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Gender differences in participation of physical activities: a comprehensive model approach

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GENDER DIFFERENCES IN PARTICIPATION OF PHYSICAL ACTIVITIES: A COMPREHENSIVE MODEL APPROACH

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Abstract

The purpose of this study was to examine the interrelationships among gender, perceptions of peer, parent, and teacher support, perceived value and meaningfulness, perceived competence, and the intention to be physically active within a proposed model. Female and male students (N=801) enrolled in a traditional multi-activity physical education class responded to a 52-item questionnaire addressing the constructs in the model. Structural equation modeling, using LISREL, was used to identify the relationships among the constructs. Gender differences emerged in this model through direct paths as well as indirect paths among these variables. Girls were more influenced than boys by their perceptions of support of significant others. Indirect effects of gender on value and meaningfulness, gender appropriateness, perceived competence, as well as engagement in physical education indicate that these variables influence girls' intention to participate more so than boys'. Overall, the model supports previous studies that have explored these variables independently. It also offers support for the importance that physical education plays in teaching children to reject physical inactivity and adopt and maintain a healthy lifestyle.

Chapter 1: Introduction

Research has established a firm link between regular physical activity and overall health. Despite the recognized benefits of an active lifestyle, an alarming proportion of our population is not participating in regular physical activity (United States Department of Health and Human Services, [USDHHS], 1996). A lack of physical activity has led to increases in the percentage of children and adults who are overweight and obese, which in turn increases the incidence of diabetes and cardiovascular disease. The Surgeon General (USDHHS, 1996) reports that activity levels decline during adolescence and few children meet the recommended guidelines for physical activity. The risk factors for cardiovascular disease are already beginning to emerge at this age and activity levels during adolescence can predict the risk for cardiovascular disease in adulthood. Of particular concern is the evidence that children who do not participate in physical activity are more likely to be physically inactive as adults (McKenzie & Sallis, 1996). In light of the belief that physically active children are more likely to be physically active adults, researchers and public health educators have targeted school physical education as a means of promoting healthy lifestyles (Sallis, et al., 1992).

Although the Surgeon General (USDHHS, 1996) and other recognized authorities such as the American College of Sports Medicine (ACSM, 1988) and the National Association for Sport and Physical Education (NASPE) (Corbin & Pangrazi, 1998) have recommended increasing physical activity in physical education programs, little is known concerning how to approach that task, or if simply increasing activity in physical education will have any long term effect. What is clear is that present policies and approaches in physical education curricula do not seem to be having a positive impact with regard to facilitating the adoption of an active lifestyle. It is of considerable concern that children, as they progress through their school years, become more and

more dissatisfied with physical education to the point of dropping out altogether (Vertinsky, 1992). The decline in physical activity level is more pronounced for girls than boys, with Healthy People 2000 (U.S. Public Health Service, [USPS], 1991), 2010 (USDHHS, 2000) and the Surgeon General (USDHHS, 1996) reporting that girls are at a disproportionate risk for the health problems associated with physical inactivity. There is also evidence that girls are less active that boys in physical education classes (USDHHS, 2000). Typical physical education programs may be contributing to the problem of the accelerating decline in physical activity engagement, rather than being part of the solution to increase adolescent girls' physical activity (Ennis, 1999). Because of this, it is important to understand why girls become less active and the role that physical education plays in this process. Additionally, it is important to explore ways to use physical education to increase physical activity and promote healthy lifestyles, especially in girls and to develop a better understanding of effective teaching in physical education contexts.

Chapter 2: Review of Literature

Recent efforts to define and understand effective teaching have viewed the student as an important mediator between teaching and learning. The mediating-process paradigm (Doyle, 1977) views students as active participants and accepts that their attitudes, past experiences, and beliefs about themselves as learners affect how they react during instruction. Included in this line of study are students' beliefs about competence, their memories of past experiences, and their expectations about future performance. Eccles and her colleagues developed a model of academic choice to explain motivational factors that individuals use in making decisions about achievement-related choices (Eccles, 1984; Eccles, et al., 1983; Meece, Parsons, Kaczala, Goff, & Futterman, 1982). The model links activity choice to performance expectations and the value attached to the available options (subjective task values) with the underlying assumption that achievement behavior involves an element of choice. The focus is on the motivational and sociocultural variables that guide an individual's choices regarding which activities to try, how much effort to expend, the types of problem-solving strategies to use and how long to persist.

Even though this research has verified the role of competence beliefs in learning, it is evident that beliefs vary as a function of gender and task. These findings point to the need for a multifaceted process to fully understand how teachers can structure an environment that will promote more physical activity for all students. Research on beliefs about competence and the connection between these beliefs and achievement is reasonably secured and currently thriving, but the findings are not entirely consistent. In some studies, researchers have reported that girls perform as well as boys in various types of physical and academic activity but still report lower perceptions of ability, particularly as they get older (Pajares & Johnson, 1996; Pajares & Miller, 1994, 1995). Clearly, it has been shown that feelings of competence are intertwined within a

motivational construct and are linked with social influences, prior experiences, self-value systems, and gender which in turn affect thought processes, behavior, and ultimately achievement.

In physical education, most of the work to date has focused on gender differences in competence beliefs and the influence of sex bias in self-perceptions of competence (Belcher, Lee, Solmon, & Harrison, 2003; Clifton & Gill, 1994; Corbin, 1981; Corbin, Landers, Feltz, & Senior, 1983; Corbin & Nix, 1979; Corbin, Stewart, & Blair, 1981; Daley & Buchanan, 1999; Gill, Gross, Huddleston, & Shifflet, 1984; Lirgg, George, Chase, & Ferguson, 1996; Petruzzello & Corbin, 1988; Solmon, Lee, Belcher, Harrison, & Wells, in press; Stewart & Corbin, 1988). A network of relationships should be investigated with a whole-model focus on gender, past experiences, social experiences, social influences and competence beliefs to better understand the direct and indirect pathways. If our goal is to improve girls' and women's participation in physical activity, it is important to identify key variables involved as well as the interrelationships among those variables. Because more models are needed to serve as frameworks to study how gender and background influence competence beliefs and the intention to participate in physical activity, the purpose of this study was to examine gender; perceptions of peer, parent, and teacher support; perceived value and meaningfulness of physical education activities; perceptions of gender appropriateness of the physical education curriculum; perceptions of competence; self-reported engagement in physical education; the intention to engage in physical activity and their interrelationships within a proposed model.

Encouragement by Others

Perceptions of parental support, peer support, and teacher support have all been shown to impact individuals' perceptions of gender appropriateness regarding an academic activity and the

value and meaningfulness of the activity. These perceptions are formed in early elementary school when boys are encouraged by parents, teachers, and peers to be active in sports, while girls are reinforced for being quiet and ladylike (Greendorfer, 1993). For boys, participation in sports, exercise, and physical activity is consistent with society's definition of masculinity and is reinforced, emphasized, and encouraged by the attitudes of parents, teachers, coaches, and peers (e.g., Griffin, 1983, 1984, 1985a, 1985b; Hay & Donnelly, 1996; Landers & Fine, 1996; Maccoby, 1990; McBride, 1995; Meece, 1987; Miller & Levy, 1996; Parker-Price & Claxton, 1996; Pissanos & Allison, 1993; Wang, 1978). Greenockle, Lee, and Lomax (1990) found that significant others, particularly peers and teachers, had a strong impact on physical activity behavior. From weekly observations of physical education classes, it appeared that interest and positive reinforcement from teachers and small "cliques" of their peers encouraged more active behavior during class. In addition, a peer group that did not dress out could easily influence other students toward off-task behavior. This study supports previous research (McIntosh & Albinson, 1982) and indicates that teenagers (13-14 yrs) are strongly influenced by significant others, particularly their peers, in their attitudes towards physical education (Greenockle, et al., 1990).

Perceptions of Gender Appropriateness of Curriculum

Research on sex-typing of physical activity choices has indicated consistent trends in beliefs about gender appropriate physical activities (Clifton & Gill, 1994; Csizma, Wittig, & Schurr, 1988; Kane & Snyder, 1989; Lee, Fredenburg, Belcher, & Cleveland, 1999; Lirgg, 1993; Matteo, 1986; Methany, 1968). Future choices regarding physical activity are greatly influenced by these stereotypical viewpoints. In a study by Lee et al. (1999), elementary students explained the main reason for sex-stereotyped views was the need to feel socially accepted. Parents and

other influential people expect boys to play basketball while girls are expected to participate in dance and other feminine-typed activities. If students stepped outside the realm of social acceptability, they viewed themselves at risk for some sort of social penalty. Higher self-perceptions of ability are reported when females are involved in a gender appropriate activity (Clifton & Gill, 1994; Corbin, 1981; Lirgg, et al., 1996; Solmon et al., in press). The results of these studies underscore the importance of providing a learning environment that meets the needs of all students. When girls feel that an activity is for boys, they may not have the confidence in their ability to be successful which will ultimately impact their potential for developing skills in a wide range of activities.

Value and Meaningfulness

Studies of junior and senior high school students indicate that the value adolescents place on a school subject influences their choice of subjects and activities (Eccles, Adler, & Meece, 1984; Meece, Wigfield, & Eccles, 1990). For example, the value and importance that students attached to math predicted their intention to continue to take math courses (Meece et al., 1990). Similarly, the value adolescents placed on sports was significantly related to their self-reported free-time involvement in sports (Eccles & Harold, 1991).

There is evidence that the value that children place on sport activities varies according to gender, and that those differences emerge relatively early in schools. Eccles, Wigfield, Harold, & Blumenfield, (1993) reported that boys in first, second, and fourth grades valued sport activities more highly than girls. More recently, Xiang, McBride, Guan, & Solmon, (2003) found that children's value of physical education significantly predicted their intent to participate. Like the Eccles et al. (1993) study, Xiang, et al. (2003) reported gender differences in elementary school-aged children. Boys in second grade, girls in second grade, and boys in

fourth grade had stronger intentions for future participation in physical education then fourth grade girls. They suggested that when children place high value on physical education, they are more likely to continue in physical education and be active as they grow older. These findings support the notion that students will be more motivated to be engaged when an activity or learning task is deemed interesting and meaningful.

Perceptions of Competence

Ability beliefs play a major role in most theories of achievement motivation, such as self-efficacy (Bandura, 1977), expectancy-value (Eccles, et al., 1983), and goal orientation (Nicholls, 1984). In these theories, perceptions of competence are assumed to influence achievement behavior. The general conclusion is that when individuals feel competent that they can be successful at a particular task, they are more likely to choose to do the task and maintain their effort, even under adverse conditions (Wigfield, Eccles, & Rodriquez, 1999). Researchers have documented that, even when previous performance is controlled, children's and adolescents' ability beliefs relate to and predict their performance in different achievement domains such as math, reading, physical activity, sport, and more recently, writing (e.g., Eccles et al., 1993; Feltz & Lirgg, 2001; George, 1994; Nicholls, 1979; Pajares & Johnson, 1996; Pajares, et al., 1999; Wigfield & Eccles, 1992). Therefore, individuals who perceive themselves to be competent may be motivated to engage in physical activity and conversely withdraw from activities when they perceive themselves to lack competence. Xiang, et al., (2003) provide evidence of this. In their study of second and fourth grade boys and girls, future intent to participate in physical education was positively related to children's ability beliefs. As in previous studies (Eccles, et al., 1983; Eccles, et al., 1984; Eccles & Harold, 1991; Harter, 1982; Lee et al., 1999; Satina, Solmon, Cothran, Loftus, Stockin-Davidson,1998; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991;

Wright, 1997), gender differences also surfaced. Boys reported higher ability beliefs than girls in their throwing ability, with fourth grade girls reporting the lowest ability beliefs about physical education and future participation. As early as fourth grade, children, particularly girls, are beginning to show a sharp decline in their beliefs about their competence in physical activity and exhibit an alarming tendency towards physical inactivity.

Summary

Based on the literature reviewed, gender, encouragement by others, social influences, and past performances all impact task choice, how much effort is expended, and expectations for success, which in turn influence competence beliefs, intentions to exercise, and ultimately involvement in physical activity. Research has clearly shown that students who intend to exercise will exercise (Greenockle, et al., 1990). There is some evidence to suggest that children who are active throughout childhood are more likely to be active adults. In the academic literature, there is ample data showing that students who find value and meaning in an activity will try harder to succeed and feel more competent (Pajares & Miller, 1994, 1995). In physical activity, when the activities offered are viewed as gender appropriate and meaningful, expectancies for success increase thereby raising students' perceptions of competence (Belcher & Solmon, 2000; Harrison, Lee, & Belcher, 1999; Lee et al., 1999; Lirgg, et al., 1996).

This study draws from studies that have explored relationships between the various mediating variables and conceptualizes the influence of each in a comprehensive model. The purpose of this study was to examine the interrelationships between gender, perceptions of peer, parent, and teacher support, perceived value and meaningfulness, perceived competence, self-reported engagement in physical education and the intention to be physically active. Figure 1 represents the proposed model depicting the variables that mediate competence and intention to

participate in physical activity. Students with high levels of perceived competence are more likely to be engaged. It is assumed that a self-reported measure of intention will reflect actual engagement in class activities. Engagement as perceived and reported by students has been correlated with the level of engagement observed in classrooms (Marks, 2000). In physical education, a self-reported measure of intention to be physically active was correlated with actual participation patterns (Greenockle, et al., 1990).

The model predicts that perceptions of gender appropriateness of the curriculum and meaningfulness of activities mediate the influence of gender on perceived competence and intention to engage in physical activity. It is hypothesized that students' perceptions of their parents', teachers', and peers' support will positively influence their perceptions of the curriculum and the meaningfulness they attach to the activities.

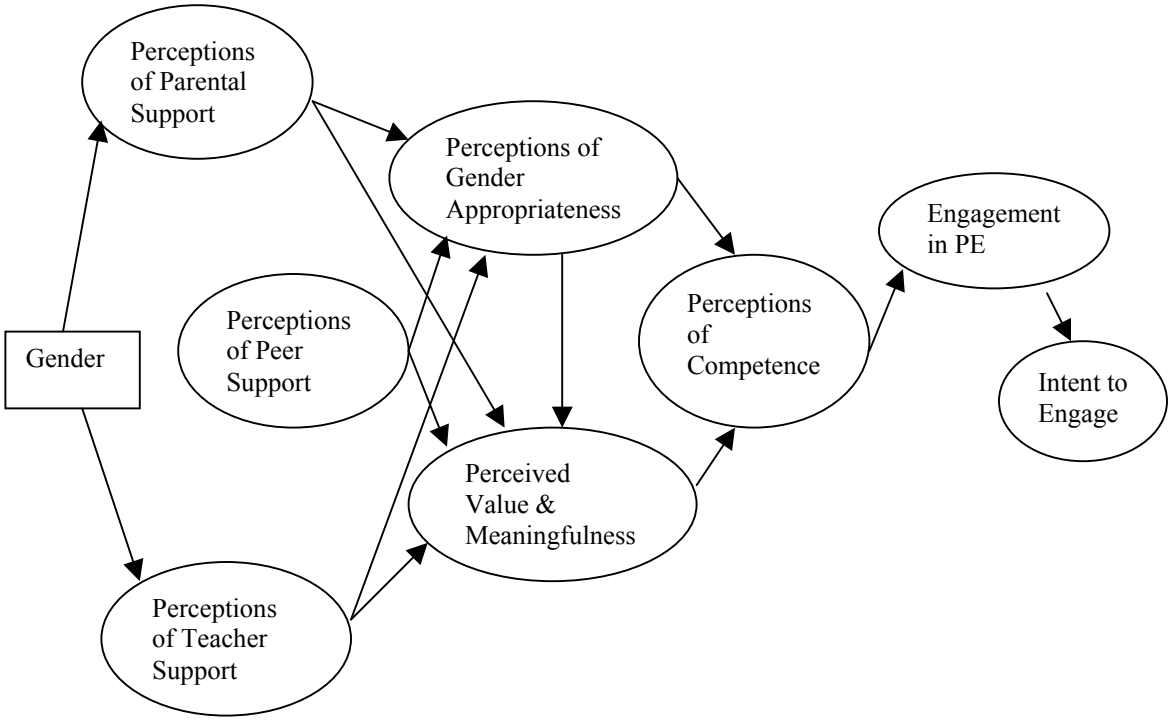

Figure 1 Proposed Model

Chapter 3: Methods

Instrumentation

Based upon an extensive pilot study, a 49-item questionnaire was developed to assess the variables of interest in this study. Items for the questionnaire were derived through a series of steps. Potential items were drawn from questionnaires used in previous studies (Godin & Shepard, 1986; Greenockle, et al., 1990; Lee, Carter, & Xiang, 1995; Marks, 2000) and additional items were generated to address the specific variables of interest in this study. The initial draft of the questionnaire was piloted with small groups of sixth, seventh, and eighth grade students. The items were read aloud to the small groups of students, asking whether or not they understood the items and what they thought the statements meant. Based upon the input from these students, items were reworded to facilitate better understanding of the items. This process resulted in a 62-item pilot instrument that was then administered to another small group of children. They were interviewed informally concerning any items they had difficulty with as well as their general impressions of the instrument. No additional modifications were deemed necessary at that point.

The pilot questionnaire was then administered to 139 seventh grade students (65 boys and 75 girls) who were not involved in the final study. Preliminary analyses were conducted to assess the reliability and validity of the instrument. Potential problems with the initial response scale used for the gender appropriateness subscale were evident so the instrument was revised based on the preliminary analysis. The revised questionnaire was administered to 175 sixth grade students, and the reliability coefficients were acceptable. A panel of experts reviewed the items for each subscale of the final version, and no further modifications were deemed necessary.

The final instrument consisted of 52 items with 8 subscales that assessed the components of the model. The response for all items was a 5-point likert scale ranging from strongly disagree (1) to strongly agree (5). Statements throughout the instrument were counterbalanced so that some were positively weighted and others negatively weighted. This was done for three reasons: (a) to encourage the participants to carefully read each item, (b) reduce the likelihood of social desirability, and (c) to help comprehend the meanings of the items (Solmon & Lee, 1997).

Perceptions of Support. Three subscales were related to perceptions of support: parent (5 items), peer (6 items), and teacher (6 items). Perceptions of parental support included statements such as: "members of my family participate in physical activity with me," and "members of my family get a lot of exercise." Statements assessing perceptions of peer support were: "my friends and I participate in physical activity after school," and "my friends do as little as possible in PE (reversal item)." Teacher support statements included: "my teacher really listens to what I have to say," and "my teacher encourages me to be the best that I can be."

Perceived Value. To assess perceived value and meaningfulness, statements were adapted from Marks (2000). Seven items were reworded to address physical activity and included statements such as: "I can use the information I get from PE class in activities outside of school" and "the activities in PE will be beneficial to me when I get older."

Perceptions of Gender Appropriateness. The eight items from this subscale were developed specifically for use in this study. The intent of these items was to assess whether or not the students believed that the activities included in the physical education curriculum were equally appropriate for boys and girls. Based on previous literature (Ennis, 1999), the assumption is made that the physical education curricula generally include more activities that are considered mostly for boys (team sports) and include few, if any, activities that are viewed as

primarily for girls (aerobics and dance). Sample items from this subscale were "the activities in PE are equally appropriate for boys and girls" and "the activities in PE are boring (reversal item)." The wording for three of the items on this subscale is specific for boys and girls. For example, the item "the activities in PE are mostly for boys" is a reversal item for girls, meaning that strong agreement with that statement indicates the curriculum is perceived to be gender inappropriate for girls. The item was not reversed for boys. The inverse of the item appeared as "the activities in PE are mostly for girls," and that was scored as a reversal item for boys, but not reversed for girls.

Perceived Competence. Five items were adapted from Lee, et al.'s (1995) study to measure perceptions of competence. Examples of these items are "I am better than most of the other students in PE" and reversal item "most of the other students are better than I am in PE."

Engagement in PE and Intention to be Active. Items were derived from Godin and Shepard's (1986) and Greenockle, et al.'s (1990) studies to assess present engagement in PE classes (8 items) and intention to be active outside of school (4 items). Examples of items from the engagement in PE class subscale are "I actively participate in the activities in PE," and "I would rather sit in the bleachers than participate in PE classes (reversal item)." "I plan to be physically active outside of school" is representative of the intention to be active subscale.

Procedures

Informed consent from the participants, as well as parental consent was obtained prior to administration of the questionnaire. The investigator administered the questionnaire to the participants during regularly scheduled class times. The regular physical education teachers were not present during data collection. At the beginning of the session, a brief explanation of the purpose of the study was given. Participants were assured that no one other than the

researcher would see their responses and were told that there were no right or wrong answers. The importance of reading each question carefully and answering honestly was stressed. The response scale was reviewed and students were encouraged to ask questions about the response scale or any item that they did not understand. Participants completed the instrument in small groups and were asked to follow along with the investigator as each question was read aloud. They were asked to stay with investigator and not get ahead on the questionnaire.

Participants

Participants (N=801) were adolescents 12 to 15 years of age in 8th grade who were currently enrolled in regular physical education classes. All volunteers were accepted that met the inclusion criteria, returned a parental consent form, and signed a child assent form. Participants were selected from three junior high schools located in the southeastern area of a southern state that offered daily coeducational physical education taught by certified physical education teachers. Of the three sites, two were located in a suburb of a large city. The third site was an inner-city school. The selected sites offered a traditional multi-activity program with students receiving daily physical education. The curriculum consisted of competitive team and individual sports with several weeks allocated to fitness testing. Respondents consisted of 397 females and 404 males. Ages of the participants ranged from 12 to 15 years of age (mean = 13.69; SD = .71). The majority of the respondents were Caucasian (64.7%) and African American (20.6%). Other races accounted for 14.7 % of the total sample.

Data Screening

Indicator data were evaluated through univariate statisitics using SPSS version 10. The statistics of indicator variables are described in Table 1. The majority of missing data was due to respondents missing only one item, therefore, missing data for any of the indicators were

computed using a Full Information imputation method to retain the full sample size. The data set was submitted to Prelis 2.0 for construction of the covariance matrix to be used in structural equation modeling analysis and a check of the multivariate normality of the data. No problems with non-normality were evident and all items were retained.

Table 1 Descriptive Statistics by Item

	Mean	Std. Deviation	Skewness	Kurtosis
Family (i1)	2.94	1.28	-.130	-1.046
Family (i25)	2.93	1.15	.027	-.625
Family (39)	3.06	1.09	-.158	-.431
Teacher (i11)	2.99	1.22	-.140	-.839
Teacher (i29)	3.04	1.19	-.142	-.818
Teacher (i42)	2.82	1.16	.032	-.733
Teacher (i43)	3.13	1.18	-.200	-.741
Friends (i5)	3.24	1.19	-.247	-.725
Friends (i10)	2.67	1.17	.167	-.798
Friends (i15)	2.71	1.14	.102	-.698
Friends (i45)	3.01	1.05	-.125	-.312
Value (i9)	2.87	1.17	-.011	-.823
Value (i16)	3.42	1.16	-.449	-.556
Value (i22)	3.16	1.21	-.344	-.795
Value (i23)	3.74	1.14	-.784	.023
Value (i32)	3.21	1.16	-.300	-.672
Value (46)	3.22	1.11	-.301	-.456
Value (i47)	3.00	1.23	-.017	-.879
Ga (i8)	3.13	1.20	-.243	-.717
Ga (i19)	3.63	1.10	-.582	-.236
Ga (i28)	2.84	1.18	.124	-.704
Ga (i33)	3.46	1.17	-.411	-.574
Ga (i37)	3.17	1.14	-.293	-.514
Ga (i52)	3.70	1.16	-.635	-.258
Pc (i4)	3.54	1.24	-.525	-.641
Pc (i6)	2.64	1.16	.250	-.658
Pc (i14)	3.55	1.10	-.568	-.179
Pc (i24)	3.24	1.16	-.251	-.599
Engage (i18)	3.43	1.36	-.500	-.882
Engage (i20)	3.30	1.18	-.389	-.534
Engage (i27)	3.33	1.35	-.412	-1.005
Engage (i30)	3.39	1.13	-.474	-.369
Engage (i31)	3.22	1.31	-.305	-.949
Engage (i40)	3.13	1.14	-.139	-.608
Engage (i49)	3.32	1.27	-.313	-.874
Intent (i7)	3.43	1.19	-.504	-.511
Intent (i21)	3.48	1.19	-.499	-.532
Intent (i51)	3.40	1.15	-.377	-.516

Data Analysis

Structural equation modeling (SEM) was used to test the model described above. SEM consists of two subparts, the measurement model and the structural model. The measurement model shows the relationship between the indicators and the latent variables (constructs). The structural model, on the other hand, specifies the relationships between each of the latent variables.

Testing the Measurement Model. A confirmatory factor analysis, using LISREL 8.51 (Joreskog & Sorbom, 1993) was used to confirm the factor structure. Maximum likelihood with item level data was used as the estimation procedure. Item level data were used because of the exploratory nature of this study. Upon examination of the contribution of the item to the subscale reliability, the standardized residuals (> /5/), t-values (>1.96) that indicate the significant contribution of the item to the overall model, the squared multiple correlations (< .10), factor loading values and the modification indices, several items were eliminated from the final analysis. The decision to retain an item was based upon its overall contribution to the construct definition based on the above criteria. This resulted in a 38-item survey and was used in the final SEM analysis (see Table 2). Factor loadings of the items on the constructs, reliability estimates and the squared multiple correlations by subscale are presented in Table 2. The error between items 10 and 15 were allowed to correlate based upon examination of the modification indices and the wording of the items.

Testing the Structural Model. After the measurement model was tested and refined, the structural model was tested using several stages. First, a theoretical model was expressed and the relationships between the variables were identified (see Figure 1). One of the advantages of SEM is that the model used to explain the data are not derived from the data, but rather the

theoretical predictions are tested as to how well the hypothesized model fits the data. Once constructed, the model was expressed as a series of equations in the form of matrices. This step in SEM involves a determination of whether or not a unique solution for the model can be obtained and is known as identification.

After the model was diagrammed and expressed as equation matrices, the model was estimated using the maximum liklihood technique and the fit of the model to the data was assessed. Evaluating structural equation models involves the examination of indices and parameters indicating how well the model is able to reproduce the relationships in the data. The chi-square goodness-of-fit test is an indication of how well the model fits the data. In contrast to traditional hypothesis testing, a model representing good fit to the data will have a nonsignificant chi-square value. Stated another way, there is not a significant difference between the implied model and the data. The Goodness of Fit index (GFI) is an indication of how much of the variance/covariance is accounted for by the proposed model. A value of greater than .9 is suggested as an acceptable criterion (Joreskog & Sorbom, 1993).

Unlike the Chi-square and the GFI, the Comparative Fit Index (CFI) and the Nonnormed Fit Index (NNFI) represent how well the model fits the data as compared with a model that is known to not fit the data (Bentler, 1990). Most commonly, a null model (no relationships between variables) is used as a comparison standard. Higher values represent the degree to which the model represents an improvement of fit to the data when compared with a null model. Values of .90 and above represent good fit (i.e., the model represents a 90% better fit to the data than the null model).

Table 2 Item Summary with Factor Loadings, Reliability Estimates, and Squared Multiple Correlations

	Loading	Alpha	SMC
Family		.73	.44
I1 Members of my family participate in physical activity with me	.70		
I39 Members of my family value physical activity and exercise	.72		
I25 Members of my family get a lot of exercise	.75		
Teacher		.78	.38
I11 My PE teacher really listens to what I have to say	.69		
I29 My PE teacher encourages me to be physically active outside of school	.79		
I42 My PE teacher gives me extra help when I can't do something	.67		
I43 My PE teacher encourages me to be the best that I can be	.74		
Friends		.68	.40
I10 My friends encourage me to participate in physical activity	.41		
I45 My friends enjoy the activities in PE class	.77		
I15 My friends encourage me to participate in PE class	.49		
I5 My friends do as little as possible in PE (reversed)	.84		
Value		.81	.80
I16 It is important for me to participate in physical education	.68		
I46 It is important for me to be good in physical education	.69		
I47 Physical education class is just as important as any other school subject	.60		
I22 I can use the information I get from PE class in activities outside of school	.69		
I32 The activities in PE will be beneficial to me when I get older	.71		
I9 The information and skills I learn in PE class are useful to me	.57		
I23 Being physically active is important to me	.62		
Gender Appropriateness		.62	.35
I8 The activities in PE are boring (reversed)	.70		
I19 The activities in PE are too competitive (reversed)	.71		
I28 The activities in PE are mostly for boys (reversed for girls)	.79		
I33 The activities in PE are equally appropriate for boys and girls	.73		
I37 The activities in PE are fun	.81		
I52 The activities in PE are too rough (reversed)	.61		
Perceived Competence		.79	.68
I24 I am really good at the activities in PE class	.84		
I6 I am better than most of the other students in physical education	.67		
I4 I feel confident that I can be good at any activity in physical education class	.65		
I14 I am able to meet the challenge of performing well in physical education class	.71		
Engagement in PE		.85	.78
I18 When I get the chance, I will never take PE again (reversed)	.55		
I27 If I could I would choose another class instead of PE (reversed)	.37		
I31 If I have the choice, I will choose to take PE in school	.76		
I30 I actively participate in the activities in PE	.56		
I40 I try my hardest in PE class	.77		
I20 I like to do the activities in PE	.73		
I49 I would rather sit in the bleachers than participate in PE class (reversed)	.36		
Intent to Participate		.71	.51
I7 I intend to exercise regularly	.20		
I21 I intend to do active sports or vigorous activities a few times a week	.78		
I51 I intend to engage in physical activities almost every day	.54		

The last category of fit indices, alternative fit, includes the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Residual (SRMR) and represents an analysis of the residual values between the implied model and the data. Stated another way, the RMSEA is an indication of how well the model represents an approximation to reality. Lower values represent better fit of the model to the data. Browne and Cudeck (1993; see also, Joreskog and Sorbom, 1993) suggest that RMSEA values less than .08 represent models with good fit to the data. Similar to the RMSEA, the SRMR represents the square root of the mean residuals between the implied model and the data. Values less than .05 are generally indicative of a good fit of the model to the data.

Chapter 4: Results

After a series of developments and modifications of the initial hypothetical model, an acceptable, substantive LISREL model which depicts the causal relationships among the constructs is shown in Figure 2. Also shown are the LISREL standardized parameter estimates for the finalized model. The parameter estimates reflect indices representing the simultaneous contribution of each observed and latent variable to the overall model.

The overall goodness-of-fit of the model may be determined by several types of indices. The Chi-square, GFI, CFI, NNFI, RMSEA, and the RMSR, are several that are recommended (Crowley & Fan, 1997). Theses are displayed in Table 3. A significant chi square (650, 4032.37, $p<.000$) was found. It is not surprising due to the large sample size and complexity of the model. As discussed above, the GFI indicates the relative degree of variance and covariance jointly explained by the model. The GFI is sensitive to sample size and model complexity, which may be an explanation for the less than optimal result of .76 which falls below our acceptable criterion.

When evaluating the model as compared to the null model, or one that has no structure, the CFI index of .94 is acceptable. In other words, this model represents a 93% better fit to the data than a model without structure. An NNFI index of .93 can also be seen as exceeding the acceptable criterion.

The SRMR is the average of the variance and covariance left unexplained by the model. Given a good fit of the model to the data, this value should be close to zero. The value of this index is .09 which does not meet the pre-established criterion of .05 and indicates that some error is inherent in the model. The RMSEA for this model is .088 (.086, .091), representing 'fair' fit.

Although the criterion of .08 was not reached, given the complexity of the model and the large number of subjects, the fit can be deemed very close to acceptable.

Table 3
Fit Indices

Chi-Square	GFI	CFI	NNFI	RMSEA	SRMR
650, 4032.37	.76	.94*	.93*	.088 (.086, .091)	.09

* Meets acceptable criteria

The proposed model depicted family, teacher and friend support of engagement in physical activity impacting the value and gender appropriate perceptions held by the students. These perceptions influenced perceived competence, engagement in physical education and ultimately intent to engage in physical activity. Gender was expressed as a dichotomous exogenous indicator variable influencing perceptions of significant others' support. The decision to accept the proposed model was based on the overall fit of model to the data and the theoretical soundness of the model.

Engagement in physical education class significantly predicted a student's intent to engage in physical activity. Perceptions of competence significantly predicted engagement in physical education. When a student felt that he/she was able to perform a task, he/she was more likely to engage in physical education class. A student's perception of the gender appropriateness of the activity predicted the perceived competence that a student felt in physical education activities. In addition, perceptions of gender appropriateness also predicted the value that was placed on the physical education experience. When a student valued physical education, he/she was more likely to report participating more often and more readily in physical education class. When looking at the effect that perceptions of support by significant others play

in this model; family, friends, and teacher support affect the gender appropriateness of the activity for the student. Friends and teacher support predict the value that is placed on physical education, but family support failed to produce a significant path. A significant gender effect was found on the paths to family, teacher, and friends. Descriptive statistics of the subscales by gender are presented in table 4.

Table 4 Descriptive Statistics by Subscale and Gender

Subscale	Gender	Mean	Std. Deviation
Family	Male	8.94	2.81
	Female	8.90	2.85
Teacher	Male	12.08	3.74
	Female	11.86	3.67
Friends	Male	11.82	3.30
	Female	11.45	3.18
Value	Male	22.52	5.83
	Female	22.70	5.39
Gender	Male	20.22	3.48
Appropriateness	Female	19.64	4.62
Perceived	Male	13.87	3.60
Competence	Female	12.06	2.47
Engagement	Male	24.31	5.95
	Female	21.91	6.59
Intent	Male	10.44	2.84
	Female	10.18	2.77

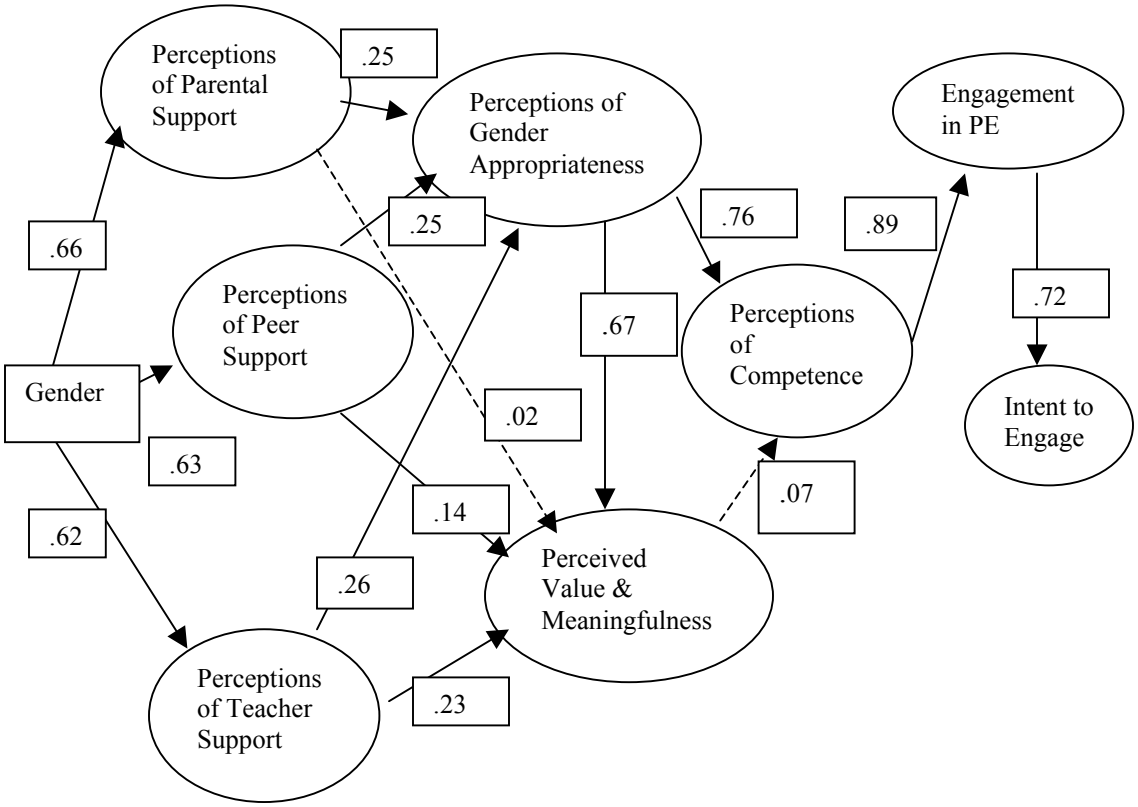

Figure 2 Standardized Parameter Estimates of the LISREL Model
Note: Non-significant paths represented by dashed lines

In addition to the direct effects among the variables, significant indirect effects were found and are presented in Table 5. An indirect effect was found between gender and value as well as gender and gender appropriateness. Girls and boys differ on their perceived value and their perceived gender appropriateness of the activities, regardless of the influence of significant others. Gender also indirectly affects perceived competence, engagement, and intent. Boys and girls differ in their perceived competence, self-reported engagement in physical education class, and their intent to participate in physical activity.

Table 5
Standardized Indirect Effects

	gender	family	teacher	friends	value	pc	ga
family	- -	- -	- -	- -	- -	- -	- -
teacher	- -	- -	- -	- -	- -	- -	- -
friends	- -	- -	- -	- -	- -	- -	- -
value	0.57*	0.17*	0.17*	0.17*	- -	- -	- -
pc	0.41*	0.20*	0.23*	0.21*	- -	- -	--
ga	0.48*	- -	- -	- -	- -	- -	- -
engagement	0.36*	0.18*	0.20*	0.19*	0.06	- -	0.72*
intent	0.26*	0.13*	0.14*	0.13*	0.05	0.63*	0.52*

Note: * notes significant path

Indirect effects between perceived family, teacher, and peer support and value, perceived competence, engagement, and intent. This indicates that students who feel supported by significant others also value the activity more, have a higher perceived competence, engage in physical education more often, and report a stronger intent to participate in physical activity. The indirect effect between gender appropriateness and engagement suggests that when a student feels that the activity is more appropriate for their gender, they are more likely to engage in that activity and will report an intent to participate in physical activity. It is also interesting to note that a higher perceived competence indirectly affects the student's intent to participate in physical activity, as evidenced by the significant indirect effect found in these results. A student

that feels more competent reports a stronger intent to participate. Value did not significantly indirectly affect engagement or intent.

Limitations

Inherent in any self-report survey research, the effect of social desirability cannot be overlooked. Even though every attempt was made to lessen this impact, it should be considered as a potential limitation of the study. Additionally, because this study included only 8th grade, primarily caucasian students, it cannot be assumed that these results could generalize to a different age or racial group. These results may be very specific to this population.

Chapter 5: Discussion

The purpose of this study was to examine the effects that gender has on participation patterns in physical activity using a whole model approach. It was hypothesized that a significant gender effect would be found among the proposed mediating variables on the intent to engage in physical activity. These results provide support for the hypothesis and previous independent research on the various constructs. This model, although exploratory in nature, provides a contribution to the literature by addressing the factors known to mediate participation patterns from a comprehensive whole model approach.

Gender –> Perceptions of Support

Results from this study show that boys and girls view support of significant others differently. Historically, boys are encouraged to participate in physical activity while girls are reinforced for being quiet and ladylike (Greendorfer, 1993). It has been shown that teachers and peers can influence a student's participation in physical education (Greenockle, et al., 1990) The results of this study support these lines of research. Significant paths from gender to each of the significant other categories suggest that boys and girls differ in how they view this support. A large positive value indicates that the impact affects girls more than boys.

Perceptions of support -> Value and Gender Appropriateness

A large body of research exists on gender differences in attitudes towards physical education in regard to gender appropriateness and the value that is placed on physical activity and physical education (Clifton & Gill, 1994; Csizma, et al., 1988; Kane & Snyder, 1989; Lee et al., 1999; Lirgg, 1993; Matteo, 1986; Methany, 1968). These results offer support for that research. Family, friends, and teachers all significantly impact the way a student views physical activity. When family, friends, and/or teachers support the student, he/she has a stronger gender

connection to the activity. When a student feels supported by teachers and friends, he/she also values the physical education experience more. It is not surprising that family plays a diminishing role. There is abundant research in the psychological literature that suggests as children mature, family influence lessens as friends and other significant adults become more important.

Value and Gender Appropriateness -> Perceived Competence

In addition to an indirect effect, it was also found that gender appropriateness also directly affects perceived competence. When a student feels that the activity is appropriate for his/her gender, he/she also feels more competent in that activity. These findings support previous research in this area. In opposition to the literature, this study failed to find a significant path between value and perceived competence. The model suggests that gender indirectly affects value with boys finding physical education and physical activity more meaningful, but it stops there. It does not carry over to self-reported engagement patterns or intent to participate in physical activity.

Perceived Competence -> Self-reported Engagement in Physical Education

There is a positive direct effect between perceived competence and engagement in physical education. When a student feels competent in an activity, he/she reports engaging in physical education. A great deal of research in the academic areas report similar findings(Pajares & Johnson, 1996; Pajares & Miller, 1994; Pajares, et al., 1999; Meece, et al., 1990).

Engagement in PE -> Intent to Participate in Physical Activity

When a student reports engaging in physical education class he/she also reports a stronger intent to engage in physical activity, even outside of class. This is important because it

provides evidence of the connection between physical education and actual involvement of physical activity outside of school. If our goal is to increase girls' participation in physical activity, the results of this study provide strong implications for the importance of physical education in influencing increased physical activity levels among females. With physical education programs becoming increasingly at risk for elimination in our school systems, these results offer some encouraging evidence in support of our programs.

Chapter 6: Summary and Implications for Future Research

The results of this study are promising but should be viewed as exploratory. Overall, the model supports past research that has explored these variables independently. It also offers support for the importance that physical education plays in influencing participation in physical activities that will counter the health risks associated with obesity and inactivity.

Gender differences emerged in this model through direct paths as well as indirect paths among these variables. Girls were more influenced than boys by their perceptions of support of significant others. Indirect effects of gender on value and meaningfulness, gender appropriateness, perceived competence, as well as engagement in physical education indicate that these variables influence girls' intention to participate more so than boys'.

With physical education at risk for cuts in the school system, these results provide support for the importance of including and keeping physical education in our school curriculum from kindergarten through high school. For practitioners, by offering a variety of activities that students feel are gender appropriate, supporting students in their efforts, and helping students to feel competent will all likely increase engagement in class and ultimately encourage participation in physical activity outside of school. These results could be used by teacher educators to improve awareness among future physical education teachers regarding the impact that gender differences, curricula choice, class environment, and skill development for student success can have on students' future long term involvement in physical activity. It is exciting to see results that confirm the importance of physical education teachers' potential influence in turning kids on to physical activity.

It is one of the first attempts to explain the theory behind gender differences in participation of physical activity using a comprehensive approach. A lot of work remains to be

done before making any conclusive statements regarding the theory. This model provides one explanation of the theory. Replication should be considered to improve upon the measurement model. An invariant test between females and males would be helpful in pinpointing exactly where the differences occur within the model. Are boys and girls viewing the constructs differently or does a different structure exist for boys and girls? This model should be viewed as one solution to describing the theory. Competing models could be offered and compared.

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Appendix A: Extended Literature Review

For years researchers have examined gender differences in motor skill performance and the influences that underlie the physical activity patterns and accomplishments of children and young adults. Empirical research (Nelson, Thomas, Nelson, & Abraham, 1986; Smoll & Schutz, 1990; Thomas & French, 1985; Thomas & Thomas, 1988) suggests that males outperform females in many motor tasks during childhood and adolescence and the magnitude of the differences increases with age. There is also evidence to suggest that males are more physically active than females at all ages (Eaton & Enns, 1986) with females becoming increasingly more sedentary during adolescence (Rowland, 1990).

Because research has established a firm link between regular physical activity and overall health, interest in studying gender differences in physical activity participation patterns has increased during the past decade. The Surgeon General (United States Department of Health and Human Services, [USDHHS], 1996) has expressed a concern targeting the female population as one at risk for health problems that could be avoided with a regular exercise. Overall, females are not participating in exercise programs that could lower their health risks, despite the recognized benefits (USDHHS, 1996). Few female high school students (19%) report attending daily physical education classes (Heath, Pratt, Warren, & Kann, 1994). Vertinsky (1992) found that, by grade eight, girls become so dissatisfied with physical education that by grade 11, when given the choice, drop out altogether. Not only do girls drop out earlier than boys, but also those that do continue have lower expectations for their performance (Coles, 1980; Mitchell, 1996).

Researchers have identified perceptions of ability as a powerful mediating construct that might explain gender differences in children's and adolescents' decisions to choose and persist at different movement tasks (Harter, 1978; Nicholls, 1984a). In every cognitive theory of

achievement motivation, competence beliefs are assumed to influence behavior and learning. This construct has been suggested by Nicholls (1984b) to be the key to understanding student motivation and learning. Perceived ability, perceived competence, performance expectancies, ability beliefs, expectancy beliefs, and self confidence are all terms that are used in the literature to indicate a student's belief that he or she has the ability to accomplish a certain level of performance. Self-efficacy is used by Bandura (1977) to describe the belief in one's ability to execute a specific task (e.g., shooting a basketball). It specifies that confidence is specific to a situation rather than a general belief about one's skill performance. The general conclusion is that when individuals feel positively about their ability in a given area, they are more likely to choose that activity and maintain their effort and persistence during participation (Wigfield, Eccles, & Rodriguez, 1999). To be meaningful, however, the confidence constructs must be considered for different types of tasks and within the context of other motivational processes such as goal orientation. Therefore, it is the purpose of this paper to provide a better understanding of the interaction among gender, perceptions of ability, and other motivational constructs, by reviewing the research published thus far and targeting areas that need further research. The first section of the paper will review how beliefs about ability have been conceptualized and measured. Second, the research examining ability beliefs in physical activity will be summarized, highlighting the research reports focusing on gender differences. Finally, a conceptual model will be proposed and a research agenda for the future will be offered, noting the questions that need to be answered based on what is currently known.

Self-Beliefs and Related Constructs

Researchers have studied beliefs about ability using different operational definitions, but the mediating role is clear. First, using William James (1892/1985) initial work on self and its

effect on achievement, investigators have clarified the global constructs of self-concept and self-esteem (Deci & Ryan, 1985; Weiss, 1987). Self-concept is a general term used to describe the way an individual views him or herself in comparison to others in terms of abilities, achievements, performance and physical appearance. Self-concept includes an evaluation of one's abilities, a value judgment placed on those abilities, and in general, a sense of one's self worth or self-esteem (Eccles, et al., 1989). Self concept differs from perceived ability in that perceived ability is a context-specific assessment of competence to perform a particular task (Schunk, 1991). It is hypothesized that individuals with a high level of perceived ability will be more likely to display the kinds of behavior that will promote achievement. Compared to competency judgments, the feelings of self-worth are more global and less context dependent, are measured at a broader level of specificity, and include an evaluation of the competence and feelings of self-worth associated with the ability in question (Pajares, 1996). For example, an individual may feel highly competent in soccer, but without valuing the accomplishments in that area may not have the corresponding positive feelings of self-worth.

How Beliefs about Ability are Conceptualized

Researchers interested in studying beliefs about ability are currently debating the similarities and differences between the various judgment constructs (Pajares, 1996). The general conclusion is that when individuals feel competent they can be successful at a particular task, they are more likely to choose to do the task and maintain their effort, even under adverse conditions (Wigfield, et al., 1999). Competence beliefs predict the future performance and involvement of an individual in a given task even when previous performance is taken into account.

Self-perceptions of ability is a domain (Harter, 1982), and situational specific (Feltz & Brown, 1984; Pajares, 1996) construct, and can be altered with intervention (Goodway & Rudisill, 1996; Goodway, Rudisil, & Blume, 1995). Self-perceptions of ability are multidimensional construct (Harter, 1982) and includes conceptions of ability and perceived competence within its conceptualization. Conceptions of ability are an individual's understanding of the difference between ability and effort. Perceived confidence involves an individual's belief about what they can do and how good they are at different tasks (Nicholls, 1984a). Some researchers simply use the term ability beliefs to conceptualize evaluations made by students about their competence in different areas (Wigfield, et al., 1999). Researchers have documented that, even when previous performance is controlled for, children's and adolescents' ability beliefs relate to and predict their performance in different achievement domains such as math, reading, physical activity, sport, and more recently, writing, (e.g., Eccles et al., 1983; Feltz & Lirgg, 2001; George, 1994, Nicholls, 1979; Pajares & Johnson, 1996; Pajares, Miller, & Johnson, 1999; Wigfield & Eccles, 1992). A construct closely related to students' ability beliefs is their expectancy for success. In comparison to ability beliefs, expectancies refer to an individual's sense of how well they will do on an upcoming task, instead of their general belief of how good they are at the task (Stipek, 1984). These beliefs also predict an individual's performance on different tasks. Individuals are more likely to accomplish a task when they think they can be successful. A number of studies have shown that individuals who approach tasks with a high expectancy of success are more likely to perform better than those with a low expectancy (Battle, 1965; Dalton, Maier, & Posavac, 1977; Feather, 1966; Nelson & Furst, 1972; Sanguinetti, Lee, & Nelson, 1985).

Self-efficacy, sport confidence, and performance expectations are situation-specific measures of how confident one feels in performing. Perceived competence, physical estimation, and perceived ability are more general and multidimensional in nature. All are concerned with perceptions of physical ability. Therefore, in this paper, the terms self-confidence, self-efficacy, perceived ability, and perceived competence will be used synonymously.

Theoretical Base for Perceptions of Ability

Perceived ability is not a motivational perspective unto itself. Because it is a judgment made by an individual regarding his/her ability to accomplish a goal, it must be considered within a broader conceptualization of motivation that provides a goal context (Druckman & Bjork, 1994). Many theories of motivation include perceptions of ability as a primary construct. This has been proposed in an attempt to explain the choices individuals make in regard to participation and the amount of effort and persistence in the activity (see Ford, 1992). Bandura's (1986, 1989) theory of self-efficacy; Harter's (1981a, 1981b, 1982) competence motivational theory; Eccles' et al.'s (1983) expectancy-value model of achievement; and achievement goal theory (Ames, 1984; Dweck & Elliot, 1983; Maehr, 1984; Nicholls, 1984a, 1984b) have been used to explain motivation within the academic setting. All models acknowledge the role of confidence or perceived ability in achievement motivation, although each has different terminology and outcomes for self-confidence.

Self-Efficacy Theory. Bandura's (1977) theory of self-efficacy has received a vast amount of attention in sport, physical activity, and health, as well as, various academic subjects (see Feltz & Lirgg, 2001; Multan, Brown, & Lent, 1991; Pajares, 1997; for reviews). Bandura hypothesized that strong feelings of confidence will lead to increased effort and will determine the course of action an individual takes in an achievement setting. According to Bandura (1977,

1997), self-efficacy varies according to the task, can be positive or negative, and is very specific to a situation. Bandura (1977) proposed that social influences, such as verbal persuasion and vicarious experiences, combined with past performance affect self-efficacy. In turn, an individual's efficacy expectations have a major influence on activity choice, the amount of effort, and the amount persistence they exert, which directly affects achievement (see also Bandura, 1997). In other words, the beliefs that individuals develop about their academic or sport capabilities help to determine what they will do with the knowledge and skills they possess. Consequently, other influences on their performance in various domains are partly the result of what they believe they can accomplish. This helps to explain why academic achievements can differ among individuals even though they may have similar ability. Bandura's (1977) theory has been widely used in a variety of academic and physical activity settings to study relationships between self-efficacy and health-promoting behaviors, athletic performance, and self-regulation of eating and exercise behavior (Bandura, 1997).

Competence Motivation Theory. Competence motivation theory, developed by Harter (1981b), proposed that high perceived competence is a motivational factor leading to intrinsic pleasure and consequently more mastery attempts. Harter's (1981b) theory asserts that individuals will be motivated to engage in tasks when they perceive themselves to be competent, and conversely will withdraw from activities when they perceive themselves to lack competence. Based on her model and the supportive research, Harter developed a scale to measure perceived competence. Harter (1981b) demonstrated that children's beliefs about their competence in a variety of domains are differentiated at a very young age. Harter's Perceived Competence Scale has been used in physical activity research to study relationships between students' perceived competency, their effort during practice, and their level of achievement (e.g. Solmon & Lee,

1996). Other researchers have used Harter's (1981b) model to predict motivation and continued interest in sport (Feltz & Petlichkoff, 1983). Mullan, Albinson, and Markland (1997) found that students differentiated between their competence judgments for different categories of physical activities such as play, competitive games, and recreational sports. These researchers modified the Harter Scale to refer to specific types of physical activities.

Expectancy-Success Theory. In an attempt to explain motivational factors that individuals use in making decisions about achievement-related choices, Eccles and her colleagues developed a model of academic choice (Eccles, 1985; Eccles et al., 1983; Meece, Parsons, Kaczala, Goff, & Futterman, 1982). The model links activity choice to performance expectations and the value attached to the available options. The model assumes that achievement behavior involves an element of choice. It focuses on the motivational and sociocultural variables that guide individuals' choices concerning which activities to try, how much effort to expend, the types of problem-solving strategies to use, how long to persist, and so forth. The conclusive pathways that are presented, as well as the inclusion of socializing influences, and the individual's perceptions, are the strengths of this model (Lirgg, 1992).

In summary, while all three models are fairly consistent with the mediating variables on an individual's self-confidence and ultimately performance, the pathways that the variables take are disputed. For example, Bandura (1977) contends that self-efficacy influences attributions while Eccles et al. (1983) holds an opposite view that attributions directly influence ability beliefs. Harter (1981b), on the other hand, argues that perceptions of ability and attributions are being simultaneously influenced, they are not necessarily influencing each other. Additionally, although all three models acknowledge that socialization and past performance experiences influence an individual's confidence, there are differences in respect to whether the impact is

direct or indirect. Bandura (1977) and Harter (1981b) contend that social influences have a direct impact on confidence, while Eccles et al. (1983) argue that socializing agents first influence the individual's past experiences.

Goal Theory. Goal theories have been used extensively by researchers to explain task choices and efforts to improve performance (Ames, 1992; Dweck & Elliot, 1983; Nicholls, 1979). Regardless of the theoretical framework, the relationship between motivation and an individual's future goal-setting is mediated by confidence beliefs. In general, research has shown that stronger ability beliefs result in higher goals and a stronger commitment to achieving those goals. Although researchers in achievement goal theory have all included conceptions of ability as a mediator, different terminology has been used to explain the relationships (see Ames, 1992; Dweck & Elliot, 1983; Nicholls, 1979). According to Nicholls (1984a, 1992), the conception of ability construct refers to an individual's conceptualization of the relationship between effort and ability and has been identified as an important influence on competence beliefs. Nicholls (1979) refers to a "differentiated"or "undifferentiated" conception of ability that is explained from a developmental perspective. Most young children cannot differentiate between ability and effort and believe that over time ability can be developed with effort. Older students, on the other hand, understand ability as a stable capacity. A differentiated conception of ability leads to the notion that higher effort implies lower ability. Nicholls (Nicholls & Miller, 1984) and others (Dweck & Leggett, 1988) have argued, however, that students can understand ability as a stable capacity and still believe it can be modified through effort. Thus, some students at any age will believe that competence can be enhanced through increased effort. Dweck (Dweck & Leggett, 1988) refers to an incremental or acquired conception of ability to denote one who believes that ability can be learned and errors are a natural part of this process. Similar to the undifferentiated

view of ability, individuals with an acquired conception would be more likely to persist in an activity even if they have a low perception of their ability because they believe that with effort their ability will improve. The belief that ability is a fixed capacity (Ames, 1992, Dweck & Leggett, 1988) that cannot be changed with effort or practice is consistent with Nicholls (1979) differentiated conception of ability, attributing performance to natural ability. If individuals believe they lack the ability necessary for success and also believe that ability is a fixed capacity, they are likely to quit trying since success does not seem possible. Beliefs about ability can certainly influence an individual's competence beliefs since the evaluation of one's current ability and the ability to perform skills are critical elements in self-confidence judgments (Kanfer, 1990). Successes are more likely to enhance self-confidence if performances are viewed as resulting from acquired ability. Additionally, individuals can talk themselves out of success by seeing failure as a result of inherent ability or lack of it. Individuals are most at risk when a fixed conception of ability is combined with a low self-perception of ability. The result is the feeling that it doesn't matter what they do or how hard they try, nothing will help them improve their performance. If the individual does not think they have the ability and that it can't be changed, then they will not try. On the other hand, an individual can have a low self-perception of ability and still succeed if it is coupled with an acquired conception of ability because they feel that with effort they can improve. These conceptions of abilities are also connected to two different types of goal patterns.

In goal theory research, a student's goal perspective is also a primary factor related to perceptions of competence. Nicholls and his colleagues (e.g. Nicholls, 1979, 1984a, 1984b, 1992; Nicholls, Cobb, Yackel, Wood, & Wheatley, 1990) defined two major kinds of motivationally important goal perspectives: ego-involved goals and task-involved goals.

Individuals with ego-involved goals participate in activities that will result in favorable evaluations of their competence and avoid activities that might result in negative judgments of their competence. Examples of typical questions that reflect ego-involved goals are: 'Will I look smart?" and "Can I do better than others?' (Wigfield, et al., 1999). Because individuals with an ego-involved goal orientation see errors as a threat to being able to show their ability, challenging goals are avoided thus hindering skill development. On the other hand, individuals who focus on mastering tasks and increasing their skill reflect a task-involved goal orientation. According to Wigfield, et al. (1999), examples of questions that reflect task-involved goals include, "What will I learn?" and "How can I do this task?' Because individuals focus on improving their skill and evaluating their competence in terms of improvement, this goal orientation is conducive to skill development. These individuals view errors as a natural process in skill acquisition (Druckman & Bjork, 1994). Nicholls (1984a) also discussed a third type of goal orientation: work avoidance. As its label suggests, work avoidance refers to attempting to do as little work as possible in achievement settings.

Dweck and her colleagues provided a similar contrast in orientation (e.g. Dweck & Elliot, 1983, Dweck & Leggett, 1988) differentiating between performance goals and learning goals. Thinking of ability as acquirable leads to a learning goal orientation concerned primarily with increasing competence. On the other hand, an individual with a performance goal orientation conceives of ability as fixed and is primarily concerned with how good their competence at the task will appear to others. Similarly, Ames (1992) distinguished between the association of performance goals and mastery goals with both performance and task choice. With performance goals, children try to outperform others, are more likely to participate in tasks they know they can do, and view ability as a stable. Mastery-oriented children view ability as acquirable thus

choosing challenging tasks and focusing on their own progress rather than trying to outperform others.

In summary, regardless of the terminology, individuals who view ability as modifiable through effort and adopt a mastery-goal orientation are more likely to try new activities and will display the appropriate motivation present to persist in activities, even under adverse conditions, with the intent to improve their competence. Even with a low self-perception of ability, if the individual is mastery oriented, they are more likely to succeed because they are not afraid to try to improve. More at-risk are the individuals that have a low self-perception of ability and are ego-oriented. Individuals may not want to put forth the effort to succeed because they feel inferior in their performance. When coupled with a fixed conception of ability, the likelihood that the child will participate in the activity is virtually non-existent.

The Development of Competence-Related Beliefs

All frameworks focusing on ability beliefs as a primary construct in motivation have a developmental component and propose that as children get older their perceptions of competence decline. Developmental theorists such as Harter (1983) proposed that children begin with broad understandings of whether or not they are smart which later develops into a more differentiated understanding of their competencies. Additionally, it has been found that children, as early as kindergarten and first-grade, can distinguish among their self-perceptions of competence across many different domains, including math, reading, music, sports, general school ability, physical appearance, and both peer and parent relations (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Harter, 1982; Marsh & Hocevar, 1985).

Another important development is an improvement in the correlation between actual ability and reported competence. Nicholls (1979) found that first graders' self-reported reading

ability was not correlated with their actual performance in reading. These young children consistently ranked themselves near the top of the class, when in actuality their abilities were widely dispersed. In contrast, 12-year-olds' ratings were a more accurate report of their actual ability and correlated highly with school grades (.70 or higher).

Expectancies for success also decrease during the elementary school years. In most laboratory-type studies, even after repeated failure, 4- and 5-year-old children expect to do quite well on specific tasks (Parsons & Ruble, 1977; Stipek, 1984). Stipek (1984) argued that young children's optimistic success predictions might reflect wishful outcomes rather than real expectations. In addition, Parsons and Ruble (1977) suggested that, since young children experience rapid improvement in skill, high expectancies for future success might be based on experience. However, as children age, their expectancies for success become more accurate in terms of their actual performance and more sensitive to both success and failure expectations (Eccles, Midgley, & Adler, 1984; Parsons & Ruble, 1977; Stipek, 1984).

The declines in children's competence-related beliefs have been explained in two primary ways. First, children become much better at understanding and using the feedback they receive. As children become involved in more social comparison, a more accurate and realistic self-evaluation occurs which results in some children seeing themselves as being less competent (Dweck & Elliot, 1983; Nicholls, 1984a; Ruble, 1983; Stipek & Mac Iver, 1989). Second, as a result of changing school environments that require clear evaluation and make competition between students more likely, some children's self-assessments will decline as they get older (Blumenfield, Pintrich, Meece, & Wessels, 1982; Eccles & Midgley, 1989; Eccles, et al., 1984; Stipek & Daniels, 1988; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). In the physical domain, when compared to older children, children in kindergarten and first grade are inclined to

be overly optimistic about their own abilities (Lee, Hall, & Carter, 1983; Lee, Nelson, & Nelson, 1988). Similar to academic areas, there is some evidence that as children age, their perceived competence in sport activities tends to be a more accurate account of their actual performance (Feltz & Brown, 1984; Horn & Weiss, 1991; McKiddie & Maynard, 1997; Xiang & Lee, 1998). For example, in both physical education (Xiang & Lee, 1998) and sport settings (Feltz & Brown, 1984; Horn & Weiss, 1991) the correlation between children's perceived competence and teachers' ratings of competence increased with age. These findings support the contention that children's self-evaluations become more accurate as they age in the sense of being in closer agreement with their teachers' assessment. This increase in accuracy is probably related to developmental changes in the use and understanding of social comparison.

According to Nicholls (1989), most young children cannot differentiate ability from effort. They believe that ability can be developed with effort and persistence over time, and competence is determined in a self-referenced manner. By the time children reach the end of their elementary school experience, they understand the distinction between ability and effort and how these relate to success viewing ability as a stable characteristic (Fry & Duda, 1997). Fry and Duda (1997) studied changes in children's conceptions of ability from a developmental perspective. Children, aged 5-13, were shown films depicting various amounts of effort and the resulting outcome scores. Findings indicated that older children were more likely to be able to distinguish between ability and effort. Likewise, older children recognized that higher effort meant lower ability and they were inclined to judge competence in terms of comparison to others. Xiang and Lee (1998) reported similar findings to suggest that children's conceptions of ability change with age and a more differentiated conception is acquired as they progress through the grades. However, these researchers (Xiang & Lee, 1998) and others have argued (Dweck &

Leggett, 1988; Lee, Carter, & Xiang, 1995; Nicholls & Miller, 1984) that it is possible for children to believe that ability can be modified through effort even though they hold the notion that ability is a stable entity.

Research by Xiang, Lee and Williamson (2001) found that children and adolescents believe that the ability, effort, and comparison to others determine competence in physical education. In this study, participants were asked to explain the basis for their views about their own competence, and findings suggested that the criteria used differed by grade level. Fourth graders were more likely to use task mastery and class behavior as evidence of their ability, while eleventh graders perceived natural ability and a willingness to try as the indicators. At all grade levels, students were inclined to compare their own ability with that of their classmates. However, grade-related differences were evident. For example, in fourth grade, competence was determined by successful performance on specific tasks, listening to the teacher, and following directions. This is consistent with the earlier findings of Lee, Carter, and Xiang (1995) indicating that children in grades kindergarten, first, fourth, and fifth used task mastery, effort, and conduct in class to assess competence, but by fifth grade, the more important indicator of competence became performance. Although older students held a more mature understanding of the difference between natural ability and effort and believed those to be the major indicators of competence, some still believed that effort could enhance ability. This was more recently supported by Freedman-Doan, Wigfield, Blumenfeld, Arbreton, and Harold (2000) who found that children in grades 1, 2, and 4 were very optimistic that with increased effort and better strategies they could improve their ability in a variety subjects such as academics, sports, music and art. However, it is important to note that some children reported doubts that they could improve their ability enough in their current worst subject to become the best. The reason

provided by the children was a lack of ability and a lack of interest. In contrast to previous research, grade differences in beliefs about ability in the academic areas (math, reading, spelling, science) were not as strong as previously reported by Marsh (1989), Eccles et al. (1983), or Wigfield et al. (1991). In these earlier studies, younger children consistently reported higher ability beliefs regarding academics, especially math and reading, than older children. In the Freedman-Doan, et al. study (2000), the largest differences among the grades were in the sports domain. Consistent with the earlier research conducted by developmental theorists regarding academics, younger children were more optimistic about improving their sports ability than older children. Younger children also reported themselves best at noncompetitive, individual sports while older children felt that they were better at team sports.

Gender as a Mediating Variable

Over the years, many researchers have attempted to identify the processes that might influence gender differences in performance and achievement (e.g., Eisenberg, Martin, & Fabes, 1996; Maccoby & Jacklin, 1974), and beliefs about the self has become a dominant theme. Further, as we learn more about feelings of competence and the development of competency beliefs, the more complicated the issue becomes with gender arising as one variable that seems to be making a difference (Pajares & Johnson, 1996; Pajares, Miller, & Johnson, 1999). Early reports (Maccoby & Jacklin, 1974) provided evidence that, when compared to males, females tend to lack confidence and expect a lower performance in most achievement contexts. Likewise, in physical activity studies (see Table 1), gender differences in children's beliefs about their own competence have been reported rather consistently over the years (Biddle & Armstrong, 1992; Garcia, et al., 1995; Simons-Morton, et al, 1997; Tappe, Duda, & Menges-Ehrnwald, 1990; Trost, et al., 1996, 1997; Zakarian, et al., 1994). For most activities, males are

more positive than females about their ability and their performance expectations. Lenney (1977) was among the first to mention that the task and the context should be considered when studying competence and performance. Many researchers gained an increased interest when Lenney (1977) argued that females might lack self-confidence when they were in a comparative/competitive situation, when ambiguous feedback was presented, and/or when the task was considered masculine in nature. Additionally, research regarding gender differences in academic achievement and performance has found that females underestimate their academic abilities more than males (Eccles, 1985; Maccoby & Jacklin, 1974). When individuals are participating in activities deemed gender appropriate, their expectancies for success increase. On the other hand, when the task is perceived as gender inappropriate, males and females success expectations decrease (Huston, 1983) even though performance is similar (Entwistle & Baker, 1983; Ilardi & Bridges, 1988). As early as age 4, girls, when compared to boys, generally have lower expectancies for success, set lower, as well as less challenging goals, tend to fear failure more often, and tend to attribute their failure to a lack of ability and their successes to unstable factors such as luck (Crandall, 1978; Huston, 1983). These gender differences in competency beliefs, according to Eccles et al. (1983), influence children's activity choices and participation and should be considered when studying achievement (Eccles et al., 1983, 1985; Stipek & Gralinski, 1991).

Gender and Competence Beliefs in Physical Activity

Sex typing of tasks. Although Lenney's notions and the work of Eccles are based on research studying achievement in academic situations, there are numerous studies to support similar conclusions in sport and various physical activities (Belcher, Lee, Solmon, & Harrison, 2003; Clifton & Gill, 1994; Corbin, 1981; Corbin, Landers, Feltz, & Senior, 1983; Corbin & Nix,

1979; Corbin, Stewart, & Blair, 1981; Daley & Buchanan, 1999; Gill, Gross, Huddleston, & Shifflet, 1984; Lirgg, Chase, George, & Ferguson, 1996; Petruzzello & Corbin, 1988; Solmon, Lee, Belcher, Harrison, Wells, in review; Stewart & Corbin, 1988). In general, boys consistently report higher perceptions of their overall physical competence and are more positive than girls about their ability in most traditional sport activities (Eccles et al., 1989; Harter, 1982; Marsh, Barnes, Cairns, & Tidman, 1984). As suggested by Lenney, (1977), and supported by more recent research (Clifton & Gill, 1994; Daley & Buchanan, 1999; Lirgg, 1991; Lirgg, Chase, George, & Ferguson, 1996; Sanguinetti, Lee, & Nelson, 1985) females do not display a lack of confidence in all situations. For example, Corbin and Nix (1979), found that in pre-competition elementary females' self-confidence was lower only for male activities.

Research on sex typing of physical activity choices (Clifton & Gill, 1994; Csizma, Wittig, & Schurr, 1988; Kane & Snyder, 1989; Lee, Fredenburg, Belcher, & Cleveland, 1999; Lirgg, 1993; Matteo, 1986; Methany, 1968) has indicated consistent trends in beliefs about gender-appropriate physical activities. Future choices regarding physical activity are greatly influenced by these stereotypical viewpoints. Activities such as dance, gymnastics, and figure skating are generally viewed as feminine activities (Lee et al., 1999). Conversely, activities that are associated with strength and power such as football, basketball, and soccer are considered masculine (Lee et al., 1999). Although research on the role of gender knowledge in children's thinking about their ability has answered some important questions, the findings remain inconsistent. For example, females, despite successful performance in tumbling, maintained lower expectations for future success than males (Eccles et al., 1983). In another study, Thout and Martin (1998) found that even though the performance of males and females on the gender neutral task of serving a tennis ball was similar, females reported significantly lower

performance estimates and self-confidence than did the males. In theLee, et al., (1999), study elementary students explained the main reason for sex-stereotyped views was the need to feel socially accepted. Boys are expected by parents and others to play basketball and girls were expected to participate in dance. If students stepped outside this realm of social acceptability, they viewed themselves to be at risk for some sort of social penalty. The discouraging aspect of these findings is that it eliminates a wide range of activities for girls and may in part explain the why girls begin to avoid physical activity as they enter junior high school. According to Savin-Williams, Bolger, and Spinola (1986), there is more social pressure on girls to act "ladylike." As a result, girls are conditioned to select physical activities such as cheerleading, gymnastics, and dance team, to avoid masculine sports like football, basketball, hockey, and baseball (Eder & Parker, 1987; Weinberg, 1997).

Taken together, the literature reviewed suggests the sex typing of activities has an unquestionable effect on self-perceptions of confidence, which in turn will likely affect future choices and attempts at learning an activity. For example, Corbin, et al. (1983), using a leg extension task, investigated the extent to which male boastfulness or female lack of confidence accounted for differences in motor performance estimates between groups of high school boys and girls. Their results supported Lenney's (1977) contention that females lack self-confidence in certain situations when the task is viewed as masculine in nature. Males and females performed equally well, but girls estimated a lower score than they actually achieved. Following Corbin et al. (1983), Lirgg (1991) conducted a meta-analysis to test this situational vulnerability. The results indicated that a competitive situation did not influence female self-confidence, while in support of Lenney's (1977) contentions, the sex type of the task did contribute to gender differences. It was concluded that the more masculine the task, the greater the difference. It

should be noted, however, that it is difficult to make conclusive statements about the differences in masculine and feminine tasks because most of the research, with the exception of Sanguinetti, Lee, & Nelson (1985), has involved masculine tasks.

Sanguinetti, et al. (1985) found that the sex typing of activities influenced participants' expectancies for success, with higher estimates on the gender-appropriate task. In other words, females had higher expectancies for success than males on the feminine-typed task (ballet) and males displayed higher estimations of performance on the masculine-typed task (football). When success predictions were compared for the neutral task (swimming), although males reported a higher expectancy for success than females, difference was not statistically significant. In support, Clifton and Gill (1994) and Lirgg, et al. (1996) found females to be more confident than males on a feminine typed task such as dance, and females were less confident than males on a perceived masculine task, such as throwing a football. Solmon et al., (in review) reported findings to support the previous research in a study using hockey skills. Most females viewed hockey as a masculine sport and as a consequence did not have the confidence in their ability to learn the skills needed to participate. When asked to explain their viewpoints, participants reported a concern with the rough play, hostile aggression, and competitiveness associated with the sport of hockey.

Using participants who have internalized stereotypical beliefs regarding the gender appropriateness of basketball and dance, Lee, et al., (1999) investigated gender differences in children's conceptions of competence and motivational beliefs. Students with well-established sex-role conceptions were motivated by a sense of gender appropriateness. More recently, Daley and Buchanan (1999) reported that females involved in aerobics and physical education improved in physical self-perceptions when compared to a physical education only group.

Additionally, using a hockey skill, Belcher, et al., (2003), found that when compared to participants who viewed hockey as gender neutral, girls who indicated that the activity was primarily for males had lower expected outcomes and actual performance. These results support other studies (Lirgg, et al, 1996; Corbin, 1981; Clifton and Gill, 1994) reporting higher self-perceptions of ability when females are involved in a gender appropriate activity. Collectively, the results support the importance of providing a learning environment that meets the needs of all students. When females feel that an activity is for boys, they may not have the confidence in their ability to be successful which will ultimately impact their potential for developing skills in a wide range of activities.

Feedback. Several studies have attempted to test the effects of performance feedback on confidence perceptions, but the results have been mixed (Corbin, Stewart, & Blair, 1981; Petruzzello & Corbin, 1988; Stewart & Corbin, 1988). Findings from a study by Corbin, et al., (1981) indicated that when performing a task perceived to be "neutral" in sex orientation in a noncompetitive, non-comparative environment, the self-confidence of young girls, and feedback dependency did not differ from boys. It was suggested by the authors that, by itself, the absence of performance feedback may not result in low confidence. In contrast, a subsequent study by Stewart and Corbin (1988) found that performance feedback did influence self-confidence in adolescent girls 10 to 12 years of age. Self-confidence improved in low confidence females who received performance feedback whereas it remained low in those females who did not receive feedback. It may be that performance feedback becomes a more important issue as low confidence females/males mature (Petruzzello & Corbin, 1988).

Competition. Addressing Lenney's (1977) contention that females will be less confident than males in a competitive situation, and controlling for gender appropriateness by using a

neutral task, Corbin (1981), found that males and females were equal in self-confidence after performing against opponents thought to be of "poor ability." Females were lower than males in self-confidence after performance against an opponent thought to be "good." These findings are consistent with Argote, Fisher, McDonald, and O'Neal (1976) who note that performance expectations of females tend to be unstable, allowing success expectancy to change even after just one failure. Males, on the other hand, are less likely to allow one failure to affect performance estimations. Accordingly, Pheterson, Kiesler, and Goldberg (1971), contend that information about performance is likely to be used by females in making judgments about future performance in motor as well as non-motor skills.

Gill et al. (1984) suggests that competition is not necessarily detrimental for females when the task is perceived as gender appropriate or neutral. It was hypothesized that females would give lower performance estimates, perform more poorly, report a lower ability level, and attribute success or failure to external causes when compared to males in a competitive task. Interestingly, with the exception of success expectancy measures, females responded quite favorably to the competition by improving performance, attributing their improved performance to greater effort, and increasing their ability ratings following competition. Female winners in opposite-sex competition showed a greater increase in perceived ability when compared to female winners in a same-sex condition and to male winners in either the same- or opposite-sex competition. When comparing losers, females in the opposite-sex competition gave higher ability ratings than losers in the other three groups. Although males and females differed in their predictions of an overall win or loss in competition, females by no means predicted failure with 70% of the females predicting a win and 100% of the males. The sex of the opponent did not have a significant influence on the win-loss prediction.

More recently, Freedman-Doan, (2000) investigated grade and gender differences in children's beliefs about activities they were best and worst in reading, math, spelling, science, music, art, and sports. The sports were grouped into four categories: team competitive, individual competitive, individual noncompetitive, individual ambiguous. They found that boys reported being best at competitive team sports (T-ball, baseball, basketball, soccer, ice-hockey, football, kickball) while girls reported being best at individual noncompetitive sports (jogging, biking, climbing on outdoor equipment, jump roping, roller skating). It is important to note that these activities were grouped according to the competitive nature of the sport and the kind of organization (team versus individual). Gender appropriateness of the activity was not considered.

Interaction of variables. Investigating the interaction between conception of ability and gender-typed activities, Jourden, Bandura, and Banfield (1991) found that, in gender-neutral tasks, participants who believed that ability on a task was unchangeable were less confident than those who believed that ability could be acquired. Following the work of Jourden, Bandura, and Banfield (1991), Lirgg, Chase, George, and Ferguson (1996) used both perceived feminine and masculine tasks and conception of ability to expand upon their results. For females, as shown by these analyses, both sex-type of task and conception of ability influenced self-efficacy. When the task was considered feminine, females were equally as confident that they could learn the skill, regardless of the conception of ability condition. However, when the task was perceived as masculine, those in the acquired condition were much more confident than those in the innate condition. When the task was feminine in nature, females felt confident that they could learn baton twirling, regardless of the conception of ability condition. However, when the task was masculine in nature, those in the acquired condition were more confident than those in the innate

condition. These results indicated that, for females, the impact of the sex-type of the task on self-efficacy beliefs was influenced by their conception of ability. Specifically, those tasks believed to be masculine in nature were more likely to be affected by conception of ability. This was not true for the feminine task, or for the martial arts task when it was perceived as gender neutral. Apparently, the combination of a perceived masculine task and a belief that ability is unchangeable was enough to cause much lower efficacy beliefs in females (Lirgg, et al., 1996). Interestingly, males were not influenced by the sex-type of the task or by their conception of ability. Males were equally as confident in baton twirling as they were in martial arts. This finding is consistent with previous research that found males to report higher levels of confidence in a variety of physical skills (Corbin, et al., 1983; George, 1994; Lirgg & Feltz, 1989, 1991; Vealey, 1986).

Influence of Sport Socialization

It can be concluded, given the research thus far, that self-confidence is fragile and can be influenced by different situations as well as by other individuals. Self-confidence, especially in physical activity and sport, is greatly influenced by the socialization process. According to Colley, Nash, O'Donnell, and Restorick (1987), male's sex-type physical activities more often and more extremely than do females, primarily because of social influence and reinforcement in the school system. In our society, masculine behavior is portrayed as aggressive, competitive, and tough (Streitmatter, 1994) which conditions males to work toward feelings of dominance and self-confidence (Bell, 1986). Children learn early to believe that sport participation is more appropriate for boys (Brustad, 1996; Pissanos & Allison, 1993; Talbot, 1993; Wright, 1996, 1997). For boys, participation in sports, exercise, and physical activity is consistent with society's definition of masculinity and is reinforced, emphasized, and encouraged by the attitudes

of parents, teachers, coaches, and peers (Griffin, 1983, 1984, 1985a, 1985b; Hay & Donnelly, 1996; Landers & Fine, 1996; Maccoby, 1990; McBride, 1995; McCoy, 1990; Meece, 1987; Miller & Levy, 1996; Olivares & Rosenthal, 1992; Parker-Price & Claxton, 1996; Pissanos & Allison, 1993; Wang, 1978).

According to McPherson (1982), "socialization is a process whereby individuals learn skills, traits, values, attitudes, norms, sanctions, knowledges, and dispositions associated with the performance of present anticipated social roles" (p. 250). Sport socialization begins in early elementary school when boys are encouraged by parents, teachers, and peers to be active in sports and girls are reinforced for being quiet and ladylike (Greendorfer, 1993). Children, especially boys, become aware that active sports are considered masculine and develop narrow views of gender appropriate activities (Ignico & Mead, 1990; Pellett & Harrison, 1992). As early as the preschool years, gender-role stereotyped interests develop as children work to behave consistently with their gender identity by differentiating between appropriate and inappropriate activities resulting in distinctive behavioral patterns (Eccles, 1987; Renninger & Wozniak, 1985; Ruble & Martin, 1998). For example, Clark, Wyon, and Richards (1969), in a study of preschool aged children, found that girls spent most of their time in fine motor skill activities while boys preferred more active gross motor skill activities. As well, Lever (1976), found that boys played outside and in larger, more age-heterogeneous groups than girls with the younger boys trying to keep up with the older ones. Even though girls played in age-heterogeneous groups, the younger girls were more submissive to the older girls who tended to dominate the group. Another important factor that emerges in the preschool years is the rough-and-tumble, competitive play style of boys (Maccoby, 1988). Because of the dominating characteristics of this kind of play, Maccoby (1988) found that girls have a difficult time trying

to influence boys. However, the girls' cooperative and caring style of play proves effective with one another and is conducive to interaction with teachers and adults. Following this line of research, Garcia (1994) studied the differences in play and interaction patterns among preschoolers. Findings supported previous research (Griffin, 1981, 1983, 1984, 1985a, 1985b; Lever, 1976; Maccoby, 1988; Solomons 1980; Wang, 1978), indicating that while girls interacted in a cooperative, patient, and submissive manner, boys tended to be more competitive, individualized, and aggressive during play. It appeared that, for girls, the social interaction was more important than skill practice while the boys were more interested in actual skill development. Both boys and girls tried to maintain their unique interaction style with the opposite sex with the girls seemingly waiting for the boys to change their style of play before attempting to join the playgroup. It can be argued that this lack of actual skill practice could be a critical factor in the development of movement competency and manipulative skills for girls. According to Garcia (1994), this situation may diminish girl's self-confidence in movement abilities, thus possibly affecting future participation in those types of skills. If the strongest predictor of adult participation is childhood involvement, as pointed out by Greendorfer (1977, 1983), it is critical to understand and assist girls' participation in motor skills activity during early childhood by ensuring equal participation for both boys and girls.

Teacher Influences

Not only do boys and girls interact differently during team sports and play but also their interactions with teachers appear to play a significant role in the development of the differing attitudes toward physical education and physical activity as a whole. Using observations, student and teacher interviews, and student drawings, Solmon and Carter (1995) found that students perceived physical education to be different for boys and girls. Further, the teacher reinforced

girls for good behavior and boys for skill performance. This sent a message that while girls were expected to comply with the rules for good behavior; boys could focus on skill improvement. In an earlier study, MacDonald (1990) found that female teachers gave more skill-based interactions than male teachers in mixed-sex classes and in all-girl classes. In mixed-sex physical education classes there were examples of teacher/pupil interactions that were consistent with sex-role stereotyping. Not only did boys receive or initiate a higher proportion of overall interactions with the teachers, the proportion of positive interactions was greater for boys than for girls. These findings also support research by Dunbar and O'Sullivan (1986) who reported that interactions between teachers and students in coed elementary physical education classes were inequitable and favored boys. When same-sex class data were analyzed, contrary to what was hypothesized, boys in all-boys classes did not receive a proportionate amount of management interactions when compared to the girls in all-girls classes. In fact, they received a lesser proportion of negative management interactions than did the girls.

In addition to sending messages through verbal contact and other interactions with students, teachers can also impact motivation through the selection of activities and classroom atmosphere. Luke and Sinclair (1991) found that the curricular offering was an important determinant for females not electing to take physical education when given the choice. It was also the most influential determinant of both positive and negative attitudes for students. For students not choosing physical education, the teacher was ranked the second most determining factor. Self-perceptions were ranked third with most of the negative self-statements coming from the students not electing physical education. Whether intentionally or not, teachers can send clear messages to their students regarding their expectations for student achievement and these are at times embellished with sex-role stereotyped connotations.

Teachers can also create a climate that encourages students to believe that competence can be improved through effort. In a task-involved environment, students are predicted to be more likely to exert effort, persist in the face of difficulty, and judge their ability in a self-referenced manner. While research designed to relate achievement goals and perceived competence is not clear (Xiang & Lee, 1998), there is ample evidence to indicate that a task oriented environment will enhance the overall quality of student motivation (Treasure & Roberts, 1995). When teachers define success as mastering a task rather than outperforming others, it follows that students, both male and female, have more confidence in their ability.

Following this line of research in actual physical education classes, Solmon (1996) found that students in a task-involved climate, compared to those in an ego-involved climate, were more persistent during practice at a difficult level. This study also supported the notion that an ego-involved climate would be linked to a belief that ability, rather than effort is the major cause of success. Based on the research available, it appears that teachers should create an environment that emphasizes task-involvement in an effort to facilitate practice patterns that are conducive to skill development and persistence. While research designed to determine the influence of climate on competence beliefs is not currently available, it would appear that the instructional strategies teachers use to create a task-involved climate would also enhance ability perceptions. It is interesting to note that in regard to gender, Solmon (1996) reported that boys responded more favorably than girls in the ego-involved climate. In support, Solmon, Lee, Rukavina, Landry, Harrison, and Li (2001, April) found that students selected physical fitness lessons where individual improvement and effort were emphasized over classes where social comparison and superior performance were rewarded. The children felt that a task-involved

climate was more effective in motivating them to become physically fit than a class where extrinsic rewards were given to those students who performed the best.

In summary, when teachers organize curriculum into competitive team sports, girls do not feel as competent. When teachers buy into a sports-oriented curriculum, girls are placed at a distinct disadvantage. This, in turn, negatively impacts future decisions regarding participation in physical activity. Second, students are aware of the motivational focus in physical education classes. Teachers should work towards creating an equitable environment by offering a task-involved learning climate. When asked, "What would motivate you to be more active?" Students overwhelming choose a class that focuses on effort and individual improvement as opposed to social comparison and rewards for being the best.

Gender Schema as a Mediator

In an attempt to explain how gender-typing of activities develops, children's understanding of gender in the gender-role socialization process has been the focus of the major gender role developmental theorists (Constantinople, 1979; Roopnarine & Mounts, 1987). Using an information-processing perspective (Bem, 1981, 1984; Levy 1989; Martin & Halverson, 1981, 1987) and drawing from cognitive developmental theories (e.g., Kohlberg, 1966; Kohlberg & Ullian, 1974; Stangor & Ruble, 1987), it is suggested that children's behaviors are guided by a desire to adhere and conform to sociocultural standards (Bem, 1981). According to these models (i.e., Bem, 1981; Martin & Halverson, 1981), the critical component behind the development of the gender-typing of activities is a child's readiness to respond to information based on socially reinforced gender roles, selective attention to gender-relevant information, and gender schematic processing (Levy & Carter, 1989).

Influence of a Male-Oriented Learning Environment

Wright (1996, 1997), using a feminist perspective, argued that the dominance of a masculine oriented sport curriculum within physical education limits other forms of physical activity, such as gymnastics and dance, which are more likely to be associated with women. She goes on to claim that individual achievement through aggressive competition becomes the norm when our physical education curriculums are built around male-dominated sports. This typically works against girls' participation in physical education and contributes to the development and/or support of the beliefs that women are "weaker" and "lacking" in relation to male strength and skill (Wright, 1996, 1997). In reality, is an environment in which girls are given an equal opportunity to participate in a curriculum dominated by a masculine tradition really in the best interest of females? Research suggests that, in practice, a curriculum that addresses girls' needs and interests should be the goal.

The relationship Between Perceived Competence and Physical Activity

Self-perceptions of competence regarding physical activity and intentions to exercise have been strongly associated with, and/or predictive of, the physical activity levels of children and adolescents. Table 6 lists several studies that address the issue of gender, perceived competence, and activity levels and the results are consistent. First, within gender groups, students with higher competence had higher levels of physical activity. When comparing the gender groups, boys had higher efficacy beliefs regarding their physical abilities, and were more physically active than were females. The study by Biddle and Armstrong (1992) indicated that the type of activity mediated competence beliefs and activity patterns, with boys reporting more confidence and more activity in team sports. In contrast, girls displayed higher perceived competence and more involvement in non-competitive activity.

Table 6 Gender, Perceived Competence, and Activity Levels

Authors	Year	Subjects	Measure	Results
Tappe, Duda, & Menges-Ehrnwald	1990	N=237; 15-17 year old	Exercise related beliefs & behaviors	Boys had higher perceived competence than females; Females with higher perceived competence had a higher activity level than other females
Biddle & Armstrong	1992	N=72; 11 & 12 year olds	Physical activity levels using heart rate telemetry	Type of activity mediated level of activity with boys displaying a higher activity level in competitive sports & females displaying higher perceived competence & activity involvement in non-competitive activities
Zakarian, Hovell, Hofstetter, Sallis, & Keating	1994	N=1634; 9th & 11th graders	Physical activity level	Self-efficacy explained variance in vigorous exercise, even after adjusting for other variables; Males & 9th graders displayed higher levels of activity than did females & 11th graders
Garcia, Broda, Frenn, Coviak, Pender, & Ronis	1995	N=286; 5th & 6th graders	Exercise related beliefs & behaviors	Gender predicted activity level with females displaying lower activity level & lower self-efficacy than males
Trost, Pate, Dowda, Saunders, Ward, & Felton	1996	N=365; 5th graders	Physical activity level	Boys displayed higher levels of activity & higher self-efficacy than girls
Simmons-Morton, McKenzie, Stone, Mitchell, Osganian, Strickmiler, Ehlinger, Cribb, & Nader	1997	N=2410; 3rd graders	Physical activity level	Boys displayed higher levels of activity than girls; Boys with higher perceived efficacy displayed higher levels of activity than other boys
Trost, Pate, Dowda, Saunders, Ward, & Felton	1997	N=229; 5th graders	Physical activity level	Boys & girls with higher self-efficacy participated in more physical activity

Summary and Agenda for Future Research

Research on beliefs about competence and the connection with achievement is reasonably secured and is currently abundant and thriving, but there is a lot of work that still remains to be done. In some studies, researchers have reported that girls perform as well as boys in various types of activity but still report lower perceptions of ability, particularly as they get older (Pajares & Johnson, 1996; Pajares & Miller, 1994, 1995). Additional studies are needed to discover why these differences exist when similar ability and performance are demonstrated. Investigations are particularly needed in the elementary school grades because it is here that these sorts of self-beliefs begin to form. These findings should be geared toward the practitioner where teacher beliefs can be impacted. Interventions would be an effective means in making teachers aware of inequitable practices. Action research projects would be a viable choice in guiding future research.

Proposed Model

Clearly, it has been shown that feelings of competence are intertwined within a motivational construct and are linked with social influences, prior experiences, self-value system, and gender which in turn affect thought processes, behavior, and ultimately achievement. The models offered thus far differ in respect to the pathways these variables take. To date, independent research on these variables is extensive. This network of relationships should be investigated with a whole-model focus to better understand the direct and indirect pathways. If our goal is to improve girls and women's participation in physical activity, it is important to determine the exact variables, as well as their relationships, involved. More comprehensive models are needed to serve as a framework to study how gender and background influence competency beliefs and the intention to exercise. Based on the literature, gender, encouragement

by others, social influences, and past performances all impact task choice, how much effort is expended, and expectations for success which in turn influence competence beliefs, intentions to exercise, and ultimately involvement in physical activity. Research has clearly shown that students who intend to exercise will exercise. There is some evidence to suggest that children, who are active throughout childhood, stay active as adults. Academic literature is abundant and shows that students who find value and meaning in an activity will try harder to succeed and feel more competent. In physical activity, when the activities offered are viewed as gender appropriate and meaningful, expectancies for success increase thereby raising students' perceptions of competence. Figure 1 represents a proposed model depicting the variables that mediate competence and intention to participate in physical activity. Students with high levels of perceived competence are more likely to be engaged during physical education class. The model links perceived competence to intention to be engaged. It is assumed that a self-reported measure of intention will represent actual engagement in class activities. Engagement as perceived and reported by students has been correlated with the level of engagement observed in classrooms (Marks, 2000). In physical education, a self reported measure of intention to be physically active was correlated with actual participation patterns (Greenockle, et al, 1990).

On the basis of the research reviewed, the model predicts that perceptions of curriculum appropriateness and meaningfulness of the activities mediate the influence of gender on perceived competence and intention to engage. It is hypothesized that students' perceptions of their parents', teachers', and peers' support positively influence their perceptions of the curriculum and the meaningfulness they attach to the activities.

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Appendix B: Questionnaire

Gender _____Male _____Female
Age ____11 _____12 _____13 _____14 _____15

Race _____African American _____Asian _____Caucasian _____Hispanic
_____Other
Number of brothers in my house_____
Number of sisters in my house_____
I live with the following adults:
Mom
Dad
Stepfather
Stepmother
Grandparents
Other (please specify)_____

Strongly Agree Strongly Disagree
1 5

1. Members of my family participate in physical activity with me
2. The activities in PE are mostly for girls
3. My PE teacher treats us fairly
4. I feel confident that I can be good at any activity in physical education class
5. My friends do as little as possible in PE
6. I am better than most of the other students in physical education
7. I intend to exercise regularly
8. The activities in PE are boring
9. The information and skills I learn in PE class are useful to me
10. My friends encourage me to participate in physical activity
11. My PE teacher really listens to what I have to say
12. I goof off a lot during PE class
13. PE includes too many activities that are mostly for boys
14. I am able to meet the challenge of performing well in physical education class
15. My friends encourage me to participate in PE class
16. It is important for me to participate in physical education
17. PE includes too many activities that are mostly for girls
18. When I get the chance, I will never take PE again
19. The activities in PE are too competitive
20. I like to do the activities in PE
21. I intend to do active sports or vigorous activities a few times a week
22. I can use the information I get from PE class in activities outside of school
23. Being physically active is important to me
24. I am really good at the activities in physical education class
25. Members of my family get a lot of exercise
26. PE should include more activities that are good for girls

27. If I could, I would choose another class instead of PE
28. The activities in PE are mostly for boys
29. My PE teacher encourages me to be physically active outside of class
30. I actively participate in the activities in PE
31. If I have the choice, I will choose to take PE in school
32. The activities in PE will be beneficial to me when I get older
33. The activities in PE are equally appropriate for boys and girls
34. Members of my family would rather watch TV than exercise
35. My friends don't get a lot of exercise
36. My PE teacher participates with us in physical education activities
37. The activities in PE are fun
38. PE should include more activities that are good for boys
39. Members of my family value physical activity and exercise
40. I try my hardest in PE class
41. Members of my family never participate in any kind of physical activity
42. My PE teacher gives me extra help when I can't do something
43. My PE teacher encourages me to be the best that I can be
44. My friends and I participate in physical activity after school
45. My friends enjoy the activities in PE class
46. It is important for me to be good in physical education
47. Physical education class is just as important as any other school subject
48. Most of the other students are better than I am in PE
49. I would rather sit in the bleachers than participate in PE class
50. I plan to be physically active outside of school
51. I intend to engage in physical activities almost every day
52. The activities in PE are too rough

Appendix C: Parental Permission Form

Project Title:	Gender differences in performance of physical activities: A comprehensive model approach
Performance Site:	X Junior High School
Investigators:	The following investigator is available for questions, M-F, 8:30am-3:30pm Kay Daigle Kinesiology Department, LSU (985) 320-7776
Purpose of the Study:	The purpose of this research project is to validate a questionnaire that will be used to explain the variables that influence a child's intent to be physically active.
Inclusion Criteria:	Adolescents 12-15 years of age in 8th grade that are currently enrolled in a regular physical education class
Exclusion Criteria;	Adolescents who do not meet the age requirements or who do not attend a regular physical education class.
Description of Study:	The investigator will administer the questionnaire during regular class time. Students will be required to answer the likert-format questions on a pencil/paper questionnaire.
Benefits:	The study may identify the variables that influence a person to choose to be physically active. These results will be available for all interested subjects.
Risks:	There are no known risks.
Right to Refuse:	Participation is voluntary, and a student will become part of the study only if both child and parent agree to the child's participation. At any time, either the subject may withdraw from the study or the subject's parent may withdraw the subject from the study without penalty or loss of any benefit to which they might otherwise be entitled.
Privacy:	The subject's answers will in no way be connected to the individual. All answers are private and confidential. Results of the study may be published, but no names or identifying information will be included for publication. Subject and school identity will remain confidential unless disclosure is required by law.

Financial Information: There is no cost for participation in the study, nor is there any compensation to the subjects for participation.

Signatures: I understand what the study is about and all of my questions have been answered. I may direct additional questions regarding study specifics to the investigator. If I have questions about subjects' rights or other concerns, I can contact Robert Mathews, chairman, Institutional Review Board, (225) 578-8692. I will allow my child to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

_____ _____

Parent's signature Date

The parent/guardian has indicated to me that he/she is unable to read. I certify that I have read this consent form to the parent/guardian and explained that by completing the signature line above he/she has given permission for the child to participate in the study.

_____ _____

Signature of Reader Date

Appendix D: Covariance Matrix

	i1	i39	i25	i11	i42	i43
i1	4.76					
i39	1.68	2.62				
i25	1.72	1.28	2.10			
i11	0.93	0.93	0.65	4.08		
i42	0.87	0.65	0.52	1.48	2.48	
i43	0.70	0.55	0.42	1.67	1.16	2.47
i29	0.80	0.52	0.45	1.70	1.39	1.61
i45	0.70	0.51	0.38	0.63	0.42	0.36
i15	0.64	0.63	0.46	0.55	0.44	0.54
i5	0.73	0.69	0.53	0.69	0.59	0.60
i10	0.50	0.38	0.37	0.35	0.17	0.22
i16	0.87	0.78	0.46	1.13	0.73	0.62
i47	0.61	0.48	0.37	0.69	0.51	0.57
i22	1.11	0.81	0.47	1.40	1.16	0.92
i32	0.88	0.77	0.47	1.04	0.81	0.75
i9	0.57	0.43	0.25	1.11	0.65	0.69
i23	2.08	1.83	1.43	1.38	1.49	0.73
i46	0.83	0.69	0.48	1.00	0.78	0.62
i24	1.31	0.93	0.81	0.64	0.57	0.47
i4	0.94	0.60	0.50	0.24	0.38	0.22
i6	1.12	0.71	0.48	0.56	0.55	0.35
i14	1.18	0.88	0.57	0.83	0.70	0.52
i33	1.41	0.80	0.77	1.08	0.89	0.83
i28	1.41	0.91	0.79	1.21	0.86	0.92
i19	1.36	1.11	0.92	1.17	0.94	0.73
i52	0.67	0.76	0.45	0.98	0.65	0.61
i37	1.48	1.12	0.82	1.66	0.93	1.24
i8	0.64	0.46	0.27	0.83	0.57	0.76
i18	0.72	0.62	0.32	0.35	0.42	0.28
i31	1.65	1.48	1.14	1.28	1.40	0.75
i30	1.38	0.98	0.72	0.87	0.74	0.40
i40	1.27	1.25	0.80	0.80	0.65	0.41
i20	1.47	1.24	0.92	0.80	0.83	0.53
i27	0.58	0.52	0.19	0.74	0.44	0.54
i49	0.16	0.08	-0.10	0.16	0.19	0.04
i7	0.25	0.32	0.24	0.20	0.42	0.13
i51	0.40	0.48	0.22	0.68	0.45	0.45
i21	0.96	0.90	0.56	1.17	0.91	1.03

	i29	i45	i15	i5	i10	i16
i29	2.74					
i45	0.43	2.02				
i15	0.74	0.65	2.17			
i5	0.59	1.43	0.84	2.24		
i10	0.29	0.77	0.64	0.78	2.53	
i16	0.93	0.70	0.82	0.80	0.44	2.75
i47	0.64	0.25	0.79	0.41	0.18	1.03
i22	1.03	0.84	1.01	0.98	0.53	1.42
i32	0.91	0.59	0.88	0.75	0.46	1.23
i9	0.71	0.58	0.47	0.58	0.34	0.96

i23	1.41	1.15	1.30	1.21	0.84	2.10
i46	0.88	0.59	1.04	0.64	0.31	1.54
i24	0.58	0.53	0.86	0.68	0.48	1.17
i4	0.29	0.31	0.54	0.40	0.12	0.64
i6	0.47	0.45	0.73	0.67	0.64	1.00
i14	0.76	0.48	0.96	0.77	0.52	1.47
i33	1.21	0.73	1.85	0.71	1.47	1.94
i28	1.14	0.58	1.50	0.74	0.51	1.68
i19	1.00	0.61	1.19	0.82	0.84	1.57
i52	0.75	0.46	0.84	0.70	0.55	1.24
i37	1.33	1.03	1.67	1.23	0.95	1.88
i8	0.69	0.33	1.19	0.63	0.80	1.26
i18	0.55	0.29	0.87	0.34	0.68	0.81
i31	1.19	0.96	1.04	0.96	0.74	1.43
i30	0.52	0.81	0.57	0.58	0.30	1.02
i40	0.65	0.75	0.87	0.86	0.71	1.06
i20	0.84	0.65	0.91	0.65	0.58	1.03
i27	0.67	0.71	0.91	0.76	1.03	0.95
i49	0.08	0.07	0.16	0.05	0.42	0.32
i7	0.15	0.21	0.20	0.29	0.14	0.44
i51	0.76	0.44	0.77	0.51	0.46	0.81
i21	1.21	0.69	1.53	0.99	0.70	1.43

	i47	i22	i32	i9	i23	i46
i47	2.24					
i22	1.12	3.86				
i32	1.07	1.83	2.73			
i9	0.67	1.64	1.11	2.08		
i23	1.38	2.66	2.17	1.20	9.79	
i46	1.35	1.38	1.21	0.81	2.24	2.88
i24	0.81	1.14	1.02	0.43	3.16	1.23
i4	0.45	0.49	0.54	0.16	1.79	0.65
i6	0.99	1.02	0.93	0.53	2.72	1.14
i14	0.87	1.24	1.06	0.69	3.27	1.22
i33	2.16	2.65	2.51	1.46	4.17	2.24
i28	1.70	2.09	2.14	1.03	3.22	1.87
i19	1.05	1.56	1.46	0.73	3.14	1.56
i52	0.97	1.03	0.98	0.73	1.63	1.35
i37	1.61	2.21	1.95	1.49	3.59	2.02
i8	1.31	1.51	1.45	0.74	2.49	1.50
i18	0.87	0.91	1.05	0.41	1.87	1.06
i31	0.75	1.38	1.45	0.72	4.89	1.80
i30	0.38	0.98	0.98	0.71	3.57	0.90
i40	0.72	1.14	1.07	0.46	3.35	1.18
i20	0.54	1.32	1.17	0.55	3.60	1.12
i27	0.78	0.98	1.05	0.84	1.49	1.01
i49	0.37	0.46	0.42	0.17	1.41	0.47
i7	0.30	0.39	0.27	0.24	0.31	0.43
i51	0.69	1.14	1.08	0.73	1.62	0.84
i21	1.47	1.94	1.68	1.18	2.57	1.69

	i24	i4	i6	i14	i33	i28
i24	3.10					

i4	1.57	2.01				
i6	2.08	1.53	4.35			
i14	2.20	1.18	2.16	4.13		
i33	2.70	1.41	2.85	2.49	11.53	
i28	2.16	1.31	1.97	2.00	5.56	5.76
i19	2.07	1.09	1.82	2.13	2.94	2.61
i52	0.95	0.62	1.01	1.06	1.95	1.51
i37	2.39	1.41	2.24	2.09	4.60	3.43
i8	1.96	1.10	1.87	1.58	5.46	3.86
i18	1.18	0.68	1.45	1.23	3.14	1.90
i31	2.24	1.31	1.93	2.48	2.51	2.12
i30	1.35	1.24	1.34	1.51	1.48	1.16
i40	1.63	1.05	1.40	1.72	2.16	1.75
i20	2.11	1.25	1.57	1.96	2.58	1.90
i27	1.04	0.29	1.16	1.09	2.66	1.32
i49	1.07	0.43	1.36	1.14	2.40	1.01
i7	0.18	0.09	0.18	0.30	0.30	0.38
i51	0.95	0.35	0.82	1.05	1.70	1.41
i21	1.54	0.75	1.60	1.58	3.33	2.58

	i19	i52	i37	i8	i18	i31
i19	4.12					
i52	1.59	2.32				
i37	2.86	1.97	5.73			
i8	1.90	1.20	3.07	5.62		
i18	1.59	0.97	2.18	2.08	3.27	
i31	2.61	1.24	2.60	1.91	1.87	6.53
i30	1.52	0.66	1.46	0.93	0.82	2.62
i40	1.85	1.01	1.92	1.35	1.23	3.11
i20	1.85	0.94	2.52	1.61	1.20	3.16
i27	1.28	0.96	2.07	1.71	1.36	0.96
i49	0.79	0.34	1.10	1.54	1.03	1.05
i7	0.25	0.21	0.37	0.05	0.19	0.00
i51	1.08	0.51	1.54	1.15	0.76	1.07
i21	2.03	1.45	3.16	2.25	1.55	1.78

	i30	i40	i20	i27	i49	i7
i30	4.49					
i40	1.84	3.12				
i20	1.98	1.97	4.23			
i27	0.38	0.78	0.79	4.13		
i49	0.58	0.68	0.74	0.67	3.35	
i7	0.10	0.11	0.18	0.36	0.15	2.04
i51	0.47	0.65	0.89	0.92	0.70	0.58
i21	0.83	1.35	1.67	1.81	0.87	0.41

	i51	i21
i51	2.89	
i21	1.43	4.27

Appendix E: Pilot Study

To develop a valid instrument to assess student perceptions of the mediating variables and the intention to exercise, a pilot study was conducted. Items for the questionnaire were derived through a series of steps, and several versions of the instrument were piloted. The steps are presented in sequential order, with the evolving versions of the questionnaire presented in the text.

Step 1: Instrument Development

Potential items were drawn from questionnaires used in previous studies (Godin & Shepard, 1986; Greenockle, et al., 1990; Lee, Carter, & Xiang, 1995; Marks, 2000) and new items were generated for specific variables of interest. A pool of items for each of the following subscales were identified: family support, teacher support, peer support, perceived value, perceptions of gender appropriateness, perceived competence, and intent to engage. Specific sources of information for each subscale and short descriptions are reported in the main body of this paper. For all potential subscales except for the gender appropriateness scale, a 5 point likert scale ranging from strongly disagree to strongly agree was used. In the initial version of the instrument, a semantic differential scale was piloted for the gender appropriateness subscale.

The initial questionnaire was piloted with small groups of 6^{th}, 7^{th}, and 8^{th} grade students. First, the items were read aloud to the small groups of students, asking whether or not they understood the items and what they thought the statements meant. Based upon the input from these students, items were reworded to facilitate better understanding of the items. The process resulted in a 62-item scale. The form was then administered to a small group of children who were interviewed informally concerning any items they had difficulty with as well as their general impressions of the instrument. No additional modifications were necessary.

Step 2: Administration of the Initial Draft

The initial draft of the survey was administered to a pool of participants that would not be involved in the final study. The purpose of this phase was to test the psychometric properties of the instrument and eliminate items that did not make contributions to the scales.

Participants

Participants in this phase were 139 students (65 boys, 74 girls) enrolled in physical education classes in a public junior high school located in a southern state in the southeastern United States. The students, enrolled in 5 different classes taught by 4 different teachers, were in grade 7 and ranged in age from 12-13. The school system granted permission to conduct the study and participants' parents gave informed consent prior to the study.

Questionnaire

The 61 item pilot questionnaire that was administered consisted of seven subscales. The first six were scored using a 5-point likert scale ranging from strongly disagree to strongly agree. The final subscale, for gender appropriateness, used a semantic differential type scale, also ranging from one to five. The items are presented by subscale below:

Family Support

1. Members of my family participate in physical activity with me
2. Members of my family value physical activity and exercise
3. Members of my family never participate in any kind of physical activity
4. Members of my family would rather watch TV than exercise
5. Members of my family discuss the importance of physical activity with me
6. Members of my family get a lot of exercise
7. Members of my family want me to be physically active
8. Members of my family want me to participate in all activities offered during physical education class
9. Members of my family think that physical education is very important

Teacher Support

10. In physical education class, I often feel "put down" by the teacher
11. My teacher really listens to what I have to say

12. My teacher allows disruptions by other students get in the way of my learning
13. My friends & I are treated fairly
14. My teacher expects me to do my best all of the time
15. My physical education teacher gives me extra help when I can't do something
16. My teacher compares me to other kids in the class
17. My teacher encourages me to the best that I can be
18. My teacher expects me to work hard
19. My teacher encourages me to be physically active outside of class
20. My physical education teacher participates with us in PE activities

Peer Support

21. My friends and I help each other to do better in physical education class
22. My friends and I participate in physical activity after school
23. My friends encourage me to play hard in physical education class
24. My friends don't get a lot of exercise
25. My friends encourage me to participate in physical activity
26. My friends enjoy playing in physical education class
27. My friends get a lot of exercise
28. My friends try to get by with doing as little as possible in PE
29. My friends want me to dress out and play in PE
30. My friends want me to sit in the bleachers with them

Perceived Value

31. I can use the information I get from physical education in activities away from school
32. The activities in physical education are important to me
33. The activities in physical education will be beneficial to me when I get older
34. It is important for me to participate in physical education
35. I will never use the information I get from physical education class
36. It is important for me to be good in physical education
37. Physical education class is just as important as any other school subject
38. The information and skills I learn in pe class are useful to me
39. PE class is a waste of time
40. Being physically active is important to me

Perceived Competence

41. I am really good at the activities in physical education class
42. Most of the other students are better than I am in PE
43. I am better than most of the other students in physical education
44. I feel confident that I can be good at any activity in PE class
45. It doesn't matter how hard I try, I will never be good in physical activities
46. I am able to meet the challenge of performing well in pe class

Intent to Engage

47. I always try my very best in physical education class
48. If I could, I would choose another class instead of PE
49. If I have a choice, I will always choose PE in school
50. I always plan to be active during physical education class
51. I goof off a lot during physical education class
52. When I get the chance, I will never do physical education again
53. I plan to participate in physical activity after school
54. I would rather sit in the bleachers than participate in PE class

Gender Appropriateness

The activities in physical education:

55.	Fun	A little boring	Boring
56.	Not competitive enough	Just Right	Too competitive
57.	Safe	Sort of safe	Unsafe
58.	Do not make me feel self-conscious at all	Sort of make me feel self-conscious	Make me feel self-conscious
59.	Make me feel comfortable	Make me feel sort of comfortable	Make me feel uncomfortable
60.	Mostly for boys	For boys and girls	Mostly for girls
61.	Too rough and masculine	Just right	Too graceful and feminine

Procedure

The questionnaire was administered to the participants during their regularly scheduled physical education class by the primary investigator. At the beginning of the session, an explanation of the purpose of the study was given to the participants. Only the investigator and participants were present during the session. It was also stressed that there were no right or wrong answers and it was important that they were honest with their responses. The participants were assured that no one else would see their answers. The response scale was reviewed with the students and questions regarding their understanding were encouraged by the investigator. Each item was read aloud to the participants while the students followed along and marked their responses. They were asked to stay with the investigator and not get ahead on the questionnaire.

Data Analysis

Prior to analyzing responses on the instrument, scores on the reversal items were transformed so that a score of 5 indicated the most positive response, and a score of 1 indicated the least positive response for all items. Although there were not a sufficient number of participants to finalize a factor analysis, preliminary factor analyses were conducted to identify cohesive items for each subscale. Simple correlations between specific items were also used to determine which items would be most beneficial to assess each subscale. The reliability for each subscale was assessed using Cronbach's (1951) alpha as a measure of internal consistency as an additional criteria for the items to be retained in the final instrument.

Two areas of difficulty emerged in this process: the measure of intention and the analysis of the gender appropriateness items. In the preliminary analyses, the items that were retained for the measure of intention were all negatively worded, and there was some confusion between intent, or lack of intent, to engage in PE class, and intent to be active outside of PE. For that reason, items were re-examined, and the decision was made to try and separate engagement and intention to be active in class from intention to be physically active outside of class. This necessitated the generation of new items, and the decision to retain some items that were eliminated in the initial process. Items on the original questionnaire that were designed to measure the gender appropriateness of the curriculum were presented in a semantic differential format and could not be standardized for analysis. For this reason, these items were reformatted to be used with the 5-point likert scale used for the remainder of the instrument.

Using the results from the pilot administration in step 2, a final pool of items for each subscale was identified. The final version of the questionnaire, the 49-item instrument presented in Appendixes A and B, was administered to 175 sixth grade students. This step was deemed

necessary, given the difficulty encountered in the analysis of the gender appropriate subscale. This subscale is critical to the study, and the new items and response scale had not been tested. Additionally, I needed to pilot the revised items for the engagement and intention in PE classes and intention to be active outside of PE. The new questionnaire was distributed to 175 6th graders enrolled in regular, coeducational physical education classes (see Appendix B). Reliability of the subscales was tested and is reported in table 7.

Table 7 Reliability Coefficients for the Revised Instrument

Perceptions of Family Support	Perceptions of Peer Support	Perceptions of Teacher Support	Value and Meaningfulness	Perceived Competence	Gender Appropriateness of Curriculum	Intent to Engage
.57	.62	.81	.82	.74	.76	.78

There is some concern about the coefficients for the perceptions of family and peer support. The final version included the same five items that were retained in preliminary analysis in Step 2. The reliability coefficient in that sample was .74, which is acceptable. The reliability may have decreased with the sixth grade population. The deletion of two of the five items produced an acceptable coefficient, but the decision was made to retain all five items in the final version to increase the likelihood that the coefficient will be acceptable in the final study. The situation is similar for the peer support subscale. Elimination of items will produce an acceptable coefficient, but it is advisable to retain all items for the final study.

Table 8 Item Description of Final Questionnaire

Perceptions of family support

F_1 Members of my family participate in physical activity with me
F_2 Members of my family value physical activity and exercise
F_3 Members of my family never participate in any kind of physical activity
F_4 Members of my family would rather watch TV than exercise
F_6 Members of my family get a lot of exercise

Perceptions of teacher support

T_11 My teacher really listens to what I have to say
T_13 My friends & I are treated fairly
T_15 My physical education teacher gives me extra help when I can't do something
T_17 My teacher encourages me to the best that I can be
T-19 My teacher encourages me to be physically active outside of class
T-20 My physical education teacher participates with us in physical education activities

Perceptions of peer support

FR_22 My friends and I participate in physical activity after school
FR_25 My friends encourage me to participate in physical activity
FR_26 My friends enjoy playing in physical education class

Perceived value and meaningfulness

V_34 It is important for me to participate in physical education
V_36 It is important for me to be good in physical education
V_37 Physical education class is just as important as any other school subject

Perceptions of competence

PC_41 I am really good at the activities in physical education class
PC_43 I am better than most of the other students in physical education
PC_44 I feel confident that I can be good at any activity in physical education class
PC_46 I am able to meet the challenge of performing well in physical education class

Intent to engage in physical education activities

I_48 If I could, I would choose another class instead of physical education.
I_49 If I have the choice, I will always choose physical education in school.
I_52 When I get the chance, I will never do physical education again
I_54 I would rather sit in the bleachers than participate in physical education class

Perceived gender appropriateness of curriculum

G_ The activities in physical education are too graceful and feminine.
G_ The activities in physical education are fun.
G_ The activities in physical education are mostly for girls.
G_ The activities in physical education are too rough and masculine
G_ The activities in physical education are boring.
G_ The activities in physical education are not competitive enough
G_ The activities in physical education are too competitive
G_ The activities in physical education are mostly for boys.
G _ The activities in physical education are equally as appropriate for girls as they are for boys.

Vita

'K'Daryle Gordon Daigle was born in New Orleans, Louisiana, on April 4, 1959. She graduated from Grace King High School in Metairie, Louisiana, in 1977. After attending the University of New Orleans, Louisiana State University, and Delgado College she graduated from Southeastern Louisiana University in Hammond, Lousisiana, with a Bachelor of Arts degree in kinesiology in 1988.

Her career as a teacher began with an elementary physical education position with Alief Independent School District in Alief, Texas. During this time she began her masters studies at the University of Houston with a concentration in pedagogy.

After three years of teaching in Alief, she transferred back to Hammond, Louisiana, where she worked as a teaching assistant at Southeastern Louisiana University in the Department of Kinesiology and taught physical education at the SLU laboratory school. She completed her Master of Arts in kinesiology at Southeastern Louisiana University in 1992.

While teaching and coaching at Hammond High School, 'K' began her doctoral studies in kinesiology with a concentration in pedagogy at Louisiana State University under the direction of Amelia Lee. After three years at Hammond High School, she accepted an instructor's position in the Kinesiology Department at Southeastern Louisiana University and is currently working in that position.