Smith, & Sloan, 1991). Research on children and the impact of physical activity is important as they " . . . begin to form impressions about their own self-worth based on the types of experiences they have and the nature of the feedback they get about their performance" (Bunker, 1991, p. 469). Children need to get information from others on their performance in order for competence to be built. It does seem that the self-esteem of

boys may be impacted to a greater extent than girls by perceived athletic ability (Walker & Greene, 1986). "It is logical for the link between activity and self-esteem to be greater when the physical aspects of the self are highly valued" (Biddle, 1993, p. 207).

In a meta-analysis of 27 studies, Gruber (1986) found a positive association between self-esteem and exercise. The effect size for physical activity and self-esteem was .41, indicating a difference in self-esteem of nearly one-half a standard deviation between the physically active and control children. In addition to the positive correlation between physical activity and self-esteem, it has also been found that self-esteem serves to actually improve performance in that physical activity (Porat, Lufi, & Tenenbaum, 1989). In fact, these authors identified three dimensions of self-concept as contributing significantly to performance: personal self-concept, identity and self-satisfaction. "It is evident that high self-concept contributes to better performance in competition" (Porat et al., 1989, p. 283).

This multidimensionality approach to self-concept, discussed above, has facilitated increased interest in research on the physical component of self-concept. In his investigation of the Physical Estimation and Attraction Scales (PEAS), the first physical self-concept scale, Sonstroem (1978) concluded that at least for adolescent males, global self-esteem is related not to actual physical ability but rather to perceived ability. Another important conclusion from this research is that perceptions of physical ability are positively associated with both physical performance and desire to participate in activity. It is recommended that ". . . physical self-concept researchers focus primarily on specific components of physical self-concept most closely related to their application rather than on global or composite self-concept scores" (Marsh and Sonstroem, 1995, p. 103). In a meta-analysis of physical activity self-confidence, an overall effect size of .40 favoring

males over females was found which indicated higher confidence levels in this area for male subjects (Lirgg, 1991).

Predictions

Review of the relevant research has led to the formation of four predictions that are tested in the present study: 1) Females who are more physically active will report that experienced stressful events are less upsetting than will females participating in less activity; 2) Females who are more physically active will have higher physical ability self-concept scores than those females who are less physically active; and 3) Certain factors such as age and physical ability self-concept are more likely to result in girls' participation in physical activity; 4) It is predicted that certain factors such as age and physical ability are more likely to result in girls' participation in strenuous physical activity.

CHAPTER III

Method

Subjects

Subjects were 214 female students attending a New England suburban high school with 918 students during the 1997-1998 school year. There were 428 females enrolled in the school. Data were collected on nearly half of the females during the first quarter of their school year. Geographically, the town is located about 30 minutes outside of a state capital. Its approximately 15,000 residents are primarily middle class with a small percentage of low income families. Subjects participated in the study during their physical education class after parental permission and subject assent was obtained. Only two students failed to participate because of parent refusal to consent. Subjects were between the ages of thirteen and eighteen with the majority fourteen and fifteen (69%). The average age of the sample was 14.3. Students participating were in grades eight through twelve, with 9.1 as average. The overall average GPA for the subject pool was 3.3, with a 3.0 as a B average and 4.0 as an A average. Approximately 86% of subjects were Caucasian, 3% American Indian, 3% Asian, 3% African American, 1% Hispanic and 3% some other ethnicity, which is consistent with the town's racial makeup.

Instruments

A) Background Information

A 19 item questionnaire of mostly multiple choice but with some open ended questions requests information from subjects on a variety of areas (See Appendix A)

General demographic information includes such questions as age, grade in school, GPA, ethnicity and immediate family. Questions regarding participation on sports teams and in physical activity programs are also included.

B) Leisure Time Exercise Questionnaire (Godin & Shephard, 1985)

In completing this questionnaire, subjects note the number of 15 minute periods of exercise in an average 7 day period (See Appendix B). The number of 15 minute periods is separated by degree of exercise intensity (strenuous, moderate and mild). The total leisure time score is equal to the sum of the strenuous periods X 9, the moderate periods X 5 and mild periods X 3. A separate question is asked about how often the subject engages in activity leading to a sweat (often, sometimes, rarely). This " . . . simple questionnaire can provide information on activity patterns that will be useful when evaluating the baseline behavior of a population" (Godin & Shephard, 1985, p. 145). The test-retest correlations calculated by Jacobs et al. (1993) after one month were .62 for the overall index, .84 for strenuous activity, .36 for moderate activity, .24 for mild activity, and .69 for the occurrence of sweating. Godin and Shephard (1985) found two-week test-retest correlations of .74 for the overall index, .94 for strenuous activity, .46 for moderate activity, .48 for light activity, and .80 for the occurrence of sweating. "By a combination of various objective physiological measurement, these authors explained 58% of the variance in the subjective grading of the level of normal exercise activity" (Godin & Shephard, 1985, p. 145).

C) Adolescent Life Change Event Scale (ALCES), (Yeaworth et al., 1980)

The ALCES was developed in the 1970s and has been modified since that time. The scale assesses the occurrence of 30 developmentally appropriate life events which the adolescent may have experienced within the past year (See Appendix C). A yes-no format is used. The item weightings were derived from a standardization sample of

adolescents who indicated how upsetting each of the events was (See Appendix D) For example, the death of a parent has a life change unit of 98, losing a favorite pet is 77, starting to date is 31 and brother or sister getting married is 26. An adolescent's Life Change Event score is the sum of these weightings. Yeaworth et al., (1980) found that the mean Life Change Event score was 475 and that females experienced an average of 8.7 events while males experienced 7.8 events on average. Test-retest reliability has been reported at .83. In addition to stating whether or not they had experienced any of the 30 life events, subjects will also be asked to indicate how upsetting the event was on a scale of 1 (most upsetting) to 5 (least upsetting).

D) Self-Description Questionnaire - II (Marsh, 1990)

This 102 item scale (See Appendix E) assesses three areas of academic self-concept (math, verbal, general school), eight areas of nonacademic self-concept (physical abilities, physical appearance, parent relations, opposite-sex relations, same-sex relations, honesty, emotional and general self-concept). Additionally, a total self-concept score can be derived by summing together all of the factor scores, a score similar to that from the Rosenberg (1965, 1979) scale. For purposes of the present study, the total self-concept score will not be considered given that general self-concept is a more accepted and meaningful score. Subjects respond to declarative sentences using a scale of 1-6, with 1 being false, 2 mostly false, 3 more false than true, 4 more true than false, 5 mostly true or 6 true. It is intended for use with students in grades 7-12. The scale originated from the self-concept model of Shavelson, Hubner and Stanton (1976). Test-retest after 7 weeks for the general self-concept was .85, .82 General School, .85 Verbal, .88 Math, .72 Emotional, .73 Honesty, .77 Parent Relations, .76 Same-sex Relations, .79 Opposite-sex Relations, .75 Physical Appearance, and .86 for Physical Abilities. Coefficient alphas for the 11 scores varied from .83 to .91. "The SDQ instruments have been evaluated to be among the best multidimensional instruments

in terms of psychometric properties and construct validation research" (Marsh, Richards, Johnson, Roche & Tremayne, 1994, p. 272).

Procedure

Upon full approval from the high school's administration to enroll subjects, a form letter for parent approval was sent home. In order to prevent a biased subject pool (e.g. high achieving students in honors English classes), subjects were enrolled in the study during their physical education class to ensure, as much as possible, the heterogeneity of the pool, as this class is one that all students are required to take. Thus, high achieving, low achieving, athletic and inactive students were included in the study.

Prior to the subjects' participation, the researcher met with the physical education teacher to explain the purpose and procedure of the study. With her support and the approval of the high school principal, parental consent forms were sent home with all females enrolled in physical education that quarter. Only those students whose parents consented to their participation were involved in the study. See Appendix F for parent consent form. The two students whose parents did not consent were excused from physical education and sent to study hall. Data were collected on approximately 5 school days with students completing all four questionnaires (demographic, Leisure Time Exercise Questionnaire, Adolescent Life Change Event Scale and the Self-Description Questionnaire-II) in approximately 45 minutes. Questionnaires were administered to groups of students enrolled in the same physical education class, with groups ranging in size from 15 to approximately 50.

At the start of the physical education class, the researcher read the names of the female students whose parent consent forms had been completed. These students were then brought to a lecture hall type room, where the data collection began. The general purpose of the study was explained to students as well as instruction regarding completion of the forms. Prior to completing these forms, subjects signed an assent

form (Appendix G) which indicated their willingness to participate and awareness that they could drop out of the study at any time without recrimination from their physical education teacher. After participation in the study began, no student dropped out. Upon students' completion of the four forms, students separated their response sheets from the top assent form, placing them in separate piles to ensure anonymity. Once the assent form had been removed there was no longer any identifying information associated with the instrument responses. At the study's end, students were asked to fill out their name on a small sheet of paper handed out to them if they wished to be enrolled in a drawing to win money (\$5 or \$10). One-hundred dollars total was given out to students in cash on the final day of data collection.

With the assistance of three trained individuals, subject data were scored over the course of several months and then entered into the computer using a database program. Subjects who completed three out of four of the questionnaires were still included in the study, but such incomplete data explains the unequal Ns for the different variables.

CHAPTER IV

Results

This study was designed to analyze the relationship among the variables of physical activity, stress and self-concept in adolescent females. The four predictions investigated were: 1) Females who are more physically active will report that experienced stressful events are less upsetting than will females participating in less activity; 2) Females who are more physically active will have higher physical ability self-concept scores than those females who are less physically active; and 3) Certain factors such as age and physical ability self-concept are more likely to result in girls' participation in physical activity; 4) Certain factors such as age and physical ability are more likely to result in girls' participation in strenuous physical activity. A commonly used statistical program, SPSS, was used to analyze the data. The presentation of results is organized around two main categories: (1) descriptive statistics for all of the variables; (2) analyses relevant to each hypothesis derived through Pearson Correlations, multiple regression and logistic regression.

Descriptive Data

Physical Activity Information. The majority of respondents, approximately 80% (n=213), reported that they participated in physical activity, either school sports teams (e.g., basketball, track) or physical activity programs outside of school (e.g., dance, karate). Fourteen percent of respondents participated on teams only, 19% participated in outside physical activity programs only and 47% were involved with both. The mean number of teams on which respondents participated was 2.13 ($SD=1.03$). All respondents on school sports teams reported that their participation on the team either made them more popular (40%, n=51) or did not affect their popularity (60%, n=77). No respondent felt that their participation made them less popular. Subjects on school teams reported that other students in their high school came to cheer

them on fairly often ($M=2.48$, $SD=.63$), with a score of 1 indicating never/rarely cheered, 2 sometimes cheered and 3 often cheered.

The mean number of activity programs in which respondents participated was 1.78 ($SD=.99$). Approximately 75% of active adolescents reported that one person in particular encouraged them to participate. Twenty-eight percent ($n=32$) reported it was their mother, 22% their father, 5% their brother, 3% their sister and 17% some other person. Over 53% of active respondents began participation between the ages of five and eight. The average age of first participation in sports was 7.27 years ($SD=2.62$). All subjects, whether active or not, reported the activity level of their friends as averaging 1.72 ($SD=.72$) on a scale of one to four, with one indicating quite active and four indicating quite inactive. Scores from the Godin and Shephard (1985) Leisure Time Exercise Questionnaire indicated that on average subjects participated in 46.7 minutes of mild activity per week, 50.4 minutes of moderate activity per week, and 57 minutes of strenuous activity per week (See Table 1).

Table 1

Leisure Time Exercise Questionnaire: Minutes of Physical Activity
in Past Week by Intensity

	<u>N</u>	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>St. Dev</u>
Mild	212	0	150	46.7	7.07
Moderate	212	0	300	50.4	14.12
Strenuous	211	0	480	57.0	33.41

Stress Information. As evidenced by scores on the Adolescent Life Changes Events Scale, participants reported the number of life events experienced in the past year in addition to how upsetting each of the experienced events was. Respondents' mean Life Change Event score was 438 out of a total possible score of 1979, if subjects

experienced all 31 events in the scale, similar to the mean Life Change Event score of 475 found by Yeaworth et al. (1980). Subjects receive varying Life Change Unit scores for experienced events based on the severity of the stressor, as seen in Appendix C. The mean number of stressful events experienced by subjects in the past year was 8.2 including death of parent, loss of a job, failing a class and hassling with parents. The overall average upset score for experienced events was 2.71, with a score of 1 indicating that the event was not upsetting and a score of 5 indicating that the event was extremely upsetting. See Table 2 for descriptives on the number and percentage of subjects experiencing particular events and the mean upset response to each event.

The events found to be most upsetting to subjects were death of a friend (N=29, Upset Score=4.24), a family member getting sick (N=134, Upset Score=3.88), death of a parent (N=11, Upset Score=3.81), death of a pet (N=106, Upset Score=3.77) and flunking a grade (N=36, Upset Score=3.42). The events found to be least upsetting to subjects were starting a new job (N=49, Upset Score=1.22), starting to date (N=102, Upset Score=1.25) and making new friends (N=183, Upset Score=1.27). The most commonly experienced stress events were making new friends (N=183), starting at a new school (N=136), hassling with siblings (N=134), a family member getting sick (N=132), having trouble at school (N=126), starting menstrual period (N=118) and death of a pet (N=106) with all of these events being experienced by at least half of the participants. The least commonly experienced stress events were quitting school (N=3), a girlfriend getting pregnant (N=3), death of a sibling (N=5), arrest (N=7), loss of a job (N=10), death of a parent (N=11) and marriage of a sibling (N=11).

Table 2

Number and Percentage of Subjects Experiencing Events in ALCES

<u>Variable</u>	<u>N</u>	<u>% of Sample</u>	<u>Average Upset Score</u>
Making New Friends	183	86 %	1.27
New School	136	64 %	3.16
Hassling Sibling	134	63%	2.39
Family Sick	132	62%	3.88
Trouble at School	126	59%	3.0
Starting Periods	118	55%	1.89
Pet Death	106	50%	3.77
Starting to Date	102	48%	1.25
Change in appearance	87	41%	1.75
Breaking up boy/girlfriend	87	41 %	3.8
Hassling with Parents	62	29%	3.4
Alcohol in Family	60	28 %	3.13
New Home	55	26 %	2.52
Starting Job	49	23 %	1.22
Failing Subject	48	22%	3.23
Appearance Problems	47	22%	2.74
Parents Divorce	43	20 %	3.39
Drugs/Alcohol Self	42	20 %	2.0
Getting Hurt/Sick	38	18 %	2.97
Flunk Grade	36	17 %	3.42
Friend Death	29	14 %	4.24
Mother Pregnant	27	13 %	1.44
Someone Moves In	26	12%	2.19
Parent Loss of Job	19	9%	2.9
Sibling Marriage	11	5%	1.55
Parent Death	11	5%	3.81
Loss of Job	10	5%	2.8
Arrest	7	3%	2.29
Sibling Death	5	2%	2.8
Girlfriend Pregnant	3	1%	3.0
Quitting School	3	1%	3.0

A Pearson Product Moment Correlation revealed a significant and positive correlation between subjects' total stress score and their average upset stressful score ($r=.85$, $p=.001$), indicating that subjects who experienced a greater number of stressful events in their lives during the past year also reported more intense negative reactions to these events. Pearson Product Moment Correlations also showed significant and negative correlations between subjects' average response to stressful events and the

following variables: 1) emotional self-concept ($r = -.365$, $p = .001$); 2) physical appearance self-concept ($r = -.234$, $p = .001$); 3) general school self-concept ($r = -.191$, $p = .006$); 4) general self-concept ($r = -.183$, $p = .008$); 5) opposite sex relations self-concept ($r = -.151$, $p = .031$); 6) parent relations self-concept ($r = -.143$, $p = .05$); 7) same sex relations self-concept ($r = -.171$, $p = .014$); 8) total self-concept ($r = -.270$, $p = .001$). These significant correlations indicate that subjects responding more negatively to stressful events feel more negatively about themselves than subjects responding less negatively to stressful events.

Pearson Product Moment Correlations revealed significant correlations between subjects' perceived stress and particular self-concept scores, as evident from Table 3. Significant correlations included Stress Upset Scores with Physical Emotional self-concept ($r = -.37$, $p = .001$), Physical Appearance self-concept ($r = -.23$, $p = .001$), General School self-concept ($r = -.19$, $p = .001$), General self-concept ($r = -.18$, $p = .008$), Same Sex Relations self-concept ($r = -.17$, $p = .014$), Opposite Sex Relations self-concept ($r = -.15$, $p = .031$), and with Parent Relations self-concept ($r = -.14$, $p = .04$). The lowest correlations with the Stress Upset score were those with Physical Ability self-concept, Honesty self-concept and Math self-concept. All correlations between Stress Upset scores and self-concept scores were negative except for that with Physical Ability self-concept.

Self-concept Information. As evident from Table 4, subject scores on the Self Description Questionnaire-II fell within the average range, with all self-concept T-scores within the normal range, as were the standard deviations for each area. As expected there were numerous significant Pearson Product Moment correlations among the various specific self-concept scores. The highest correlations were between General self-concept and General School Self-concept ($r = .64$), General School self-concept and Verbal self-concept ($r = .63$), Physical Appearance self-concept and General self-concept ($r = .55$) and finally, Honesty self-concept and General self-concept

($r=.54$). The lowest correlations were between Opposite Sex Relations self-concept and Honesty self-concept ($r=.01$), Opposite Sex Relations self-concept and Parent Relations self-concept ($r=.04$), Verbal Self-concept and Math self-concept ($r=.08$) and Honesty self-concept and Emotional self-concept ($r=.09$). See Table 5 for a correlation matrix summary indicating significance of the intercorrelations among the self-concept scores.

Table 3

Pearson Product Moment Correlations: Relationship between SDQ-II Self-concept Scores and Stress Upset scores

<u>SDQ-II Score</u>	
Math	-.09
PhAp	-.23**
GnSf	-.18**
Hont	-.06
PhAb	.03
Verb	-.13
Emot	-.37**
Prnt	-.14*
GnSc	-.19**
SamS	-.17*
OppS	-.15*

* $P \leq .05$ ** $p \leq .01$

Table 4

T-scores for Self-Description Questionnaire-II Subscales

<u>Variable</u>	<u>Mean</u>	<u>St. Dev</u>	<u>Min</u>	<u>Max</u>	<u>N</u>
Math T	49.62	10.76	32	69	212
Physical Appearance T	54.35	9.36	25	69	210
General Self T	51.49	9.48	21	63	214
Honesty T	49.47	10.05	21	66	214
Physical Ability T	50.94	9.14	25	64	210
Verbal T	51.87	10.58	25	68	213
Emotional T	48.73	10.64	26	71	213
Parents T	47.18	10.12	18	65	214
General School T	50.58	11.62	24	67	213
Same Sex T	52.00	10.93	24	67	212
Opposite Sex T	51.81	10.67	24	68	212

Table 5

Pearson Product Moment Correlations: Relationship Among
Self-Description Questionnaire-II Self-concept Scores

	Math	PhAp	GnSf	Hont	PhAb	Verb	Emot	Prnt	GnSc	SamS
Math										
PhAp	.16*									
GnSf	.32**	.55**								
Hont	.20**	.14*	.43**							
PhAb	.15*	.21**	.34**	.17*						
Verb	.08	.28**	.44*	.46**	.13					
Emot	.19**	.40**	.43**	.09	.11	.21**				
Prnt	.21**	.20**	.55**	.43**	.27**	.30**	.31**			
GnSc	.42**	.39**	.64**	.54**	.30**	.63**	.31**	.44**		
SamS	.11	.30**	.45**	.19**	.19**	.40**	.37**	.31**	.38**	
OppS	.16*	.50**	.30**	.01	.26**	.14	.21**	.04	.18*	.28**

*p ≤ .05

**p ≤ .01 (2-tailed)

SDQ-II Measures:

Math=Math T Score; PhAp=Physical Appearance T Score; GnSf=General Self T Score;
Hont=Honesty T Score; PhAb=Physical Ability T Score; Verb=Verbal T Score; Emot=Emotional T Score;
Prnt=Parent Relations T Score; GnSc=General School T Score; SamS=Same Sex Relations T Score;
OppS=Opposite Sex Relations T Score

Test of Hypotheses

Hypothesis 1. It was hypothesized that females who are more physically active experience stressful events as less upsetting than do females participating in less activity. From this it was predicted that more physically active respondents would report greater tolerance for stressful events experienced in the past year. Chronbach's (1951) Alpha for the Adolescent Life Change Events Scale was .75 ($n=204$), ranging from .74 to .75 for each item. Results of a Pearson Product Moment Correlation did not reveal a significant relationship between the activity level of subjects and their response to stressful events ($r=-.08$, $p=.275$). In other words, it appears that both active and inactive adolescents are similarly upset by stressful events. In order to ensure that the number of stressful events experienced by the subjects was comparable across different activity levels, the results of an initial Pearson Product Moment Correlation were analyzed. This correlation did not reveal a significant relationship between the activity level of subjects and their total stress scores, indicating that more active subjects experienced no more stressful events in the past year than did inactive subjects ($r=-.08$, $p=.235$).

Hypothesis 2. It was hypothesized that more physically active respondents would have higher physical ability self-concept scores than those less active females. Given that there are few studies using the SDQ-II, all of the self-concept subscales were analyzed in association with physical activity. A Pearson Product Moment Correlation revealed a significant and positive relationships between activity level of subjects and three self-concept scores. Table 6 details the correlations between physical activity and all of the separate self-concept scores. First, it was revealed that subjects who had higher Physical Ability self-concept scores had higher activity levels ($r=.32$, $p=.001$). Second, those subjects with higher Math self-concept scores also had higher levels of physical activity ($r=.23$, $p=.001$). Third, subjects with higher General School self-concept scores had higher activity levels, as well ($r=.14$, $p=.04$). These results

indicate that adolescent females who feel better about themselves in the areas of academic school performance and their physical ability skills, tend to be more physically active either in or outside of school (e.g., school sports' teams or outside physical activity programs).

Table 6

Pearson Product Moment Correlations: Relationship Between Self-Description Questionnaire-II Self-Concept Scores and Physical Activity

<u>SDQ-II Score</u>	
Math	.23**
PhAp	.02
GnSf	.10
Hont	.14
PhAb	.32**
Verb	.09
Emot	-.04
Prnt	.05
GnSc	.14*
SamS	-.01
OppS	.09

* $P \leq .05$ ** $p \leq .01$

Hypothesis 3. It was hypothesized that certain factors, Age and Physical Ability Self-concept, are more likely to result in girls' increased participation in physical activity. A standard multiple regression showed that Physical Ability Self-concept, Age and GPA were the three significant factors related to amount of total exercise and predicted 31% ($R^2=.31$) of the variance ($F=3.62$, $p=.001$) when 16 variables were entered into the model (Self-concept subscores, Average Upset Score, Age of first participation in sports and Number of other children in the home). However, when only the three significant factors were included, the amount of variance predicted was 18.1%. Table 7 highlights the amount of variance explained by each of the three variables. Physical Ability was significantly and positively related to activity level($\beta=.252$,

$p=.002$), revealing that with increased sense of one's physical ability comes an increase in amount of activity. Age was found to be significantly and negatively related to activity ($\beta=-.244$, $p=.002$), indicating that as subjects increased in age, activity levels decreased. GPA was also significantly and positively related to activity level($\beta=.239$, $p=.002$), with subjects' GPAs increasing in conjunction with activity levels.

Table 7

<u>Variables</u>	<u>R Square</u> (% Variance)	<u>Beta Weight</u>	<u>Significance</u>
Physical Ability Self-concept	.064	.252	.002
Age	.060	-.244	.002
GPA	.057	.239	.002

Hypothesis 4. A logistic multiple regression, a statistic used with a categorical criterion variable, was used in order to determine how closely expected frequencies of participation in strenuous activity overlapped with obtained frequencies from the sample. The model, which included 15 variables (Age, Age at first participation in physical activity, GPA, Total amount of stress experienced and all of the T scores for the SDQ-II) was found to be significant χ^2 (15, N=153)=26.58, $p=.03$. The categorical criterion variable in this statistic was subject participation in any amount of strenuous physical activity or no participation in strenuous physical activity. The regression showed that Opposite Sex Relations self-concept (Actual $\beta=.08$, Expected $\beta=1.09$, $p=.02$), Age (Actual $\beta=-.75$, Expected $\beta=.47$, $p=.03$) and Physical Ability self-concept scores (Actual $\beta=.10$, Expected $\beta=1.1$, $p=.03$) were significantly related to adolescent female participation in strenuous activity. Table 7 depicts the logistic regression factors with expected Beta weights and actual Beta weights that significantly contributed to understanding subject participation in strenuous activity.

Table 8

Logistic Regression: Actual and Expected Beta Weights for Predictors of Strenuous Physical Activity

<u>Variables</u>	<u>Actual Beta</u>	<u>Expected Beta</u>	<u>Significance</u>
Opposite Sex Self-concept	.08	1.09	.02
Age	-.75	.47	.03
Physical Ability Self-concept	.10	1.1	.03

Opposite sex relations self-concept score was found to be positively related to participation in strenuous activity ($\beta=.08$, $p=.017$), indicating that as adolescents increased in their level of self-concept they became significantly more likely to participate in any amount of strenuous activity. Age was found to be negatively related to participation in strenuous activity ($\beta= -.75$, $p=.028$), indicating that as subjects increased in age their chances of participating in any amount of strenuous activity significantly decreased. Additionally, Physical Ability self-concept score was found to be positively related to engaging in strenuous activity ($\beta=.10$, $p =.033$) for the adolescent subjects, indicating that those who felt better about themselves in the area of physical ability were 1.1 times as likely to engage in strenuous activity.

CHAPTER V

Discussion

Findings

The purposes of the present study were to investigate the interrelationships of physical activity, stress and self-concept in adolescent females and to analyze factors that may contribute to increased physical activity. Female subjects were recruited for this study because of the dearth of previous research focusing solely on the physical activity levels of young females. Subjects were recruited from a mid-sized suburban high school in New England after approval from the school's principal and parents. In order to get a cross section of subjects, they participated in the study during their physical education class, a required course for all students at this high school.

Eighty percent of females reported being physically active, with 47% on both team sports and outside physical activity programs. These two high percentages are consistent with the literature on the increasing participation of females in sport/activity programs (Women's Sports Foundation, 1995). Covey and Feltz (1991) found that approximately 66% of their adolescent female sample was active. Noteworthy is the fact that no active adolescent female in this study reported that her participation on a team negatively influenced her popularity with peers. This finding seems to indicate increased acceptance of female participation in sports by young people, both males and females. The negative stigma of physical activity as incompatible with the social role for females may be changing, though it is likely that there is still challenge for females participating in activities deemed more "masculine" or requiring more aggression (Leaman, 1984; Holland & Andre, 1994). Similar to previous research by Weiss and Barber (1995), the present study revealed that parents were significant supporters of adolescent female participation in sports. Given their primary care role

with their children it is expected that this might be the case and it is important for parents to realize that both mothers and fathers can be contributors of support.

The average number of stressful experiences for this sample was 8.2, similar to the findings of Yeaworth et al. (1980) whose sample of adolescent females averaged 8.7 events. Top stressors experienced for adolescents in this study were making new friends and hassling with siblings, two lead stressors found in the work by Groer et al. (1992) and Yeaworth et al. (1980). This seems to speak to the developmental challenges of the adolescent years when peer relationships are gaining in importance and family relationships are sometimes viewed as a threat to independence and freedom. Adolescents are at the crossroads of separating from the influence of family and centering their identification more on those people outside of the family circle. It is no surprise that these events are found to be common stressors. Although frequently experienced by these participants, making new friends was reported as barely upsetting to them. One explanation for this is that the vast majority of subjects were entering grades 9-12, and unlike the eighth graders beginning at a new school, may already have established a support network for themselves and so do not have the same fears in this domain as newer students do. It is also possible that subjects denied the true impact of this particular stress experience, for acknowledging high stress with regard to friendship is to admit weakness and uncertainty in an area of tremendous importance for their particular age. Females, in particular, are conditioned to emphasize relationship over all else in their lives (Gilligan, 1982), so it may in fact be the case that these females are quite skilled in their ability to build friendships and therefore are not upset at such a challenge.

The prediction that physically active females would respond differently to stressful events in their lives was not supported by the data, in contrast to other researchers' findings (Brown & Lawton, 1986; Brown & Siegel, 1988; Tucker et al., 1986), although one researcher argued that ". . . the belief that exercise and fitness are

exceptional tools for increasing resistance to and recovery from psychosocial stressors may be a bit overly optimistic" (Tucker, 1990, p. 186). Results from the present study instead indicate that both active and inactive adolescents are similarly responsive to stressful experiences. This may be explained by the fact that adolescents are at a developmental stage of learning to manage emotion, conflict and the challenges that they face in the many facets of their lives. Their inexperience with major stressful events and the coping skills required to manage difficulty, may overshadow any benefit that might result from activity or improved fitness levels. It may be that these subjects, though initially responding to events in a similar manner, experience benefits that are not evident from the present study. For example, it is possible that the more active subjects actually recover faster from such stressful events than their unfit counterparts, as numerous researchers have found (Sinyor et al., 1983; Imm, 1990; Crew & Landers, 1987). It also may be that the more physically active subjects in this study were more physically fit and therefore might have significantly lower physiological responses to stress than unfit individuals, such as lower blood pressure increases in response to stress, as Perkins et al. (1986) and Cantor et al. (1978) have concluded. Some research has indicated that athletes are better able to identify physiological stress cues, such as muscle tension, when assessing their mood and response to stressful situations (Anderson & Williams, 1988). Athletic females in the present study, as a result of their experience in sports and their fitness levels, may in fact use more stress cues than their nonathletic peers, resulting in greater accuracy of experienced stress. Additionally, the physically active subjects in the study, although responding to major life events as the inactive subjects did, might have unique responding styles to the stresses of day to day living; those uplifts and hassles noted as being good indicators of stress level.

Although stress reactions were not found to differ between the physically active and inactive, the prediction that active girls be older and have higher physical ability

self-concept scores was supported. Like previous research linking aspects of positive self-esteem with physical activity (Douthitt, 1994; Scott & Myers, 1988; Imm, 1990; Gruber, 1986), the present study revealed that those females who felt confident about themselves in the areas of physical skills, math skills and school in general, participated in the most physical activity. It is of particular interest that subjects feeling best about their math skills, typically an academic avenue of strength for males and an area of low confidence for females, were the ones to engage in the most activity. Lenney's (1977) early hypothesis that females experience less confidence when performing sex-typed male behavior was supported by Lirgg (1991) in a meta-analysis of the research. Extreme activity, like math, has generally been associated with male rather than female behavior. It may be that active engagement in an area relegated for males (e.g. math) allows females to stretch the boundaries of their interests to include other possibilities atypical of their gender.

The finding that a positive correlation exists between academic performance and participation in athletics is not new, as other researchers have concluded similarly (Snyder & Spreitzer, 1992; Spreitzer, 1994). The reasoning behind this fairly well documented relationship may be explained in several different ways. First of all, it may be that adolescents who are active in academics and sports may be achievement oriented, and so attempt to achieve in many areas of their lives as opposed to just one area. It could also be the case that those students who are reinforced for good academic performance then seek further reinforcement in other areas of their lives, such as sports teams or physical activity programs. Finally, the conclusion could be drawn that students who are connected and committed to their schools participate in all that it has to offer by joining teams, working hard academically and possibly being members of different school organizations - the multitalented "scholar-athlete." Whatever the explanation for this finding, it seems clear that adolescence is a time for exploration and forming an identity through activities and connection with others (Erikson, 1986). It

is during adolescence that people are faced with Erikson's psychosocial crisis of identity vs. role confusion (1963). "The growing and developing youths, faced with this physiological revolution within them, and with tangible adult tasks ahead of them are now primarily concerned with what they appear to be in the eyes of others as compared with what they feel they are, and with the question of how to connect the roles and skills cultivated earlier with the occupational prototypes of the day" (Erikson, 1963, p. 261).

It is oftentimes during high school that the stage is set for adult roles, interests and careers. Participation in academics, sports and school clubs are sometimes the catalysts for identity formation and opportunity. The passage of Title IX in 1972 facilitated particular areas of opportunity for young women in sports, for 18 years after its passage, collegiate females were offered an average of 7.24 sports compared to 2.5 sports in 1972 (Acosta & Carpenter, 1994). It seems clear, that like young males, young females too will be seeking knowledge about themselves through sport and with a greater array of sports from which to choose comes greater opportunity for identity development.

Physical activity participation was also greater for those adolescent females who believed that they had good physical skills. This finding is not a surprising one, as it is logical that those who recognize their competence in an area will more likely seek participation in it. People generally engage in activities they view as areas of skill and for many, those things done well are the same things enjoyed. Schunk (1989) discussed how success in particular avenues of interest can both contribute to self-esteem and serve as a catalyst for continued participation. Harter, Whitesell and Kowalski (1992), too, highlighted how perceptions of competence affect self-worth and motivation for young people. Additionally, this finding provides further support for the importance of using multidimensionally scales of self-concept. If only a unidimensional self-concept

scale had been utilized, differences between the active and inactive subjects would have been undetectable.

The present study revealed that females' self-concept regarding their physical ability, age and GPA predicted a significant amount of the variance in physical activity. This finding indicates that younger females with higher GPAs and confident feelings about themselves as skilled in movement are more likely to participate in elevated levels of physical activity compared to older females with lower GPAs and depressed levels of confidence in their movement skills. It seems possible that physical activity may serve as a buffer against the stresses of academic rigor or pressure for those adolescents striving to achieve in the classroom, and that to participate actively in both academics and physical activity is possible (Goldberg & Chandler, 1992). Prior researchers in this field stressed the tremendous challenge of participating successfully in both academics and sports, noting the impact of role strain (Goode, 1960; Curry & Weaner, 1987). Other research has indicated that GPA is a predictor of sports participation (Spreitzer, 1994), though one meta-analysis found a rather low average correlation of .21 between measures of self and achievement (Hansford & Hattie, 1982) and that athletes in general perform better academically than nonathletes (Snyder & Spreitzer, 1992), despite society's stereotype of the "dumb jock." The findings of the present study challenge this stereotype as well. Besides predicting increased activity levels, better academic performance has also been found to predict other sorts of healthy behavior, such as delay of first sexual intercourse (Capaldi, Crosby & Stoolmiller, 1996)

With increased age, adolescent females in this study participated less in physical activity, a consistent finding with prior work (Sallis et al., 1993; Vaughter et al., 1994). Not surprisingly, as young people age and move closer toward adulthood, their lives grow in complexity with work, dating and participation in hobbies and organizations, possibly leaving less available time for playing on school teams or

participating in physical activity. Adolescents may have less interest in physically demanding activities as their needs change, and play is no longer of extreme importance as it was in childhood. Adolescents are oftentimes eager to move away from classification as children and so may engage in perceived adult behaviors over perceived child behaviors. Another explanation for the decrease in the present sample's physical activity level is that "Perhaps sports participation is still dissonant with conventional sex role definition for females . . ." (Spreitzer, 1994, p. 385).

Participation in strenuous activity was evident for females who were younger, more confident in their physical abilities and in their relationships with members of the opposite sex. Although a majority of subjects participated in some amount of strenuous physical activity in a week, the overall average was fairly low, approximately 8 minutes of strenuous activity a day. Unlike some previous research that indicated less reported stress for those engaging in high intensity exercise (Norris, Carroll, & Cochrane, 1992), the present study did not find that reported stress was a significant predictor of adolescent females who participated in strenuous activity. In general, girls participate in less strenuous physical activity (Myers, Strikmiller, Webber, & Berenson, 1996) than boys and tend to gravitate toward light or moderate types of activities. There are a few possibilities for why younger females participate in such activity. First of all, their bodies may not be fully developed allowing them to better handle the physical demands of intensive exercise without the extra weight that oftentimes comes with pubertal development. Secondly, it could be that parents constrict the activities of younger females, but as they get older females have more input into the types of activities to enjoy. Finally, greater opportunities for participation in a wider array of sports and activity programs may exist for older individuals.

The finding that females engaging in more strenuous exercise are those who feel more confident in their relations with the opposite sex is an interesting one, given societal norms about gender roles. Traditionally, vigorous exercise requiring exertion

and sweating has been relegated to males in this society with females participating in less strenuous activities (e.g., walking, golf). However, this constriction of roles seems to be loosening with the advent of more professional women's sports teams that require extreme output, such as basketball and hockey, and the broadening spectrum of careers in which women might enter. Particularly for females, participation in non-traditional gender role behavior is generally more acceptable than such non-traditional gender role behavior for males. However, in the present study adolescent females appear to feel comfortable engaging in strenuous "less feminine" activities only if they are confident in their relationships with males. These active females, more comfortable with males, may also have more male friends and thus engage in commonly enjoyed activities. It is the adolescent females less confident in their relationships with males who are less inclined to join strenuous activities, possibly out of concern that being deemed a "jock" might hamper their likelihood of dating or being viewed as attractive by males. Adolescent females generally have greater anxiety and awareness of how others perceive them than do males. They may have particular concern about assessments by those deemed potential intimate partners. It may very well be the case that these females are altering their behavior and ignoring their interests in order to portray themselves as a prototypical female devoid of masculine interests.

Limitations

In order to better understand the findings from the present study, it is necessary to identify some of the limitations regarding the sample, scales and methodology. Before generalizing this study's findings to other samples of adolescent females it would behoove future researchers to ensure that the sample is similar demographically to this sample. The majority of subjects in the present study were white, residing in the suburbs and possibly more financially privileged than individuals living in cities. It is also true that differences may exist among subjects from other areas, as the town residents from

which the present sample was selected are quite sports-minded, even housing the football stadium for a professional team. Another factor affecting generalization is opportunity for sports participation in different areas of the country. For example, it is possible that subjects residing near the coast or Midwest lakes region may have greater opportunity for swimming than students from other regions. Geographical climates such as cold winters in Minnesota or warm temperatures in Florida can also serve to differentiate people's ability to be active. An important consideration, too, is the fact that this study is correlational in nature and thus strong conclusions regarding cause and effect cannot be made.

Adolescents participating in the present study did not appear to be accurate reporters of their level of physical activity. Self-report for adolescents may in fact be a considerable challenge. It was noted that subjects reporting participation on sports teams or in physical activity programs frequently reported their weekly amount of physical activity as approximately the same as those subjects denying any involvement in programs or sports teams. The Leisure Time Exercise Questionnaire was selected for this study because it appears to be one of the best measures of weekly physical activity. It is possible that the directions for this measure were particularly challenging for the subjects, as it required them to record the number of 15 minute sessions of activity of the different intensity levels (mild, moderate, strenuous). Because this questionnaire considers activity levels in the past week, it is possible that those not on sports teams in the present semester will report activity levels that underrepresent their actual involvement. Self-report measures, like those used in the present study, clearly may interfere with the results given the question of accuracy of such measures. Self-report by adolescents may pose an even greater problem as young people may not take the study seriously, may guess inaccurately, or attempt to represent themselves in what they view as the best possible light.

The Adolescent Life Change Events Scale may also have presented some amount of challenge for the subjects in the present study, as this scale required them to consider the events they experienced in the past year. Thus, subjects had to not only recall whether they had experienced certain events, but also how upsetting each event was, a task that may well have been difficult given the vast array of events in the lives of adolescents and the varying intensity of emotion for the different events. An example of the difficulty of such questioning for the subjects was evident from the stress scale which asked subjects whether they had experienced the start of menstrual periods during this past year. Given that the demographic questionnaire had asked subjects their present age and age of first menses, it was possible to verify the accuracy of responses to this stress scale question by subtracting age of first menses from present age which indicated whether or not subjects first got their periods in the past year. Of subjects responding to these questions, 39% indicated in the stress scale that they had first started their periods this past year when in fact their responses to the demographic information indicated that this was not the case. It may be that numerous other questions were misinterpreted by subjects but it is impossible to verify this. Additionally, the scale is also void of important areas of stress for many young people, including poverty, rape and incest. Thus, some of the conclusions from this study may be based on faulty data.

Another limitation for this work was gathering data in the school setting where testing time was limited to one class period (45 minutes) which caused some slower working students to feel more pressure to complete the questionnaires. During the testing sessions, it is possible that some students rushed to completion in order to study for tests later in the day or to finish homework. During one testing session in particular, two students with learning difficulties asked dozens of questions regarding scale content and seemed to have significant deficits with reading. For students with such academic problems, responding to nearly 200 questions in a short amount of time could

have affected the accuracy of their responses. Testing the subjects in large groups where there sometimes was talking or possibly viewing one another's responses decreased the likelihood that all subjects were truthful in their responses.

The issue of selectivity with regard to distinctions between athletes and nonathletes has been a topic discussed by other researchers in this field. It is an issue that may most significantly affect future research that identifies differences between the athlete and nonathlete. "It is logical to expect that the differential experience of athletes will produce some changes within the individual. However, it is also possible that any characteristics that are found to differentiate athletes from nonathletes could also be due to selectivity" (Spreitzer, 1994, p. 384). This notion of selectivity might explain certain differences between groups of students, with differences already existing between active and inactive students on certain personality traits or achievement orientations.

Implications for Future Research

Subjects in this study were not asked about their physical health or number of days absent from school due to sickness. This seems to be an important and increasing area of study given society's interest in physical activity, illness and health. In addition, it was not possible to get fitness levels on the subjects participating, though this would have provided fascinating information. Future research might investigate the connections among physical activity, fitness and health. It may also be worthwhile to look more closely at how the different types of activity or sport teams attract young people with unique personality styles that best match the requirements of the sport.

An area that needs further attention in stress research is the construction and analysis of more stress scales for adolescents that measure responses to the day-to-day events and minor experiences of daily life that contribute to stress. Existence of such scales for young people is limited and those that are used should not be based on the adult

experience of day to day life because the stresses for adults differ markedly with those for adolescents. Many researchers have actually concluded that such “uplifts” and “hassles” are better measures of the stress experience and actually serve to predict psychopathology more accurately than other types of stress scales (Lazarus, 1980; Lazarus & Cohen, 1977; Coyne et al., 1981). As people age they increase their chances of experiencing extremely stressful events. Children and adolescents, though, having lived for fewer years, are not yet experienced in some of the more severe or life-changing events that impact older people. Given this, the use of a scale measuring the hassles of day-to-day life stressors may in fact be more accurate than a scale measuring rarely-occurring lifetime events (e.g., death of parent, moving out of state). Future research may focus on comparing responses to these two types of questionnaires completed by the same subjects to identify any major distinctions between the forms.

Another area in need of further investigation is how the physical changes of puberty for females (i.e. breast development, widening hips, weight gain) contribute to females decreasing their physical output. It seems likely that activities, such as sports, requiring movement of a body that is in the developing stage may be embarrassing for adolescents or uncomfortable, resulting in decreased participation. Such a study seems appropriate for qualitative methods, as interviews on such questions might elicit much insight on these questions. In addition, investigating differences in factors affecting physical activity among bisexual, lesbian and heterosexual females might add to our body of knowledge regarding motivating factors and the unique pressures of different cultures.

Numerous questions in this field of adolescent mental health and activity remain unanswered. The present study attempted to highlight the relationships among several areas relevant to the lives of young people. It is the hope of this researcher that investigations of these important factors will continue so that with an improved knowledge base we might aid in bettering the lives of young people and guiding them toward more healthy behaviors.

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Appendix A
Background Information

FORM 1Background Information

Please circle/fill in the blank your responses to the following questions about yourself. Your honesty is appreciated. If you need clarification about a question, please ask.

1. Age

a. 14	d. 17
b. 15	e. 18
c. 16	f. 19 or older

2. Grade in school

a. 9th	c. 11th
b. 10th	d. 12th

3. Grade Point Average: _____

4. Which best describes your ethnic background (circle all that apply)

a. American Indian/Alaskan Native	d. Hispanic
b. Asia-American	e. White/European American
c. Black/African American	f. Other (fill in) _____

5. Who takes care of you? (circle all that apply)

- a. one parent/guardian
- b. two parents/guardians
- c. other family member(s) (i.e. grandparents)

6. How many other children live with you?

a. none	d. three
b. one	e. four
c. two	f. five or more

7. At what age did you begin menstruating? _____

8. Which of the following will you participate in during the 1997-1998 school year? (circle all that apply)

- a. Intramurals
- b. Sports team
- c. Physical activity programs outside of school
- d. No participation in intramurals, team sports or activity programs outside of school (If no, skip to question 17)

9. During the 1997-1998 school year, in which intramural programs will you participate? (circle or fill in)

a. none	d. _____
b. _____	e. _____
c. _____	

10. During the 1997-1998 school year, on which sports teams will you participate?
(circle or fill in all that apply)

a. none (skip to question #12)	g. indoor track
b. basketball	h. outdoor track
c. field hockey	i. tennis
d. soccer	j. softball
e. cross-country	k. swimming
f. volleyball	l. other _____

11. How often do students in your high school come to watch or cheer the teams on which you participate?

- a. never/rarely
- b. sometimes
- c. often

12. Has your participation on any sport or intramural team influenced your popularity in school?

- a. yes, it's made me more popular
- b. no, it has not affected my popularity
- c. yes, it's made me more unpopular

13. During the 1997-1998 school year, in which physical activity programs outside of school will you participate?(circle all that apply)

a. none	f. softball	k. weight lifting
b. gymnastics	g. swimming	l. other _____
c. aerobics	h. running	m. other _____
d. dance	i. tennis	n. other _____
e. judo/karate	j. soccer	

14. At what age did you first begin participating in intramurals/sports teams/physical activity programs? _____

15. Did anyone encourage you to participate in sports/physical activity?

- a. no
- b. yes - who encouraged you the most? (circle only one)

a. mother	e. teacher
b. father	f. coach
c. brother	g. team member
d. sister	h. other _____

16. How physically active are your friends?

- a. quite active
- b. somewhat active
- c. somewhat inactive
- d. quite inactive

GO TO FORM 2

17. What are your reasons for not participating in sports or physical activity programs?

a. no interest	f. self-conscious about my body
b. no time	g. grades too low
c. other school involvements	h. parents won't allow
d. job	i. sports/programs too expensive
e. not good at sports	j. other _____

18. Do you exercise on your own without participation on teams or in programs?

a. no	
b. yes - if so, which exercises?	
a. aerobics	e. roller blading
b. walking	f. indoor exercises
c. jogging	(i.e. sit-ups, stretches)
d. biking	g. other _____

19. How physically active are your friends?

a. quite active	c. somewhat inactive
b. somewhat active	d. quite inactive

Appendix B
Leisure Time Exercise Questionnaire

FORM 2

Leisure Time Exercise Questionnaire (Godin and Shephard, 1985)

1. Considering a **7-day period** (a week), how many times on the average do you do the following kinds of exercise for more than **15 minutes** during your **free time** (write in each circle the appropriate number).

**TIMES PER
WEEK**

a) **STRENUOUS EXERCISE
(HEART BEATS RAPIDLY)**

(i.e. running, jogging, hockey,
football, soccer, squash, basket-
ball, cross country skiing, judo,
roller skating, vigorous swimming,
vigorous long distance bicycling)

b) **MODERATE EXERCISE
(NOT EXHAUSTING)**

(i.e. fast walking, baseball, tennis,
easy bicycling, volleyball, bad-
minton, easy swimming, alpine
skiing, popular and folk dancing)

c) **MILD EXERCISE
(MINIMAL EFFORT)**

(i.e. yoga, archery, fishing from
river bank, bowling, horseshoes,
golf, snowmobiling, easy walking)

2. Considering a **7-day period (a week)**, during your leisure-time, how often do you engage in any regular activity long enough to **work up to a sweat** (heart beats rapidly)?

OFTEN

SOMETIMES

NEVER/RARELY

—

—

(check one)

—

Appendix C
Adolescent Life Change Event Scale (ALCES)

FORM 3

Adolescent Life Change Event Scale (Yeaworth et al., 1980)

Please circle yes or no in response to whether or not you have experienced any of the following life events in the past year. If you have experienced the event, indicate next to the question how stressful it was for you.

				not at all upset	a little upset	somewhat upset	very upset	extremely upset
1.	A parent dying	yes	no	1	2	3	4	5
2.	Death of brother/sister	yes	no	1	2	3	4	5
3.	Close friend dying	yes	no	1	2	3	4	5
4.	Parents getting divorced/separated	yes	no	1	2	3	4	5
5.	Failing one or more subjects in school	yes	no	1	2	3	4	5
6.	Being arrested by the police	yes	no	1	2	3	4	5
7.	Flunking a grade in school	yes	no	1	2	3	4	5
8.	Family member (other than yourself) having with alcohol	yes	no	1	2	3	4	5
9.	Getting into drugs or alcohol	yes	no	1	2	3	4	5
10.	Losing a favorite pet	yes	no	1	2	3	4	5
11.	Parent or relative in your family very sick	yes	no	1	2	3	4	5
12.	Losing a job	yes	no	1	2	3	4	5
13.	Breaking up with a close girl/boyfriend	yes	no	1	2	3	4	5
14.	Quitting school	yes	no	1	2	3	4	5
15.	Close girlfriend getting pregnant	yes	no	1	2	3	4	5
16.	Parent losing job	yes	no	1	2	3	4	5
17.	Getting badly hurt or sick	yes	no	1	2	3	4	5
18.	Hassling with parents	yes	no	1	2	3	4	5
19.	Trouble with teacher/principal	yes	no	1	2	3	4	5
20.	Having problems with any of the following: acne, over/underweight, too tall/short	yes	no	1	2	3	4	5
21.	Starting at a new school	yes	no	1	2	3	4	5
22.	Moving to a new home	yes	no	1	2	3	4	5

			not at all upset	a little upset	somewhat upset	very upset	extremely upset
23.	Change in physical appearance	yes no	1	2	3	4	5
24.	Hassling with brother/sister	yes no	1	2	3	4	5
25.	Starting menstrual periods	yes no	1	2	3	4	5
26.	Having someone new move in with your family (grandparent, adopted brother or sister, or other)	yes no	1	2	3	4	5
27.	Starting a job	yes no	1	2	3	4	5
28.	Mother getting pregnant	yes no	1	2	3	4	5
29.	Starting to date	yes no	1	2	3	4	5
30.	Making new friends	yes no	1	2	3	4	5
31.	Brother or sister getting married	yes no	1	2	3	4	5

Appendix D
ALCES: Rank and Life Change Unit Scores for Each Event

The Adolescent Life Change Event Scale (ALCES):

Rank and Life Change Unit Scores for Each Event

Rank	Life Change Event	Life Change Unit
1	Death of parent	98
2	Death of sibling	95
3	Death of friend	92
4	Parents divorce	86
5	Failing subject	85
6	Arrest by police	85
7	Flunking a grade	84
8	Alcohol problem-family	79
9	Alcohol/Drug use-self	77
10	Death of pet	77
11	Sick parent/relative	77
12	Losing a job	74
13	Breakup boy/girlfriend	74
14	Quitting school	73
15	Close friend getting pregnant	69
16	Parent losing job	69
17	Getting sick or hurt	64
18	Hassling with parents	64
19	Trouble at school	63
20	Acne, overweight, too tall	63
21	New school	57
22	New home	51
23	Change in appearance	47
24	Hassling with sibling	46
25	Starting periods	45
26	Someone moves in with family	35
27	Starting a job	34
28	Mother getting pregnant	31
29	Starting to date	31
30	Making new friends	27
31	Sibling getting married	26

Appendix E
Self-Description Questionnaire-II

FORM 4 Self-Description Questionnaire-II (Marsh, 1990)

		False	Mostly False	More False Than True	More True Than False	Mostly True	True
1. Mathematics is one of my best subjects.	1	—	—	—	—	—	—
2. Nobody thinks that I'm good looking.	2	—	—	—	—	—	—
3. Overall, I have a lot to be proud of.	3	—	—	—	—	—	—
4. I sometimes take things that belong to other people.	4	—	—	—	—	—	—
5. I enjoy things like sports, gym, and dance.	5	—	—	—	—	—	—
6. I'm hopeless in English class.	6	—	—	—	—	—	—
7. I am usually relaxed.	7	—	—	—	—	—	—
8. My parents are usually unhappy or disappointed with what I do.	8	—	—	—	—	—	—
9. People come to me for help in most subjects.	9	—	—	—	—	—	—
10. It is difficult to make friends with members of my own sex.	10	—	—	—	—	—	—
11. People of the opposite sex whom I like don't like me.	11	—	—	—	—	—	—
12. I often need help in mathematics.	12	—	—	—	—	—	—
13. I have a nice looking face.	13	—	—	—	—	—	—
14. Overall, I am no good.	14	—	—	—	—	—	—
15. I am honest.	15	—	—	—	—	—	—
16. I am lazy when it comes to things like sports and hard physical exercise.	16	—	—	—	—	—	—
17. I look forward to English class.	17	—	—	—	—	—	—
18. I worry more than I need to.	18	—	—	—	—	—	—
19. I get along well with my parents.	19	—	—	—	—	—	—
20. I'm too stupid at school to get into a good university.	20	—	—	—	—	—	—
21. I make friends easily with boys.	21	—	—	—	—	—	—
22. I make friends easily with girls.	22	—	—	—	—	—	—
23. I look forward to mathematics classes.	23	—	—	—	—	—	—
24. Most of my friends are better looking than I am.	24	—	—	—	—	—	—
25. Most things I do, I do well.	25	—	—	—	—	—	—
26. I sometimes tell lies to stay out of trouble.	26	—	—	—	—	—	—
27. I'm good at things like sports, gym, and dance.	27	—	—	—	—	—	—
28. I do badly on test that need a lot of reading ability.	28	—	—	—	—	—	—
29. I don't get upset very easily.	29	—	—	—	—	—	—

	False					True
30. It is difficult for me to talk to my parents.	30	__	__	__	__	__
31. If I work really hard I could be one of the best students in my school year.	31	__	__	__	__	__
32. Not many people of my own sex like me.	32	__	__	__	__	__
33. I'm not very popular with members of the opposite sex.	33	__	__	__	__	__
34. I have trouble understanding anything with mathematics in it.	34	__	__	__	__	__
35. I am good looking.	35	__	__	__	__	__
36. Nothing I do ever seems to turn out right.	36	__	__	__	__	__
37. I always tell the truth.	37	__	__	__	__	__
38. I am awkward at things like sports, gym, and dance.	38	__	__	__	__	__
39. Work in English class is easy for me.	39	__	__	__	__	__
40. I am often depressed and down in the dumps.	40	__	__	__	__	__
41. My parents treat me fairly.	41	__	__	__	__	__
42. I get bad marks in most school subjects.	42	__	__	__	__	__
43. I am popular with boys.	43	__	__	__	__	__
44. I am popular with girls.	44	__	__	__	__	__
45. I enjoy studying for mathematics.	45	__	__	__	__	__
46. I hate the way I look.	46	__	__	__	__	__
47. Overall, most things I do turn out well.	47	__	__	__	__	__
48. Cheating on a test is OK if I do not get caught.	48	__	__	__	__	__
49. I'm better than most of my friends at things like sports, gym, and dance.	49	__	__	__	__	__
50. I'm not very good at reading.	50	__	__	__	__	__
51. Other people get more upset about things than I do.	51	__	__	__	__	__
52. I have lots of arguments with my parents.	52	__	__	__	__	__
53. I learn things quickly in most school subjects.	53	__	__	__	__	__
54. I do not get along very well with boys.	54	__	__	__	__	__
55. I do not get along very well with girls.	55	__	__	__	__	__
56. I do badly in tests of mathematics.	56	__	__	__	__	__
57. Other people think I am good looking.	57	__	__	__	__	__
58. I don't have much to be proud of.	58	__	__	__	__	__
59. Honesty is very important to me.	59	__	__	__	__	__
60. I try to get out of sports and physical education classes whenever I can.	60	__	__	__	__	__
61. English is one of my best subjects.	61	__	__	__	__	__
62. I am a nervous person.	62	__	__	__	__	__
63. My parents understand me.	63	__	__	__	__	__
64. I am stupid at most school subjects.	64	__	__	__	__	__

	False					True
65. I have good friends who are members of my own sex.	65	—	—	—	—	—
66. I have lots of friends of the opposite sex.	66	—	—	—	—	—
67. I get good marks in mathematics.	67	—	—	—	—	—
68. I am ugly.	68	—	—	—	—	—
69. I can do things as well as most people.	69	—	—	—	—	—
70. I sometimes cheat.	70	—	—	—	—	—
71. I can run a long way without stopping.	71	—	—	—	—	—
72. I hate reading.	72	—	—	—	—	—
73. I often feel confused and mixed up.	73	—	—	—	—	—
74. I do not like my parents very much.	74	—	—	—	—	—
75. I do well in tests in most school subjects.	75	—	—	—	—	—
76. Most boys try to avoid me.	76	—	—	—	—	—
77. Most girls try to avoid me.	77	—	—	—	—	—
78. I never want to take another mathematics course.	78	—	—	—	—	—
79. I have a good looking body.	79	—	—	—	—	—
80. I feel that my life is not very useful.	80	—	—	—	—	—
81. When I make a promise I keep it.	81	—	—	—	—	—
82. I hate things like sports, gym, and dance.	82	—	—	—	—	—
83. I get good marks in English.	83	—	—	—	—	—
84. I get upset easily.	84	—	—	—	—	—
85. My parents really love me a lot.	85	—	—	—	—	—
86. I have trouble with most school subjects.	86	—	—	—	—	—
87. I make friends easily with members of my own sex.	87	—	—	—	—	—
88. I get a lot of attention from members of the opposite sex.	88	—	—	—	—	—
89. I have always done well in mathematics.	89	—	—	—	—	—
90. If I really try I can do almost anything I want to do.	90	—	—	—	—	—
91. I often tell lies.	91	—	—	—	—	—
92. I have trouble expressing myself when I try to write something.	92	—	—	—	—	—
93. I am a calm person.	93	—	—	—	—	—
94. I'm good at most school subjects.	94	—	—	—	—	—
95. I have few friends of the same sex as myself.	95	—	—	—	—	—
96. I hate mathematics.	96	—	—	—	—	—
97. Overall, I'm a failure.	97	—	—	—	—	—
98. People can really count on me to do the right thing.	98	—	—	—	—	—
99. I learn things quickly in English class.	99	—	—	—	—	—
100. I worry about a lot of things.	100	—	—	—	—	—
101. Most school subjects are just too hard for me.	101	—	—	—	—	—
102. I enjoy spending time with my friends of the same sex.	102	—	—	—	—	—

Appendix F
Parent Permission Form

PERMISSION FORM: PARTICIPATION IN STUDY

Dear Parent/Guardian:

As a graduate student at the University of Rhode Island, I am requesting permission for your daughter's participation in my dissertation research, the focus of which is the physical activity of adolescent females. Particularly, I am interested in how girls feel about themselves, events in their lives and how these feelings might relate to their levels of physical activity. Your daughter will only participate with your signed permission as well as her consent. If your daughter participates, she will complete four different forms during one of her physical education classes in the Spring, taking approximately an hour total. These forms are:

- 1) background information (i.e. age, school sports participation);
- 2) reactions to certain life events (i.e. starting to date, moving to a new home);
- 3) short form on activity level (i.e. mild, moderate, strenuous activity levels);
- 4) feelings about self (i.e. in school, with peers)

The only other information needed which is available from her record or school personnel is her Grade Point Average, her attendance record for this year, and her Fitnessgram score. The Fitnessgram is administered by the physical education teachers to determine a student's level of physical fitness. All of your daughter's responses and information will be completely anonymous because her name will never be attached to any of the forms completed. If she decides during the study that she no longer wants to participate, she can quit at any time. Your daughter's participation will in no way affect her physical education grade or status in the class. The risks or discomforts resulting from participation in this study are minimal, but might include being bored with answering the questions or experiencing difficulty with the content of a question. The benefits to her participation might include learning more about herself or winning a small prize, as all participants in the study are entered into a raffle drawing.

If you have any questions or concerns about this study, you may call Anne Dineen, doctoral student, at 401-467-5024 or you may wish to speak with Foxborough High School's principal. In addition, you may also contact Dr. Janet Kulberg, the advisor for this project and professor at the University of Rhode Island, at 401-874-4228.

(return portion below)

PERMISSION FORM: STUDY

I give my daughter, _____, permission to participate in the University of Rhode Island study on the physical activity of adolescent females. I understand that my daughter is not required to participate and that her participation is completely confidential.

Parent Signature

Appendix G
Student Assent Form

The University of Rhode Island
Department of Psychology

The Relationship of Physical Activity to Self-concept and Perceived Stress in Adolescent
Females

ASSENT FORM FOR RESEARCH

ALL PARTICIPANTS MUST HAVE A SIGNED PERMISSION SLIP FROM A PARENT/GUARDIAN

I have been asked to take part in a research project described below. The researchers will explain the project to me and its purpose. I should feel free to ask questions. If I have more questions later, Anne Dineen (401-467-5024), the person mainly responsible for the study, will discuss them with me. Any other questions or concerns may be directed to Dr. Janet Kulberg, the advisor for this project (401-874-4228) and professor at the University of Rhode Island.

I have been asked to participate in this study, the purpose of which is to determine how girls feel about themselves, events in their lives and their participation in physical activity. If I take part in this study, I will be asked to fill out four different forms:

- 1) some background information about myself (i.e. age, school sports participation);
- 2) my reactions to certain life events (i.e. starting to date, moving to a new home);
- 3) a short form on my activity level (i.e. mild, moderate, strenuous activity levels);
- 4) how I feel about myself in different situations (i.e. school, with peers)

Completion of these forms should take less than an hour.

Given that I am voluntarily completing these forms, the risks or discomforts resulting from participation in this study are minimal, but might include being bored with answering the questions or experiencing difficulty with the content of a question. I do realize that the decision to participate is up to me. I do not have to participate. If I decide to participate, I know that I can quit at any time and may refuse to answer particular questions. Whatever I decide will in no way affect my grade or status in this class. If I wish to quit the study, I will simply inform Anne Dineen or a research assistant, who will be present in the class during my participation.

My part in this study is confidential. I am aware that the researcher will be obtaining my attendance record and grade point average from my school file. This is the only additional information that will be gathered from my record. Upon completion of the surveys at my school, if I choose, I may enter my name into a raffle, along with all of the other participants. All raffle participants have a chance of winning a small prize, such as cash or a free coupon to select a music CD from a local mall.

If I am dissatisfied with how this study is performed, I can discuss my complaints with Anne Dineen, anonymously if I choose. In addition, I may contact the University of Rhode Island's office of the Vice Provost for Research, 70 Lower College Road, University of Rhode Island, Kingston, Rhode Island at 401-874-2635.

I have read this assent form and my questions have been answered. By continuing in the study and responding to the forms that follow, I am agreeing to participate in the study. I may keep a copy of this form so that if concerns arise they can be addressed.

Student signature

Date

Researcher's signature

Date

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