PSYCHOLOGICAL BENEFITS OF SPORT PARTICIPATION AND PHYSICAL ACTIVITY FOR ADOLESCENT FEMALES

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Recent research has suggested that the effects of sport on well-being are mediated by psychological characteristics such as physical self-concept, instrumentality and positive body images; in addition, sport was found to be related to these psychological benefits for high school girls. However, physical self-concept played a central role by mediating the sport -body image and sport instrumentality relationships. Positive body image and instrumentality, in turn, predicted greater psychological well-being. The purpose of this investigation was to replicate earlier studies, and to examine these relationships with non-sport physical activity. Sport and physical activity were expected to contribute to higher physical self-concept, which in turn, would contribute positively to instrumentality and body image. Further, instrumentality and body image would be positively related to psychological well-being. Participants were 355 9^{th} (n = 170) and 10^{th} (n = 193) graders and they completed measures of involvement in sport/physical activities, physical self-concept, instrumentality, body satisfaction, self-esteem, satisfaction with life, depression, and demographics. Structural equation modeling was utilized to analyze the data. Overall, for both sport and physical activity, the models fit the data well (sport model: NNFI=.95, CFI=.96, SRMR=.08, RMSEA=.09, physical activity model: NNFI=.96, CFI=.97, SRMR=.08, RMSEA=.09). Specifically, sport participation was positively related to physical self-concept (R^2 = .47); physical self-concept related to body image (R^2 = .30) and instrumentality (R^2 = .23); Physical activity was positively related to physical self-concept (R^2 = .61); physical self-concept related to body image (R^2 = .30) and instrumentality (R^2 = .26). For both models, positive body image and higher levels of instrumentality contributed to greater psychological

well-being (R^2 = 66). These results highlight the importance of developing physical competence for high school girls through sport participation and physical activity.

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CHAPTER 1

INTRODUCTION

Psychological well-being is a subjective concept that is generally characterized by the presence of "healthy" characteristics such as self-esteem and ability to cope with life demands, and the absence of "unhealthy" characteristics such as depression and anxiety. Researchers have been particularly interested in the psychological well-being of adolescents, as this period is associated with an increase in self-consciousness, and an increased likelihood to be self critical (Harter, 1990; Rosenberg, 1979). This shift in attention to the self, in combination with transitioning to high school, physical and physiological changes, and changing relationships with same sex and opposite sex peers, may have a negative influence on the psychological well-being of adolescents. Understanding what factors promote positive psychological well-being in adolescents is important, because they may serve to protect adolescents against the experience of negative affect, self doubt, and engagement in risky health behaviors (Irwin, Burg, & Cart, 2002).

Subjective Well-Being

Subjective well-being is one aspect of psychological well-being. Subjective well-being is a global evaluation of the quality of one's life as it is determined by an individual's own values, expectations, and experiences (Diener, 1984). Therefore, each facet of a person's life is differentially and individually weighted in importance, contributing uniquely to the sum total of the person's perceived quality of life. Subjective well-being consists of three components: positive affect, negative affect, and life satisfaction (Andrews & Withey, 1976). Whereas positive and negative affect represent the emotional aspect of subjective well-being, life satisfaction represents the cognitive judgment process that occurs as one evaluates his or her life.

Research has demonstrated that the three components are separate, although strongly related, constructs that are each important in the overall evaluation of adults' and adolescents' subjective well-being (Andrews & Withey, 1976; McCullough, Huebner, & Laughlin, 2000).

Both adults and adolescents have been found in general to report positive levels of life satisfaction (Diener & Diener, 1996; Huebner, Drane, & Valois, 2000). No significant differences for either population have been found with regard to gender, ethnicity, or age. Although by definition there are no absolute determinants of subjective well-being, research has found factors such as extraversion, internal locus of control, religiosity, and goal directedness to be strongly related to it (Diener & Lucas, 2001).

Self-esteem is the psychological factor most consistently related to subjective well-being for adults and adolescents. Campell (1981) found self-esteem to be the strongest correlate of life satisfaction among a national adult sample, with a correlation coefficient of .55 between the two concepts. Extending the research to a multicultural adult population, Diener and Diener (1995) found satisfaction with self to be more strongly related to life satisfaction than satisfaction with finances, family, or friends. This finding was consistent for college students across 31 different nations. It is interesting to note, however, that the correlation between self-esteem and overall life satisfaction was stronger for students from individualistic cultures, in comparison to students from collectivist cultures. Although satisfaction with finances, family, and friends also was related strongly and significantly to satisfaction with self, self-esteem and subjective well-being were statistically found to be separate, though strongly related, constructs for adults and adolescents (Dew & Huebener, 1994; McCullough et al., 2000; Neto, 1993). Other environmental factors that have been related to subjective well-being for adolescents are major life events, positive daily events, and relationships with parents.

Self-Esteem and Self-Concept

Self-esteem is defined as an evaluative attitude toward the self (Coopersmith, 1967; Rosenberg, 1965). It is a judgment of overall personal worth, as the individual takes into account all of the different aspects of their selves. Self-esteem is one of the most researched areas with regard to adolescent well-being and development. Not only has self-esteem been found to be a positive outcome of development, it has been found to correlate with other positive psychological characteristics and behaviors. For example, youth high in self-esteem have been found to be happier and more effective in meeting situational demands (Coopersmith, 1967). Teenagers high in self-esteem also have been found to report less drug and alcohol use, and high levels of self-esteem have been found to serve as a protective factor against disordered eating behaviors in girls (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Zimmerman, Copeland, Shope & Dielman, 1997). In contrast, adolescents who reported low levels of self-esteem had higher levels of depression, lower levels of overall happiness, higher rates of anxiety, and higher incidence of engagement in risky health behaviors (Bergman & Scott, 2001; Harter, 1990; Rosenberg, 1985).

Because self-esteem is subjective, and the individual weights the importance and values of different aspects of one's self, there is no absolute structure to global self-esteem. However, it is considered to be one important dimension of a more universal perception of the self, or self-concept (Coopersmith, 1967; Marsh & Shavelson, 1985). Shavelson, Hubner, and Stanton (1976) defined self-concept as a person's perception of him / herself, and these perceptions have been formed through experience and interaction with the environment. Self-concept is a description of oneself, focusing on the attitudes, attributes, and perceptions of their abilities (Harter, 1990; Shavelson et al., 1976). The Shavelson et al. model described self-concept as possessing a

multidimensional, hierarchical structure that becomes increasingly differentiated with age. The multidimensional structure is described with a global self-concept at the apex, branching down into academic and non academic facets that then branch further into math and verbal self-concepts, and physical and social self-concepts, respectively. Marsh and Shavelson (1985) performed confirmatory factor analysis in order to find empirical support for this model. Using the Self Description Questionnaire, which includes subscales of several domain specific self-concepts, strong empirical support for the original structure was found (Marsh & Shavelson, 1985). The self-concept structure did become modified slightly, however, in that two higher order academic factors were identified, rather than just one. Therefore, verbal academic, math academic, and non academic self-concepts are considered to be directly differentiated from the global self-concept.

Global self-concept is a distinct construct from global self-esteem, although the two are closely related (Marsh & Shavelson, 1985). As global self-concept represents the overall description of one's capabilities, global self-esteem is the evaluation and perception of the worthiness of the self with those capabilities. Therefore, global self-esteem is considered to be influenced by the different specific domains of self-concepts to the degree of the weighted importance of each domain (Harter, 1986; Marsh, 1986). For example, global self-esteem may be higher for individuals who value academic achievement and have high levels of academic self-concept.

The possibility that perceptions of competence in personally important domains has the greatest effect on evaluations of self worth makes intuitive sense, however, this finding has not been consistent across studies. Although Harter (1986) has provided evidence that there is a strong relationship between overall self-worth and domains that are weighted as being more

important, Marsh's research (1986) has not consistently replicated this relationship. The inconsistency in results could be due to measurement and methodological issues. For example, Marsh (1986) used one item responses to measure importance in specific domains, which may not have provided reliable information. In addition, the difference in importance between specific domains of self-concept, such as academic, social, or physical self-concepts, may be non significant as each domain has already been determined to be large contributors to overall positive self perceptions and self worth. Therefore, possessing positive perceptions in domains considered to be more important than other important domains may have little effect on overall self-esteem.

Age and gender

Rosenberg (1979) stated that adolescence is a stage in life in which there is a shift in attention from external experiences, which is the focus of childhood, to the exploration and evaluation of the self. Despite the fact that this increase in self introspection and self consciousness could lead to disturbance in self-esteem, self-esteem has been found to remain stable, or even increase linearly, throughout adolescence (McCarthy & Hoge, 1982; Moneta, Schneider, & Csikzentmihalyi, 2001; Savin-Williams & Demo, 1984). For example, McCarthy and Hoge (1982) investigated the self-esteem in a sample of male and female adolescents across the grades 7-11 using both longitudinal and cross sectional designs. Results indicated that, as a group, self-esteem scores increased steadily throughout junior and senior high school. Regarding self-concept, Marsh (1989) also reported an increase from the 10^{th} grade, throughout high school, and into adulthood, although the preadolescent period did not reflect the same linear pattern that had been found by previous research. Marsh (1989) indicated that the increase in self-concept in

10th grade occurred after a declining trend from grades 5-9. This pattern was consistent for both males and females.

Although overall self-esteem seems to be consistent and stable across different ages for adolescents as a whole, the effects of gender during this period have been equivocal (Kling, Hyde, Showers, & Buswell, 1999). For example, a meta-analysis (Kling et al., 1999) indicated that males reported higher levels of self-esteem than females, although this difference was quite small. Further, the largest difference in self-esteem between males and females was found to occur during the time period of 15-18 years old. What could not be determined was whether this gap occurred because girls' self-esteem decreases in high school, boys' self-esteem increases at a faster rate than girls, or both of these changes occur concurrently.

Zimmerman et al. (1997) studied self-esteem levels of male and female students across four years of high school and grouped the participants into four different categories characterized by the trajectory of their self-esteem. These four groups were: consistently high, moderate and rising, steadily decreasing, and consistently low. Females were more likely to be classified in the decreasing steadily group compared to males, whereas males were more likely to be classified in the moderate and rising category than females. Although the relationship between gender and self-esteem is still not completely understood, there is evidence to suggest that females experience a decrease in self-esteem during adolescence. This evidence is contrary to the increasing self-esteem patterns found for adolescents in general. However, when self-esteem levels for male and female adolescents are reported as a combined group, the higher levels of self-esteem for males may mask the patterns of females' self-esteem and produce an overall increasing trend in self-esteem for adolescents.

Investigating gender within a multidimensional view of the self has provided a better understanding of the nature of potential differences. For example, Marsh (1989) did not find any significant differences in global self-concept or self-esteem, however, he did uncover differences in specific self-concept domains. Although girls were found to be higher in same sex relationships, honesty / trustworthiness, and verbal domains, boys were found to be higher in the physical abilities and physical attractiveness domains. Because each gender was high in some specific areas, there were no differences in total global self-concept between the two groups. Harter (1990), on the other hand, has argued that physical abilities and physical attractiveness are two key areas that contribute to peer acceptance. Therefore, lower levels in these areas may contribute to a female's perception of lower acceptance by others, which in turn could lead to lower self worth or self acceptance. In addition, Harter (1990) suggested that females consider physical attractiveness to be more important to global self-concept than males, and are more likely to base their global self evaluation on their self perceptions within this specific domains.

Overall, self-esteem steadily increases throughout middle and late adolescence, with boys generally reporting higher levels of self-esteem than girls (Kling et al., 1999). However, what has yet to be consistently determined are how changes in self-esteem patterns for males' and females' in the adolescent stage account for the overall gender difference in self-esteem. There is a lack of information regarding what external events or factors may be most influential in the development of and stability of adolescents' self-esteem. For example longitudinal studies (McCarthy & Hoge, 1982; Savin-Williams & Demo, 1984) have measured self esteem throughout high school, but have not included measures of involvement in activities that may have been specifically linked to more drastic changes in self-esteem. Boys may be more consistently involved in activities that provide opportunities to develop and demonstrate physical competence throughout

adolescence compared to girls, influencing their perceptions of their physical abilities and physical attractiveness, two important contributors to self-esteem. It is possible that as girls become less involved in activities that foster physical abilities, they experience decreases in self-esteem. By only viewing the sample as one group of adolescents, information regarding positive and negative changes in self-esteem over time for specific groups of students may have been lost. Therefore, it is important to examine which activities contribute to the development of self-esteem and subjective well-being; ultimately contributing to overall psychological well-being.

Benefits of Extracurricular Activities

Participation in extracurricular activities, such as music, drama, sports, and government, results in positive psychological development. For adolescents, these activities provide avenues for demonstrating competence, experiencing achievement, developing identities, and forming positive relationships with peers and adults (Eccles & Barber, 1999). Holland and Andre (1987) summarized research on participation in extracurricular activities in relation to a variety of different outcomes, and found that participation in activities was associated with higher levels of self-esteem, educational attainment and aspirations, and lower rates of delinquency. Expanding on this research, Eccles and Barber (1999) divided participation in extracurricular activities into five main categories: prosocial activities (e.g., Eagle Scouts), sport teams (e.g., varsity basketball), performing arts (e.g., drama club), school involvement (e.g., student government), and academic clubs (e.g., debate team). Each category was found to be related to higher than expected grade point averages compared to those who did not participate in any activities, and sport teams and academic clubs were associated with an increased likelihood that the participants would be enrolled in college at age 21. Additional health benefits were established for

participants in prosocial activities and academic clubs, because they were found to be less likely to engage in alcohol and drug use.

Sport Participation and Physical Activity

Because of its overwhelming number of participants, sports has been extensively studied as an extracurricular activity. An estimated 52 million youth participated in at least one organized sport during the year 2000 (National Council of Youth Sports, 2001) and almost two thirds of the high school sample in Eccles and Barber (1999) study reported being involved in at least one organized team sport. Specific benefits related to sport participation versus other types of extracurricular activity participation have been documented. For example, McNeal (1995) reported that high school athletes were less likely to drop out of school than non-athletes. In addition, Kirshnit, Ham, and Richards (1989) found that higher levels of positive affect and motivation were associated with participation in sport compared to all of the other extracurricular activities offered in high school.

Because society has become more accepting and girls are actually participating more in sports, understanding the benefits of such participation has become particularly important. Although opportunities continue to increase for girls in sport, female adolescents have higher attrition rates than males, especially during the ages 16-18 (National Council of Youth Sport, 2001). Therefore, fewer females actually participate in athletics throughout high school. Eccles and Barber (1999) found that significantly fewer numbers of girls were involved in high school athletics compared to the boys in their sample. Similar patterns have been found for female adolescents' engagement in regular exercise and physical activity. In comparison to their male counterparts, high school girls are less physically active with rates of moderate or vigorous activity declining throughout adolescence (Grunbaum et al., 2004; Kimm et al., 2002).

The fact that girls are less likely to continue to participate in sport and vigorous physical activity throughout high school is particularly disturbing given the positive psychological benefits associated with these activities. For example, Boyer and Petrie (2005) found that high school female's participation in non-physical extracurricular activities (e.g., government, drama, music) did not appear to contribute uniquely to the development of positive psychological characteristics, such as instrumentality and psychological well-being. However, these benefits were associated with participating in high school sports, particularly in comparison to being minimally involved in physical activity or being physically inactive. Also, female adolescent athletes have demonstrated higher levels of self-confidence, higher grade point averages, lower frequencies of drug and alcohol use, and less engagement in unprotected sex than their non-athlete classmates (Lirgg, 1991; Sabo, Miller, Farrell, Melnick, & Barnes, 1999). Health benefits also have been documented for high school girls who engage in regular physical activity. For example, Aaron, Dearwater, Anderson, Olsen et al. (1995) found that girls with high levels of physical activity were less likely to smoke cigarettes than those who engaged in low levels of physical activity.

Although sport participation and physical activity has been linked to high self-esteem and overall well-being in females (Jackson & Marsh, 1986; Marsh & Jackson, 1986; Snyder & Kivlin, 1975) the strength of these relationships has been weaker than expected. Additionally, some research has yielded no significant differences between female athletes and non athletes on measures of self-esteem (Hall, Durborow, & Progen, 1986). It is possible that differences are not being detected due to methodological problems, such as (a) how "sport" participants are classified and (b) failure to consider potential mediating variables. For example, Melnick, Vanfossen, and Sabo (1988) reported a correlation between athletic participation and self-esteem

for high school girls, but found no significant difference between sport participants and non-participants' mean self-esteem scores. The fact that no statistically significant difference was found could be due to the authors not accounting for those who were involved in organized sport outside of their school, or those who engaged in informal sporting activities. Therefore, their "non sport participants" may actually have been involved in athletics and / or physical activity, and thus reported levels of self-esteem similar to school sport participants. Indeed, positive relationships have been found between non-sport vigorous physical activity and psychological well-being (Fox, 1999; McAuley, 1994; Sonstroem, 1997). Concerning the influence of potential intervening characteristics on self-esteem, it may be that the effects of sport participation or physical activity are mediated by other positive psychological characteristics, such as physical self-concept, instrumentality, and positive body image. Therefore, sport and physical activity participation may enhance self-esteem indirectly, as it enhances physical self-concept, instrumentality, and positive body image (Parsons & Betz, 2001; Richman & Shaffer, 2000; Sonstroem, 1997).

Mediating Factors

Physical Self-Concept

Marsh, Richards, Johnson, Roche, and Tremayne (1994) proposed that, like global self-concept, physical self-concept is a multidimensional construct that represents the perceptions that one has with regard to aspects of physical competence, physical attractiveness, and overall health. There are 9 specific facets that Marsh et al. (1994) conceptualized as part of the global physical self-concept, including sport competence, strength, flexibility, endurance, coordination, physical activity, physical appearance, body fat, and health. Of these, the skills representing physical competence (strength, flexibility, endurance, coordination, sport competence), along

with physical appearance, appear to most strongly contribute to the development of psychological well-being. Newcomb and Bukowski (1983) reported that young adolescents value personal appearance and athletic skills more than academic skills when it comes to selecting friends. In addition, research has demonstrated that physical attractiveness and physical competence are related positively to higher levels of global self-concept and self-esteem, especially for adolescents (Bowker, 2006; Fox, 1997; Harter, 1990).

Although the factor structure of physical self-concept is consistent among males and females (Marsh et al., 1994), gender differences exist with respect to level of physical self-concept. Both adult and adolescent females report lower levels of physical competence and physical self-concept than adult and adolescent males (Hayes, Crocker, & Kowalski, 1999; Marsh et al., 1994). Larger discrepancies in physical self-concept are found between genders when global self-concept measures that contain a physical self-concept subscale are used, compared to when physical self-concept is measured exclusively (Marsh, et al., 1994). However, it should be noted that, in a general adolescent sample, boys had stronger correlations between sport competence and global physical self-concept than girls. This difference in the relationship between sport competence and global self-concept for males and females could explain the gender differences in total physical self-concept, as males are more likely to be involved in athletics, and thus more likely to develop strong sport competence perceptions. In addition, the strength difference in the relationship between sport competence and global self-concept for males and females could be indicating that females have lower levels of sport competence, regardless of degree of sport participation, compared to males. Finally, it may be possible that sport competence is considered to be more important to males than females, therefore strong

sport competence may lead to stronger physical self-concepts for males. In order to investigate these relationships further, physical self-concept was examined in an athletic population.

Indeed, gender differences in physical self-concept also are present within athletic populations. Marsh (1998) examined the physical self-concepts of both athletes and non athletes in grades 7-10. Results indicated significant gender differences between boys and girls across ages on all subscales of physical self-concept (except Health) and although the differences were smaller, male athletes reported higher levels of physical self-concept than female athletes. Both male and female athletes reported higher levels of physical self-concept compared to non athletes, indicating that sport participation can contribute to positive perceptions of the physical self. The contribution that sport participation makes toward positive physical self perceptions may be especially true for females, as the difference in athletes' and non-athletes' physical self-concepts was significantly larger for females compared to males.

Other evidence has been provided for the relationship between sport participation and physical activity, and physical self-concept for females in college and high school. For example, Miller and Levy (1996) reported levels of positive physical appearance and athletic competence to be higher for athletes compared to non athletes. In a related study, Raudsepp, Liblik, and Hannus (2002) found higher perceptions of sport competence, strength, and conditioning among adolescents who participated in moderate physical activity compared to adolescents who did not engage in any physical activity. In addition, Sonstroem (1997) provided strong evidence that physical activity and exercise are related to higher levels of physical competence. Further, his research indicated that physical activity contributes to overall self-esteem, but is mediated by physical self-concept.

In summary, there is evidence that sport participation and physical activity are related to physical self-concept, and to increased levels of self-esteem. In some studies, physical self-concept has been shown to mediate the relationship between physical activity / sport and self-esteem (Bowker, 2006; Dishman et al., 2006; Sonstroem, 1997). Because self-esteem and physical self-concept are so important during the adolescent years and because involvement has the potential to positively influence the lives of girls, more research is needed on how sport participation and physical activity influences physical self-concept and in which specific domains.

Instrumentality

Instrumentality is a set of psychological characteristics that include self-confidence, assertiveness, decisiveness, and independence (Parsons & Betz, 2001). Traditionally, society has determined roles that each gender should fulfill, with men being responsible for providing resources to the family and the women being responsible for taking care of the home and children. In order to successfully fulfill these roles, men are required to develop self reliant, assertive, competitive behaviors (referred to as instrumental), whereas women must develop nurturing, social, interpersonal behaviors (referred to as expressive). Measures of gender role attributes were developed (Bem, 1974; Spence, Helmreich, & Stapp, 1975) based on the characteristics that are determined to be socially desirable in men and women. Indeed, men have consistently reported higher levels of instrumental traits compared to both women and to their own levels of expressive traits, and women have reported higher levels of expressive traits compared to males and to their own levels of instrumental traits (Spence et al., 1975). Therefore, the instrumental and expressive gender roles have been labeled masculinity and femininity, respectively.

Possession of the attributes that are consistent with socially prescribed gender roles and an individual's actual gender was once believed to be related to higher levels of psychological well-being (Spence & Helmreich, 1978). However, research has demonstrated that higher levels of self-esteem are more strongly related to higher levels of reported masculinity and masculinity-femininity than levels of reported femininity for both men and women (Spence et al., 1975). Further investigating the contributions of masculinity and femininity to self-esteem, Bem (1974) and Spence et al. (1975) each developed a procedure for classifying individuals into one of four gender roles: Undifferentiated (low in both masculinity and femininity), Androgynous (high in both masculinity and femininity), Femininity (high in femininity and low in masculinity) and Masculinity (high in masculinity and low in femininity). Both Bem (1974) and Spence et al., (1975) demonstrated that, for both men and women, the androgynous group had the highest self-esteem, with the masculinity, femininity, and undifferentiated categories following respectively. These findings led researchers to believe that being androgynous led to higher levels of psychological well-being, because the individuals possessed both expressive and instrumental traits that allowed them to be flexible and to adapt to many different situations.

However research with adolescents has demonstrated that well-being is determined primarily by the extent to which individuals possess masculine traits, regardless of gender. For example, Cate and Sugawara (1986) examined the relationship of masculinity and femininity attributes and adolescents' levels of self-esteem and specific domains of self-concept. Both boys and girls who were high in masculine traits rated themselves as higher in social competence, physical competence and global self worth compared to those low in masculine traits. Masculine characteristics were particularly important for girls because those who were high in masculinity reported the highest levels of social competence and general self-esteem compared to both girls

who were low in masculinity and boys who were high in masculinity. Butcher (1989) also investigated the relationship of self-esteem and adolescents psychological gender traits. She extended the previous research in the area by examining the relationship each year for a five year period. Throughout the five years, higher self-esteem ratings were consistently associated with higher levels of masculinity; there were no significant relationships to femininity. Therefore, because significantly higher levels of self-esteem are associated with higher levels of masculinity regardless of the level of femininity, the assumption of the importance of possessing flexible traits is not supported. What is most salient with regard to gender-self-esteem research is that both the androgynous and masculine models have demonstrated the importance of possessing instrumental traits in the development high self-esteem. Remembering that masculine traits are instrumental traits, it makes intuitive sense that characteristics such as self-reliance, independence, and assertiveness would be connected to greater self worth regardless of gender. The recognition of instrumental traits as key factors is especially important when considering the psychological well-being of girls, because they are less likely to be socialized to develop such traits than boys. Therefore, girls may need to seek alternative methods to foster the development of instrumentality.

It is reasonable to assume that achievement oriented activities, such as sport participation, would develop or enhance instrumental characteristics in adolescents. Research has provided evidence for associations between possession of masculine characteristics and sport participation. Both male and female college varsity athletes were found to be significantly more likely to endorse androgynous characteristics than non-athletic college students (Hall et al., 1986; Uguccioni & Ballantyne, 1980). In addition, Miller and Levy (1986) demonstrated that female college athletes rated themselves significantly higher on masculinity than non-athletes, though no

significant differences were found between athletes and non-athletes with regard to levels of femininity. Parsons and Betz (2001) investigated the relationship of instrumentality with both sport participation and physical activity in college females. Those who participated in two or more sports in high school demonstrated significantly higher levels of instrumentality than those who only participated in one sport. In addition, females who engaged in moderate levels of physical activity reported higher levels of instrumentality than those who did not engage in any physical activity. Marsh and Jackson (1986) examined levels of masculinity for both college and high school female students. In their samples, both college and high school athletes reported significantly higher levels of masculinity than non athletes. In addition, athletes and non-athletes did not differ in levels of femininity, supporting the notion that sport participation does not suppress the development of feminine characteristics. This finding was replicated by Andre and Holland (1995) who investigated the relationships of sport participation to masculinity and femininity specifically in a sample of female athletes drawn from multiple sports. No significant differences were found in masculinity and femininity levels between participants in aggressive and non aggressive sports (Andre & Holland, 1995).

As instrumentality has been connected to greater levels of self-esteem, and sport participation has been associated with higher levels of instrumentality, it can be hypothesized that instrumentality mediates the relationship between sport participation and self-esteem. Past research has provided some support for this hypothesis. College athletes who were classified as masculine and androgynous, reported significantly higher levels of self-esteem than the athletes that were classified as feminine or undifferentiated (Del Rey & Sheppard, 1981; Marsh & Jackson, 1986; Spence et al., 1975). In addition, Richman and Shaffer (2000) found that high school sport participation predicted higher levels of masculinity, and higher levels of masculinity

predicted higher levels self-esteem in a college sample of females. Research has yet to directly test the mediating role that instrumentality may possess on the relationship of sport participation and psychological well-being in adolescents.

Body Image

Body image is a subjective, multidimensional evaluation of the body, consisting of perceptions, attitudes, and affect directed toward and about the body (Striegel-Moore & Franko, 2001). The perceptual aspect of body image refers to the degree of congruence between the actual body shape and size, and the individual's own subjective judgment of his or her body's shape and size. The closer these are to one another, the less body distortion the individual experiences. The affective and attitudinal aspects refer to the pleasant or unpleasant feelings that one has about the shape of the body. The affective aspect is represented by satisfaction or dissatisfaction with one's body and its features. Cash (2001) stated that body image is influenced by factors such as socialization, one's own physical characteristics, personality attributes, interpersonal experiences, and cultural socializations.

Levine and Smolak (2001) argued that female adolescents are particularly vulnerable to having negative body image. They estimated that 40-70% of adolescent girls are dissatisfied with at least two aspects of their body, and that body satisfaction has been shown to decline over the years 12-15. This decrease may be for several different reasons. First, girls are experiencing physiological changes and sexual maturation during this age period, and this developmental period may be particularly difficult for those who go through puberty early in adolescence (Davies & Furnham, 1986). Second, females in high school, compared to males, may be more likely to internalize the thin ideal, which has been found to be associated with lower levels of body satisfaction (Durkin & Paxton, 2002). Third, a highly feminine gender role has been found

to be related to lower body image, thus increasing the chance for negative body image to occur more in females than males (Usmiani & Daniluk, 1997).

A relationship between body image and self-esteem has been found consistently (Fox, 1997; Levine & Smolak, 2001; Usmiani & Daniluk, 1997), although the nature of this relationship is not specifically understood. For example, Levine and Smolak (2001) contend that body image is one of the most important components to self-esteem, such that positive body image leads to higher self-esteem. However, Cash (2001) viewed negative self-esteem as the precursor, leading individuals to be less satisfied with their body and appearance. In addition, he suggested that positive self-esteem could act as a buffer against the negative effects of social comparison with others or with the thin ideal. Although the causal direction and mediating and moderating effects are not absolutely known, it is important to recognize the strong, positive relationship between self-esteem and body image.

Research regarding the relationship between body image and sport participation has demonstrated a positive relationship between the two. Hausenblas and Downs (2001) performed a meta-analysis in order to examine the empirical research on body image and sport participation. Athletes in college as well as high school were found to have more positive body images than their non athlete counterparts, although this difference was small. One possible reason for the small effect between sport participation and body image is that different types of sport may have different impacts on body image. For example, Davis and Cowles (1989) reported greater body image dissatisfaction in gymnasts and long distance runners compared to athletes in other sports. This increased body dissatisfaction may be due to the fact that success in gymnastics and long distance running is more dependent on a specific thin body type than other sports. Therefore, participants in "lean" may be more critical of their bodies and under more

pressure to achieve a thin ideal that they may be physiologically unable to reach. Physical activity also has been associated with higher levels of positive body image. Covey and Feltz (1991) examined the benefits of physical activity for female adolescents, and found that girls with higher levels of physical activity reported higher levels of body and self images compared to their non-physically active classmates. In addition, a meta-analysis by Hausenblaus and Fallon (2006) revealed that exercisers reported more positive body image than non-exercisers, and that exercise demonstrated effectiveness as an intervention to increase levels of positive body image.

Sport Participation, Physical Activity, Mediating Variables, and Psychological Well-Being

The three psychological constructs of physical self-concept, instrumentality, and positive body image have been shown to be important contributors to overall psychological well-being (Cate & Sugawara, 1986; Fox, 1997; Usmiani & Daniluk, 1997). The development of these characteristics is especially important to the well-being of female adolescents, because they are less likely to inherently possess strong physical self-perceptions or instrumental traits and are more vulnerable to negative body images compared to male adolescents. Sport participation and engagement in physical activity have been shown to be avenues for the development of these three psychological characteristics for female adolescents (Hausenblas & Downs 2001; Marsh, 1998; Parsons & Betz, 2001). Therefore, physical self-concept, instrumentality, and positive body image may mediate the relationships between sport participation and physical activity and overall psychological well-being.

Richman and Shaffer (2000) examined the relationship between high school sport participation and subsequent college self-esteem in women as it is mediated by physical self-concept, instrumentality, and body image. One of the strengths of this study was the manner in which sport participation was measured. Rather than simply grouping participants based on

whether or not they participated in school sports, a total score was calculated for each participant based on their total number of years and their self reported involvement in sport. This approach allowed for the influence of a variety of sport experiences to be examined. In general, Richman and Shaffer found that greater levels of sport participation were related to higher levels of self-esteem. More importantly, this relationship was mediated by physical self-concept, instrumentality, and body image. College self-esteem was strengthened as sport participation increased levels of these important psychological constructs, providing a more descriptive and meaningful explanation of the benefits of participating in sport for females.

Boyer and Petrie (2005) replicated and extended the research by Richman and Shaffer (2000) and examined the benefits of sport participation for 9th and 10th grade high school females. Specifically, sport participation was hypothesized to contribute to greater psychological well-being for female adolescents by leading to more positive body images, greater physical self-concept, and higher levels of instrumentality. Results indicated that sport participation did contribute positively to physical self-concept, which mediated the relationships between sport participation and instrumentality, and sport participation and body image. A direct negative relationship was found between sport participation and body image. Therefore, sport participation only contributed to higher levels of body satisfaction and instrumentality as it contributed to higher levels of physical self-concept. Both body image and instrumentality in turn contributed to more positive psychological well-being. Physical self-concept was not found to be significantly related to psychological well-being for this sample.

The centrality of physical self-concept to the sport-instrumentality relationship suggests that sport participants rate themselves higher on characteristics such as independence and assertiveness when they perceived themselves to be physically competent.

Although past research (Marsh & Jackson, 1986) has supported relationships between sport participation and instrumental characteristics and physical abilities, as was found initially in this study, no other study has directly tested for the mediating potential of physical self-concept, suggesting that there may be direct and mediating effects. Therefore, further examination of the benefits of developing physical self-concept through sport participation is necessary.

Physical self-concept also mediated the relationship between sport participation and body image. Initially, sport participation was found to have a weak, yet positive direct relationship with body image; however, when a path between physical self-concept and body image was included, the relationship between sport participation and body image became negative. In the model, sport participation contributed to greater body satisfaction only as it was related to stronger perceptions of physical competence. The more physically skilled and capable the female adolescents felt, the more they evaluated their bodies positively. Although the negative relationship between sport participation and body image was weak, it was significant. Sport participation could have negative effects because psychosocial factors within the sport environment could be influencing participants' evaluations of their bodies. More research is necessary to further examine the relationships between sport participation, and body satisfaction.

Relative Psychosocial Benefits of No Activity, Physical Activity, or Sport Participation

Boyer and Petrie (2005) also compared the relative psychosocial benefits of participating in high school sports, engaging in physical activity, and being inactive. Overall, female adolescents who participated in sport had higher levels of physical self-concept, instrumentality, body image, and psychological well-being than high school students who either were not involved in any sport or physical activity, or were only involved in low levels of physical activity. It is important to note that the benefits of participating in sport were greater for those in

at least two different high school sports or teams. Although engaging in high levels of physical activity was not associated with significantly more benefits compared to not being physically active, high activity females also reported similar levels of the psychological variables compared to those who participated only in sport. Because those who reported they participated in sport also engaged in high levels of physical activity within their sports, the high physical activity and sport participation groups may produce similar benefits. If so, then female adolescents would have another route through which to develop positive psychosocial characteristics (e.g., body image) and increase their overall well-being. Further research is needed to determine the extent to which high levels of physical activity may provide such benefits.

Summary and Conclusions

Both Richman and Shaffer (2000) and Boyer and Petrie (2005) have demonstrated that, for females, sport participation is related to physical self-concept, body satisfaction, higher levels of instrumentality, and subsequently greater psychological well-being. Additionally, physical self-concept, as characterized by perceived competence in the areas of strength, flexibility, endurance, sport skills, and coordination, has been shown to play a particularly important role in the development of positive body satisfaction and instrumentality among female adolescents. This relationship has only been investigated in one study, and therefore, it would be beneficial to re-examine these relationships for high school girls. Because physical competence may be a main contributor to positive body image and instrumentality, it is important to consider other avenues that females have to develop these positive physical perceptions. Moderate or vigorous physical activity that is separate from sport also is a way that high school girls can develop physical skills and physical competence. Thus, involvement in non-sport physical activity also may positively influence physical self-concept, body image, instrumentality, and in turn, overall

psychological well-being. Examining the same mediating relationships for sport and physical activity separately is necessary, and could provide greater understanding of how different activity contexts contribute to positive psychological characteristics for high school girls. Understanding factors that promote psychological well-being for females is especially important as they be more at risk for reduced psychological well-being compared to males.

Hypothesis

Based on the research by Richman and Shaffer (2000) and Boyer and Petrie (2005), this study will re-examine the relationships between high school sport participation, body image, physical self-concept, instrumentality, and psychological well-being. Further, this study will examine the psychological benefits that are associated with participation in non-organized physical activity. A priori hypothesized models, three each for sport participation and physical activity, will be tested and compared. The first set of a priori hypothesized models are based on the research by Richman and Shaffer (2000). It is hypothesized that higher levels of sport participation will be associated with higher levels of physical self-concept, instrumentality, and positive body image, and that these in turn, will be associated with higher levels of overall psychological well-being (see Figure 1). Therefore, physical self-concept, instrumentality, and body image are hypothesized to mediate the relationship between sport participation and psychological well-being. The second a priori hypothesized model will be tested to confirm the respecified model found in research with high school girls (Boyer & Petrie, 2005). It is hypothesized that sport participation's effects on body image and instrumentality will be mediated by physical self-concept. Additionally, it is hypothesized that the direct relationship between sport participation and body image will be negative; positive body image and instrumentality will be associated with higher levels of psychological well-being (see Figure 2).

An alternative model is the third a priori hypothesized model. It is hypothesized that sport participation will only be significantly associated with higher levels of physical self-concept, which in turn will be associated with higher levels of body image and instrumentality, which in turn will be associated with higher levels of psychological well-being (see Figure 3).

The psychological benefits of physical activity also will be examined. Although physical activity will be conceptualized as a different activity than organized sport, it is hypothesized to have similar psychological benefits as sport because of the similarities between the two activities. Therefore, the relationships between physical activity and the positive psychological benefits will be hypothesized to be the same as with sport participation. The a priori hypothesized relationships for physical activity are demonstrated in Figures 4, 5, and 6.

Finally, in order to examine the psychological and behavioral effects of participating in different types of activities, participants will be divided into three groups: those who participate in sport, those who participate in non-sport physical activity, and those who only participate in other extracurricular activities. To more specifically examine differences between sport participation and physical activity, these groups will be further divided into levels. Based on previous research (Boyer & Petrie, 2005; Parsons & Betz, 2002), sport participation will be divided into low (participation in one sport) and high (participation in two or more sports) levels. Based on recommendations for sufficient physical activity for adolescents (Center for Disease Control and Prevention, 2004), physical activity groups will be divided into low frequency (vigorously active 1-2 times per week for at least twenty minutes), moderate frequency (vigorously active for 3-4 times per week for at least twenty minutes) and high frequency (vigorously active 5-7 times per week for at least 20 minutes) levels. It is hypothesized that those who participate in sport and physical activity will have higher levels of body image, physical

self-concept, instrumentality, and psychological well-being compared to those who are inactive. In addition, it is hypothesized that higher levels of sport participation and physical activity will be associated with higher levels of body image, physical self-concept, instrumentality, and psychological well-being compared to lower levels of sport and physical activity.

CHAPTER 2

METHOD

Participants

Participants consisted of 363 females from a large private high school located in the southwest region of the United States. Participants were 9th (n = 170) and 10th (n = 193) graders whose ages ranged from 14 to 16 years (M = 15.09, SD = .73). Participants were predominantly Caucasian (79%), followed by Latin American (9.6 %), Asian American (5.5 %), African American (1.4%), Native American (.3%) and of undisclosed origin (4.1%). The participants' reported body masses ranged from 15.35 to 31.95 kg/m^2 (M = 20.62, SD = 2.79) and their reported ideal body masses ranged from 15.66 to 27.53 kg/m^2 (M = 19.29, SD = 1.79). Seventy four percent of the participants indicated their ideal weight was less than their current weight, with the difference between their real and ideal weights ranging from 1 to 65 pounds (M = 11.8, SD = 9.23). In addition, 56.1% (n = 199) of participants reported they were currently trying to lose weight, and 39.1% (n = 139) reported they were either trying to stay the same weight or were not trying to do anything about their weight. The majority of the participants (67.6 %, n = 240) reported participating in organized high school sports. Out of those that participated in at least one sport, the total number of high school sports in which they participated ranged from 1 to 5 (M = 1.75, SD = .86), and the average number of hours per week participating ranged from 1 to 25.0 (M = 9.09, SD = 4.06). Thirty one percent (n = 110) of participants reported engaging in physical activity without participating in high school sports, and the number of days per week in which they participated in vigorous activity ranged from 1 to 7 (M = 3.38, SD = 1.26). Only 1.4% (n = 5) of participants reported that they were not physically active or involved in sports.

Additionally, 74.1% (n = 263) of participants reported participating in non-athletic extra curricular activities. The students' grade point averages (on a 4.0 grade point scale) ranged from 2.10 to 4.0 (M = 3.65, SD = .36).

Instruments

Demographics

A demographic questionnaire designed by the researcher was used to collect the following information: age, year in school, race/ethnicity, height, weight, ideal weight, current grade point average, and general history of sport participation.

High School Extracurricular Activity Participation

An extracurricular activity participation questionnaire designed by the researcher measures the students' participation in non sport activities, such as music, drama, and student government. Participants reported the number of months they participated in each activity, and rated their involvement on a 5-point Likert type scale ranging from 1, *low involvement* to 5, *high involvement*.

High School Sport Participation

A sport participation questionnaire, adapted from Richman and Shaffer (2000) and Parsons and Betz (2001), measures the students' participation in organized, competitive sports. The total number of high school sports is calculated by summing the number of sports in which students participated for their school, and the sports in which students participated that are independent from their school sports during their high school years (e.g., club sports). Students indicated the number of months and hours per week they spent participating in each sport. The average number of months spent in high school sports is calculated by totaling the number of months of participation reported for each sport and then dividing by the total number of high

school sports in which they participated. The average number of hours spent in high school sports is calculated by totaling the number of hours of participation reported for each sport and then dividing by the total number of high school sports in which they participated. In addition, participants rated their level of involvement in each sport on a 5- point Likert type scale ranging from 1, *low involvement* to 5, *high involvement*. An average sport involvement score is calculated by totaling the involvement ratings reported for each sport, and then dividing by the total number of sports in which they participated.

Physical Self-Concept

The 70- item Physical Self Description Questionnaire (PSDQ; Marsh, Richards, Johnson, Roche, & Tremayne, 1994) measures 9 specific components of physical self-concept as well as global physical self-concept and global self-esteem. For the purposes of this study, only 42 items measuring 6 subscales representing physical competence skills (strength, coordination, flexibility, endurance, sport competence) and 1 scale measuring global physical self-concept were used. Each item is a declarative statement that participants respond to using a 6-point Likert type scale ranging from 1, *false*, to 6, *true*. Negatively worded items are reverse scored. Mean total scores are determined for each scale and range from 1, *low competence* to 6 *high competence*.

The PSDQ is appropriate for adolescents at least 12 years of age, and has been used with college athlete and adult samples (Marsh, 1998). Internal consistency reliabilities have ranged from .82 to .96 (Marsh et al., 1994). Cronbach's alphas for the current sample were .91 (Strength), .92 (Coordination), .92 (Flexibility), .93 (Endurance), .96 (Sport Competence), and .97 (Global).

Confirmatory Factor Analysis models of the PSDQ responses provided clear support for the 11 distinct physical self-concept components of the PSDQ (Marsh et al., 1994). Marsh et al. (1994) also found support for construct validity through Multitrait-Multimethod Analyses on the PSDQ, Physical Self-Concept Scale (PSC; Richards, 1988), and the Physical Self Perception Profile (PSPP; Fox, 1990). Correlations between factors representing different instruments were classified into three a priori categories: scales that are most closely matched, scales that are less closely matched, and scales that are non matched. The convergent validities in the first category (in which the scales were most closely matched) were found to range from .79 - .90, with a median of .84. Convergent validities in the second category (in which scales were less closely matched) yielded coefficients from .61 - .73, with a median of .68. Providing further support for construct validity is the fact that the convergent validities in the first category were systematically larger than those in the second category (Marsh et al., 1994).

High School Physical Activity Participation

The physical activity subscale of the Physical Self Description Questionnaire (PSDQ; Marsh, et al., 1994) consists of six items that measure the frequency and intensity of physical activity in which participants engage. Examples of items include: Several times a week I exercise or play hard enough to breathe hard (to huff and puff); I do physically active things (like jogging, dancing, bicycling, aerobics, gym or swimming) at least three times a week. Each of the six items is a declarative statement that participants respond to using a 6-point Likert type scale ranging from 1, *false*, to 6, *true*. See above in Physical Self-Concept for scoring instructions and psychometric information. Cronbach's alpha for the current sample for the Physical Activity scale was .93.

The 87 - item Youth Risk Behavior Surveillance Survey (YRBSS; Centers for Disease Control and Prevention, 2003) assesses adolescent characteristics and lifestyle behaviors that contribute either directly or indirectly to morbidity and mortality. For the purposes of this study, only 4 items were used to measure adolescents' behaviors in the physical activity category. Three questions measure the frequency in which adolescents engage in vigorous, moderate, and conditioning activities per week, ranging from 0 to 7 days. Vigorous activity is measured by the frequency in which participants engage in activity that makes them sweat or breathe hard for at least 20 minutes. Moderate activity is measured by the frequency in which participants engage in activity that does not make them sweat or breathe hard for at least 30 minutes. The conditioning item measures the frequency in which participants lift weights or do activities specifically to tone muscles. Participants also respond to one question measuring the number of hours per day participants watch television. Responses range from no hours per day, to more than 5 hours per day. Test- retest reliability for the scale has been demonstrated for a high school student sample, with a mean Kappa statistic of 60.7% (Brener et al., 2004).

Instrumentality

The 24- item Personal Attributes Questionnaire- Short Form (PAQ; Spence & Helmreich, 1978) assesses instrumental and expressive characteristics, and consists of three subscales: Masculinity (M) Femininity (F), and Masculinity-Femininity (M-F). For the purposes of this study, only the 8- item Masculinity (M) scale was used. The M scale consists of instrumental traits that were judged by college students to be socially desirable in both sexes, but to be more characteristic of males than females. Participants respond to each of the 8 bipolar items by rating themselves on a five point scale. Total scores range from 0, *low masculinity* to 32, *high masculinity*.

Cronbach's alphas for the M scale have ranged from .71 to .85 in adults and adolescents (Helmreich, Spence, & Wilhelm, 1981). Internal consistency for the current sample was .67. Factor analyses revealed coefficients of .51 and .53 for M items to masculinity, and F items to femininity, respectively (Helmreich et al, 1981). When M items were loaded for femininity and F items were loaded for masculinity, loadings of .06 and .09, respectively, were found. These results lend support to the conceptualization of masculinity and femininity being separate constructs. In addition, factor analyses revealed the presence of two factors in each gender that confirmed the assignment of instrumental and expressive items to the M and F scales**,** respectively (Helmreich et al., 1981).

The 20-item instrumentality scale (Parsons & Betz, 2001) measures the construct of instrumentality, which is defined as the "ability to take action on one's behalf and to feel a sense of control of one's life" (p. 214). Items are declarative statements that are worded both positively and negatively, and participants respond to each using a 5-point scale ranging from 1, *strongly disagree* to 5, *strongly agree*. Total scores range from 20, *low instrumentality*, to 100, *high instrumentality*.

Cronbach's alpha of .85 has been reported (Parsons & Betz, 2001), and was .83 for the current sample. The Instrumentality Scale has been correlated with the Bem Sex Role Inventory-Masculine Scale (r = .58), the Bem Sex Role Inventory-Instrumentality items (r = .52), and the Personal Efficacy (r =.62) and Interpersonal Control (r =.61) subscales, respectively, of the Spheres of Control Scale (Parsons & Betz, 2001), providing support for the scale's validity. The instrumentality scale has been used previously with adolescents (Boyer & Petrie, 2005).

Body Image Satisfaction

The 11-item Body Parts Satisfaction Scale-Revised (BPSS-R; Petrie, Tripp, & Harvey, 2002) measures two aspects of body satisfaction: satisfaction with body (weight, arms, stomach, buttocks, hips, upper thighs, and general muscle tone) and satisfaction with face (hair, complexion, overall face, and chest / breasts). Additionally, a one-item overall body satisfaction rating is included. Participants respond by rating their satisfaction with each item on a 6-point Likert scale, ranging from 1, *extremely dissatisfied* to 6, *extremely satisfied*. A mean total score is calculated for each factor, and ranges from 1, *low satisfaction* to 6, *high satisfaction.*

Cronbach's alphas of .89 and .76 for the satisfaction with body and satisfaction with face factors, respectively, have been reported (Petrie et al., 2002). Internal consistencies for the current sample were .88 and .66 for the Body factor and Face factor, respectively. Both factors negatively correlated with other measures of body image disturbance and disordered eating, such as, the Body Shape Questionnaire (r = -.75, r = -.39, respectively), the Situational Inventory of Body Image Dysphoria (r = -0.73, r = -0.46, respectively) and Revised Restraint Scale Concern for Dieting (r = -.60, r = -.31, respectively), providing support for the scale's validity. BPSS-R has demonstrated to be an appropriate measure for adolescents (Boyer & Petrie, 2005).

A BMI Difference (BMI Actual minus BMI Ideal) score was used as an indicator of body satisfaction, with a larger discrepancy indicating more body dissatisfaction. The Body Mass Index score is calculated by multiplying participants' reported weights in pounds by 703 divided by their reported heights in inches squared (weight * 703/ $(\text{height})^2$ = BMI kg/m^2). The ideal Body Mass Index score is calculated by multiplying participants' reported ideal weights in pounds by 703 divided by their reported heights in inches squared (ideal weight * 703/ $(\text{height})^2$ = BMI kg/m^2).

In addition, one item from the Youth Risk Behavior Surveillance System is used to measure students' current efforts to change their weight (*lose weight, gain weight, maintain weight, do nothing about their weight*).

Psychological Well-Being

The 10-item Self-Esteem Scale (SES; Rosenberg, 1965) measures a global dimension of self-esteem. For each item, participants rate their level of agreement ranging from 1, *strongly disagree*, to 4, *strongly agree*. Total scores are determined by summing the 10 items, and range from 0, *low self-esteem*, to 40, *high self-esteem*.

Strong internal consistency (alpha = .88) and test - retest (.82) reliabilities were found for a college student sample (Gray-Little, Williams, & Hancock, 1997). Cronbach's alpha for the current sample was .87. Additionally, Gray-Little et al. (1997) reported item-total correlations that ranged from .61 to .76. Factor analysis produced factor loadings for each of the 10 items that ranged from .60 to .78 (Gray-Little et al., 1997). The SES has correlated with other measures of self-esteem, including the Coopersmith Self-Esteem Inventory (r = .59) and the California Psychological Inventory Self-Acceptance Scale (r = .66) (Robinson & Shaver, 1973).

The 5-item Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffen, 1985) provides a unidimensional measure of global life satisfaction. Participants rate their agreement with each item using a 7-point Likert scale ranging from 1, *strongly disagree*, to 7, *strongly agree*. Total scores range from 5, *minimal satisfaction with life*, to 35, *very high satisfaction with life,* with a score of 20 representing the neutral point on the scale. Most groups fall into *the slightly satisfied* to *satisfied* range with scores of 23 to 28 (Pavot & Diener, 1993).

Diener et al. (1985) reported a Cronbach's alpha of .87, and a two month test- retest reliability .82. Cronbach's alpha for the current sample was .87. The SWLS has been found to

correlate with other subjective well-being measures, such as the Differential Personality Questionnaire (r = .68), the Self-Anchoring Ladder (r = .66), and the Positive Affect Balance Scale (r =.50). Further support for the scale's criterion validity was found by Pavot and Diener (1993) as they reported the groups with the lowest scores of SWLS were psychiatric patients, prisoners, and abused women. Pavot, Diener, Colvin, and Sandvik (1991) found that participants' satisfaction with their lives was correlated with peers' ratings of them (r = .64). The SWLS can be used with adolescents (Diener et al., 1985).

The 20-item Center for Epidemiological Study, Depression Scale (CES-D; Radloff, 1977) measures depressive symptoms in the general population. Participants rate the frequency with which they have experienced each item in the last week on a four point scale ranging from 0, *rarely or none of the time*, to 3, *most or all of the time*. Total scores range from 0 to 60, with higher scores indicating more symptoms and more frequent occurrence. Although the standard cutoff score for indicating mild depression is 16, adolescents have been found to score slightly higher on the CES-D than adults (Roberts, Andrews, Lewinsohn, & Hops, 1990)

Radloff (1977) reported a Cronbach's alpha of .85, and a four week test-retest reliability of .67. The CES-D has been demonstrated to be an appropriate measure for adolescents, with internal consistency ranging from .89 to .92 across four female high school samples (Roberts et al., 1990). The Cronbach's alpha for the current sample was .90. The CES-D has been found to correlate with other measures of mood and depression, such as the Profile of Mood State Fatigue Scale (r = .66, r = .54), the State-Trait Anxiety Inventory-State version (r = .77, r = .65), and the Mental Health Summary Scale-Short Form, (r = -.65, r = -.67) in both cancer patient and healthy comparison groups, respectively (Hann, Winter, & Jacobsen, 1999).

Procedure

The data for this study is archival, and was collected in the spring of 2004 as part of a longitudinal project. Parents of participants who volunteered for this study received an information letter in advance of the data collection period, explaining the general topic of research and that the participants would complete questionnaires individually during their physical education class period. In addition, the letter described the voluntary nature of the study, and required one parent's signature indicating consent for his / her daughter to participate in the study. A graduate student researcher verbally explained to participants the purpose of the study and the method used to maintain confidentiality, which included omitting their names and using number coded questionnaires. Participants completed an informed consent form that explained their rights as voluntary participants, returned one copy of the informed consent to the researcher, and received one to keep. The researcher distributed the numbered packets of self-report questionnaires to the participants to be completed by hand, instructed them to answer each item as honestly as possible, and then answered any questions. Participants took about 30 minutes to complete the above-described questionnaires, which were counterbalanced to control for ordering effects. When finished, the participants returned the packets to the researcher and were thanked for their participation and time. Due to the intended longitudinal nature of the study, consent forms and questionnaires were coded with corresponding numbers. Responses on questionnaires in the second data collection will be matched to participants' original responses.

Data Analysis

Structural Equation Modeling

Structural Equation Modeling was used to test the proposed models in this study.

A sample of 363 participants was adequate in order to utilize SEM to analyze the data (Bentler & Chou, 1987). SEM is a multivariate statistical method of relating the observed measures to their proposed theoretical constructs in a theoretically derived model (Bentler, 1980). The adequacy of the representations are measured by the degree of fit of the proposed model to the observed data.

The EQS Structural Equations Program (Bentler, 1995) was used to perform the SEM analysis in this study. EQS implements a mathematical and a statistical model to analyze the structural equation models. The mathematical model uses a variety of covariance models, while the statistical model estimates parameter values and tests models using traditional multivariate normal theory, and general distribution theories.

The primary index of fit is the chi-square (χ^2). A significant χ^2 is used to conclude that a particular model does not fit the data. A small, non significant chi-square indicates that a model is a good representation of the actual observed data. Additionally, a p-value is determined, which indicates the likelihood that the sample data would be obtained if the proposed model was correct in the population. However, there are some limitations to using a χ^2 test. First, the χ^2 is affected by sample size (Bollen & Long, 1993). A large sample ($N > 100$) increases statistical power, and in this case, excessive power can lead to making a Type II error. It is possible to obtain a significant χ^2, even though the hypothesized model is actually a good fit. Additionally, a χ^2 is affected when assumptions, such as multinormality are violated. If the assumption of multinormality is false, then the χ^2 may not be distributed as expected, causing a model to be rejected even though it is conceptually correct. Due to these limitations, additional methods are used to evaluate the model's goodness of fit.

The incremental fit indices are used to compare the hypothesized model to a null model. The specific indices utilized were the Non-normed Fit Index (NNFI; Bentler & Bonnett, 1980),

and the Comparative Fit Index (CFI; Bentler, 1990). The NNFI compares the chi-square value of the purposed model to the chi-square value of an alternative model with uncorrelated variables. In addition, the NNFI incorporates the degrees of freedom in the model. Values can exceed 1 and fall below 0, and values over .9 are considered to indicate an acceptable fit. It has been suggested that the criteria of .95 and above are better indicators of model fit (Hu & Bentler, 1999). The CFI compares the non-centrality parameters between the proposed and null models. The observed values range from 0 to 1, with values over .90 indicating good fit. Additionally, the NNFI and the CFI may perform better with nonnormal data. To help control for biases that occur due to outliers or non-normally distributed data, EQS utilizes the Satorra Bentler Chi-Square as a robust estimate. The Satorra Bentler Chi-Square is based on the calculation of the chi-squared index, using robust parameter values (Chou, Bentler, & Satorra, 1991).

EQS also utilizes two absolute fit indices: the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA). The SRMR is the average difference between the predicted and the observed variances and covariances in the proposed model, based on standardized residuals (Ullman, 1996). Small SRMR values are associated with better fit. Values below .08 suggest that the model is correctly specified. A value of 0 indicates a perfect fit. The RMSEA (along with its corresponding 90% Confidence Interval) is used as a measure of the discrepancy per degree of freedom for the model (Browne & Cudeck, 1993). This provides an estimation of the lack of fit of the model to the estimated population covariance matrix (Browne & Cudeck, 1993). A value of 0 indicates that the model fits exactly, and a value of .05 or less indicates that the model is a close fit.

Parameters whose estimates are large compared to their standard errors indicate that the parameter is significant (Bentler, 1980). When the parameters are small compared to their

standard errors, the parameters can be eliminated from the model. This evaluation process leads to the modification of a model by removing paths. In addition, a univariate test (Z test) can be used in order to determine a parameter's consistency with a population value. This is done by dividing the parameter estimate by the SE.

Structural Equation Modeling involves a two step process. First, confirmatory factor analysis (CFA) is used in order to determine what observed variables best represent the latent constructs. This is confirmed by the observed variables adequately loading on the latent constructs as they are hypothesized by the existing theory. If the observed variables do not load significantly (t-value < 1.96), they are dropped from the model. Additionally, variables may not be included in the model if they correlate too highly with other measured variables (average absolute standardized residuals > .05).

The second step is measuring the fit of the structural model, which is tested by comparing the proposed model to alternative models, and measuring the degree to which the covariance predicted by the proposed models correspond to the observed covariance in the data. If a hypothesized model is not found to fit with the observed data, methods of removing parameter restrictions are used to improve the fit of the model (Bentler & Chou, 1993). EQS utilizes two methods, the Wald test and the Lagrange Multiplier (LM) test. These tests indicate the effect on the χ^2 that would occur by respecifying one or more of the parameters. The Wald test evaluates the effect of eliminating free parameters from a model in order to improve the model fit. The LM indicates the effect of adding a free parameter to a restricted model in order to improve the model fit. An improved model fit for a respecified model is demonstrated by a decrease in the chi-square, SRMR, or RMSEA, or by increases in the NNFI, or CFI. In addition, a priori hypothesized alternative models may be compared by examining the improvements of the

incremental, absolute and predictive fit indices, and by conducting chi-square difference tests. The predictive fit index utilized by EQS is the Akaike Information Criterion (AIC) and measures the fit of the model if it were tested in other samples of the same population (Weston & Gore, 2006). Increases in the NNFI or CFI, indicate improved fit. Similarly, decreases in chi-square, SRMR, RMSEA, or AIC indicate an improvement in model fit of the alternative model over the originally specified model. For the purposes of this study, one hypothesized model and two alternative models, each for sport participation and physical activity, were specified a priori and tested. The hypothesized model and hypothesized alternative models are displayed in Figures 1-6.

Structural equation modeling can also be utilized to test for mediating effects of body image, physical self-concept, and instrumentality between the sport and physical activity and psychological well-being relationships. Frazier, Tix, and Barron (2004), outline specific steps to analyze mediating effects in SEM. First, three pathways are initially tested: a) the direct pathway from the predictor variable to the outcome variable, b) the pathway from the predictor variable to the mediator variable, and c) the pathway from the predictor variable to the mediator variable, to the outcome variable. If the strength of the relationship between the predictor and outcome variables becomes zero or is significantly reduced when the mediator is included, the relationship is considered to be fully mediated. In addition the significance of the mediated effect is tested by comparing the fit of the models with and without the direct pathway. If the model with the direct pathway does not provide a better fit, then the mediational model is supported (Frazier et al., 2004)

Multivariate Analysis of Variance

Multivariate analysis of variance (MANOVA) tests were used in order to examine differences in body image, physical self-concept, instrumentality, and psychological well- being between different activity groups. MANOVAs are used to examine differences between groups across multiple conceptually related dependent variables simultaneously. The alpha level used to determine significant differences between groups in the MANOVA tests was .01 ($p < .01$). A post hoc Scheffe's test was utilized to examine the specific differences among the activity groups.

Specifically, participants were divided into inactive (no extracurricular activity, no sport participation, and no physical activity), extracurricular activity (no sport participation and no physical activity), sport participation (no extracurricular activity and no physical activity beyond sport) and physical activity (no extracurricular activity, no sport participation) groups. To more specifically examine differences between sport participation and physical activity, these groups were further divided into levels. Based on previous research (Boyer & Petrie, 2005; Parsons & Betz, 2002), sport participation was divided into low (participation in one sport) and high (participation in two or more sports) levels. Based on recommendations for sufficient physical activity for adolescents (Center for Disease Control and Prevention, 2004), physical activity groups were divided into low frequency (vigorously active 1-2 times per week for at least twenty minutes), moderate frequency (vigorously active for 3-4 times per week for at least twenty minutes) and high frequency (vigorously active 5-7 times per week for at least 20 minutes) levels. Overlap in groups may occur due to students' participation in multiple types of specific activities. Therefore, groups may be combined to form broader activity groups.

CHAPTER 3

RESULTS

Descriptive Analysis

The raw data were initially examined for missing data. Ten cases (2.82 %) were missing entire measured variables, so these cases were removed from the data. Of the 355 remaining cases, 219 individual data values across all the measured variables were missing. These values were replaced by calculating the mean score of the scale for each individual for each of the measured variables.

Measured variables were then totaled and descriptive statistics run to determine means, standard deviations, and the distributional properties. Additionally, internal consistency reliability analyses were run for each measured variable. See Table 1 for means, standard deviations, skewness, kurtosis, and Cronbach's alphas for all measured variables. Results indicated that all measured variables, with the exception of BMI Difference (slight kurtosis), appeared to be in acceptable ranges, and therefore demonstrated bivariate normality. Multivariate normality was tested by obtaining Mardia's Coefficients (Mardia, 1970) for each model. The obtained Mardia's Coefficients indicated multivariate kurtosis for both the sport participation and physical activity models (Mardia's normalized estimate = 9.56 and 11.32, respectively); however, Maximum likelihood (ML) estimation was still utilized as recent research suggests that ML is robust to violations of multivariate non-normality (Olsson, Foss, Troye, & Howell, 2000).

Correlations were run to examine the bivariate relationships among measured variables. Correlations that had an alpha level of .01 or less ($p < .01$) were considered significant. All relationships were in the expected directions. See Table 2 for a correlation matrix of the measured variables.

Hypothesis Testing

Sport Participation Measurement Model

Confirmatory factor analysis of the measurement model was begun on the construct of body image. The BMI difference (value of the difference between the participants' reported BMI and ideal BMI), Body Parts Satisfaction Scale- Revised Body (BPSS-R Body), and the Body Parts Satisfaction Scale-Revised Overall item (BPSS-R Overall) were tested on the Body Image factor. The BMI difference variable loaded negatively on the construct, and the BPSS-R Body and Overall items loaded positively, designating the body image construct as representing positive body satisfaction.

Next, the construct of instrumentality was added to the model next. The Personal Attribution Questionnaire- Masculine scale (PAQ-M) and the Instrumentality Scale (IMTS) were tested, and both loaded positively and significantly on the Instrumentality factor.

The physical self-concept construct was then added to the existing model. The Physical Self Description Questionnaire's Strength, Flexibility, Coordination, Endurance, and Sport Competence scales were tested on the construct. All loaded positively on the factor; however, the Flexibility variable appeared to be too highly associated with the other measured variables, and thus created large standardized residuals. Therefore, this scale was dropped from the model. Therefore, the physical self-concept construct was represented by Sport Competence, Endurance, Strength, and Coordination, and was oriented such that higher scores represented greater competence.

The psychological well-being construct was added next. Rosenberg's Self-Esteem Scale (SES), Satisfaction With Life Scale (SWLS), and the Center for Epidemiological Studies-Depression scale (CES-D) were tested. The SES and SWLS variables loaded positively on the

construct whereas the CES-D variable loaded negatively. Therefore, positive self-esteem, higher levels of satisfaction with life, and low levels of depression represent the Psychological Well-Being factor.

Finally, the sport participation construct was added. Based on past research (Boyer & Petrie, 2005; Parsons & Betz, 2001; Richman & Shaffer, 2000), the number of high school sports (Sports), average number of months participated in high school sports (Months), average number of hours participated in high school sports per week (Hours), and average involvement in high school sports (Involvement) were considered the best representations of the High School Sport Participation factor. The measured variables were tested, and all loaded appropriately on the construct. Due to non-significance, however, the error term for the Involvement variable was constrained to the value .479, which was calculated using the formula, (1-alpha) multiplied by the variance.

The EQS program for structural equation modeling and the Maximum Likelihood (ML) procedure were used to estimate the parameters of the model. Confirmatory factor analysis (CFA) supported the resulting measurement model and the overall fit of the model was good. See Table 3 for the sport participation measurement model fit indices. The standardized parameter estimates for the sport participation measurement model are displayed in Table 4 and the final measurement model is displayed in Figure 8.

Sport Participation Structural Model

The validated measurement model was modified to include the hypothesized structural pathways between latent constructs. The following hypothesized relationships were tested in the initial structural model. High School Sport Participation was hypothesized to have a direct positive effect on Body Image, Physical Self-Concept, and Instrumentality, which, in turn, were

hypothesized to have a direct positive effect on the Psychological Well-Being factor. From this perspective, Body Image, Physical Self-Concept, and Instrumentality factors were hypothesized to mediate the relationship between the Sport Participation and Psychological Well-Being factors. See Figure 1 for the hypothesized structural model.

All paths were tested simultaneously to identify the best fitting model. The initial attempt to fit all pathways as hypothesized was not entirely successful. First, the measured variables Satisfaction With Life Scale and BMI Difference produced high residuals preventing a solution from being able to converge, thus they were removed from the hypothesized model, as well as, both alternative models. Next, due to non significance, the error terms for the BPSS-R Overall and IMTS variables were set to .147 and 15.29, respectively, using the formula, (1-alpha) multiplied by the variance. Finally, the Physical Self-Concept factor loaded negatively onto the Psychological Well-Being factor. All other hypothesized pathways did load significantly onto their hypothesized factors in the expected direction. See Figure 9. The model resulted in an adequate fit. See Table 3 for fit indices.

Next, mediation was tested. First, the Sport Participation factor was tested and found to load significantly onto the Psychological Well Being Factor (with no mediating variables included). Second, the Sport Participation factor was demonstrated to load significantly and positively onto the mediating factors of Body Image, Physical Self-Concept, and Instrumentality, and the Body Image and Instrumentality factors were demonstrated to load significantly and positively onto the Psychological Well-Being factor. Physical Self-Concept was also found to load significantly onto Psychological Well-Being, however in a negative direction. Finally, mediation was demonstrated as the entire model was tested, including the direct pathway from the Sport Participation factor to the Psychological Well-Being factor, and the pathways between

the Sport Participation factor and the mediating factors and the mediating factors and the Psychological Well-Being factor (See Figure 1). Results demonstrated that the direct pathway from the Sport Participation factor to the Psychological Well-Being factor became non-significant, thus indicating that the Body Image, Physical Self-Concept, and Instrumentality factors were mediating the relationship between Sport Participation and Psychological Well-Being (Frazier et al., 2004).

A Priori Alternative Models

Structural equation modeling often involves testing specified a priori alternative models. These can be compared to the hypothesized model by examining the incremental fit of the fit indices, as well as by testing the differences between the chi-squares of the different models (if the models are nested). Two alternative models were specified a priori. The hypothesized alternative models are displayed in Figures 2 and 3.

Alternative Model # 1 was defined, a priori, based on previous research (Boyer and Petrie, 2005). It was hypothesized that Physical Self-Concept played a more central role in how sport participation contributed to psychological well-being. Specifically, the Sport Participation factor was hypothesized to have a direct effect on the Physical Self-Concept factor, and the Physical Self-Concept factor would, in turn, have a direct positive effect on the Body Image and Instrumentality factors. Additionally, the Sport Participation factor was hypothesized to have a negative direct effect on the Body Image factor, and to not have any significant direct effect on the Instrumentality factor. Therefore, the Physical Self -Concept factor was hypothesized to mediate the relationships between the Sport Participation and Body Image factors and the Sport Participation and Instrumentality factors. Both the Body Image and Instrumentality factors were hypothesized to have a direct positive effect on the Psychological Well-Being factor.

Recall that the BMI Difference and SWLS measured variables were removed from the alternative models. In addition, due to non significance, the error terms for the BPSS-R Body and IMTS variables were set to .138 and 15.29, respectively, using the formula, (1-alpha) multiplied by the variance. All pathways loaded significantly on to their hypothesized factors in the expected direction. See Figure 10. Although the Satorra-Bentler chi-square statistic was non-significant, S-Bχ^2(74, *N* =*355*) = 280.64, the remaining fit indices indicated that this model did adequately represent the data. See Table 3. In addition, the fit indices demonstrated improved fit compared to the original hypothesized model, indicating that the confirmatory model was a better representation of the data. See Table 3 for a comparison of the fit indices.

Alternative Model # 2, defined a priori, hypothesized that there was no significant direct relationship between the Sport Participation and Body Image factors. All other pathways as hypothesized in Alternative Model # 1 were hypothesized for Alternative Model # 2. Thus, it was hypothesized that the Sport Participation factor would have a direct effect on the Physical Self-Concept factor, and the Physical Self-Concept factor would, in turn, have a direct positive effect on the Body Image and Instrumentality factors. The Physical Self-Concept factor was hypothesized to directly and positively contribute to the Body Image and Instrumentality factors. Both the Body Image and Instrumentality factors were hypothesized to have a direct positive effect on the Psychological Well-Being factor. See Figure 3. Alternative Model # 2 is considered to be a nested within Alternative Model # 1.

The error terms for the BPSS-R Body and IMTS variables were set to .138 and 15.29, respectively, as they were in Alternative Model # 1. All pathways loaded significantly on to their hypothesized factors in the expected direction. See Figure 11. The model demonstrated adequate fit. See Table 3. In order to determine if Alternative Model # 2 represents a better fit of the data

compared to Alternative Model # 1, specific indices were examined. Although the incremental fit indices for Alternative Model # 2 decreased slightly compared to Alternative Model # 1, and the ACI for Alternative Model # 2 increased slightly compared to Alternative Model # 1, the chi-square difference test (Δ S-Bχ^2 = 2.55, df = 1, p >.05) was not significant. Thus, testing the second alternative model failed to indicate a significant difference between models. Because the additional path from Sport Participation to Body Image in the model did not make a significant difference in the fit, the nested (simpler model), Alternative Model # 2, is the better representation of the data.

Conclusions

The original hypothesized model for High School Sport Participation yielded pathways loading significantly in all expected directions, except for the negative relationship demonstrated between Physical Self-Concept and Psychological Well-Being. In addition, Body Image and Instrumentality were demonstrated to mediate the relationship between Sport Participation and Psychological Well-Being. Although the original hypothesized model demonstrated good fit, Alternative Model # 2 was determined to be a better representation of the data than the original hypothesized model and the Alternative Model # 1. Therefore, the best fitting model indicated that for these data, Sport Participation was positively related to Physical Self-Concept (R^2 = .47). Physical Self-Concept mediated the relationship between Sport Participation and Body Image, with Physical Self-Concept explaining 30% of the Body Image variance. The pathway from Sport Participation to Instrumentality became non-significant when Physical Self-Concept was allowed to be directly related to Instrumentality. Physical Self-Concept accounted for 23% of the Instrumentality variance. More positive body image and higher levels of instrumentality were related to greater psychological well-being (R^2 = .66).

Physical Activity Measurement Model

Confirmatory factor analysis of the measurement model was begun on the construct of body image. The BMI difference (value of the difference between the participants' reported BMI and ideal BMI), Body Parts Satisfaction Scale- Revised Body (BPSS-R Body), and the Body Parts Satisfaction Scale-Revised Overall item (BPSS-R Overall) were tested on the Body Image factor. The BMI difference variable loaded negatively on the construct, and the BPSS-R Body and Overall items loaded positively, designating the body image construct as representing positive body satisfaction.

Next, the construct of instrumentality was added to the model next. The Personal Attribution Questionnaire- Masculine scale (PAQ-M) and the Instrumentality Scale (IMTS) were tested, and both loaded positively and appropriately on the Instrumentality factor.

The physical self-concept construct was then added to the existing model. The Physical Self Description Questionnaire's Strength, Flexibility, Coordination, Endurance, and Sport Competence scales were tested on the construct. All loaded positively on the factor; however, the Flexibility variable appeared to be too highly associated with the other measured variables, and thus created large standardized residuals. Therefore, this scale was dropped from the model Therefore, the physical self-concept construct was represented by the Sport Competence, Endurance, Strength, and Coordination, and was oriented such that higher scores represented greater competence.

The psychological well-being construct was added next. Rosenberg's Self-Esteem scale (SES), Satisfaction With Life Scale (SWLS), and the Center for Epidemiological Studies-Depression scale (CES-D) were tested. The SES and SWLS variables loaded positively on the construct whereas the CES-D variable loaded negatively. Therefore, positive self-esteem, higher

levels of satisfaction with life, and low levels of depression represented the Psychological Well-Being factor.

Finally, the physical activity construct was added to the measurement model. Based on past research (Parsons & Betz, 2001; Richman & Shaffer, 2000) the Youth Risk Behavior Surveillance System Moderate item (YRBSS Moderate), Youth Risk Behavior Surveillance System Vigorous item (YRBSS Vigorous), Youth Risk Behavior Surveillance System Conditioning item (YRBSS Conditioning), Youth Risk Behavior Surveillance System Inactivity item (YRBSS Inactivity), and the Physical Self Description Questionnaire Physical Activity scale (PSDQ Physical Activity) were considered the best representations of the High School Physical Activity factor. The measured variables were tested. The YRBSS Inactivity and YRBSS Moderate items were dropped from the model as they each only accounted for less than five percent of the variance. Therefore, the YRBSS Vigorous item, YRBSS Conditioning item, and the PSDQ Physical Activity scale were considered to best represent the physical activity construct.

The EQS program for structural equation modeling and the Maximum Likelihood (ML) procedure were used to estimate the parameters of the model. Confirmatory Factor Analysis (CFA) supported the resulting measurement model and the overall fit of the model was adequate. See Table 3 for the sport participation measurement model fit indices. The standardized parameter estimates for the sport participation measurement model are displayed in Table 5 and the final measurement model is displayed in Figure 8.

Physical Activity Structural Model

The validated measurement model was modified to include the hypothesized structural pathways between latent constructs. The following hypothesized relationships were tested in the

initial structural model. Physical Activity was hypothesized to have a direct effect on Body Image, Physical Self-Concept, and Instrumentality, which in turn, were hypothesized to have a direct effect on the Psychological Well-Being. From this perspective, Body Image, Physical Self-Concept, and Instrumentality were hypothesized to mediate the relationship between the Physical Activity and Psychological Well-Being factors. All paths were tested simultaneously to identify the best fitting causal model. See Figure 4 for the hypothesized structural model.

As with the Sport Participation models, the measured variables Satisfaction With Life Scale and BMI Difference produced high residuals preventing a solution from being able to converge, thus they were removed from the hypothesized and alternative models. Due to non-significance, the error term for the IMTS measured variable was set at 15.29, using the formula, (1-alpha) multiplied by the variance. All hypothesized pathways loaded significantly in the expected directions except for the pathway from Physical Self-Concept to Psychological Well-Being, which was a significant negative relationship. See Figure 12. The model resulted in an adequate fit. See Table 3 for fit indices.

Next, mediation was tested. First, the Physical Activity factor was tested and found to load significantly onto the Psychological Well Being Factor (with no mediating variables included). Second, the Physical Activity factor was demonstrated to load significantly and positively onto the mediating factors of Body Image, Physical Self-Concept, and Instrumentality, and the Body Image and Instrumentality factors were demonstrated to load significantly and positively onto the Psychological Well-Being factor. Physical Self-Concept was also found to load significantly onto Psychological Well-Being, however in a negative direction. Finally, mediation was demonstrated as the entire model was tested, including the direct pathway from the Physical Activity factor to the Psychological Well-Being factor, and the pathways between

the Physical Activity factor and the mediating factors and the mediating factors and the Psychological Well-Being factor (See Figure 4.) Results demonstrated that the direct pathway from the Physical Activity factor to the Psychological Well-Being factor became non significant, thus indicating that the Body Image, Physical Self-Concept, and Instrumentality factors were mediating the relationship between Sport Participation and Psychological Well-Being (Frazier et al., 2004).

A Priori Alternative Models

Two alternative models were specified a priori based and are displayed in Figures 5 and 6. The Physical Activity Alternative Model # 1 hypothesized that Physical Self-Concept played a more central role in the relationship between physical activity and psychological well-being. Specifically, the Physical Activity factor was hypothesized to have a direct effect on the Physical Self-Concept factor, and the Physical Self-Concept factor would, in turn, have a direct positive effect on the Body Image and Instrumentality factors. Additionally, Physical Activity was hypothesized to have a negative direct effect on the Body Image, and to not have any direct effect on the Instrumentality factor. Therefore, the Physical Self-Concept factor was hypothesized to mediate the relationships between the Physical Activity and Body Image factors and the Physical Activity and Instrumentality factors. Both the Body Image and Instrumentality factors were hypothesized to have a direct positive effect on the Psychological Well-Being factor.

All pathways loaded significantly on to their hypothesized factors in the expected direction, except for the pathway from the Physical Activity factor to the Body Image factor, which was non significant. The removal of the non significant pathway between Physical Activity and Body Image was consistent with the a priori defined relationships in the second

alternative model (Physical Activity Alternative Model #2; See Figure 13). The Physical Activity Alternative Model # 2 demonstrated improved fit indices compared to Alternative Model # 1, thus is a better representation of the data than the original hypothesized model. See Table 3 for a comparison of fit indices.

Conclusions

The original hypothesized model for High School Physical Activity yielded pathways loading significantly in all expected directions, except for the negative relationship demonstrated between Physical Self-Concept and Psychological Well-Being. In addition, Body Image and Instrumentality were demonstrated to mediate the relationship between Physical Activity and Psychological Well-Being. Although the original hypothesized model demonstrated good fit, Alternative Model # 2 was determined to be a better representation of the data than the original hypothesized model. Therefore, the best fitting model indicated that for these data, Physical Activity was positively related to Physical Self-Concept ($R^2 = .61$). Physical Self-Concept was directly related each to Instrumentality, and Body Image, explaining 26% and 30% of the variances, respectively. More positive body image and higher levels of instrumentality were related to greater psychological well-being ($R^2 = .66$).

Multivariate Analysis of Variance

Originally, it was the intention to explore the differences between those who were inactive or participated in only extracurricular activities, only physical activity, and only sport participation. Participation in physical activity was determined by the YRBSS vigorous physical activity item that measured the frequency in which students participated in physical activity that made them breathe hard for at least 20 minutes a day. This item was based on the criteria used at the time of measurement to assess sufficient levels of physical activity.

Participants that indicated engagement in vigorous activity for at least one day were included in the Physical Activity group. Students that indicated participation in at least one sport during high school were included in the Sport Participation group. Students who reported participation in at least one extracurricular activity were included in the Extracurricular Activity group. The majority of the students in the current sample participated in more than one of these activities, therefore the number of participants in mutually exclusive groups was too small to analyze. In addition, almost all participants who reported participating in high school sports also reported engaging in vigorous physical activity. It is not clear whether the physical activity was the actual participation in their high school sport, conditioning for their high school sport, or engaging in unrelated physical activity. Therefore, the Sport Participation group consists of participants who reported participating in at least one high school sport, and engaged in vigorous physical activity. When the data were collapsed to create combined activity groups, 6 groups emerged: No Activity (n = 1), Extracurricular Activity (n = 4), Physical Activity (n = 26), Physical Activity / Extracurricular Activity (n = 84), Sport Participation (n = 65), and Sport Participation / Extracurricular Activity (n = 175). The No Activity and Extracurricular Activity groups were removed from further analyses due to the low numbers of participants in the groups. See Table 6 for means and standard deviations for each measured variable. Therefore, no group represented inactivity.

In order to examine the potential influence of participating in extracurricular activities, 2 separate analyses were run to test for differences between: (1) Physical Activity and Physical Activity / Extracurricular Activity groups; and (2) Sport Participation and Sport Participation / Extracurricular Activity groups. See Table 6. These analyses were run to determine if there were

particular benefits to participating in activities other than sports and physical activity, and if activity groups could be combined.

First, analyses were run to test for differences between the Physical Activity and the Physical Activity / Extracurricular Activity groups in physical self-competence, body image, instrumentality, and psychological well-being. Four MANOVAs were used to examine the related multiple dependent variables of each construct at the same time (physical self-concept = strength, endurance, sport competence, flexibility and coordination; body image = BMI Difference, BPSS-Overall item, and BPSS-Body; instrumentality = PAQ-M and IMTS; psychological well-being = SES, SWLS, and CES-D). Results revealed no significant group differences in physical self-concept, Wilks' Lambda $F(5, 104) = 1.58$, $p > .05$, body image, Wilks' Lambda $F(3, 106) = 2.59$, $p > .05$, instrumentality, Wilks' Lambda $F(2, 107) = 1.77$, $p > .05$, or psychological well-being, Wilks' Lambda $F(3, 106) = 1.09$, $p > .05$.

Second, four one-way MANOVAs were run to test for differences in measured variables between the Sport Participation group, and Sport Participation / Extracurricular Activity groups. Results indicated no significant group differences in physical self-concept, Wilks' Lambda $F(5, 234) = 1.5$, $p > .05$, body image Wilks' Lambda $F(3, 236) = .79$, $p > .05$, instrumentality, Wilks' Lambda $F(2, 237) = .17$, $p > .05$, or psychological well-being, Wilks' Lambda $F(3, 236) = 1.0$, $p > .05$. Therefore, participating in extracurricular activities does not appear to provide any unique contributions to the development of the psychological characteristics of physical self-concept, body image, instrumentality, and psychological well-being for high school girls.

Because no significant differences were found between the Physical Activity and Physical Activity / Extracurricular Activity groups, nor the Sport Participation and Sport Participation / Extracurricular Activity groups, they were collapsed to form a single Physical

Activity and a single Sport Participation group, respectively. In order to more specifically examine the influence of physical activity and sport participation, these two groups were divided into levels based on previous research (Boyer & Petrie, 2005;Center for Disease Control and Prevention, 2004; Parsons & Betz, 2001). Therefore, the Physical Activity group was divided into a Physical Activity Low Frequency (PA-L) group (n = 25, engaged in vigorous physical activity 1-2 times / week), Physical Activity Moderate Frequency (PA-M) group (n = 66, engaged in vigorous physical activity 3-4 times / week), and a Physical Activity High Frequency (PA-H) group (n = 19, engaged in vigorous physical activity 5 -7 times / week). The Sport Participation group was divided into a Sport Participation Low (SP-L) group (n = 110, participated in 1 high school sport) and a Sport Participation High (SP-H) group (n =130, participated in 2 or more high school sports). Four separate MANOVAs were used to test the differences between the PA-L PA-M, PA-H, SP-L, and SP-H groups in each of the following sets dependent variables: physical self-competence, body image, instrumentality, and psychological well-being. See Table 7 for the means, standard deviations, and multivariate statistics.

Results revealed that there was a significant difference between groups in physical self-concept, Wilks' Lambda $F(20, 1131.92) = 10.37$, $p < .001$, $\eta_p^2 = .13$. One-way ANOVAs revealed significant differences between activity groups on all variables. For coordination, $F(4, 345) = 23.89$, $p < .001$, $\eta_p^2 = .22$, sport competence $F(4, 345) = 39.78$, $p < .001$, $\eta_p^2 = .32$, strength $F(4, 345) = 22.75$, $p < .001$, $\eta_p^2 = .21$, flexibility $F(4, 345) = 11.11$, $p < .001$, $\eta_p^2 = .11$, and endurance $F(4, 345) = 35.18$, $p < .001$, $\eta_p^2 = .29$. See Table 7 for means and standard deviations for all groups. Post hoc Scheffe's test indicated significant differences between groups in coordination. Specifically, the SP-H and SP-L groups scored significantly higher compared to

the PA-L group (Cohen's *d* = 1.31 and Cohen's *d* = 1.13, respectively), PA-M group (Cohen's *d* =.98 and Cohen's *d* = .79, respectively), and the PA-H group (Cohen's *d* = 1.02 and Cohen's *d* = .83, respectively). No significant differences were found between the SP-L and SP-H groups, or between the PA-L, PA-M, and PA-H groups. For sport competence, the SP-H group scored significantly higher compared to the PA-L (Cohen's *d* = 1.41), PA-M (Cohen's *d* = 1.41), PA-H (Cohen's *d* = 1.07), and SP-L (Cohen's *d* = .55) groups; the SP-L group scored significantly higher than the PA-L (Cohen's *d* = .86) and the PA-M (Cohen's *d* = .86) groups. No significant differences were found between the PA-L, PA-M, and PA-H groups, or between the PA-H and SP-L groups. For strength, the SP-H group scored significantly higher in strength than the PA-L (Cohen's *d* =1.18), PA-M (Cohen's *d* = 1.10), and PA-H (Cohen's *d* = .72), groups. In addition, the SP-L group scored significantly higher than the PA-L (Cohen's *d* = .92), and PA-M (Cohen's *d* = .84), groups. No significant differences were found between PA-L, PA-M, and PA-H groups, or the SP-L and SP-H groups. Finally, no significant differences were found between SP-L and PA-H groups. With regard to flexibility, each of the SP-H and the SP-L groups scored significantly higher than the PA-L (Cohen's *d* =.68 and Cohen's *d* = .69, respectively) and PA-M groups (Cohen's *d* =.50 and Cohen's *d* = .52, respectively). Differences were not indicated between PA-L, PA-M, and PA-H groups, or the PA-H, SP-L and SP-H groups. Finally, the SP-H group scored significantly higher in endurance than the PA-L (Cohen's *d* = 1.63), PA-M (Cohen's *d* = 1.17), PA-H (Cohen's *d* = 1.18), and SP-L (Cohen's *d* = .53) groups; and the SP-L group scored significantly higher than the PA-L (Cohen's *d* = 1.11), PA-M (Cohen's *d* = .64), and PA-H (Cohen's *d* = .65), groups. The PA-L, PA-M, and PA-H groups did not differ significantly from each other in endurance. Overall, results suggest that those who participate in high school sports have higher perceptions of their physical skills compared to high school

students who only participate in physical activity. Participants in two or more high school sports appear to have greater physical self-competence, in particular, compared to the physical activity groups and those that only participate in one high school sport. Finally, the level of physical activity does not appear to have a significant influence on female adolescents' perceptions of physical skills.

The MANOVA also indicated significant group differences in body image, Wilks' Lambda $F(12, 907.78) = 2.67$, $p < .01$, $\eta_p^2 = .03$. One-way ANOVAs revealed differences on the BPSS-Body factor, $F(4, 345) = 6.57$, $p < .001$, $\eta_p^2 = .07$, and for the BPSS-Overall item, $F(4, 345) = 6.91$, $p < .001$, $\eta_p^2 = .07$, but not for the BMI difference factor, $F(4, 345) = 1.78$, $p > .05$. (See Table 7 for means and standard deviations for all groups.) Specifically, post hoc Scheffe's analysis revealed that the SP-H group reported significantly higher body satisfaction than the PA-L (Cohen's $d = .92$) and PA-M (Cohen's $d = .52$) groups. In addition, those that participated in the SP-L group reported significantly higher body satisfaction than the participants in the PA-L (Cohen's $d = .74$) group. No significant differences were found in body image between the PA-L, PA-M and PA-H groups, nor between the SP-H, SP-L, and PA-H groups. Finally, no significant differences were evident between the SP-L and PA-M groups. Results revealed the same pattern of significant differences between groups in the overall body satisfaction item. The SP-H group reported significantly higher body satisfaction than the PA-L (Cohen's $d = 1.0$) and PA-M (Cohen's $d = .47$) groups. In addition, those who participated in the SP-L group reported significantly higher body satisfaction than the participants in the PA-L (Cohen's $d = .80$) group. No significant differences were found in body image between the PA-L, PA-M and PA-H groups, nor between the SP-H, SP-L, and PA-H groups. Finally, no significant differences were evident between the SP-L and PA-M groups.

Results suggest that for high school girls, participating in at least one or more sports is associated with higher body satisfaction compared to those who only participated in low and moderate levels of physical activity.

A one way MANOVA indicated significant differences in instrumentality between activity groups, Wilks' Lambda $F(8, 688) = 2.61$, $p < .01$, $\eta_p^2 = .03$. Univariate ANOVAs demonstrated significant group differences on the PAQ-M, $F(4, 345) = 4.54$, $p = .001$, $\eta_p^2 = .05$, and the IMTS, $F(4, 345) = 2.45$, $p < .05$, $\eta_p^2 = .03$. See Table 7 for means and standard deviations for all groups. Post hoc Scheffe's tests revealed that the SP-H group scored significantly higher than the PA-L group (Cohen's $d = .78$) on the PAQ-M scale. Significant differences were not found between the PA-L, PA-M, PA-H, and SP-L groups, or between the PA-M, PA-H, SP-L, and SP-H groups. Although results from the ANOVA indicated significant differences between groups on the Instrumentality Scale, post hoc Scheffe's tests between groups were insignificant. Physical activity and sport participation groups were collapsed in order to test for differences in scores on the Instrumentality Scale between physical activity and sport participation in general. An Independent Samples t-test revealed that those that participated in high school sports ($M = 74.22$, $SD = 9.14$), reported significantly higher levels of instrumentality compared to those who only participated in physical activity ($M = 71.21$, $SD = 9.73$), $t(348) = -2.801$, $p = .005$ (two-tailed). Therefore, high school females who participated in high school sports, particularly two or more sporst, consistently had higher levels of instrumentality than the high school females who only participated in physical activity.

Finally, the one way MANOVA demonstrated significant group differences in psychological well-being, Wilks' Lambda $F(12, 907.784) = 3.21$, $p < .001$, $\eta_p^2 = .04$. Follow-up univariate ANOVAs indicated significant group differences for depression, $F(4, 345) = 3.66$,

$p < .01$, $\eta_p^2 = .04$, and satisfaction with life $F(4, 345) = 2.93$, $p < .05$, $\eta_p^2 = .03$, but not for self-esteem $F(4, 345) = .915$, $p > .05$. See Table 7 for means and standard deviations of all groups. Scheffe's post hoc tests revealed that the SP-H, SP-L, and PA-M groups reported significantly lower levels of depression compared to the PA-H group (Cohen's $d = .87$, Cohen's $d = .89$, and Cohen's $d = .91$, respectively). No significant differences were found in depression between the PA-L, PA-M, SP-L, and SP-H groups, or the PA-H and PA-L groups. Although a univariate ANOVA test indicated significant differences between groups on satisfaction with life, post hoc analysis indicated no significant results between the PA-L, PA-M, PA-H, SP-L, and SP-H groups. Physical activity and sport participation groups were collapsed in order to test for differences in scores in satisfaction with life between physical activity and sport participation in general. An independent samples t-test revealed that those that participated in high school sports ($M = 24.32$, $SD = 5.94$) reported significantly higher satisfaction with life compared to the students who only participated in non-sport physical activity ($M = 21.95$, $SD = 6.54$), $t(348) = -3.353$, $p = .001$ (two-tailed). Thus, participating in sport appears to have more benefits with regard to satisfaction with life compared to only being physically active.

CHAPTER 4

DISCUSSION

This study examined the psychological benefits of participation in high school sports and non-sport physical activity for adolescent females. Specifically, it was hypothesized that sport participation would lead to increased psychological well-being and that positive body image, instrumentality, and physical self-concept would mediate the relationship between sport and psychological well-being. Further, this study examined the more central role that physical self-concept may have on the development of positive body image and instrumentality through sport participation. Although physical activity was conceptualized as a different activity than organized sport, it was hypothesized to have similar psychological benefits as sport. In addition, this study compared the benefits between participating in high school sports, engaging in physical activity, and being inactive to see what the relative psychosocial benefits were to engaging in different forms of activity.

Sport Participation, Physical Activity, Mediating Variables, and Psychological Well-Being

As hypothesized, sport participation and physical activity were found to contribute positively to physical self-concept, body image and instrumentality, and these variables were found to mediate the relationships between sport participation and psychological well-being and physical activity and psychological well-being. Specifically, being involved in high school athletics and being physically active each promoted more positive development of physical skills, body satisfaction, and instrumental characteristics, such as assertiveness and self-reliance, which in turn led to more positive overall psychological health. These findings are consistent with previous research (Bowker, 2006; Boyer & Petrie, 2005; Delaney & Lee, 1995; Richman & Shaffer, 2000; Sonstroem, 1997). However, the final models revealed that physical self-concept,

represented by perceptions of strength, endurance, coordination, and sport competence, mediated the effects of sport participation and of physical activity on both instrumentality and body image (Frazier, Tix & Barron, 2004).

The centrality of physical self-concept to each of the sport-instrumentality and physical activity-instrumentality relationships suggests that sport participants and physically active students rate themselves higher on characteristics such as independence and assertiveness when they perceived themselves to be physically skilled. Past research has supported associations between sport participation, positive physical perceptions, and instrumental characteristics, (Bowker, Gadbois, & Cornack, 2003; Marsh & Jackson, 1986); however only one other study (Boyer & Petrie, 2005) has tested for the mediating effect that physical self-concept has within the sport-instrumentality relationship for adolescent females. As an achievement oriented environment, sport offers opportunities for developing leadership, competitiveness, and decision making skills, and thus could directly contribute to the development of instrumentality. However, for young adolescent female athletes, sport participation appears to contribute most directly to their perception of themselves as being physically capable and competent, which in turn, relates to their instrumentality. It may be that as sport offers opportunities to focus on objective goals of increasing strength, coordination, endurance, and sport related skills to improve performance, opportunities are created to feel a sense of control over one's competencies and sport outcomes. Therefore, the process of pursuing a physical goal, as well as accomplishing such goals, may lead to increased perceptions of personal competence, agency, and self-reliance. In addition, higher levels of physical skills could increase female athletes' perceptions that they have the necessary abilities to meet the demands of the physical challenges presented within the sport context. Thus, a greater sense of confidence, ability to handle pressure,

and competitiveness could be fostered through greater perceptions of their own physical competence.

Similarly, previous research has indicated a relationship between instrumental characteristics and physical activity (Delaney & Lee, 1995; Parsons & Betz, 2001); however no other studies have examined the mediating role of physical self-concept within this relationship. Engaging in non-sport physical activity does not necessarily occur within a structured environment that directly facilitates or reinforces instrumental characteristics. Rather, engaging in physical activity provides opportunities for females to develop and increase perceptions of physical capabilities through setting and accomplishing exercise goals. By successfully completing physical challenges through one's own physical strength and endurance, perceptions of self reliance, agency and confidence may be enhanced, contributing to a greater sense of personal competence. Therefore, as with sport participation, greater perceptions of physical competence in turn, lead to perceptions of instrumentality. These findings highlight the importance of encouraging females at a young age to participate in sport and other activities that develop physical competence, and subsequently instrumental traits, and to continue to participate in these activities throughout their adolescence. Instrumentality is important to foster in adolescence as it is related to other benefits such as self-esteem, relationship satisfaction, and protection from depression (Butcher, 1989; Russo, Green, & Knight, 1993; Stake, Zand & Smalley, 1996). Finding methods to developing instrumentality in females particularly is important as they are less likely than males to be socialized to adopt these characteristics (Spence, Helmreich, & Stapp, 1975).

Physical self-concept also mediated the relationships between sport participation and body image, and physical activity and body image. Initially, sport participation and physical

activity were found to have positive direct relationships with body image respectively; however, when paths were included between physical self-concept and body image, the relationships between sport participation and body image, and physical activity and body image changed. Specifically, the relationships between sport participation and body image, and physical activity and body image became non-significant. Therefore, in the models, sport participation and physical activity contributed to greater body satisfaction only as they were related to stronger perceptions of physical competence. The more physically skilled and capable the female adolescents felt, the more they evaluated their bodies positively, which is consistent with the past research. For example, Cook-Cottone and Phelps (2003) found that physical self-concept accounted for 45% of the body satisfaction variance among college females. In addition, physical self-concept was the only aspect of the multidimensional self-concept that was significantly related to body satisfaction for a sample of African-American college females (James, Phelps, & Bross, 2001). These findings are important considerations for both the sport participation – body image, and physical activity- body image relationships, as previous research has yielded equivocal results (Hausenblaus & Downs, 2001; Hausenblaus & Fallon, 2006). We may now have a clearer understanding of how sport and exercise contribute to body satisfaction. By being physically active, developing strength and coordination, and learning new physical skills, athletics and exercise provide young females with the opportunity to become more aware of and confident in what their bodies can do. Such body competence has positive implications for protecting against the potential damaging effects of body related concerns for young women. For example, females in this society are at risk for internalizing the "ultra thin" cultural body standards and for being sexually objectified by others through their bodies being viewed to exist for the pleasure of others (Fredrickson & Roberts, 1997). These factors have been found to

contribute to negative body image, which in turn is one of the strongest contributors to unhealthy weight control behaviors and disordered eating for adolescent females (Neumark-Sztainer, Wall, Story & Perry, 2003). However, focusing on the skills that the body can execute and physically accomplish may potentially serve as a way to combat the socio-cultural pressures to maintain the thin ideal and the shame associated with body objectification, thereby serving as a protective factor against eating disorders. Illustrating this concept, Harrison and Fredrickson (2003) found that for adolescent females, reading sport- related magazines (which are more likely to be focused on what the body can do compared to traditional fashion magazines) was negatively correlated with body dissatisfaction, shame, and eating disturbances. Therefore, developing strong perceptions of physical skills has clear beneficial effects on body image and thus strongly underscores the importance of early involvement in sport and physical activity. More research is necessary to further examine the relationships between sport participation, physical activity, physical self-concept, socio-cultural pressures, and body satisfaction.

Mediating Variables and Psychological Well-Being

Consistent with previous research (Frost & McKelvie, 2004; Levine & Smolak, 2001; Richman & Shaffer, 2000), positive body image contributed to overall psychological well-being including higher levels of self-esteem and lower levels of depression. Appearance and attractiveness have been found to be especially important factors in peer acceptance and self-perceptions for high school girls (Harter, 1990). Thus, by feeling more satisfied with their bodies, female adolescents may feel more attractive and perceive themselves to be more accepted socially, which in turn increases their sense of self-worth.

Additionally, instrumentality contributed to the overall psychological well-being of the female adolescents. Research has found a consistent relationship between female athletes,

instrumentality, and greater self-esteem (Butcher, 1989; Marsh & Jackson, 1986; Richman & Shaffer, 2000). Instrumentality influences adolescent girls' self-esteems in similar ways as body satisfaction. As girls perceive themselves to be more independent, assertive, and competitive, which are valued traits in our society, they may feel they fit society's standards more, and thus may feel more positively about themselves overall. In addition, instrumental characteristics represent traits that are associated with achievement and feeling personally competent. It would make sense that feeling agentic, that is, able to assertively and independently handle the situation in one's life, would lead to higher evaluations of global self-worth.

Physical self-concept was initially found to have a negative relationship to psychological well-being; however the final model demonstrated that physical self-concept was not directly related to the psychological well-being of female adolescents. Although this finding was consistent with the previous research by Boyer and Petrie (2005), it was inconsistent with other research results (Bowker, 2006; Dishman et al., 2006; Richman & Shaffer, 2000; Sonstroem, 1997). These inconsistencies may be due to differences in how physical self-concept has been represented. For example, Richman and Shaffer (2000) used physical self-concept scales that included appearance and body fat, factors that have been related to both global physical self-concept and global self-esteem (Fox, 1997; Harter, 1990). Further, Sonstroem (1997) found that physical competence scales, such as strength, were only weakly related to overall physical self-concept and global self-esteem. Therefore, when physical self-concept is represented by feeling competent in specific physical areas, such as strength, flexibility, endurance, coordination and sport competence, it may not be directly related to global self-esteem or psychological well-being. Therefore, when physical self-concept is more broadly represented, and includes factors

such as body attractiveness and appearance, it may explain young women's evaluation of their overall worth. Both Bowker (2006) and Dishman et al. (2006) found that perceptions of body fat and appearance, along with perceived strength, physical activity, coordination, and flexibility, were significant contributors to global physical self-concept, which was directly related to self-esteem. Thus, when comparing the results of different studies, it will be important to take into account the ways in which self-concept have been operationalized. Dishman et al. (2006) further found that self-esteem was in turn, negatively related to depression, demonstrating that through global physical self-concept, and in turn self-esteem, sport and physical activity can indirectly affect levels of depression. In future research, investigators will need to clearly define how they are conceptualizing and measuring self-concept, as well as be consistent in the psychological benefits to which physical self-concept is examined.

Overall, sport participation and involvement in physical activity provide high school girls with avenues for developing physical skills and the perceptions of physical competence, which is associated with more body satisfaction and higher levels of instrumentality. Physical competence, particularly with regard to conditioning and sport, also is important because it may contribute to continued engagement in physical activity for youth ages 10-14 years old (Crocker, Eklund, & Kowalski, 2000). Therefore, the very perception of being competent may help motivate younger females to continue to be physically active as they progress through high school. As females still tend to spend less time being physically active and are more likely to drop out of sport throughout high school than males (National Council of Youth Sport, 2001; Neumark-Sztainer, Goeden, & Story, 2004), developing greater physical competence in middle school and / or early in high school is important because it may facilitate continued involvement in sport, and / or influence females to be physically active outside of organized sport throughout

high school and into college. Additionally, instrumentality and positive body satisfaction were influenced by sport participation and physical activity through its development of physical competence. Thus, continued involvement in sport and remaining active physically, have important psychosocial benefits, such as the development of positive body image and instrumentality, and subsequently greater psychological well-being.

Conclusions

Results indicated that there were similar benefits associated with participating in high school sports or physical activity. Overall, the relationships between sport participation and physical activity, body image, physical self-concept, instrumentality, and psychological well-being were supported, and the central role of physical self-concept to the development of positive body image and instrumentality was confirmed.

Relative Psychosocial Benefits of No Activity, Physical Activity, or Sport Participation

Overall, participation in extracurricular activities does not appear to be uniquely related to positive body image, physical self-concept, instrumentality, nor psychological well-being. There are, however, benefits to participating in high school sports, in particular in comparison to engaging in low and moderate frequencies of vigorous physical activity.

The high school girls who participated in sport reported higher levels of physical competence, such as strength, flexibility, coordination, endurance and sport competence, than those who only participated in non-sport physical activity. Participation in two or more sports appeared to be particularly more beneficial compared to only participating in one sport for the development of sport skills and endurance; however, participation in only one sport was associated with higher perceptions of strength, flexibility, coordination, endurance and sport competence than low and moderate frequency levels of physical activity. Past research has found

that high school athletes report higher levels of physical self-concept, physical abilities, and the specific skills of endurance, sport competence, and coordination, compared to non-athletes (Marsh, 1998; Marsh & Jackson, 1986; Schumaker, Small & Wood, 1986). Such differences were larger for female athletes and non-athletes compared to males, indicating that participating in sport is a particularly important avenue for the development of physical skills and competence for high school girls. Through strength training, conditioning and drills on sport technique, opportunities not found in other areas of society are offered for girls to develop themselves physically. Whereas boys may have other socially accepted avenues for developing physical competence, such as building and repairing, sport may be the primary (and most socially acceptable) avenue for girls. By receiving technical feedback from coaches and from competition itself, girls receive direct information regarding their specific sport skills, strength, endurance, flexibility, and coordination, which may reinforce and solidify their physical perceptions. Research has shown that feedback is an important component in developing perceptions of competence (Harter, 1986). Feedback may be less available to those who are physically active outside of a structured sport environment. Therefore, sport participation may offer more possibilities to develop greater physical competence than just being physically active because of the broad training environment focused on the development of multiple skills, and the opportunities present to receive technical feedback from coaches and important others.

Consistent with past research, the high school girls who participated in sport also reported higher levels of instrumentality than those who only engaged in low frequency levels of non-sport physical activity (Andre & Holland, 1995; Marsh & Jackson, 1986). In comparison to those who are only active one or two times per week, sport participation was associated with greater instrumentality through the achievement nature of the sport environment and the opportunities

that sport offers for participants to develop and demonstrate leadership behaviors, decision making skills, and competitiveness. In addition, higher levels of instrumentality among sport participants also may be due to higher levels of physical self-concept. Although participating in one sport was related to increased instrumentality, being involved in two or more sports appears to have even greater benefits. Parsons and Betz (2001) also found that athletes only scored significantly higher in instrumentality if they participated in two or more sports, compared to only participating in one sport. Therefore, the number of sports, teams, and athletic opportunities may be an important factor for women in relation to the development of instrumentality. It also may be that girls who perceive themselves as self-determined and agentic may be more likely to participate in achievement oriented activities such as sport, and may choose to participate in more than one sport, compared to just being physically active. Longitudinal research could help determine the causal relationship between sport participation and the development of instrumentality.

Adolescent females who participated in two or more sports reported higher body satisfaction than those who participated in low and moderate frequency levels of physical activity. Girls who were physically active at least 5 times per week did not differ in their body image significantly from those who participated in sport or from those who participated in low and moderate levels of physical activity. Past research has demonstrated that athletes have a more positive body image than non-athletes (Hausenblas & Downs, 2001). Higher body satisfaction in athletes could be partly due to the contribution that participating in sport has toward the development of greater physical competence, which was found to be positively related to body image. The more physically skilled and capable female adolescents feel, especially if it is relevant to achieving in their sports, the more positively they may evaluate their

bodies. Also, participating in at least two sports, compared to engaging in low and moderate frequency levels of physical activity, may provide sufficient opportunities to develop a toned, physically fit physique, which is more similar to the socio-cultural standard of the "ideal" body (Hausenblas & Downs, 2001). Having a similar body to the "ideal" body may produce more overall body satisfaction.

No significant differences in self-esteem were found between high school girls who participated in physical activity or sport. The average in self-esteem for each of the groups was just above 3 out of a 4-point rating, indicating moderate to high self-esteems. Past research has demonstrated positive relationships between sport and physical activity and self-esteem (Bowker 2006; McAuley, 1994; Sonstroem, 1997). It is important to note that both physical activity and sport participation appear to contribute to global self-worth for high school girls. Thus, remaining physically active could be especially important for females as they leave organized sports, such as during the transition from high school to college. In contrast, differences were found between sport participation and engagement in physical activity with regard to life satisfaction. Satisfaction with life was significantly higher for those who participated in sports, compared to those who only participated in non-sport physical activity. Participating in sport and engagement in low and moderate frequency levels of physical activity was associated with significantly lower levels of depression than participation in high frequency level of physical activity. This was unexpected, as previous research supports an inverse relationship between physical activity and depression for females (Wise, Adams-Campbell, Palmer, & Rosenberg, 2006), as well as demonstrates the benefits of using physical activity as a treatment for depressive symptoms (Burbach, 1997). For this particular sample, the high frequency physical activity group reported higher than average levels of depression ($M = 24.71$), scoring in the

moderate depression range and meeting the cutoff score that indicates clinical depression for adolescent females (Roberts, Andrews, Lewinsohn, & Hops, 1990). All other groups scored below the cut-off score of suggesting mild depression. Although it is unclear what factors may be influencing the experience of increased depression in the group in this sample that engages regularly in vigorous physical activity, past research has indicated a relationship between excessive exercise and problems related to both eating disorders and depression. Engaging in excessive exercise is prevalent among females diagnosed with anorexia nervosa, and symptoms of anorexia nervosa can lead to excessive exercise (Davis et al., 1997). Further, ratings of depressive symptoms and anxiety have been found to be elevated in excessively exercising eating disorder patients (Penas-Lledo, Vaz Leal, & Waller, 2002). In addition, over-activity and overtraining can lead to burnout, which is associated with disturbances in mood, such as increases in depression (McKenzie, 1999). Determining which activities, and what frequency and intensity, are associated with higher levels of self-esteem and lower levels of depression for high school girls is especially important as females compared to males tend to: (a) have lower levels of self-esteem, (b) be more likely to experience decreases in self-esteem throughout adolescence, and (c) be more likely to suffer from depression (Kling, Hyde, Showers, & Buswell, 1999; Zimmerman, Copeland, Shope, & Dielman, 1996).

Although both sport participation and physical activity appear to contribute to self-esteem, results suggest that there may be psychosocial factors within the sport participation context particularly that promote life satisfaction, as well as protect against depression. First, students who participate in sports and physical activity may report higher body image and instrumentality, which are important for psychological well-being. Also, participation in sport provides an opportunity to belong to a team and work together with peers. As girls are socialized

to value cooperation and relationships, sport may contribute to increased feelings of self-worth and satisfaction with life as it offers an avenue to build these valued relationship skills. Indeed, girls self-report that making friends is one of the most important reasons why they participate in team sports (Ryckman & Hamel, 1992). In addition, sport continues to have status and value in our society and high schools, and students who participate in sport may be more accepted by their peers and have greater popularity (Harter, 1986; Melnick, Vanfossen, & Sabo, 1988), which may cause these athletes to evaluate themselves more favorably and be more satisfied with their life. Singly or in combination, these factors could facilitate greater psychological well-being in those who participate in sport or physical activity, which is critical because of the relationship with other positive outcomes such as higher academic achievement, reduced negative affect and reduced engagement in risky behaviors (Bergman & Scott, 2001; Irwin, Berg & Cart, 2002).

Overall, female adolescents who participated in sport had higher levels of physical self-competence, instrumentality, body image, and psychological well-being than high school students who were only involved in low and moderate frequency levels of physical activity. It is important to note that the benefits of participating in sport were greater for those in at least two different high school sports or teams. Two or more teams or sports may be more beneficial than only one sport as there are greater opportunities to make more friends, develop broader skills, and receive more feedback from different coaches. Further, as females participate in one sport and develop increased physical competence, body image, instrumentality, and psychological well-being, they may in turn, be more likely to participate in more sports and on more teams. Therefore, those that participate in two or more sports may possess more positive self-perceptions, which leads to more participation. Longitudinal research would be beneficial to

better understand the positive psychological characteristics associated with participating in two or more sports.

Engaging in high frequency levels of physical activity was not associated with significantly more benefits compared to low and moderate frequency levels of physical activity. The lower number of participants in the high frequency physical activity group and the conservativeness of the post hoc test utilized could be contributing to the non-detection of significant differences between high, moderate, lower frequency levels of physical activity. In addition, there may have been no significant differences in levels of physical activity because the groups were not distinct enough from each other to detect differences. Although at the time of measurement, recommendations for adolescents by the Center for Disease Control were engaging in vigorous activity for twenty minutes, at least 3 times a week, the recommendations for sufficient activity have since been increased. Currently, for adolescents, the criteria for sufficient physical activity is vigorous activity for sixty minutes, at least five times a week (CDC, 2006). Therefore, all of the activity levels that were measured represent current insufficient levels of activity, and thus participants in the high frequency level may not have been engaging in enough physical activity to experience particular benefits compared to lower frequency physical activity levels.

Additionally, with the exception of depression, females who engaged in higher frequencies of activity reported similar levels of characteristics compared to those that participated in sport. Those who reported they participated in sport may also engage in high levels of physical activity within their sports. Indeed, approximately 55% of students participating in one sport, and 75% of participants in two or more sports reported engaging in vigorous activity five or more days. Therefore, the high frequency physical activity and sport

participation groups may be associated with similar benefits. If so, then female adolescents would have another route through which to develop positive psychosocial characteristics (e.g., instrumentality and body image) and increase their overall well-being. Moreover, participating in sport, particularly two or more, may serve as an avenue for female adolescents to meet recommendations for sufficient levels of physical activity. This is especially important as only 28 % of female adolescents reported meeting the current recommendations of sufficient physical activity (CDC, 2006). Further research is needed to determine the extent to which different levels of physical activity contribute to positive psychological characteristics, as well as the differences in benefits between sufficient levels of physical activity and sport participation.

Practical Considerations

The results indicate greater psychological benefits are associated with sport participation, highlighting the importance of finding ways to keep females engaged and involved in sports throughout their adolescence. In addition, engaging in physical activity also contributed to more positive psychological characteristics. Thus, developing and maintaining a love of sport and physical activity will be important. Schools, beginning even at the elementary level, can promote such an approach to life through physical education classes and after school sports. In addition to fostering more traditional activities (e.g., soccer and basketball), schools might integrate "life long" activities, such as walking and rollerblading, into their education curricula. It is especially important for schools and physical activity programs to encourage adolescents to engage in the current recommendations for sufficient physical activity.

Participation in two or more different sports or teams was found to be especially important, which lends support for the continued implementation of programs and legislation such as Title IX, in order to continue to ensure that females have ample opportunities to

participate in high school sports. Therefore, a variety of sport options should be available from which females can choose. Although the trend may be for girls to specialize in particular sports, they may benefit from participating in organized sports outside of their specialization during the "off season." It may be the continued involvement of participating in multiple sports or teams that is most beneficial for the consistent development of physical skills and positive psychological characteristics. Coaches may want to balance these real benefits against the presumed ones associated with single sport specialization.

Additionally, administrators and coaches can provide opportunities for female athletes to develop, test, and display their physical skills, with consistent technical and constructive feedback. Practice and feedback will enhance the development of actual physical skills, such as strength and coordination, and facilitate stronger perceptions of physical competence. The development of strong physical competencies has been shown to be most important in order for females to experience other psychological benefits, such as positive body image, instrumentality and higher psychological well-being, through participating in sport.

Limitations and Future Research.

There were limitations to the current research. First, the physical activity questions were based on the recommendations for sufficient levels of vigorous and moderate activity at the time of measurement; however, these recommendations have since increased, and therefore, no benefits associated with the recommended levels could be examined. Future research is needed to explore these relationships. In addition, it is not clear whether all participants responded to the physical activity measure by including the physical activity in which they engage specifically for their sport, and to what extent the physical activity in which they engaged was separate from sport. It is difficult to separate the constructs of physical activity and sport because physical

activity is an inherent part of sport participation. The current models were analyzed drawing from the same sample, so that the physical activity construct could have represented some sport participation as the reported physical activity engaged could have been specifically for their high school sport. In order to gain increased understanding of if and how sport participation and non-sport physical activity are differentially related to body image, instrumentality, physical self concept, and psychological well-being, it is recommended to survey a much larger sample of students. This would provide the ability to compare models with sufficient numbers of students each that reported participating in high school sports, and reported only engaging in non-sport physical activity. Additionally, longitudinal research would allow for the examinations of the patterns of sport and physical activity participation for high school females. Given that participating in two or more sports was especially beneficial with regard to positive psychological characteristics, longitudinal research would demonstrate how longer term participation affects body image, instrumentality, physical self-concept, and psychological well-being.

Another limitation to the study was the select sample of the population. The sample included students from a private, all female high school. Therefore, this sample may be limited in diversity, and over represent the experience of female Caucasian students, and those from a higher socioeconomic status. In addition, it is possible that the environment of an all female school has a unique influence on the participation patterns of sport and physical activity, as well as the psychological characteristics measured. It is recommended that future research include multiple schools with diverse student populations. Further, it is recommended that these relationships be examined within a male population in order to determine any gender differences among patterns of psychological benefits and sport and physical activity participation.

Finally, this research utilized Structural Equation Modeling to analyze the relationships of the factors measured. Although the sample size was adequate for SEM a larger number of participants would have possibly allowed for a better fit of the model and a better representation of how the factors were related. In addition, SEM only tests models based of the factors that were measured and represented. It is possible that there are other factors that were not included that indeed are important to the development of psychological characteristics as a result of participation in sport and physical activity. One such factor that may be important to include in future research is an internalization factor. Examining the degree to which adolescent females internalize cultural standards of attractiveness and/or "ideal" body types for their specific sport could help further the understanding of how sport participation influences body satisfaction. Additionally, this model was only tested and validated in one other sample.

Overall, this research project could have been strengthened by including more participants from diverse backgrounds, different methods for measuring physical activity, and other important factors possibly related to sport participation, such as the internalization of the "thin ideal." Future research also should consider the important role that physical self-concept was found to have with sport participation, particularly with regard to how it was related to the development of positive body image and instrumental characteristics. Continuing this research through a longitudinal design will allow the opportunity to examine these relationships further.

Table 1

Descriptive Statistics for Measured Variables

Variable	No. Items	*M*	*SD*	Skewness	Kurtosis	Internal Consistency
SPORTS	1	1.18	1.08	.769	.389	
INVOLVEMENT	1	3.04	2.19	-.581	-1.514	
MONTHS	1	5.24	5.41	1.082	.579	
HOURS	1	6.15	5.41	.409	-.564	
PSDQ PA	6	4.72	1.31	-.892	-.215	
YRBSS CONDITIONING	1	3.01	2.15	3.00	-.997	
YRBSS VIGOROUS	1	4.27	1.68	-.385	-.262	
YRBSS MODERATE	1	3.76	2.20	-.044	-1.151	
YRBSS INACTIVITY	1	2.68	1.33	.445	-.600	
BMI DIFFERENCE	1	1.33	1.82	.672	4.882	
BPSS-R FACE	4	4.20	.88	-.386	.267	.66
BPSS-R BODY	7	3.79	1.07	-.159	-.415	.88
BPSS-R OVERALL	1	4.04	1.21	-.509	.012	
PAQ-M	8	21.06	4.17	-.194	-.127	.67
IMTS	20	73.34	9.49	-.393	.983	.83
STRENGTH	6	4.42	1.04	-.571	-.022	.91
FLEXIBILITY	6	4.45	1.11	-.499	-.329	.92
COORDINATION	6	4.56	.98	-.600	-.084	.92
ENDURANCE	6	3.68	1.34	-.022	-.843	.93
SPORT COMPETENCE	6	4.12	1.30	-.451	-.604	.96
SES	10	31.10	5.05	-.584	.236	.87
SWLS	5	23.61	6.27	-.506	-.282	.87
CES-D	20	16.10	10.26	.911	.274	.90

Note. SPORTS= Number of high school sports participated; INVOLVEMENT= Average rated high school sport involvement; MONTHS = Average # of months participated in high school sports; HOURS = Average # of hours per week participated in high school sports; PSDQ PA = Physical Self Description Questionnaire-Physical Activity Scale; YRBSS CONDITIONING = Youth Risk Behavior Surveillance System strength and conditioning item; YRBSS VIGOROUS = Youth Risk Behavior Surveillance System vigorous activity (exercise that makes you breathe hard for 20 minutes or more) item; YRBSS MODERATE = Youth Risk Behavior Surveillance System moderate activity (30 minutes or more) item; YRBSS INACTIVITY = Youth Risk Behavior Surveillance System number of hours of television watched per week item; BMI DIFFERENCE = difference in reported body mass index and reported ideal body mass index; BPSS-R FACE = Body Parts Satisfaction Scale-Revised Face Factor; BPSS-R BODY= Body Parts Satisfaction Scale-Revised Body Factor; BPSS-R OVERALL = Body Parts Satisfaction Scale-Revised 1-item overall body rating; PAQ-M = Personal Attributes Questionnaire-Masculinity Scale; IMTS = Instrumentality Scale; STRENGTH = Physical Self Description Questionnaire-Strength Scale; FLEXIBILITY = Physical Self Description Questionnaire-Flexibility Scale; COORDINATION = Physical Self Description Questionnaire-Coordination; ENDURANCE = Physical Self Description Questionnaire-Endurance Scale; SPORT COMPETENCE = Physical Self Description Questionnaire-Sport Competence Scale; SES = Rosenberg Self Esteem Scale; SWLS= Satisfaction With Life Scale; CES-D = Center of Epidemiological Studies-Depression Scale.

Table 2

Correlation Matrix of Measured Variables and Demographic Variables

Variables	1	2	3	4	5	6	7	8	9
1. SPORTS	--								
2. INVOLVEMENT	.72**	--							
3. MONTHS	.44**	.67**	--						
4 HOURS	.61**	.80**	.52**	--					
5. PSDQ PA	.55**	.58**	.42**	.56**	--				
6. YRBSS CONDITIONING	.36**	.30**	.17*	.34**	.51**	--			
7. YRBSS VIGOROUS	.50**	.45**	.27**	.46**	.71**	.53**	--		
8. YRBSS MODERATE	.16*	.07	.00	.13	.21**	.18**	.27**	--	
9. YRBSS INACTIVITY	-.19**	-.14*	-.04	-.15*	-.21**	-.17**	-.17*	-.02	--
10. BMI DIFFERENCE	-.09	-.09	-.03	-.07	-.13	-.12	-.14*	-.02	.07
11 BPSS-R FACE	.08	.06	.12	-.02	.12	.02	.05	.05	.04
12 BPSS-R BODY	.23**	.28**	.17*	.18**	.36**	.21**	.26**	.09	-.08
13. BPSS-R OVERALL	.24**	.25**	.12	.18**	.26**	.14*	.22**	.08	-.12
14. PAQ-M	.24**	.24**	.13	.24**	.34**	.18**	.26**	.06	-.10
15. IMTS	.16*	.18**	.11	.14**	.28**	.13	.17**	.08	-.11
16. STRENGTH	.43**	.50**	.30**	.47**	.58**	.29**	.40**	.11	-.16*
17. FLEXIBILITY	.22**	.31**	.33**	.23**	.43**	.20**	.26**	-.01	-.1
18. COORDINATION	.40**	.52**	.34**	.42**	.58**	.25**	.37**	.07	-.08
19. ENDURANCE	.53**	.49**	.25**	.52**	.69**	.40**	.51**	.16*	-.17**
20. SPORT COMPETENCE	.55**	.58**	.30**	.54**	.61**	.33**	.47**	.15*	-.10
21. SES	.05	.11	.06	.06	.18**	.02	.13	-.02	-.01
22. SWLS	.17**	.19**	.12	.12	.23**	.11	-.12	-.03	-.13
23. CES-D	-.03	-.08	-.03	-.05	-.14*	.01	-.03	.05	-.02

Note. SPORTS= Number of high school sports participated; INVOLVEMENT= Average rated high school sport involvement; MONTHS = Average # of months participated in high school sports; HOURS = Average # of hours per week participated in high school sports; PSDQ PA = Physical Self Description Questionnaire-Physical Activity

(*table continues*)

Table 2 (*continued*).

Variables	10	11	12	13	14	15	16	17	18
1. SPORTS									
2. INVOLVEMENT									
3. MONTHS									
4 HOURS									
5. PSDQ PA									
6. YRBSS CONDITIONING									
7. YRBSS MODERATE									
8. YRBSS VIGOROUS									
9. YRBSS INACTIVITY									
10. BMI DIFFERENCE	--								
11 BPSS-R FACE	-.09	--							
12 BPSS-R BODY	-.47**	.46**	--						
13. BPSS-R OVERALL	-.40**	.46**	.8**	--					
14. PAQ-M	.01	.35**	.33**	.34**	--				
15. IMTS	-.12	.46**	.44**	.45**	.62**	--			
16. STRENGTH	-.01	.30**	.45**	.36**	.52**	.41**	--		
17. FLEXIBILITY	-.09	.23**	.31**	.24**	.30**	.34**	.46**	--	
18. COORDINATION	-.12	.31**	.43**	.34**	.42**	.39**	.60**	.67**	--
19. ENDURANCE	-.22**	.12	.38**	.33**	.38**	.32**	.58**	.28**	.48**
20. SPORT COMPETENCE	-.10	.19**	.41**	.31**	.46**	.28**	.72**	.29**	.62**
21. SES	-.16*	.46**	.46**	.51**	.50**	.72**	.30**	.20**	.32**
22. SWLS	-.18**	.38**	.42**	.50**	.36**	.61**	.24**	.17**	.26**
23. CES-D	.14*	-.33**	-.30**	-.34**	-.32**	-.55**	-.20**	-.12	-.21**

Scale; YRBSS CONDITIONING = Youth Risk Behavior Surveillance System strength and conditioning item; YRBSS VIGOROUS = Youth Risk Behavior Surveillance System vigorous activity (exercise that makes you breathe hard for 20 minutes or more) item; YRBSS MODERATE = Youth Risk Behavior Surveillance System moderate activity (30 minutes or more) item; YRBSS INACTIVITY = Youth Risk Behavior Surveillance System number of hours of television watched per week item; BMI DIFFERENCE = difference in reported body mass index and reported ideal body mass index; BPSS-R FACE = Body Parts Satisfaction Scale-Revised Face Factor; BPSS-R BODY= Body Parts Satisfaction Scale-Revised Body Factor; BPSS-R OVERALL = Body Parts Satisfaction Scale-

(*table continues*)

Table 2 (*continued*).

Variables	19	20	21	22	23
1. SPORTS					
2. INVOLVEMENT					
3. MONTHS					
4 HOURS					
5. PSDQ PA					
6. YRBSS CONDITIONING					
7. YRBSS MODERATE					
8. YRBSS VIGOROUS					
9. YRBSS INACTIVITY					
10. BMI DIFFERENCE					
11 BPSS-R FACE					
12 BPSS-R BODY					
13. BPSS-R OVERALL					
14. PAQ-M					
15. IMTS					
16. STRENGTH					
17. FLEXIBILITY					
18. COORDINATION					
19. ENDURANCE	--				
20. SPORT COMPETENCE	.63**	--			
21. SES	.18**	.24**	--		
22. SWLS	.25**	.21**	.66**	--	
23. CES-D	-.16*	-.15*	-.65**	-.55**	--

Revised 1-item overall body rating; PAQ-M = Personal Attributes Questionnaire-Masculinity Scale; IMTS = Instrumentality Scale; STRENGTH = Physical Self Description Questionnaire-Strength Scale; FLEXIBILITY = Physical Self Description Questionnaire-Flexibility Scale; COORDINATION = Physical Self Description Questionnaire-Coordination; ENDURANCE = Physical Self Description Questionnaire-Endurance Scale; SPORT COMPETENCE = Physical Self Description Questionnaire-Sport Competence Scale; SES = Rosenberg Self Esteem Scale; SWLS= Satisfaction With Life Scale; CES-D = Center of Epidemiological Studies-Depression Scale.
* = $p < .01$; ** = $p \leq .001$.

Table 3

Model Fit and Comparison (N = 355)

Model	*df*	χ^2	S-Bχ^2	*p*	AIC	NNFI	CFI	SRMR	RMSEA (90% CI)
Sport Participation Measurement Model	95	321.19	304.3	<.0001	131.19	.916	.934	.06	.082 (.072-.092)
Sport Participation Hypothesized Model	74	403.21	377.17	<.0001	255.21	.952	.962	.139	.112 (.101-.123)
Sport Participation Alternative Model #1	74	298.456	280.64	<.0001	150.46	.965	.973	.080	.093 (.082-.103)
Sport Participation Alternative Model #2	73	302.184	283.19	<.0001	156.18	.945	.957	.084	.09 (.083-.105)
Physical Activity Measurement Model	80	281.60	252.08	<.0001	121.60	.912	.933	.062	.084 (.074-.095)
Physical Activity Hypothesized Model	61	316.15	274.34	<.0001	194.15	.938	.953	.110	.109 (.097-.120)
Physical Activity Alternative Model #1	61	250.27	219.70	<.0001	128.26	.954	.965	.081	.094 (.082-.106)
Physical Activity Alternative Model #2	62	253.69	223.56	<.0001	129.68	.954	.965	.083	.093 (.081-.105)

Note. S-Bχ^2 = Satorra-Bentler Scaled Chi Square; AIC = Akaike Information Criterion; NNFI = Non-Normed Fit Index; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Squared Residual; RMSEA = Root Mean Square Error of Approximation. NNFI, CFI, and RCFI values greater than .90 indicate a good fit; SRMR below .08 indicate a good fit; RMSEA (with 90% Confidence Intervals) values below .06 indicate a good fit.
All analyses based on 355 cases.

Table 4

Standardized Parameter Estimates for the Sport Participation Measurement Model

Latent Variables	Observed Variables	Factor Loadings	Error Variance
Sport Participation	SPORTS	.748	.663
	INVOLVEMENT	.949	.316
	MONTHS	.669	.743
	HOURS	.838	.546
Body Image	BMI DIFFERENCE	-.475	.880
	BPSS-R BODY	.932	.363
	BPSS-R OVERALL	.856	.517
Physical Self -Concept	STRENGTH	.825	.565
	COORDINATION	.735	.678
	ENDURANCE	.718	.696
	SPORT COMPETENCE	.849	.528
Instrumentality	PAQ-M	.692	.722
	IMTS	.898	.439
Psychological Well-Being	SES	.751	.660
	SWLS	.901	.434
	CES-D	-.706	.708

Note. SPORTS= Number of high school sports participated; INVOLVEMENT= Average rated high school sport involvement; MONTHS = Average # of months participated in high school sports; HOURS = Average # of hours per week participated in high school sports; BMI DIFFERENCE = difference in reported body mass index and reported ideal body mass index; BPSS-R BODY= Body Parts Satisfaction Scale-Revised Body Factor; BPSS-R OVERALL = Body Parts Satisfaction Scale-Revised 1-item overall body rating; PAQ-M = Personal Attributes Questionnaire-Masculinity Scale; IMTS = Instrumentality Scale; STRENGTH = Physical Self Description Questionnaire-Strength Scale; COORDINATION = Physical Self Description Questionnaire-Coordination; FLEXIBILITY = Physical Self Description Questionnaire-Flexibility Scale; ENDURANCE = Physical Self Description Questionnaire-Endurance Scale; SPORT COMPETENCE = Physical Self Description Questionnaire-Sport Competence Scale; SES = Rosenberg Self Esteem Scale; SWLS= Satisfaction With Life Scale; CES-D = Center of Epidemiological Studies-Depression Scale.

Table 5

Standardized Parameter Estimates for the Physical Activity Measurement Model

Latent Variables	Observed Variables	Factor Loadings	Error Variance
Physical Activity	PSDQ PA	.947	.321
	YRBSS CONDITIONING	.554	.832
	YRBSS VIGOROUS	.750	.661
Body Image	BMI DIFFERENCE	-.475	.880
	BPSS-R BODY	.932	.362
	BPSS-R OVERALL	.856	.517
Physical Self-Concept	STRENGTH	.818	.576
	COORDINATION	.731	.682
	ENDURANCE	.747	.665
	SPORT COMPETENCE	.833	.553
Instrumentality	PAQ-M	.690	.724
	IMTS	.901	.434
Psychological Well-Being	SES	.751	.660
	SWLS	.901	.434
	CES-D	-.706	.708

Note. PSDQ PA = Physical Self Description Questionnaire-Physical Activity Scale; YRBSS CONDITIONING = Youth Risk Behavior Surveillance System strength and conditioning item; VIGOROUS = Youth Risk Behavior Surveillance System vigorous activity (exercise that makes you breathe hard for 20 minutes or more) item; BMI DIFFERENCE = difference in reported body mass index and reported ideal body mass index; BPSS-R BODY= Body Parts Satisfaction Scale-Revised Body Factor; BPSS-R OVERALL = Body Parts Satisfaction Scale-Revised 1-item overall body rating; PAQ-M = Personal Attributes Questionnaire-Masculinity Scale; IMTS = Instrumentality Scale; STRENGTH = Physical Self Description Questionnaire-Strength Scale; COORDINATION = Physical Self Description Questionnaire-Coordination; FLEXIBILITY = Physical Self Description Questionnaire-Flexibility Scale; ENDURANCE = Physical Self Description Questionnaire-Endurance Scale; SPORT COMPETENCE = Physical Self Description Questionnaire-Sport Competence Scale; SES = Rosenberg Self Esteem Scale; SWLS= Satisfaction With Life Scale; CES-D = Center of Epidemiological Studies-Depression Scale.

Table 6

Means and standard deviations for activity groups

	PA (n = 26)		PA/EA (n = 84)		SP (n =65)		SP/EA (n =175)	
	M^a	*SD*	M^a	*SD*	M^b	*SD*	M^b	*SD*
Physical Self-Concept								
Coordination	4.19	.69	3.88	.97	4.95	.95	4.86	.76
Sport Competence	3.61	.84	3.05	1.20	4.63	1.17	4.57	1.05
Strength	3.91	1.00	3.72	1.01	4.89	.95	4.68	.88
Flexibility	3.92	.99	3.99	1.26	4.82	1.00	4.64	1.00
Endurance	2.93	.88	2.69	1.04	3.98	1.33	4.17	1.20
Body Image								
BPSS- Body	3.57	1.05	3.38	1.03	3.99	1.04	3.95	1.07
BPSS-Overall item	3.46	1.24	3.70	1.24	4.29	1.26	4.21	1.13
BMI Difference	1.37	2.71	1.63	1.53	1.44	1.53	1.14	1.90
Instrumentality								
PAQ-M	20.27	4.19	19.91	.41	21.68	4.35	21.54	4.28
IMTS-Scale	69.15	3.66	71.85	1.06	73.95	8.95	74.33	9.24
Psychological Well-Being								
CES-D	18.50	12.10	16.83	10.39	14.14	8.95	16.25	10.31
Life Satisfaction	21.62	6.85	22.05	6.48	24.71	5.11	24.17	6.23
Self-Esteem	28.96	5.54	30.91	5.53	32.09	3.61	31.10	4.74

Note: PA = Physical Activity group, PA / EA = Physical Activity and Extracurricular Activity, SP = Sport Participation, and SP / EA = Sport Participation and Extracurricular Activity.
Groups that share the same superscript (a, b) were compared using one way MANOVAs. No MANOVAS were statistically significant at the .05 level.

Table 7

Comparisons of physical activity, and sport participation groups.

	PA-L (N=25)		PA-M (N=66)		PA-H (N=19)		SP-L (N=110)		SP-H (N=130)		*F*
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Physical Self-Concept											
Coordination	3.71[a]	.76	4.03[a]	.92	3.99[a]	1.08	4.79[b]	.85	4.97[b]	.79	23.89**
Sport Competence	3.11[a]	1.12	3.11[a]	1.16	3.54[ab]	1.13	4.21[b]	1.10	4.91[c]	.96	39.78**
Strength	3.63[a]	.91	3.72[a]	1.06	4.11[ab]	.92	4.59[bc]	.95	4.86[c]	.83	22.75**
Flexibility	3.39[a]	.93	4.12[a]	1.22	4.22[ab]	1.25	4.70[b]	1.04	4.68[b]	.97	11.11**
Endurance	2.27[a]	.92	2.89[a]	1.02	2.87[a]	.94	3.74[b]	1.15	4.44[c]	1.22	35.18**
Body Image											
BPSS-Body	3.06[a]	1.08	3.48[ac]	.95	3.69[ab]	1.18	3.86[bc]	1.08	4.04[b]	1.04	6.57**
BPSS-Overall item	3.12[a]	1.17	3.77[ac]	1.19	3.89[ab]	1.37	4.10[bc]	1.24	4.34[b]	1.09	6.91**
BMI Difference	1.95	1.63	1.51	1.96	1.28	1.81	1.43	2.06	1.04	1.55	1.78
Instrumentality											
PAQ-M	18.72[a]	4.09	20.20[ab]	3.68	21.00[ab]	3.40	21.05[ab]	4.32	22.03[b]	4.40	4.54**
IMTS-Scale	69.44	11.21	72.05	9.24	70.66	9.48	73.76	9.38	74.62	8.95	2.45*
Psychological Well-Being											
CES-D	16.52[a]	11.51	15.34[a]	8.90	24.71[b]	12.99	15.58[a]	10.09	16.16[a]	9.94	3.66**
Life Satisfaction	21.48	5.86	22.11	6.86	22.00	6.55	24.06	6.34	24.53	5.60	2.93*
Self-Esteem	29.52	5.92	30.73	5.63	30.71	4.99	31.44	4.60	31.31	4.87	.92

Note: PA-L = Physical Activity Low Frequency group (engaged in vigorous physical activity 1-2 times / week), PA-M = Physical Activity Moderate Frequency group (engaged in vigorous physical activity 3-4 times / week), PA-H = Physical Activity-High Frequency group (engaged in vigorous physical activity 5-7 times/ week), SP-L = Sport Participation-Low group (participated in 1 high school sport), and SP-H = Sport Participation-High (participated in 2 or more high school sports).

** = p<.01, * = p<.05

Mean scores that do not share a common superscript are significantly different at the $p < .05$ level.

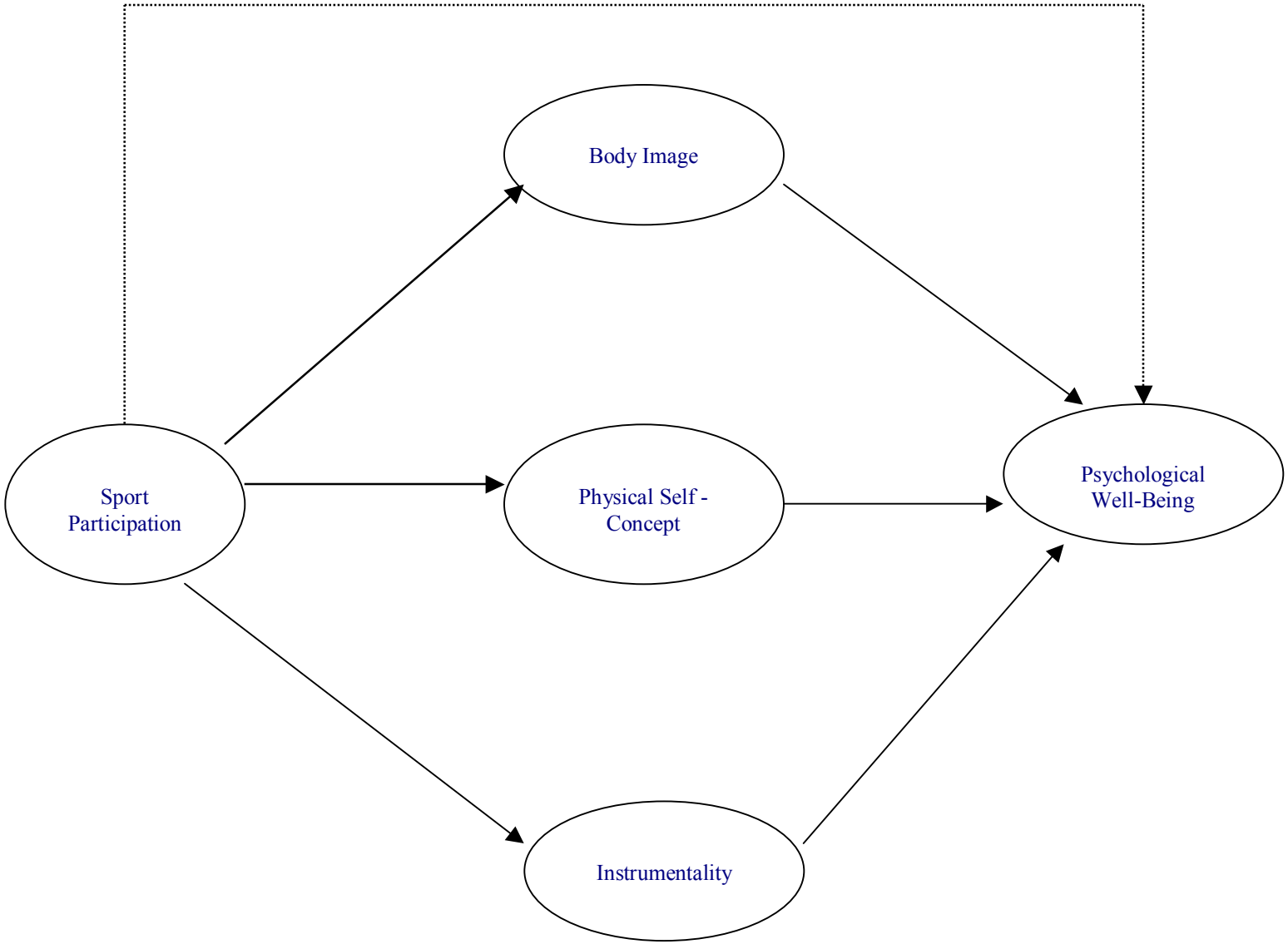

Figure 1. Diagram of the a priori hypothesized sport participation model. Solid lines indicate proposed mediated relationships.

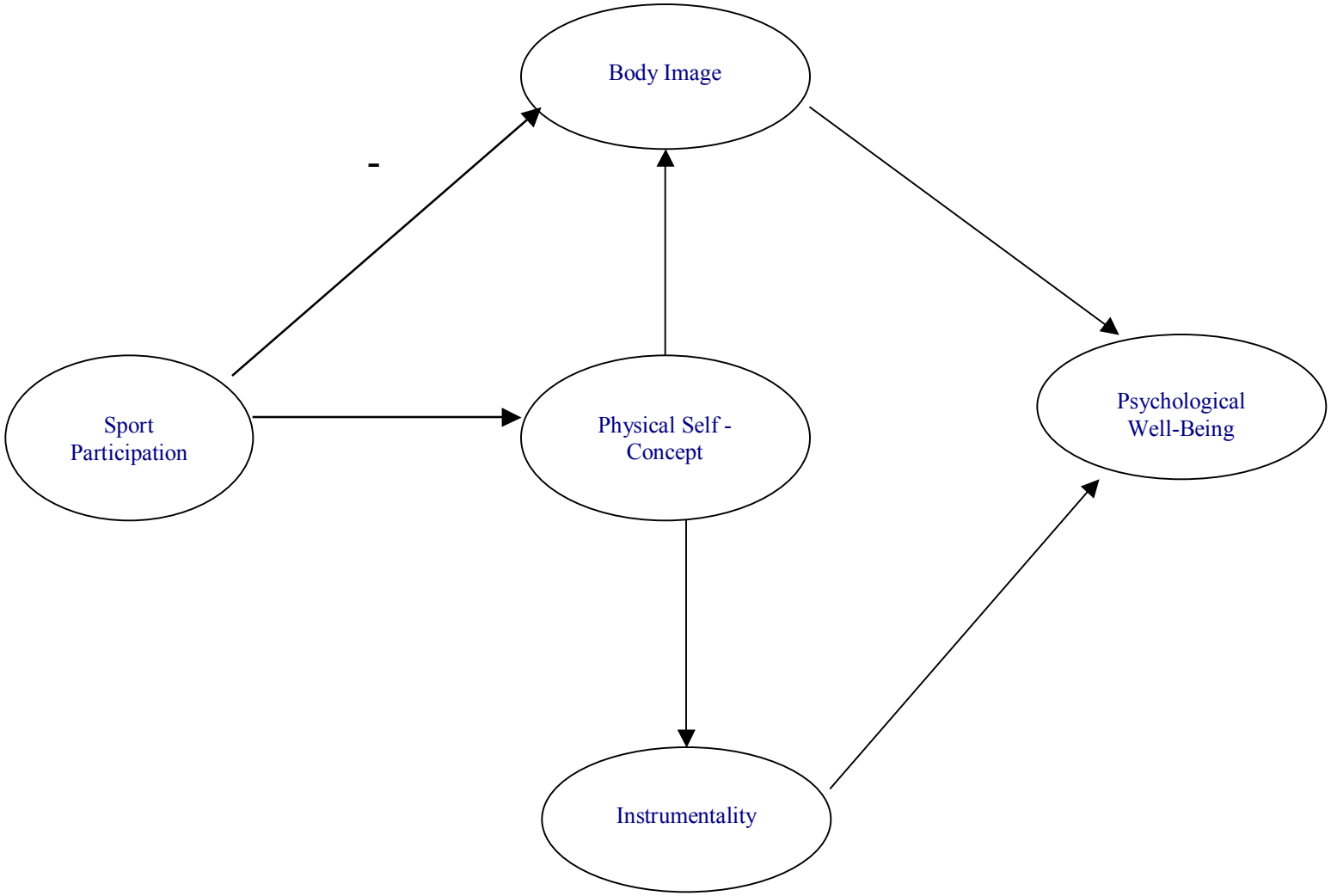

Figure 2. Diagram of the a priori hypothesized sport participation alternative model 1 (confirmatory model).

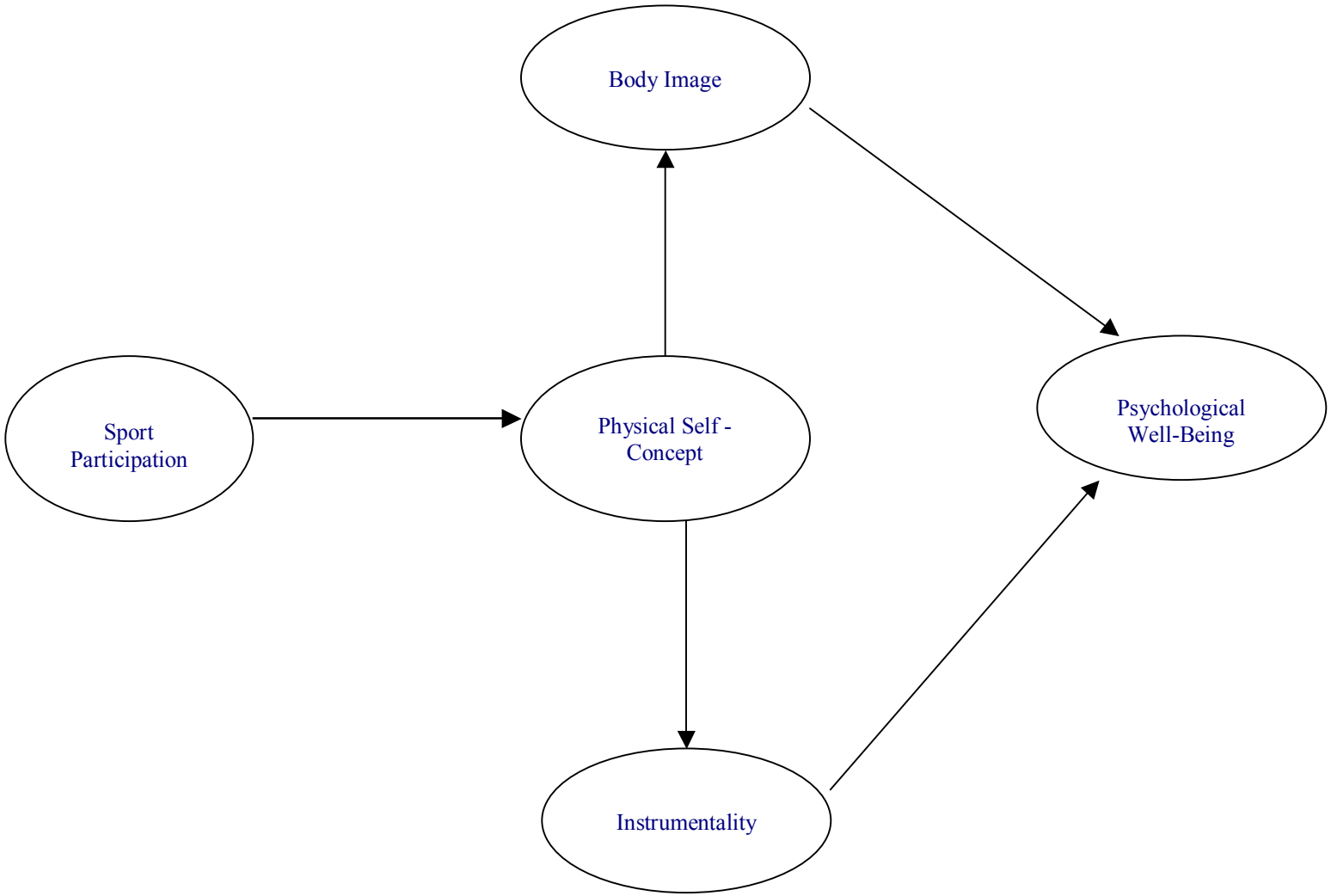

Figure 3. Diagram of the a priori hypothesized sport participation alternative model 2.

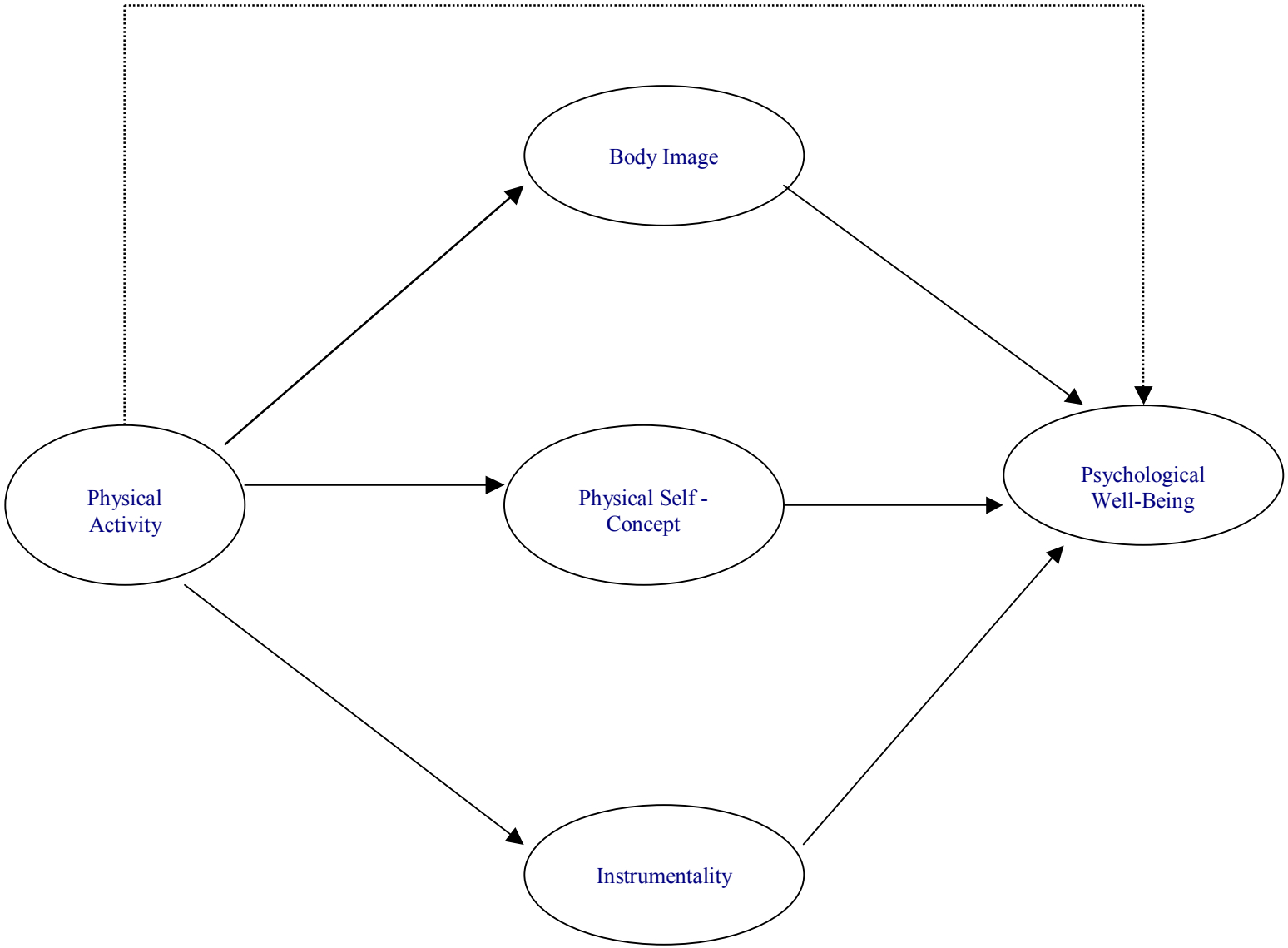

Figure 4. Diagram of the a priori hypothesized physical activity model.

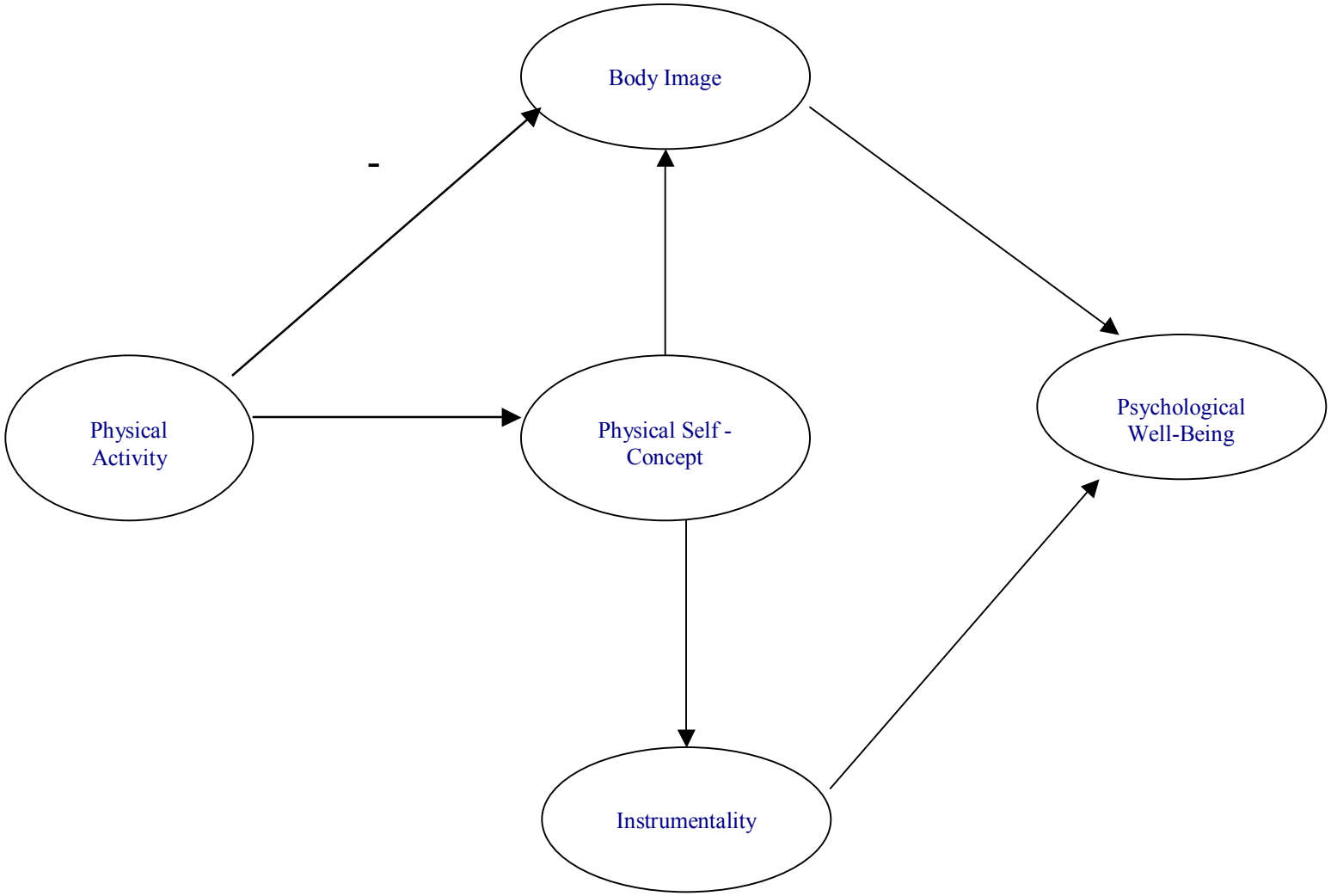

Figure 5. Diagram of the a priori hypothesized physical activity alternative model 1.

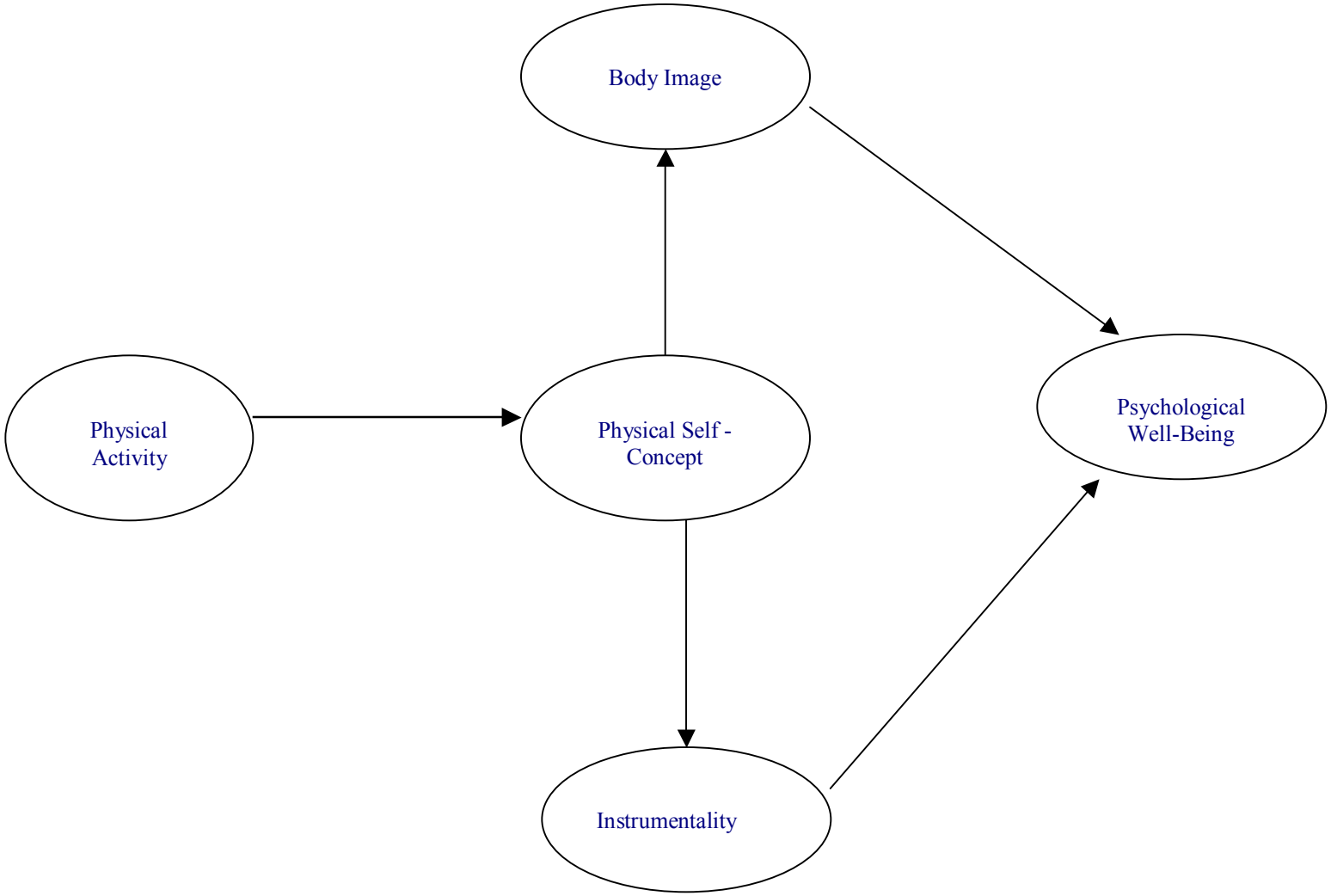

Figure 6. Diagram of the a priori hypothesized physical activity alternative model 2.

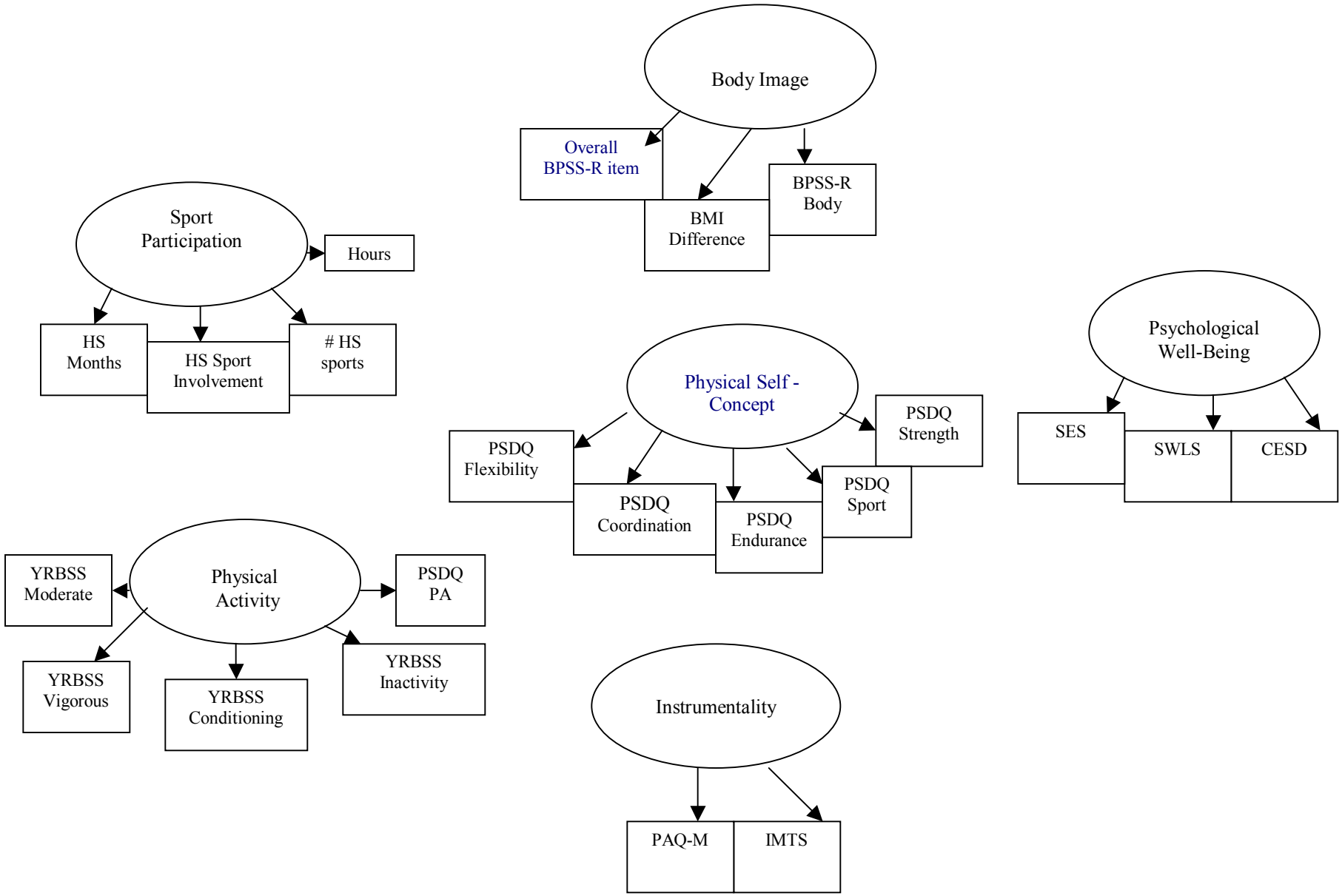

Figure 7. Diagram of the hypothesized measurement model.

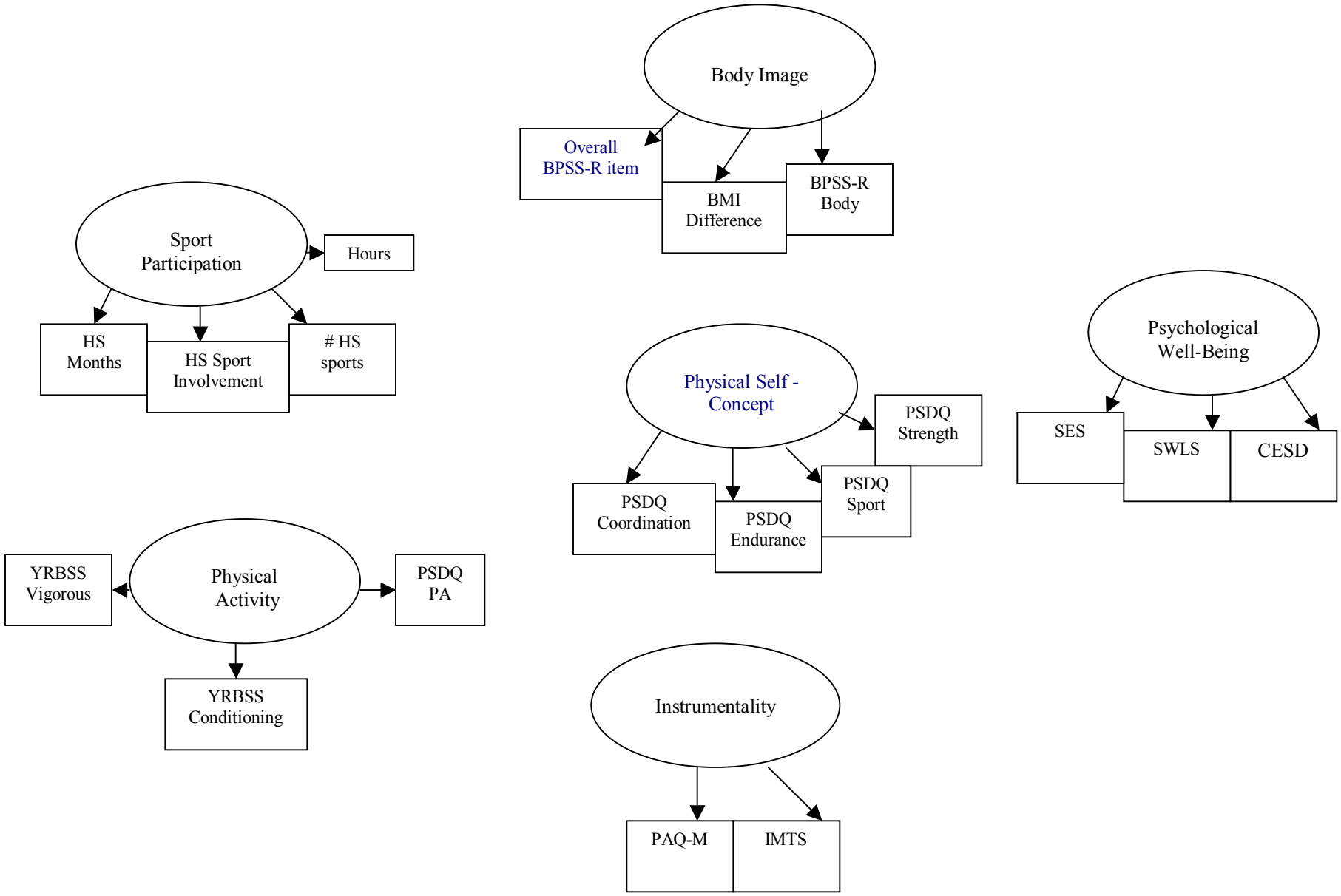

Figure 8. Diagram of the final measurement model.

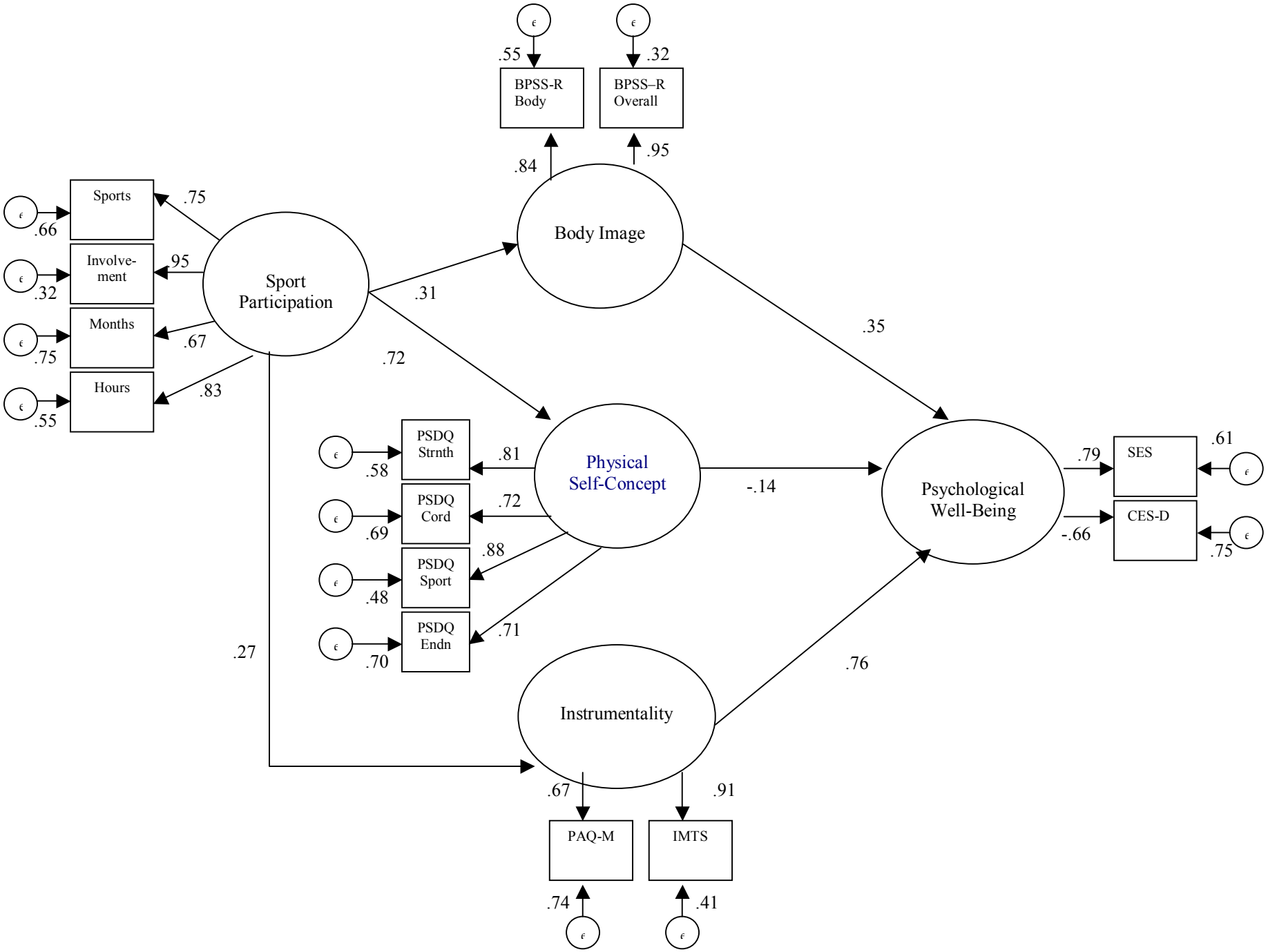

Figure 9. Diagram of the hypothesized sport participation structural model with parameter and error estimates.

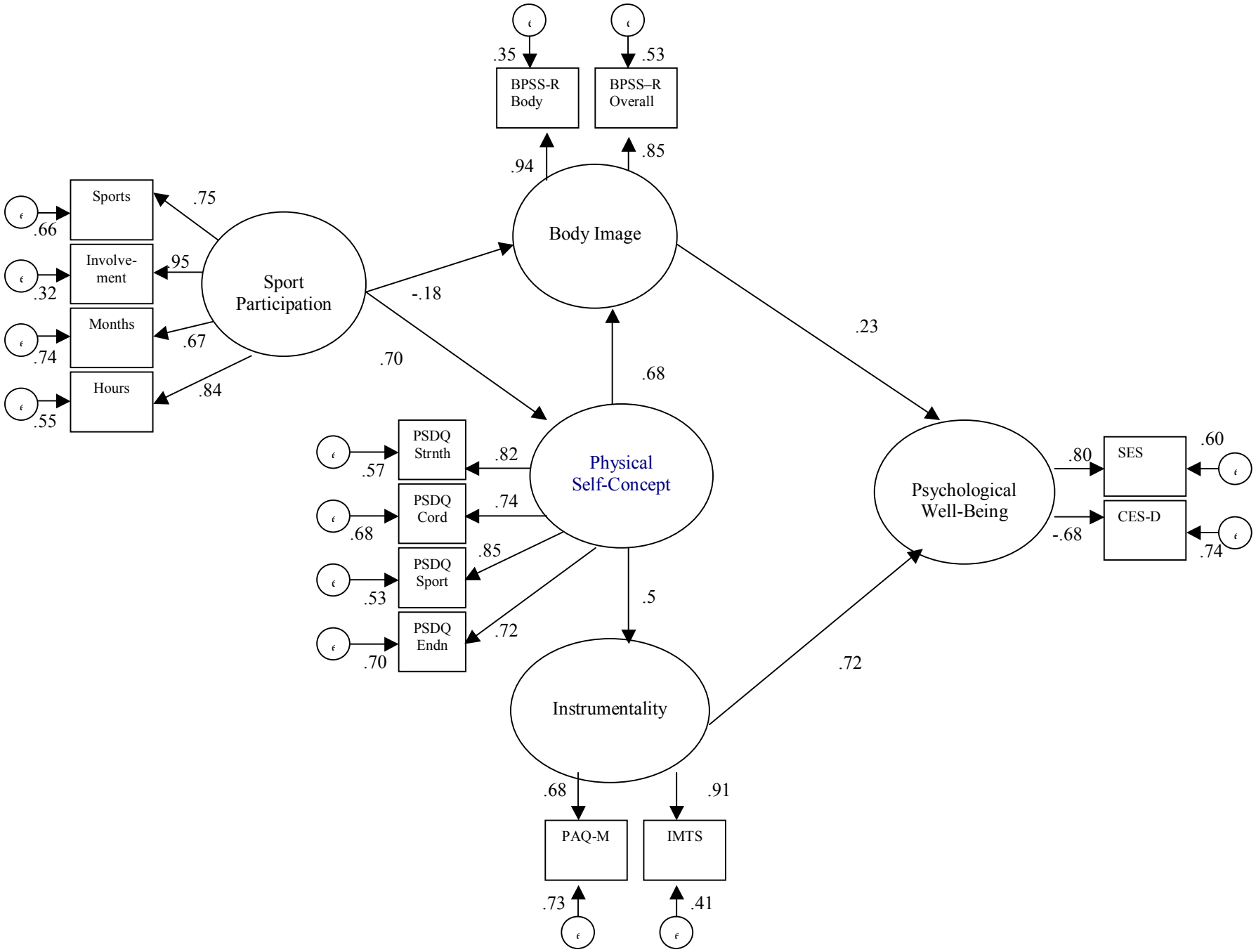

Figure 10. Diagram of the sport participation Alternative Model #1 with parameter and error estimates

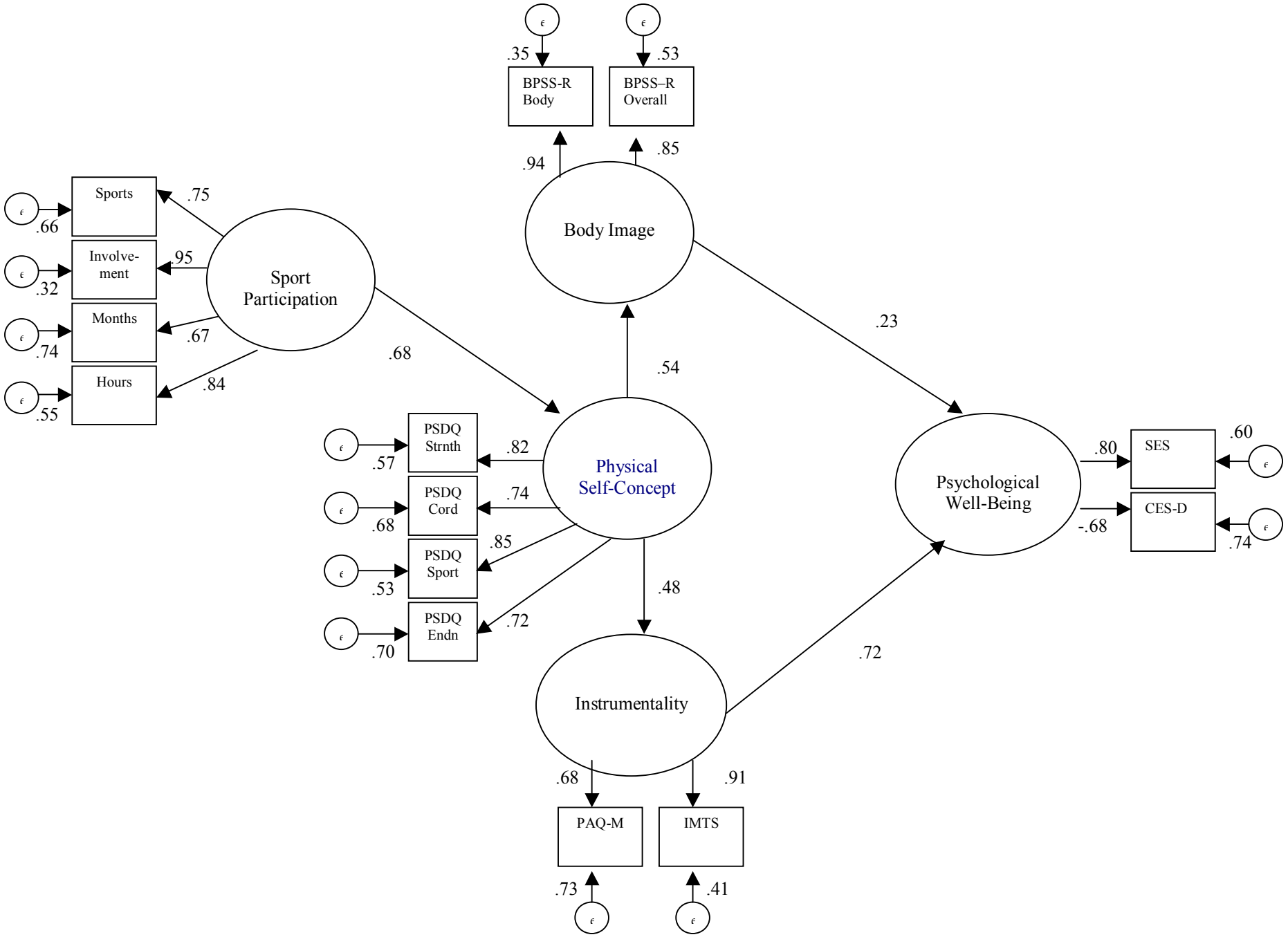

Figure 11. Diagram of the sport participation structural alternative model #2 with parameter and error estimates.

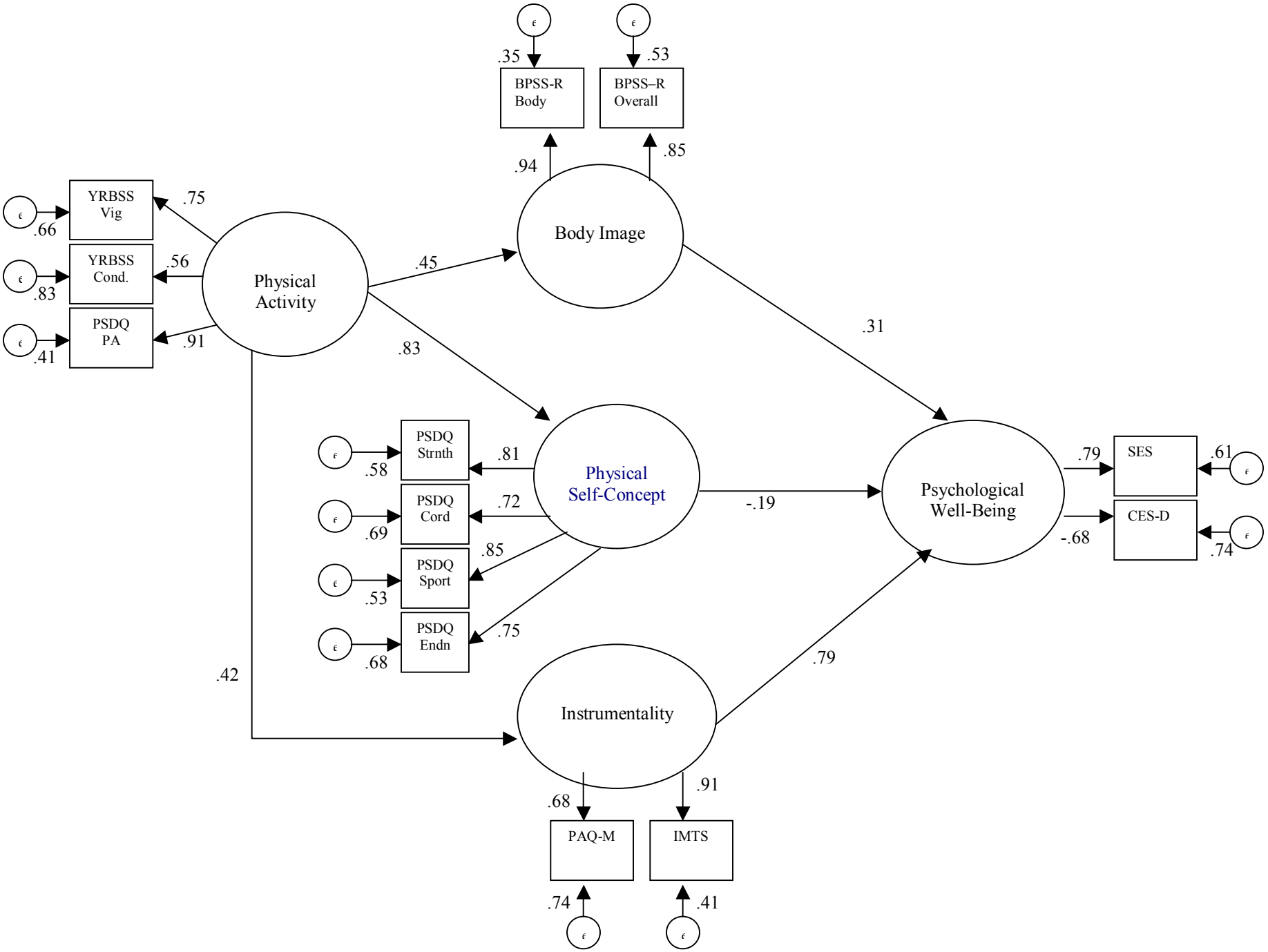

Figure 12. Diagram of the hypothesized Physical Activity structural model with parameter and error estimates.

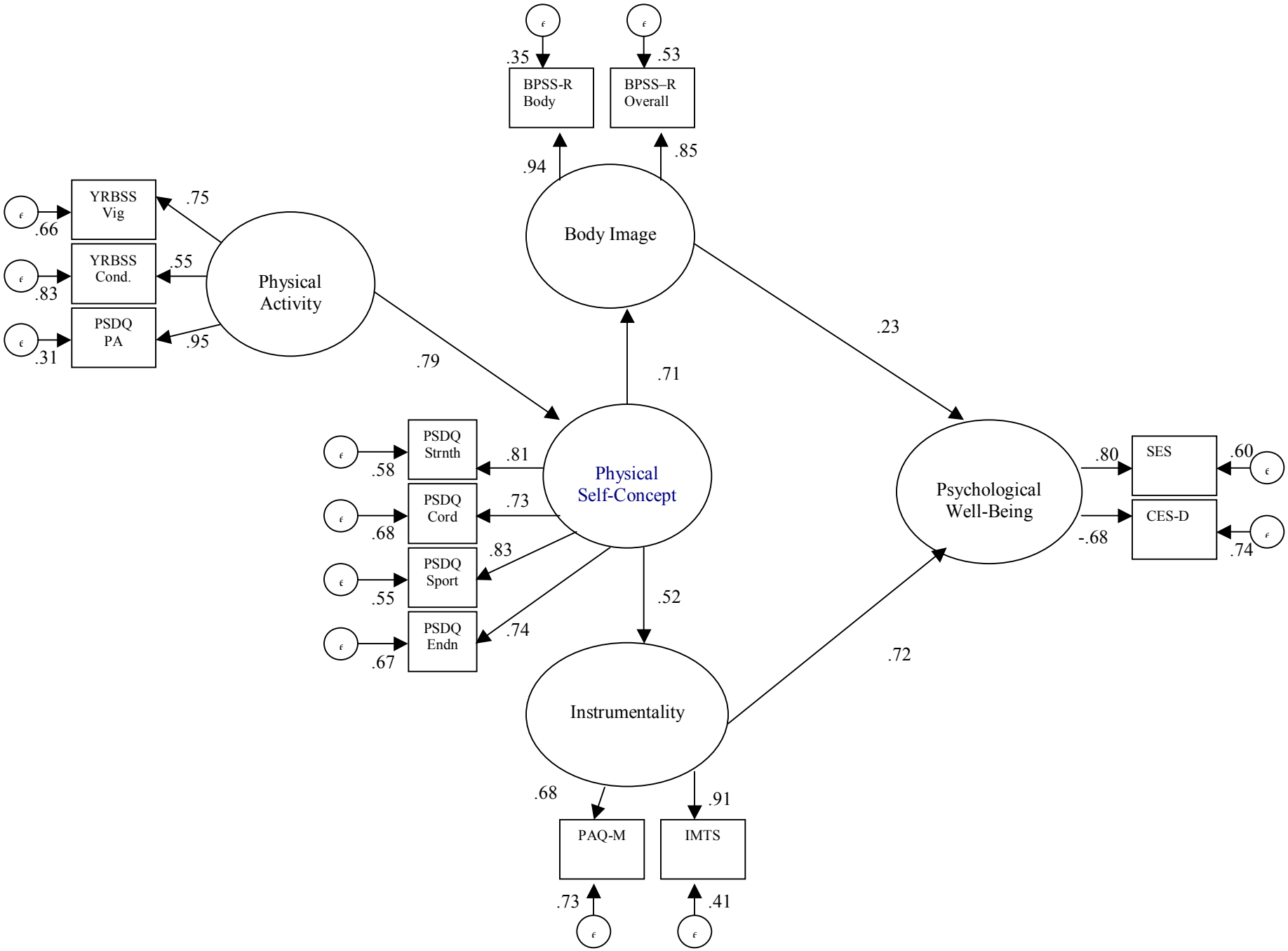

Figure 13. Diagram of the structural Physical Activity Alternative model # 2 with parameter and error estimates.

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