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CHILDREN'S SOURCES OF SELF-EFFICACY, ACCURACY OF APPRAISAL AND MOTIVATION IN SPORT SKILLS AND PHYSICAL ACTIVITIES

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CHILDREN'S SOURCES OF SELF-EFFICACY, ACCURACY OF APPRAISAL AND MOTIVATION IN SPORT SKILLS AND PHYSICAL ACTIVITIES

By

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ABSTRACT

CHILDREN'S SOURCES OF SELF-EFFICACY, ACCURACY OF APPRAISAL AND MOTIVATION IN SPORT SKILLS AND PHYSICAL ACTIVITIES

By

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Although research has supported self-efficacy as a common cognitive mechanism for mediating thought patterns and motivated behavior there is a need for age and gender-related research in children's formation and utilization of efficacy expectations. The purpose of this study was to examine age and gender differences in children's sources of self-efficacy, accuracy of self-appraisal, and motivation in sport skills and physical activities. This issue was investigated using quantitative and qualitative methodologies. A total of 289 children (143 girls, 146 boys) were assigned to one of two treatment groups (high or low self-efficacy). Each group listened to a similar scenario that resulted in performance failure in a sport skill or physical activity of their choosing. Subjects then completed measures for intended effort, intended persistence, choice of participation, future self-efficacy, and sources of self-efficacy. In the quantitative phase, results indicated that children exposed to the high self-efficacy scenario had higher intended effort, persistence, and future self-efficacy than children exposed to the low self-efficacy scenario. Children in the high self-efficacy treatment also chose to participate in the future more frequently than children in the low self-efficacy treatment. Age differences were found with 8 to 9 year olds having higher effort and future self-efficacy than 10 to 14 year olds. For sources of self-efficacy, significant others, ability, and effort were found to be important sources of information. In the qualitative phase, interviews determined that children combine sources of significant others and performance information to form their self-efficacy beliefs. Effort was found to be a source of efficacy information and a technique to improve performance

and efficacy expectations. Most children set goals and most thought that failure to obtain their goals would increase their motivation.

Dedication

To my parents and grandmothers who have always been a great source of self-efficacy and motivation for me.

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Lastly, I'd like to thank and acknowledge my parents, grandmothers, sister, and brother-in-law for their support in so many ways and for always instilling in me the belief that I could achieve my goals.

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CHAPTER I

Introduction

"Among the different aspects of self-knowledge, perhaps none is more influential in people's everyday lives than conceptions of their personal efficacy" (Bandura, 1986). Self-efficacy refers to a judgment about one's capability to successfully perform a task. Self-efficacy theory (Bandura, 1977, 1986) suggests that efficacy beliefs are a common cognitive mechanism for mediating one's thought patterns, motivation, and behavior. Research in a variety of domains has presented evidence that one's perception of ability is the central mediating construct in achievement behavior (Ericsson, Krampe, & Tesch-Romen, 1993; Feltz, 1994a; Harter, 1978; Kuhl, 1992; Nicholls, 1984). More specifically in the sport and physical activity literature, self-efficacy expectations are not the only influence on thoughts and behavior; however, they are consistently found to be an important and necessary cognitive mechanism.

Self-Efficacy and Performance Relationship

In the sport and physical activity literature, over 50 studies have investigated the relationship between self-efficacy and performance, and treatment methods for increasing efficacy beliefs and performance (Feltz, 1994b). In general, we know that performance success raises efficacy beliefs and failures tend to lower beliefs. In turn, given that an individual has the proper incentives and requisite skills, self-efficacy will be a major determinant of behavior (Bandura, 1977). A person with high self-efficacy will choose to participate more eagerly, put forth more effort, and persist longer at a task than an individual with low self-efficacy. Inefficacious people may dwell upon their deficiencies which creates stress and undermines effective use of their abilities (Bandura, 1986). Individuals with high self-efficacy who experience failure tend to attribute that failure to lack of effort (a "fixable" state); whereas, individuals with low self-efficacy who

experience failure attribute that failure to low ability (a "fixed" capacity) (Bandura, 1990; Collins, 1982).

Thought patterns (e.g., goals, satisfaction) are also affected by one's level of self-efficacy. Individuals with high self-efficacy set higher goals and are more committed to reaching those goals than individuals with low self-efficacy (Bandura & Wood, 1989; Kanfer, 1990; Locke, Frederick, Lee, & Bobko, 1984). Some research suggests that when a negative discrepancy between goal and performance occurs and individuals become dissatisfied, those with high self-efficacy will heighten their level of effort and persistence; whereas, those with self-doubts will give up quickly (Bandura, 1986; Bandura & Cervone, 1983, 1986; Carver & Scheier, 1990).

Bandura and Cervone (1983, 1986) have been the only researchers to test whether self-evaluative and self-efficacy mechanisms mediate the effects of personal standards on performance motivation in a physical activity. They suggested that negative discrepancies between standards and performance would be motivating if one's efficacy expectations were high. These discrepancies would be discouraging if one's efficacy expectations were low. In their experiments with college age students performing on an Air-Dyne ergometer, they found that the higher the self-dissatisfaction and the stronger the perceived self-efficacy, the greater the subsequent effort (Bandura & Cervone, 1983) and perceived self-efficacy contributed to motivation at a wide range of discrepancy levels (Bandura & Cervone, 1986). These studies have not been replicated with subjects of various ages or with other tasks (e.g., sport tasks of high or low efficacy in which the subject regularly participates).

Sources of self-efficacy

Individuals are believed to gather information about their efficacy beliefs from four categories of sources: performance accomplishments, vicarious experience, forms of persuasion, and physiological states (Bandura, 1977). These four categories are not considered mutually exclusive but rather result from a complex self-persuasion process that

relies on cognitive processing of all sources of information. Bandura (1986) has suggested that past performance accomplishments are the most dependable source of efficacy information. However, the research has been limited in exploring the sources of information one uses to determine efficacy beliefs.

Some researchers suggest that there may be other variables, specific to the task, situation, or age group that influence the formation of efficacy beliefs that must be examined more closely (Bandura, 1986; Schunk 1989). Bandura (1989) has stated that efficacy information is cognitively appraised by individuals taking into account factors such as perceived ability, effort expended, task difficulty, teacher assistance, and pattern of success and failure. Schunk's work (1989) has also suggested that how students cognitively process task cues such as outcome patterns, attributions for success and failure, teacher aid, content difficulty, and peer comparison to form and alter perception of self-efficacy needs more attention in educational research. In other words, more research is needed on how individuals form achievement-related beliefs from these multiple sources and how these beliefs relate to efficacy development (Schunk, 1983).

Research is also needed on how children of various ages use sources of efficacy information to form efficacy beliefs. Horn and Hasbrook (1987), outside of the self-efficacy paradigm, conducted an exploratory study of the criteria children use to evaluate their physical competence. They found for their subjects, ages 8 to 14, that younger children relied upon evaluative feedback from adults and older children relied upon peer comparison. This study used self-report (forced choice) questionnaires to identify sources of information which did not allow children to determine their own sources. Therefore, how children combine various sources of information to develop efficacy judgments is still unknown.

Age-Related Issues

Most of the research and findings regarding the utilization and formation of self-efficacy beliefs pertain to adults. The literature to date that has used a developmental

perspective for studying children's perception of ability and/or efficacy beliefs in sport is sparse. Weiss and colleagues (Weiss & Bredemeier, 1983; Weiss & Raedeke, 1994) have been advocating the need for developmentally-based research in psychosocial aspects of learning, teaching, and coaching in sport for over 10 years. Schunk (1983, 1989, 1991) and Bandura (1986, 1989) continue to state the importance and need for study of self-efficacy development in children.

In Bandura's (1986) explanation of the development of self-efficacy, he does not formulate his ideas within the framework of existing developmental cognitive theories. Instead, he offers that self-referent thought is derived from the child observing the action of others and the child's experiences with her/his environment. He describes the developmental analysis of self-efficacy as stages in infancy, when children acquire language skills, when their social world with peers expands, and during transition from adolescence to adulthood. Initially, efficacy experiences are centered in the family, but as children age their involvement with peers has a stronger influence. School is cited as a significant setting for cultivation and validation of cognitive efficacy. While Bandura has stated, "with development of cognitive capacities, self-efficacy judgment increasingly supplants external guidance," his writings have not addressed how children of different developmental ages develop and utilize efficacy information.

Other theories of child development could be examined to hypothesize how children of different developmental ages would develop and utilize self-efficacy (Harter, 1978; Nicholls, 1978; Piaget, 1972). First, Piaget's work suggests that all behavior and thought are directed toward adapting to the environment. Children often develop and use schemas to help adapt to changing environmental needs. Sometimes they reshape events of the world to fit their existing schemas. Piaget referred to this process as assimilation. When the environment and available schemas cannot be matched, then children alter their schema, which is referred to as accommodation. How and when children acquire their schemas depend upon heredity, physical experience, social transmission (education), and

equilibrium. These four factors are believed to regulate the stages of cognitive development in which all children progress. More specifically, Piaget proposed four major periods of cognitive development and the approximate age designations: (a) sensorimotor (birth to age 2), (b) preoperational thought (2 to age 7), (c) concrete operations (7 to age 11), and (d) formal operations (11 to age 15). Piaget's testing and conception of these four periods of cognitive development do not relate directly to children's development or conception of their own physical ability. However, these periods could be used to associate and select ages in which children might differ in their perceptions of efficacy beliefs.

Harter's (1978) theory of competence motivation examined motivation within a developmental or age-related framework. She suggested that reinforcement, mastery attempts, perceived competence, and perceived control were important mediators of competence motivation that would differ in children of different developmental ages. More specifically, developmental differences in one's perceived competence should be found in three different competence domains (physical, social, cognitive). Children 4 to 7 years do not differentiate competence in each domain clearly; whereas, older children can distinguish between perceived physical, social, or cognitive competence. Of interest in this study are children's perceptions of their physical competence. Some developmental differences have been found in the role of significant others as a source of perceived competence. As stated previously, younger children (8 to 11 years) tend to rely more on the feedback from parents, teachers or coaches and the outcome of events for sources of information; whereas, older children (12 to 14 years) rely more on feedback from peers and social comparisons (Horn & Hasbrook, 1987). Also, as children grow older (Grades 3 to 9) they move from an intrinsic to extrinsic motivation orientation in their preference for challenge and mastery. Despite Harter's attention to developmental aspects of competence motivation, very little research has been conducted to test her theory on children in sport (Weiss, 1987).

Lastly, Nicholl's (1984) work in achievement motivation theory is developmentally based. He suggests that conceptions of ability, task difficulty, and effort will vary in meaning for children of different cognitive maturity levels. Children 7 to 9 years who perform tasks of varying difficulty will believe that outcome is dependent on how much effort they put forth. Children ages 10 to 11 are able to partially differentiate conceptions of effort, ability, and task difficulty. They sometimes equate less effort with high ability. Children 11 and older can differentiate ability and effort. They understand that ability is a capacity, so that when an individual performs better than a friend and an equal amount of effort was put forth or performs as well without putting forth much effort, the outcome is due to higher ability. Nicholl's description of sequential changes in the psychological structure of children, such as children's conception of ability and effort, provides an example of the developmental inquiry that is needed with self-efficacy theory. These three developmental theories provide examples of a conceptual framework in which inferences about children's development and utilization of self-efficacy at various ages could be initiated.

The literature identifies middle childhood, ages 8 to 12 years, as important periods of cognitive growth and maturity differences. Age 8 represents a time of rapid cognitive-developmental growth. By this age, children begin to process information and use it to guide subsequent performance. They attend to or process information that indicates low or high competence on a task (Stipek & Tannatt, 1984). Piaget cites age 8 as a time when children are able to understand that more than one factor at a time influences an outcome and that they are "on the verge of a major advance in logical thought" (Thomas, 1985). However, children this young perceive effort to be the cause of the outcome, so that equal effort would mean equal outcome regardless of ability (Nicholls, 1978). Therefore, children at this stage of development should be able to articulate their perception of their own ability, yet the accuracy of this perception may not be valid and the basis of their beliefs unknown.

Age 10 is a mid-point developmentally for children to process and evaluate perceptions of abilities. By age 10 to 11, children begin to differentiate effort and ability so that they recognize that when outcomes differ though effort is equal, the reason may be due to ability (Nicholls, 1978). Although also, during this age, they sometimes equate less effort with high ability. In addition, changes in their interpretation of evaluative feedback has occurred (Stipek & Tannatt, 1984). Children at this age begin to focus more on the feedback from peers than significant others. Piaget would suggest that children of this age are in the later stages of concrete operations. Therefore, they are able to recognize that two or more dimensions of an event will interact to produce an outcome. Also, they begin to understand the cause of physical events and relationships. These changes seem to be an important step or stage of development for children in relation to their ability to cognitively appraise and utilize efficacy information.

Age 13 represents a higher level of cognitive development of perceived ability. These children typically are able to understand and separate effort from ability and realize that ability is capacity (Nicholls, 1978). They are likely to be in the formal operations period where they can imagine the conditions of an event, develop beliefs and draw deductions about possible outcomes. In addition, by age 13, children are believed to have reached a more asymptotic level shared with adults than with younger children (Yando, Seitz, & Zigler, 1978). Therefore, age 13 would characterize an end-point with which children of younger ages could be compared to study age-related differences in children's self-efficacy.

Accuracy of Self-Appraisal of Physical Ability

An important issue within the study of children's self-efficacy is the accuracy with which they appraise their own physical ability. Bandura (1986) refers to one's overestimation of ability as similar to a resilient sense of efficacy. Resilient efficacy expectations, if not unrealistically exaggerated, can be advantageous (Bandura, 1986). However, misjudgment of one's efficacy has consequences. Individuals who overestimate their ability may try what they cannot succeed and experience needless failures. These

faulty experiences may undermine their development of efficacy or, present potentially dangerous situations that result in injury (Bandura, 1986). Underestimators of their ability may become self-limiting and restrict the activities that they experience. Therefore, the degree to which children are accurate in their self-appraisal is important information that could affect their motivation (choice, effort, and persistence) and future efficacy beliefs.

Research in related areas of age differences in perceived academic competence has found children's perceptions of their competence declines with age (Benenson & Dweck, 1986; Stipek, 1981; Stipek & Tannatt, 1984); however, they become more accurate in their estimates of competence as they grow older (Harter, 1982; Nicholls, 1978). Kaley and Cloutier (1984) examined the impact of cognitive ability on accuracy of self-efficacy predictions in children Grades 1, 5, and 9. Using Piaget's theory of cognitive development, they found that the precision of efficacy predictions improved across preoperational, concrete, and formal operational levels, with preoperational being less accurate than the other two. Therefore, they suggested that cognitive competence influenced the accuracy of efficacy predictions.

In the physical domain, Horn and Weiss (1991) found that accuracy judgments of physical competence increased with age, and the criteria used in competency judgments were related to accuracy levels. Feltz and Brown (1984) found that soccer players, ages 9 to 13, were more accurate in their perceptions of soccer competence as age increased. However, when Chase, Ewing, Lirgg, and George (1994) examined efficacy expectations they found that children, ages 9 to 11, tended to drastically overestimate their basketball shooting efficacy in relation to actual shooting performance, regardless of age.

Perceived control over outcome is also believed to have an impact on determining an individual's self-efficacy judgment and the accuracy with which they make appraisals. When people believe they have control over the outcome they tend to have higher efficacy expectations (Bandura & Wood, 1989; Chase, Lirgg, & Feltz, 1993). Individuals who perceive they have little control over the outcome have little incentive to work hard

(Bandura, 1986). Weiss and Horn (1990) examined differences in perceptions of control by gender and accuracy of self-appraisal of physical ability. They found a gender by accuracy interaction effect that indicated underestimating girls were higher on external sources of control than accurate estimating girls. For boys, underestimators were higher on unknown control than accurate or overestimators but similar on external control. There were no differences among boys or girls at different accuracy levels for perceptions of internal control. Differences among girls and boys at different ages in their perceptions of control and accuracy of self-appraisal of ability have not been investigated.

Gender Issues

Most of the early research on gender differences in efficacy or confidence beliefs suggested that males had higher self-confidence than females in all achievement situations (Maccoby & Jacklin, 1974). However, research by Lenney (1977) suggested that gender differences in confidence occur only under specific achievement situations, most notably in competitive tasks, when ambiguous feedback is given, and/or when the task is male oriented. In a meta-analysis examining gender differences in self-confidence, Lirgg (1991) found sex-type of task to be an important variable contributing to those differences. The more masculine the task the greater confidence difference there was between males and females, with males having higher confidence.

Several studies have examined gender differences in self-confidence of children performing various motor tasks and results have been mixed (Chase et al., 1994; Corbin, Landers, Feltz, & Senior, 1983; Corbin & Nix, 1979; Corbin, Stewart, & Blair, 1981; Lewko & Ewing, 1980). In Lirgg's (1991) meta-analysis of self-confidence studies, she contends that use of masculine tasks and differing confidence measures have contributed to males having higher confidence than females in some situations. When these results were examined by age she found that self-confidence decreases by age while gender differences in self-confidence increase. This suggests that in elementary school, boys and girls are similar in levels of self-confidence; however, by high school, boys have higher confidence

than girls. Lirgg warns that these results are hampered by the small number of studies conducted with children. In the Chase and colleagues study (1994), boys and girls, ages 9 to 11, did not differ in their self-efficacy by gender or by age for a basketball shooting task. The explanation provided for the lack of gender differences was that basketball was perceived as a gender "neutral task." One possible explanation for lack of age differences was the similarity in children's conception of ability at this stage of development, ages 9 to 11. If a wider range of ages had been studied, age and gender differences may have occurred. In other words, whether girls and boys differ from each other at different ages and at what age differences may begin requires further study.

In summary, the need for age-related research in children's formation and utilization of efficacy expectations is apparent. The areas in need of investigation of age and gender differences are (a) how high and low self-efficacy influence the relationships among outcome variables such as attributions, motivation (choice, effort, persistence), and future self-efficacy expectations; (b) interpretation of the effects of accuracy of self-appraisal on selection of sources, perceived control, and outcome variables; and (c) identification of the sources of information and if they are combined to form initial efficacy beliefs. The implications from this information include development of a conceptual working model that would explain factors which contribute to the utilization of self-efficacy in children, development of reliable and valid measurement of efficacy beliefs, design of appropriate teaching/coaching methods and intervention strategies for children at various stages of cognitive development in physical education and sport.

Statement of the Problem

The purpose of this study was to examine age-related and gender differences in children's utilization of self-efficacy information when performing a hypothetical sport skill or physical activity. This issue was investigated using quantitative and qualitative methodologies. How different levels of self-efficacy influence attributions, motivation (choice, effort, persistence), and future self-efficacy expectations following failure and

performance dissatisfaction, how perceived control relates to accuracy of self-appraisal of ability (over-estimation, accurate estimation, under-estimation), and the type of information children select as sources of information were explored. In addition, using a qualitative approach, how children combined sources of information to form their efficacy beliefs and how internal standards (goals) interact with motivation in children of differing levels of accuracy in self-appraisal of ability were examined.

Research Questions and Hypotheses

Due to the exploratory nature of some aspects of this study, research questions were proposed instead of hypotheses where appropriate. The hypotheses are first organized by the phase in which the data were collected: Phase 1 - Quantitative and Phase 2 - Qualitative. The quantitative section is grouped into three categories: (a) level of self-efficacy, (b) accuracy of self-appraisal of ability, and (c) sources of self-efficacy information.

Phase 1

A. Level of Self-Efficacy

Hypotheses:

1: Children in the high self-efficacy condition will attribute their failure more often to lack of effort than to lack of ability, whereas; the children in the low self-efficacy condition will attribute their failure to lack of ability more often than to lack of effort.

2: Children in the high self-efficacy condition will choose to participate in the activity more often than children in the low self-efficacy condition.

3: Children in the high self-efficacy condition will report higher intended persistence, higher intended effort, and higher future self-efficacy expectations than children in the low self-efficacy condition.

4: Children in age group 8 to 9 will report higher intended persistence, higher intended effort, and higher future self-efficacy expectations than children in age groups 10 to 11 and 13 to 14.

5: Males will attribute their failure more often to lack of effort than lack of ability; whereas, the females will attribute their failure to lack of ability more often than lack of effort.

6: Males will report higher intended effort, persistence and future self-efficacy expectations than females.

B. Accuracy of Self-Appraisal

7: Within each age group, boys will show greater overestimation of ability than girls.

8: Children's age will positively correlate with their accuracy of self-appraisal of physical ability.

9: Children's accuracy of self-appraisal of physical ability will positively correlate with intended effort, persistence, and future self-efficacy.

10: Children's accuracy of self-appraisal of physical ability will positively correlate with perceived internal control, and negatively correlate with perceived external control and perceived unknown control.

C. Sources of Efficacy Information

Research Questions:

11: What type of information will children select as important sources in determining their self-efficacy expectations?

12: Will sources of efficacy information differ by age and gender?

Phase 2

Research Questions:

1. Do children combine sources of efficacy information to form their expectations?
2. How will internal standards interact with motivation in children of differing levels of accuracy in self-appraisal of ability?

Delimitations

Generalizations are limited to children ages 8 to 14 years who attend middle class elementary and middle schools. Delimitations also include children of ethnic minorities other than Caucasian and those from geographical areas other than mid-Michigan.

Definitions

The following terms and operational definitions are used in this study:

Accuracy of Self-Appraisal - Accuracy was operationalized by how much congruence there was between students' own perceptions of their ability and their physical education teacher's perceptions of the student's ability in physical activities. Accuracy was computed by subtracting the student's perceived competence score from the teachers' rating of actual competence for the student.

Elementary School Subjects - Children in the third and fifth grades were the elementary students involved in this study.

Importance - Importance was defined as how much students would like to successfully complete their sport or activity.

Middle School Subjects - Adolescents in the eighth grade were the middle school students involved in this study.

Motivation - Motivation was operationalized as one's intended effort, intended persistence, and intended choice to participate at a future date.

Perceived Competence - Perceived competence refers to a perception that one has the competence and/or ability to master a task.

Scenario - A scenario was a situation and sequence of events that the subjects listened to and/or read about in their chosen sport or activity. The scenario did not actually occur; rather, subjects were asked to imagine that it did.

Self-confidence - Sometimes self-confidence is used interchangeably with self-efficacy; however, self-confidence refers to the strength of the belief and not the direction (Feltz, 1988).

Self-efficacy - Self-efficacy refers to a judgment about one's capability to successfully perform a task. This includes the strength and level of one's beliefs (Bandura, 1986).

Basic Assumptions

1. The children answered the questionnaires accurately and honestly.
2. The children were able to imagine that the scenario did occur and effects were similar to actual performance.
3. The teacher's assessments of student's actual physical competence were reliable and valid.

Limitations

1. The amount of contact hours that physical education teachers had with their students varied among the different schools involved in this study. Therefore, the accuracy of teacher assessment of student's actual physical competence may have been affected by lack of contact time or differences among teachers.

CHAPTER TWO

Review of Literature

The conceptualization for this study was developed from the theoretical framework of self-efficacy (Bandura, 1977, 1986). This chapter presents an overview of self-efficacy theory that includes (a) the sources of self-efficacy, (b) the relationship between performance and self-efficacy, (c) the relationship between motivation and self-efficacy, (d) attributions for failure, (e) age-related and gender issues with self-efficacy, and (f) accuracy issues for children's self-appraisal of physical ability.

Self-Efficacy Theory

Self-efficacy theory was originally developed from Bandura's work (1977, 1986) in social cognitive theory. He proposed that self-referent thought mediates the relationship between knowledge and behavior. Therefore, how individuals evaluated their capabilities and their self-percepts of efficacy would affect their motivation and performance. Self-efficacy is defined by Bandura as a judgment about one's capability to successfully perform a task at given levels. Efficacy is not just knowing what behavior is appropriate; rather, it involves organizing cognitive, social, and behavioral subskills and strategies into action. This suggests that judgments are not based on what those skills are; rather, they are based on what one can do with whatever skills one possesses. Efficacy expectations should not be confused with outcome expectations. Outcome expectations reflect a belief about a likely consequence of a behavior (e.g., recognition, rewards, self-satisfaction). An important distinction between efficacy expectations and outcome expectations is that people can believe that if they behave in a certain manner it will produce a desired outcome; however, whether they actually execute that behavior will be more dependent upon their belief of being capable than their belief regarding the expected outcome (Bandura, 1986).

Bandura (1986) proposes that self-efficacy beliefs contribute to psychosocial behavior in distinct ways. These beliefs will influence how people behave, their thought patterns,

and emotional reactions in various situations. People will avoid situations in which they believe they are not capable of handling. Their level of efficacy will determine how much effort they put forth and how long they persist in the face of failure. Thoughts and emotional reactions are affected by one's efficacy in regards to stress, attentional demands, and effort. People with high self-efficacy can focus their attention on the task at hand and expend more effort than people with low efficacy who may be stressed and tend to divert attention from possible solutions. Bandura cautions that efficacy judgments are believed to be a major determinant of behavior only when requisite skills and proper incentives are present.

Sources of Self-Efficacy

Bandura (1986) suggests there are four sources of efficacy information: past performance, vicarious experience, verbal persuasion, and physiological/emotional states. These four sources influence one's efficacy expectations which, in turn, influence one's behavior patterns (e.g., choice, effort, persistence) and thought patterns (e.g., goals, worry, attributions) (See Figure 1). Individuals may depend upon one or more of these sources to form their efficacy expectations. The cognitive processing of efficacy information involves (a) determining the types of information people attend to and use, and (b) the combination rules or heuristics they use for weighting and integrating various efficacy information.

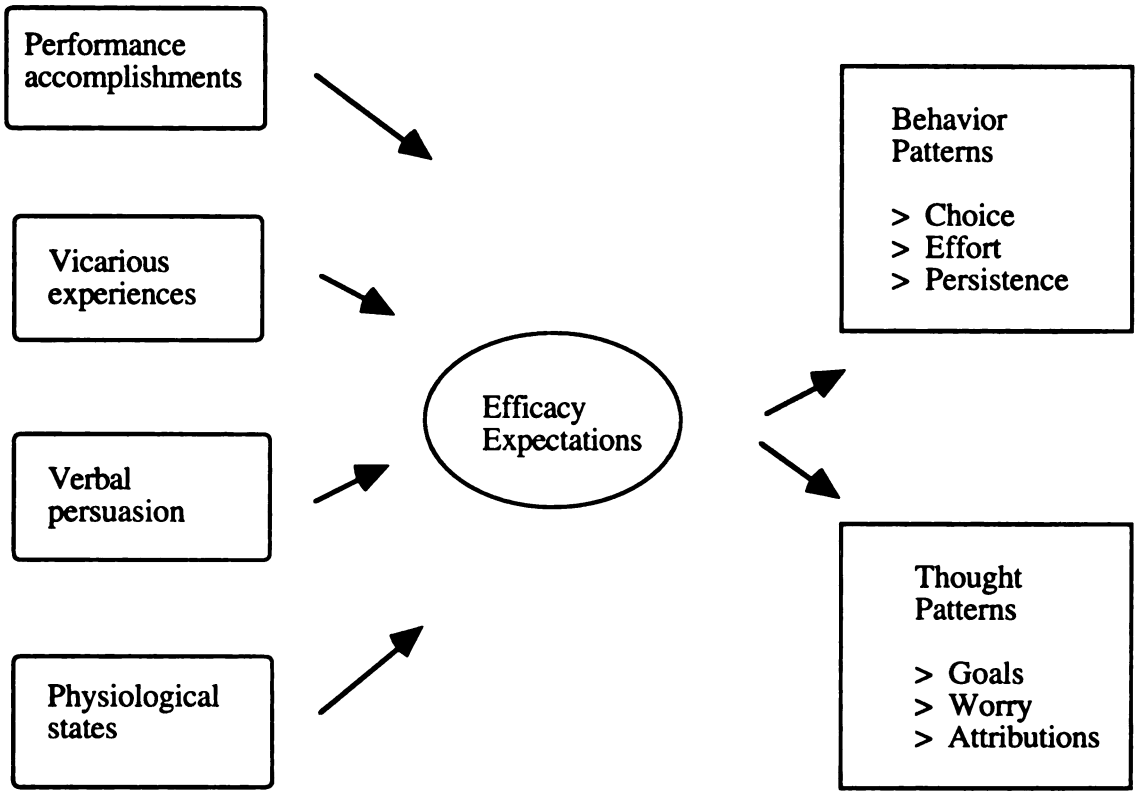


Figure 1. Relationship between sources of self-efficacy, efficacy expectations, and behavior/thought patterns (Feltz, 1994a).

Past Performance. Sources of past performance are based upon one's mastery experiences or accomplishments. This source is believed to be the most influential. Typically, if past performances are successful, efficacy expectations will increase; if performances are unsuccessful, efficacy expectations will lower. Bandura (1982) has also stated that difficulty of tasks, temporal pattern of success and failure, amount of effort expended, and amount of physical guidance received will affect performance experiences and efficacy value.

Vicarious Experience. This source of information involves observation and comparison of other's performance on a task. Visualizing or watching other people perform successfully can increase self-efficacy, while seeing others perform unsuccessfully can lower expectations. These modeling effects are more potent when one is similar to the

model. Self-efficacy can also be evaluated by making social comparisons in terms of other's performance. While vicarious experiences are believed to be weaker than performance accomplishments, they can be an influential source. For example, when people are persuaded that they are inefficacious vicariously they may behave in ways that confirm this belief.

Verbal Persuasion. Verbal persuasion is usually found in the form of feedback or persuasive techniques from significant others (e.g., teachers, parents, coaches, peers). Bandura (1986) states that it is more difficult to raise efficacy beliefs with this source than it is to lower beliefs. Verbal messages directed toward performance must be realistic and the extent of the influence will depend upon the credibility and trustworthiness of the person providing the message.

Physiological and Emotional States. Information from this source is the result of cognitive appraisal of a physiological condition or state. These states include autonomic arousal, levels of pain, fatigue, fear, and stress. Typically, negative physiological states will lower efficacy expectations and positive states or the absence of negative states will increase efficacy expectations. Level and quality of these states must be evaluated and interpreted individually.

Several researchers have suggested that past performance is the most dependable source of efficacy information (Bandura, 1986; Feltz, 1992). However, the research in sport and physical activities has been limited in exploring the sources of information one uses to determine efficacy beliefs. Only two studies have directly examined sources of self-efficacy. Feltz and Riessinger (1990) were the first to examine directly and in an open-ended manner people's sources of their self-efficacy beliefs. In this study, researchers found that for self-efficacy beliefs, 86% of the subjects based their initial perceptions on their own past performance and abilities. The percentages for the other sources of information were 9% based on physiological states, 8% based on persuasions, and 1.5% on vicarious information.

Chase and her colleagues (Chase, Feltz, Tully, & Lirgg, 1994) examined sources of self and collective efficacy in women collegiate basketball players. Players identified their sources of efficacy expectations prior to 12 basketball games. Results indicated that past performance was the most selected source of self-efficacy information (48%) followed by physiological/emotional sources (35%), other sources outside of basketball (9%), vicarious/social comparison (4%), and verbal persuasion (3%). For past performance sources, players chose practice situations more often than game situations. In addition, 24% of the total comments were coded as consisting of a combination of multiple sources. Most of the multiple source comments contained a reference to a past performance; however, the combination of sources was varied for individual efficacy and did not represent any particular pattern.

These two studies seem to support Bandura's contention that performance accomplishments are the most salient source of efficacy information, at least for adults. Generalizations cannot be made to children and these findings may not accurately represent the complex cognitive appraisal of information. The processing of information is believed to involve two dimensions. The two studies reviewed have examined the first dimension by determining the types of information people attend to and use. To expand our knowledge in this area we must also investigate the second dimension which is the combination rules or heuristics individuals of all ages employ for integrating various efficacy information. Research in sources of other self-perceptions may be helpful in the search for new knowledge on sources of self-efficacy.

Sources of Perceived Physical Competence Information

Some research has been conducted with children to gather information about their sources of perceived physical competence (Horn & Hasbrook, 1987; Horn & Weiss, 1991). Horn and Hasbrook (1987) examined the criteria children use to evaluate their perceived physical competence. A Sport Competence Information Scale (SCIS) was developed and used to collect sources of perceived physical competence. This scale asked

children to indicate on a 5-point Likert scale how important 48 sources were in deciding how competent they were in sports. They found for their subjects, ages 8 to 14 years, that younger children relied upon evaluative feedback from adults and older children relied upon peer comparison. Weaknesses of this study were the use of a self-report (forced choice) questionnaire that did not allow children to determine their own sources and the use of a questionnaire that may be too lengthy for children (48 items).

Horn and Weiss (1991) replicated Horn and Hasbrook's (1987) study with children 8 to 13 years of age. One purpose of this study was to test for age differences in the sources children select for self-assessment. Using a revised version of the SCIS, the Physical Competence Information Scale (PCIS) measured children's rating of importance for 30 informational sources. Factor analysis found six factors: Competitive Outcomes, Self-Comparison, Parental Feedback/Sport Attraction, Teacher-Coach Feedback, Peer Comparison/Evaluation, and Affect for Learning. Results indicated that children under 10 years utilized evaluative feedback from parents and sport attraction more than did children over 10 years. Children 10 to 13 years depended more upon peer comparison than did younger children. These findings were similar to earlier findings by Horn and Hasbrook (1987).

While the research in sources of perceived physical competence has been conducted with children, it still does not examine the combination or heuristics children use to determine their perception of competence. In addition, the use of a forced choice questionnaire with pre-selected items assumes that all possible sources are included on the questionnaire. It is possible that some sources were omitted. An alternative method for collecting sources of physical competence and/or self-efficacy would be a combination of questionnaires to identify types of information and interviews with children to identify additional sources and how they might combine sources to form their beliefs.

Self-Efficacy and Performance

Bandura's 1977 article has been the foundation for much of the research on the relationship between self-efficacy and performance in sport and physical activities. His initial theorizing to explain and predict psychological changes and coping behaviors have been applied to the physical domain to explain and predict motor performance. Many of the first studies examined treatment effects for enhancing self-efficacy and performance and were correlational in nature (Feltz, Landers, & Raeder, 1979; Weinberg, Gould, & Jackson, 1979). Feltz and colleagues (1979) examined the effectiveness of using participant modeling versus live or videotaped modeling when attempting a modified back dive into a swimming pool. They found that participant modeling was more conducive to producing successful dives and higher self-efficacy than live modeling or video-taped modeling. Weinberg and colleagues (1979) induced high or low self-efficacy in their subjects and then had them compete in a muscular endurance task against a confederate. They found that higher self-efficacy produced longer muscular endurance than low self-efficacy. Numerous studies since have found similar results when employing techniques of modeling (George, Feltz, & Chase, 1992; Gould & Weiss, 1981; Lirgg & Feltz, 1991, McAuley, 1985), social comparison (Feltz & Riessinger, 1990; Weinberg, et al., 1981), and performance accomplishments (Brody, Hatfield, & Spalding, 1988; McAuley, 1985; Weinberg, Sinardi, & Jackson, 1982). While these studies were able to show that self-efficacy and performance were positively related, it was not until path analysis techniques were employed that causal inferences could be made.

Bandura (1977) proposed a reciprocal relationship between self-efficacy and performance. Feltz (1982) was the first to utilize path analysis to test the causal relationships. Using the same diving task as Feltz and her colleagues (1979), Feltz tested the relationship between self-efficacy, anxiety, and the back-dive approach performance with college-aged adults. She found that self-efficacy was the major predictor of diving performance but only on the first dive. The major predictor for the subsequent trials was

previous dive performance. Therefore, Feltz proposed a re-specified model in which past performance and self-efficacy were predictors of performance. She has since supported these findings in similar research with other samples (Feltz, 1988a; Feltz & Mungo, 1983).

McAuley (1985) also tested the relationship among self-efficacy, anxiety, and performance using path analysis. He tested female undergraduate students on a forward roll mount onto a balance beam. Subjects were assigned to an aided participant modeling group, unaided participant modeling group, or control group. McAuley concluded that both modeling groups had higher self-efficacy and performance than the control group. The proposed self-efficacy model and anxiety-based model did not fit the data, although self-efficacy was a significant predictor of performance. The author suggested that self-efficacy was an influential determinant; however, other factors may be impacting performance.

The results of studies over the past 18 years have consistently found that self-efficacy is an essential and meaningful cognitive mechanism in predicting, explaining, and describing performance whether in laboratory or competitive sport situations. Self-efficacy theory also states that efficacy expectations affect thought patterns and performance motivation. The research on the relationship between self-efficacy and motivation has not been as extensive.

Self-Efficacy and Motivation

Bandura (1977, 1986) has described the relationship between self-efficacy and motivation as positive. Defining motivation as choice, effort, and persistence, a person with high self-efficacy will choose to participate more eagerly, put forth more effort, and persist longer at a task than an individual with low self-efficacy. In the study of motivation, goal intentions and causal attributions are also believed to influence, and be influenced by self-efficacy. Research by Kanfer (1990) suggests that motivation is derived from goal choice and self-regulation. Self-regulation is composed of self-monitoring information about one's performance, self-evaluation of this performance in relation to

one's goal, and self-reaction with respect to a satisfaction or dissatisfaction with performance and self-confidence beliefs that result. As with Bandura's work, Kanfer includes goal setting and causal attributions in her framework of motivation. The following sections address motivation and self-efficacy research in sport and physical activities, satisfaction and dissatisfaction when performance discrepancies occur, goal setting, and causal attributions.

Self-Efficacy and Motivation in Sport and Physical Activities

In the sport and physical activity literature, motivation has been defined as "the direction and intensity of effort" (Gill, 1986). However, within the sport psychology literature, the study of motivation has been more complex (Weiss, 1992). The research in motivation has typically studied motivation as an individual difference that can influence people's behavior. Some of these individual differences include participation motives, intrinsic versus extrinsic motivation, and achievement goal orientations. Secondly, motivation has been studied as a dependent measure. From this viewpoint and the perspective of this study, motivation has been measured as people's choice, effort, and persistence.

Research in sport and physical activities has examined the relationship between motivation and people's level of self-efficacy. Feltz's work (Feltz, 1982, 1988a; Feltz & Mungo, 1983) has examined self-efficacy and motivation in terms of one's choice to attempt a motor skill. As reported in a previous section, she found that in terms of an approach/avoidance to a back diving task, efficacy expectations were the major predictor of performance only for the first attempt. After the first dive, previous performance was the better predictor of the next approach/avoidance to the task than was self-efficacy.

Some research has examined persistence as measured by muscular endurance (George, et al., 1992; Gould & Weiss, 1981; Weinberg, et al., 1979). These studies found the higher the self-efficacy, the greater the muscular endurance.

In more recent work by Chase, Feltz, and Fitzpatrick (1995), persistence was measured as people's willingness to attempt optional trials at a motor task. In this study, self-efficacy was manipulated by varying the temporal pattern and quantity of success and failure feedback. Results indicated that subjects would persist longer when their efficacy expectations were higher as a result of early failure and late success feedback.

This review of the literature regarding how self-efficacy influences motivation (choice, effort, persistence) demonstrates that much more research is needed. There has been little research conducted in the physical domain that directly examines self-efficacy and effort expended or choice to participate. And, this limited amount of research does not include children.

Satisfaction or Dissatisfaction from Discrepancy in Performance

When an individual's internal standard and performance does not match, a discrepancy occurs. Whether this discrepancy serves as a motivator to increase effort is partly influenced by the person's satisfaction or dissatisfaction with the performance and their self-efficacy. People with high self-efficacy will increase their effort and persistence in the face of a negative discrepancy between performance and the performance goal (Bandura, 1986). Individuals readjust their goals only if the discrepancy is too large. People with low self-efficacy may lose motivation and discontinue participation. When the performance exceeds the goal and a positive discrepancy occurs, there will be an increase in self-efficacy. People will tend to set future goals above the previous performance. Research suggests that when a negative discrepancy between goal and performance occurs and individuals become dissatisfied, those with high self-efficacy will heighten their level of effort and persistence; whereas, those with self-doubts will give up quickly (Bandura, 1986; Bandura & Cervone, 1983, 1986; Carver & Scheier, 1990).

Bandura and Cervone (1983, 1986) have been the only researchers to test whether self-evaluative and self-efficacy mechanisms mediate the effects of personal standards on performance motivation in a physical activity. They explored whether negative

discrepancies between standards and performance would be motivating if one's efficacy expectations were high and if these discrepancies would be discouraging if one's efficacy expectations were low. Subjects were college age males and females. They were assigned to groups of goals and feedback, goals alone, feedback alone, or neither goals or feedback. Different goal levels and performance improvement percentages were given to subjects. Effort was measured by subjects' performance on an Air-Dyne ergometer. Results indicated that the higher the self-dissatisfaction and the stronger the perceived self-efficacy, the greater the subsequent effort (Bandura & Cervone, 1983) and perceived self-efficacy contributed to motivation at a wide range of discrepancy levels (Bandura & Cervone, 1986). Future research should examine these relationships with subjects of various ages and with other sports and activities.

Goal Setting and Motivation

Thought patterns (e.g., goals) are also affected by one's level of self-efficacy. Individuals with high self-efficacy set higher goals and are more committed to reaching those goals than individual's with low self-efficacy (Bandura & Wood, 1989; Kanfer, 1990; Locke, et al., 1984). Setting and obtaining specific, difficult, and proximal goals are believed to enhance self-efficacy (Bandura & Schunk, 1981). The type of task could also mediate this relationship depending upon the attentional demand of the task. Complex tasks that require high levels of attention may not benefit from setting goals as much as simple tasks (Kanfer & Ackerman, 1989).

Researchers in industrial and organizational psychology have found a positive relationship between goals, effort, and performance. Research completed by Locke and his colleagues (Locke, Shaw, Saari, & Latham, 1981) have found that specific goals elicited better performance than no goals or do your best goals. In general, they suggest that goal-setting can enhance performance and level of effort.

In a study by Campion and Lord (1982), researchers examined why goal-setting works and the relationship between goals and subsequent performance. They examined how

goal-setting, test performance, effort, and performance discrepancy were related. One hundred and eighty-eight college students rated their goal for the course, goal for each weekly exam, and the effort put into studying. They were given the results of each exam and the opportunity to readjust their goal prior to the next exam. Results indicated that failure was associated with increases in effort and goal levels were influenced by the frequency and magnitude of failures. Behavioral responses, such as increased effort, occurred faster than cognitive change, such as lowering the goal.

Research supports the positive relationship between goals and performance; however, a measure of self-efficacy beliefs has rarely been included. The self-efficacy literature suggests that efficacy expectations influence goal-setting and mediate the relationship between goal intentions and motivation (Bandura, 1986). This area of self-efficacy research is untested with children, in sport and physical activities.

Attributions

Bandura (1986) states there is a reciprocal relationship between causal attributions and self-efficacy expectations. Bandura suggests that individuals with high self-efficacy who experience failure tend to attribute that failure to lack of effort; whereas, individuals with low self-efficacy who experience failure attribute that failure to low ability (Bandura, 1990; Collins, 1982). In turn, success will increase self-efficacy if the attribution is due to ability rather than luck. Failure can result if attributions for previous failures are thought to be due to lack of ability rather than low effort or bad luck.

In some of the early research with self-efficacy and causal attributions, Collins (1982) found that children with high self-efficacy did attribute their failure to insufficient effort; whereas, children with low self-efficacy attributed their failure to lack of ability. Schunk and Gunn (1984) examined how children's self-efficacy and math skills were influenced by their attributions for success. In a path analysis, they found that self-efficacy determined causal attributions and mediated their effects upon math problem solving. The authors

concluded that children with high efficacy expectations attribute success to ability and ability attributions affected performance indirectly through efficacy expectations.

Duncan and McAuley (1987) studied the relationship between self-efficacy and causal attributions in a competitive sport setting. Male and female college age students were assigned to one of four treatment groups: (a) high efficacy and success, (b) low efficacy and failure, (c) high efficacy and failure, and (d) low efficacy and success. Subjects made attributions for their performance on a bicycle ergometer. Results indicated there were no differences in attributions among high and low self-efficacy groups. A possible explanation for these findings was that testing occurred in a laboratory situation rather than a natural sport or exercise setting. The authors suggest that personal investment in the activity is important and may have influenced the relationship between efficacy expectations and attributions.

Only a few studies have examined children's causal attributions for performance in a sport situation (Bird & Williams, 1980; Bukowski & Moore, 1980; Weiss, McAuley, Ebbeck, & Wiese, 1990). Bird and Williams (1980) examined age differences in 7 to 18 year old children. They found that 7 to 9 year olds attributed success mainly to effort and luck. Children 10 to 15 years attributed performance to effort; whereas, 16 to 18 year old males attributed performance to effort and females of this age attributed performance to luck. Bukowski and Moore (1980) investigated perceived causes for success and failure among boys 7 to 16 years of age. They found that attributions for luck and task difficulty had little importance for boys. Ability was found as an important attribute only for success; whereas, effort was viewed as important for success and failure. Weiss and her colleagues (1990) explored the relationship between children's self-esteem and attributions. While this study is one of the few to examine age differences, causal attributions were operationalized as locus of causality, stability, and controllability. So results did not address specific attributions of ability, effort, luck, or task difficulty.

In the sport and physical activity literature it would be beneficial to further investigate the relationships proposed by Bandura (1977, 1986) for self-efficacy and attributions for success and failure. Collins (1982) and Schunk and Gunn (1984) have provided an example of how these relationships might be explored with children. Now we must apply this model to the physical domain.

Age-Related Differences in Children's Self-Efficacy

Bandura (1986) did not formulate his theory of self-efficacy within the framework of existing developmental cognitive theories and his writings have not addressed how children of different ages develop and utilize efficacy information. Very few studies have been conducted to examine self-efficacy in children in sport and physical activities (Chase, et al., 1994; Lee, 1982; Lirgg & Feltz, 1991). Lee examined self-efficacy as a predictor of gymnastic performance in girls 7 to 12 years old. She found that the coach's expectations were the most accurate predictor of performance, with the athlete's efficacy expectations being more accurate than previous performance. While Lee's study involved children, she did not examine age differences in self-efficacy expectations.

Lirgg and Feltz's study examined modeling effects on motor performance and self-efficacy in sixth grade girls. The purpose of this study was to contrast modeling effects of model type and model skill. They found that model skill rather than model status was more salient for their subjects. Subjects who watched a skilled model performed better and had higher self-efficacy than the subjects who watched an unskilled model or no model. This study did not examine age differences.

The purpose of the Chase et al. (1994) study was to examine the effects of modification of basketball size and basket height on shooting performance and self-efficacy of girls and boys 9 to 11 years of age. Results indicated that boys and girls did not differ in their self-efficacy by age for a basketball shooting task. One possible explanation for lack of age differences was the similarity in children's conception of ability at this stage of development, ages 9 to 11. If a wider range of ages had been studied, age differences may

have occurred. The authors suggested that whether girls and boys differ from each other at different ages and at what age differences may begin requires further study.

Gender Differences in Children's Self-Efficacy

The initial research on gender differences in self-confidence stated that males had higher self-confidence than females in all achievement situations (Maccoby & Jacklin, 1974). Then Lenney (1977) suggested that gender differences in self-confidence were due to specific achievement situations: when tasks were competitive, when ambiguous feedback was given, and/or when the task was sex-typed as male or masculine. To examine gender differences, Lirgg (1991) conducted a meta-analysis examining research in self-confidence and sport. She found sex-type of task to be an important variable contributing to those differences. The more masculine the task the greater confidence difference there was between males and females, with males having higher confidence.

Several studies have examined gender differences in self-confidence of children performing various motor tasks (Corbin, et al., 1983; Corbin & Nix, 1979; Corbin, et al.; Lewko & Ewing, 1980). These studies have found mixed results. In Lirgg's (1991) meta-analysis of self-confidence studies, she found that when studies incorporated masculine tasks, this contributed to males having higher confidence than females in some situations. When these results were examined by age she found that self-confidence decreased by age while gender differences in self-confidence increased. This suggests that boys and girls in elementary school are similar in levels of self-confidence; however, boys have higher confidence than girls when they are in high school. Lirgg suggested that these results be interpreted with caution because studies were conducted with small samples of children.

In the Chase et al. study (1994), perceptions of competence were assessed as self-efficacy. Results indicated that boys and girls did not differ in their self-efficacy by gender for a basketball shooting task. The explanation provided for the lack of gender differences was that basketball was perceived as a gender "neutral task." The authors recommended

that gender differences in self-efficacy be examined with other sports and physical activities.

Accuracy of Self-Appraisal of Physical Ability

The accuracy with which people assess their own physical ability can influence future behavior. Bandura (1986) states that overestimation of ability, if not unrealistically exaggerated, can be advantageous. However, individuals who continually overestimate their ability may try what they cannot succeed and experience repeated failures. These failure experiences may undermine their development of self-efficacy. Or, overestimation may lead to participation in potentially dangerous situations that the individual is not equipped to handle, which may result in injury (Bandura, 1986). Underestimators of their ability may restrict the activities that they experience because they lack the efficacy to attempt skills. Therefore, the degree to which children are accurate in their self-appraisal is important information that will affect their motivation (choice, effort, and persistence) and future efficacy beliefs.

Research in perceptions of academic competence has found that as children age they become more accurate in their estimates of competence (Benenson & Dweck, 1986; Harter, 1982; Nicholls, 1978; Stipek, 1981; Stipek & Tannatt, 1984). One study has examined the accuracy of efficacy expectations. Kaley and Cloutier (1984), using Piaget's theory of cognitive development, examined the impact of cognitive ability on accuracy of self-efficacy predictions in children in Grades 1, 5, and 9. They found that the precision of efficacy predictions improved across preoperational, concrete, and formal operational levels, with preoperational being less accurate than the other two. Therefore, they suggested that level of cognitive competence influenced the accuracy of efficacy predictions.

In the physical domain, Horn and Weiss (1991) examined children's ability judgments, ages 8 to 13 years. They found that accuracy judgments of physical competence increased with age, and the criteria used in competency judgments were related to accuracy levels.

Feltz and Brown (1984) investigated the accuracy of perception of competence in soccer players, ages 9 to 13 years. They found that children were more accurate in their perceptions of soccer competence as age increased. However, when Chase and her colleagues (1994) examined basketball shooting efficacy in children, ages 9 to 11, they found no age differences. The children in their study tended to drastically overestimate their basketball shooting efficacy in relation to actual shooting performance, regardless of age.

Weiss and Horn (1990) explored whether children who varied in their accuracy of physical competence would differ in achievement characteristics. Children were classified as over estimators, accurate estimators, or under estimators based upon differences in the children's own estimate of physical competence subtracted from the teacher's estimate of the child's physical competence. Harter's (1982) Perceived Competence Scale for Children and the Teacher's Rating of Child's Actual Competence were used for the accuracy rating. Perception of control, motivation orientation, and anxiety were also assessed. Results indicated there was a gender by accuracy interaction. Underestimating girls had lower challenge motivation and higher trait anxiety than girls who were over or accurate estimators. They authors concluded that underestimating girls may potentially drop out of sport activities more so than accurate or over estimating girls.

Perceived control over outcome is also believed to have an impact on determining an individual's self-efficacy judgment and the accuracy with which they make appraisals. When people believe they have control over the outcome they tend to have higher efficacy expectations (Bandura & Wood, 1989; Chase, et al., 1993). Individuals who perceive they have little control over the outcome have little incentive to work hard (Bandura, 1986). Weiss and Horn (1990) also examined differences in perceptions of control by gender and accuracy of self-appraisal of physical ability. They found a gender by accuracy interaction effect that indicated underestimating girls were higher on external sources of control than accurate estimating girls. For boys, underestimators were higher on unknown control than

accurate or overestimators but similar on external control. There were no differences among boys or girls at different accuracy levels for perceptions of internal control. Differences among girls and boys at different ages in their perceptions of control and accuracy of self-appraisal of ability have not been investigated.

Summary of Review

Clearly, more research with children is needed in order to explain, describe, and predict the relationship between self-efficacy and performance and/or motivation as it pertains to specific ages. Too often in the sport and physical activity literature children are assumed to take-on the characteristics of adults in their perceptions, actions, and performance capabilities. Research must demonstrate if differences are present, when they occur, and to what extent they are present if accurate interpretation of results and appropriate application can be made to children in sport and physical activities.

This study's goal was to learn more about age-related and gender differences and/or similarities for children. As the literature or lack of literature illustrates, much of the research in self-efficacy theory, in sport and physical activities, has not been conducted with children. Of primary interest in this study was the relationship between self-efficacy and motivation when performance dissatisfaction occurred, the sources of information children select and/or combine to form their beliefs, and how accuracy of self-appraisal was influential in these relationships.

CHAPTER III

Method

The purpose of this study was to examine how children of different ages use efficacy information in a situation involving a sport skill or physical activity. The study consisted of a quantitative and qualitative phase. Phase One (quantitative) examined age and gender differences in how different levels of self-efficacy influenced motivation (choice, effort, persistence) following failure and performance dissatisfaction, and the effects of inaccurate self-appraisal of ability on motivation and self-efficacy expectations, and the type of information children select in forming their efficacy judgments. The second phase (qualitative) explored in more detail how and whether children combine sources of information to form their efficacy beliefs and how internal standards interact with motivation in children of differing levels of accuracy in self-appraisal of ability.

Phase One

Subjects

Subjects were third, fifth, and eighth grade girls and boys. Three hundred and seventy-two children volunteered to participate in this study and completed the first set of questionnaires. Of these subjects, 83 were eliminated from the study due to absence from school on subsequent testing days or failure to meet manipulation check requirements. Two hundred and eighty-nine children (143 girls, 146 boys) participated in the quantitative phase. Third and fifth grade students were selected from four classrooms per grade, in two elementary schools. The third grade children ranged in age from 8 to 9 years (M = 8.28, SD = .45). The fifth grade children ranged in age from 10 to 12 years (M = 10.23, SD = .42). Eighth grade students were selected from six physical education classes in two middle schools, in the same school districts as the elementary schools. These children ranged in age from 13 to 14 years (M = 13.26, SD = .47). All schools were public schools

in the mid-Michigan area. The ethnic background of the children was predominately Caucasian (95%), and 5% represented several ethnic minorities.

Seven physical education teachers assisted with providing a dependent measure of actual physical competence for the students in their classes. Four female teachers averaged 9.66 years of teaching experience and their mean age was 32.33 years. Three male teachers had an average of 18.33 years of teaching experience and their mean age was 41 years. All seven teachers had completed a Master's degree in physical education.

Design

A 3 x 2 x 2 (Age x Efficacy Level x Gender) between subjects design was employed. All subjects initially selected two sport skills or physical activities that were important to them and one in which they had high efficacy and one in which they had low efficacy. The investigator then divided subjects into two treatment groups (high efficacy, low efficacy) based on their efficacy rating and importance rating for each skill. A design summary for the number of subjects in each treatment group is presented in Table 1. The subject's selection of physical activities or sport skills in which they had high efficacy and low efficacy expectations was quite varied. Table 2 provides a listing of activities chosen by each treatment group.

Table 1

Design Summary for the Number of Subjects in Treatment Groups

	High Efficacy	Low Efficacy	Total
	n	n	n
Third Grade Girls	12	14	26
Third Grade Boys	27	14	41
Fifth Grade Girls	15	16	31
Fifth Grade Boys	25	14	39
Eighth Grade Girls	54	32	86
Eighth Grade Boys	42	24	66

Table 2

Frequency of Sport Skills or Physical Activities Chosen for Each Treatment Group.

High Efficacy Treatment Group

SKILL	8 to 9 Years n = 28	10 to 11 Years n = 35	13 to 14 Years n = 56
BASKETBALL DRIBBLING	1	1	2
BASKETBALL SHOOTING	6	3	9
BASKETBALL PASSING	0	0	1
SOCCER SHOOTING	0	1	2
BASKETBALL	0	3	7
HOCKEY	2	1	4
BASEBALL POSITIONS	0	0	4
BOWLING	1	0	0
FIGURE SKATING	0	0	3
FOOTBALL RUNNING	1	0	2
FOOTBALL	7	4	4
RUNNING	0	0	3
HOCKEY SHOOTING	0	4	0
BASEBALL HITTING	0	0	3
SWIMMING	1	1	4
BASEBALL	3	3	3
GOLF	1	0	3
BASKETBALL DEFENSE	0	1	3
SOCCER DEFENSE	0	2	3
SOCCER	4	2	1
HOCKEY DEFENSE	1	1	2
FOOTBALL CATCHING	1	1	1
SOCCER DRIBBLING	0	0	2
BASEBALL FIELDING	0	0	1
FOOTBALL THROWING	1	2	1
CHEERLEADING	0	0	1
DANCING	1	1	4
VOLLEYBALL	0	1	7
SOFTBALL	0	0	2
BALLET	0	0	1
GYMNASTICS BARS	1	0	0
GYMNASTICS	3	0	2
JAZZ DANCE	0	0	2
SKIING	0	0	1
SOCCER GOALIE	1	1	0
DANCE TAP	0	1	0
VOLLEYBALL SPIKE	0	0	2
FOOTBALL DEFENSE	1	0	1
KARATE	0	1	1
SOFTBALL PITCHING	0	0	1
INLINE SKATING	0	0	1
FOOTBALL KICKING	1	0	0
HOCKEY SKATING	1	1	0

Table 2 Continued

Low Efficacy Treatment Group

SKILL	8 to 9 Years n = 28	10 to 11 Years n = 35	13 to 14 Years n = 56
BASKETBALL DRIBBLING	1	0	4
BASKETBALL SHOOTING	2	3	8
BASKETBALL PASSING	0	0	1
SOCCER SHOOTING	1	0	2
BASKETBALL	2	2	4
HOCKEY	1	3	1
BOWLING	0	0	1
FIGURE SKATING	0	0	1
THROWING	1	0	0
FOOTBALL	0	6	3
TENNIS	3	2	3
RUNNING	0	0	5
PULL UPS	0	1	0
HOCKEY SHOOTING	1	1	2
BASEBALL HITTING	0	2	1
SWIMMING	0	0	1
BASEBALL	2	2	2
BASKETBALL DEFENSE	0	0	1
BIKING	0	0	1
SOCCER	4	3	2
SOCCER DRIBBLING	1	2	1
BASEBALL FIELDING	2	0	1
FOOTBALL THROWING	0	0	1
FLOOR HOCKEY	0	0	1
VOLLEYBALL	1	2	1
BALLET	0	0	1
GYMNASTICS	1	1	0
HANDBALL	0	0	1
SOCCER GOALIE	0	2	0
FIELD HOCKEY	0	0	1
WRESTLING	0	0	2
KARATE	0	0	1
INLINE SKATING	2	0	1
SOCCER PASSING	1	0	0
KICKING WITH LEFT FOOT	1	0	0
HOCKEY SKATING	1	0	0
ROPE CLIMBING	0	1	0

Scenarios

All subjects listened to a scenario (either high or low efficacy) read by the investigator. The fifth and eighth grade children were invited to also read the scenario written on a handout. The following are examples of each scenario:

High efficacy sport skill scenario

"Select one sport skill or physical activity that you are really good at and it is really important for you to be good. Please choose a skill and not a whole sport. For example, if you're good at basketball think of a specific skill like shooting or dribbling that you are good at and it's something you really want to be good at. Write down the sport skill you have chosen on the paper. Now please answer these questions."

Children then answered questions regarding perceived self-efficacy for their chosen skill (manipulation check) and importance of skill (manipulation check).

"Pretend the following situation happened to you while you were practicing your skill, the one in which you are very good. Your teacher asks you to practice your skill a new and more difficult way. For example, if you're shooting baskets you decide to take a shot farther from the basket, if you're hitting a ball with a bat you try to hit it harder and farther, or if you're running a race you try to run faster. Remember this is a skill that you know you can do and it is something that you really want to be good at, and you know your teacher, friends, and parents would want you to be able to do it. So you practice your skill. And you practice over and over again but, after 25 tries, you just can't do it right. Every time you try your skill you make a mistake. You thought you could do it and now you are not happy with the results."

The scenario for the low efficacy sport skill was exactly the same as the high efficacy sport skill situation except the selected skill is one in which the children have low efficacy.

Low efficacy sport skill scenario

"Select one sport skill or physical activity that you are just not very good at right now. It should be a skill or activity that is really important for you to be good but you are just not very good. Please choose a skill and not a whole sport. For example, if you're not good at basketball think of a specific skill like shooting or dribbling. Write down the sport skill you have chosen on the paper. Now please answer these questions."

Children then answered questions regarding perceived self-efficacy for their chosen skill (manipulation check) and importance of skill (manipulation check).

"Pretend the following situation happened to you while you were practicing your skill, the one in which you are not very good. Your teacher asks you to practice your skill a new and more difficult way. For example, if you're shooting baskets you decide to take a shot farther from the basket, if you're hitting a ball with a bat you try to hit it harder and farther, or if you're running a race you try to run faster. Remember this is a skill that you are not sure you can do but it is something that you really want to be good at, and you know your teacher, friends, and parents would want you to be able to do it. So you practice your skill. And you practice over and over again but, after 25 tries, you just can't do it right. Every time you try your skill you make a mistake. You weren't sure you could do it and now you are not happy with the results."

Measures

The measures are presented in the order in which the subjects completed the questionnaires. To classify children as overestimators, accurate estimators, or underestimators of their ability, the student's score on a perceived physical competence measure was compared to her or his teacher's rating of the student's actual physical competence. Three measures served as a manipulation check that children had selected a high/low efficacy skill, that the skill was important, and that they were dissatisfied with the performance outcome from the scenario. The remaining dependent measures assessed attributions for failure, effort, choice, persistence, and future self-efficacy.

Teacher's Rating of Child's Actual Competence. To obtain an accuracy rating of children's perceived physical competence in physical education, physical education teachers evaluated each subject using a modified version of the Teacher's Rating of Child's Actual Competence scale (Harter, 1982) (see Appendix A). A shortened version of the scale, with items similar to the questions used by Weiss and Horn (1990), were used in this study. The revision was made to the format of the scale by converting the response format used by Harter (1982) to a 5-point Likert scale. The reliability coefficient for the teachers in this study ($N = 7$) was $\partial = .96$. The five responses were summed to achieve a total score of physical competence for each student. The teacher's rating of a child's physical competence was subtracted from the child's rating of perceived competence to assess the child's accuracy of self-appraisal of ability. The two scales consisted of identical items.

Children's Perceived Competence. To assess children's perceived physical competence, a modified version of the physical competence subscale of the Perceived Competence Scale for Children (Harter, 1982) was used (see Appendix B). The revision was made to the format of the scale by converting the response format used by Harter (1982) to a 5-point Likert scale. A further revision was made to the format for the third grade students. Five circles increasing in size were used to represent the 5-point Likert

scale. The five responses were summed to achieve a total score of perceived physical competence for each student. The reliability coefficient for the subjects in this study was $\partial = .80$.

Perceived Control. Children's perceptions of control in the physical domain were measured by the Multidimensional Measure of Children's Perceptions of Control (Connell, 1985) (see Appendix C). This scale measures children's reasons for success and failure in three sources of control. These sources are internal control (person is responsible for outcome), unknown control (reason for outcome is unknown), and powerful others control (other people influence the outcome). Each source of control has four items (two for successful outcome, two for unsuccessful outcome) for a total of 12 items. Children rated each item on a 4-point Likert scale. This scale has been found to be a valid and reliable measure of perceived control in children and adolescents (Connell, 1985). Answers were summed for each source of control. The reliability coefficient for the subjects in this study was $\partial = .75$.

Pre Self-Efficacy for High and Low Efficacy Sport Skill Question. This question provided a manipulation check that the sport skill or physical activity that children selected was a skill in which they have high or low efficacy. Children were asked to indicate their efficacy level for performing the high efficacy skill and the low efficacy skill they selected on an 11-point scale (see Appendix D). Children were required to select a rating of 6 or higher, on a scale ranging from 0 to 10, for the high and low self-efficacy question. A rating of 6 or higher for the self-efficacy question indicated that the subjects were "sure" that they were "really good" for the high efficacy skill and "sure" that they were "really bad" for the low efficacy skill. Those children not meeting this standard were not included in the study.

Importance of Sport Skill Question. This question provided a manipulation check that the sport skill or physical activity that children selected was a skill in which they believed was important to perform well (see Appendix D). Children were asked to indicate on an

11-point scale "How important is it to you that you successfully perform this sport skill?" Children were required to select a rating of 6 or higher, on a scale ranging from 0 to 10, for the importance of their high efficacy skill and their low self-efficacy skill. A rating of 6 or higher for the importance questions, one relating to the high and one to the low efficacy skill, indicated that subjects perceived each skill important for them to be successful. Those children not meeting this standard were not included in the study.

Efficacy Source of Information Questionnaire. On the Efficacy Source of Information Questionnaire, children indicated how important each type of information was when determining their level of self-efficacy for sport or physical activity skills (see Appendix E). The list of sources was developed from Bandura's (1986) four sources of efficacy information (verbal persuasion, vicarious experience, past performance, physiological responses), Schunk's (1989) work in educational research, and the Sport Competence Information Scale (Horn & Hasbrook, 1987). Children were instructed that if a source did not apply to them (e.g., they do not have a brother or sister) they should leave that item blank. Children were encouraged to consider all the reasons and not just the most recent. Then the children were asked to circle the most important reason from the list of sources for why they thought they were good at some sports or physical activities. Their selection of sources of efficacy information did not pertain only to the high efficacy skills previously chosen, but rather sports and physical activities in general. The reliability coefficient for the subjects in this study was $\partial = .86$.

Performance Outcome Satisfaction Question. As a manipulation check, children responded to whether they were satisfied or happy with the results of their performance in the scenario (see Appendix F). Children indicated "yes" or "no." Each scenario (high or low efficacy) should have produced a dissatisfaction with performance. Children who were satisfied with their performance were not included in the study.

Attribution for Failure Question. All children were told that their performance was unsuccessful. The attribution for failure question asked them to indicated how true each

attribution statement was for why they might have failed in the scenario (see Appendix G). The attribution statements referred to effort, ability, luck, and task difficulty.

Intended Effort Question. Children's intended effort for practicing their sport skill or activity was measured with an effort question. Children indicated on an 11-point scale "How much effort or how hard will you work the next time you practice your sport skill?" (see Appendix H). Zero indicated "Not much effort at all," 5 indicated "Some effort," and 10 indicated "A lot of effort."

Persistence Question. Children's willingness to persist at their sport skill was assessed by asking children the question "The next time you practice your sport skill, if you had 30 minutes to practice, how long would you practice?" (see Appendix H). The children then circled the number of minutes out of 30 that they would choose to practice.

Choice Question. Children's choice to participate was assessed by asking children "If you had a choice, would you choose to practice this sport skill or a different sport skill the next time?" (see Appendix H). The children then selected their sport skill or a different sport skill.

Future Self-Efficacy for High or Low Efficacy Sport Skill Question. Children were asked to indicate their efficacy level for performing their high or low efficacy sport skill or activity in the future or the next time they practiced (see Appendix H). Using the same 11-point scale as the pre self-efficacy question, children circled the number which represented how sure they were that they could successfully perform their skill.

Background Questionnaire. All children completed a questionnaire regarding background information such as age, gender, year in school, ethnic background, and previous sport experience (see Appendix I). In addition, one question asked students if they would be willing to be interviewed by the investigator at a later date. If children selected yes, they were eligible for selection in Phase Two.

Procedure

Permission to conduct this study was obtained from the University Committee on Research Involving Human Subjects at Michigan State University and the principal and physical education teacher of each school where data were collected (see Appendix J). The physical education teacher distributed a cover letter and consent form for each student and parent (see Appendix K). Students who did not receive parental permission or chose not to participate remained with the physical education teacher while the other students worked with the lead investigator and an assistant. Assistants were graduate students at Michigan State University who volunteered to assist with this project.

Phase One required two days of data collection. On the first day, during physical education class, the investigator explained the purpose of the project and the student's requirements. Students were asked to listen to instructions and complete questionnaires. First, the subjects selected and rated their self-efficacy and importance for two sport skills or physical activities (a high efficacy and a low efficacy skill). Then they completed measures for the revised Harter's Perceived Physical Competence scale, Perceived Control scale, and Efficacy Source of Information Questionnaire. These measures were completed in the gymnasium of the school, in a group setting. The third grade students listened as the investigator read each item twice. The third graders were not given a copy of the questions, just an answer sheet. The fifth grade students read along with the investigator as she read each item. The eighth grade students read the questionnaires on their own and the investigator was available for questions. Students were encouraged to ask for help if they did not understand any questions. The first day of data collection required 25 minutes for students to complete all surveys.

Prior to the next visit for Phase One, the investigator divided students into two treatment groups, a high efficacy skill and a low efficacy skill, by grade level. This division was made by eliminating students who did not rate the efficacy and importance questions as a six or higher for either skill. Some students met the requirement for both a

high and a low skill. When this occurred the investigator placed the student in the efficacy group in which they had the strongest certainty rating (that they were good or not good). Most students clearly fell into either the high or low efficacy group. For administration of the second part of the questionnaires, students were further divided into small groups (within the treatment groups) based on their selection of sport skills and physical activities.

On the second day of data collection, students from each treatment group were selected during their physical education period. As a group, students completed the second set of questionnaires in a classroom with the investigator and assistant. First, all students completed a background questionnaire inquiring about various demographic information. Then, students were informed that the remaining questions would pertain to the sport skill or physical activity that they had previously selected. The high efficacy treatment groups referred to their high efficacy skill and the low efficacy treatment groups referred to their low efficacy skill. While students listened to a scenario and read along with the investigator, they were instructed to imagine that the scenario had happened to them while practicing their skill. Following each scenario subjects completed a performance satisfaction question, attribution for failure questions, intended effort question, intended persistence question, a choice to participate question, and a future efficacy question. The same administration procedures were used for this part of Phase One with each grade level as were previously described. This portion of data collection required 15 minutes for students to complete all surveys. When one treatment group had finished they returned to physical education class and another treatment group was administered the questionnaires.

Each physical education teacher made an assessment of the student's physical competence in physical education during their conference period or free time. This information was gathered on the revised Teacher's Rating of Child's Actual Competence scale. The forms were mailed to the investigator or picked up during a subsequent visit to the school. The teacher's rating was subtracted from the children's ratings to form an accuracy of competence rating (e.g., overestimator, accurate, underestimator).

Treatment of the Data for Phase 1

The research questions and hypotheses served as a guide for conducting the analysis in Phase One. The data were analyzed using Pearson Product Moment correlations, Analysis of Variance (ANOVA's), Chi-Square, and Multivariate Analysis of Variance (MANOVA's), with post hoc Discriminant Function Analyses and Tukey tests conducted on significant differences. In all analyses with unequal n's, appropriate adjustments were employed (Glass & Hopkins, 1984). The reliability for each scale was calculated along with a Factor Analysis for the Efficacy Source of Information Questionnaire. All analyses were conducted at the $p < .05$ significance level.

Phase Two

Subjects

The data from the Teacher's Rating of Student Competence and the student's Perceived Competence Scale for Children - physical subscale were analyzed to determine which girls and boys from Phase One were overestimators and which were underestimators of their ability. Children were classified into these categories by subtracting the teacher's score from the student's score on the physical competence scale. By examining a frequency distribution of scores, by age and gender, the highest positive scores (overestimators) and the lowest negative scores (underestimators) were selected to interview. If students had indicated in Phase One that they did not want to participate in an interview, they were passed and the next student was selected. See Appendix L for the listing of students who chose to participate and those who did not and their accuracy scores. Two girls and two boys from each of these categories, from each age group, were selected for an interview. A total of 24 children from Phase One were interviewed.

Interview Guide

Interviews followed a guide of questions, probing in more depth than the surveys if children combine sources of information to form their efficacy beliefs and how internal

standards interact with motivation (see Appendix K). When appropriate, additional questions were included to inquire in more detail or clarify a response.

Procedure

Individual interviews were conducted with students following the completion of Phase One. The interviews were structured and followed the interview guide. Arrangements were made with the physical education teachers and students to schedule interviews. Interviews were conducted during physical education class or during a student's free period in school, in a classroom separate from the gymnasium. Students were informed that the purpose of the interview was to follow up on questions from the surveys and that the interview would be tape recorded. The investigator received permission to record the interview and clarified any questions. The interviews varied from 15 to 30 minutes in length.

Treatment of Data

The interview tapes were transcribed verbatim into written scripts. Then the scripts were examined and searched for common themes and assertions. Once themes were established, the investigator read through the scripts looking for specific quotations that supported or did not support the assertions. This procedure was conducted for each research question.

Pilot Study

A pilot study was conducted in two parts to test the use of scenarios and questionnaires with children. The first part of the pilot study was an interview with 12 children, ages 6 to 13 years. The children were asked to listen to a scenario similar to the scenarios described previously and answer questions regarding their confidence level, source of efficacy, intended effort, intended persistence, attributions for failure, and future efficacy expectations. The subjects were also questioned about the definitions of words used in the interview to make sure that they had a clear understanding of these terms. The children had no difficulty answering the investigator's questions with the exception of one 6 year old

girl. She was not able to articulate her responses to the questions. The third part of the pilot study was conducted with the first draft of questionnaires and scenarios using three boys, ages 7, 10, and 10 years. The 10 year old subjects were given the packet of questionnaires, including the scenario and asked to read and complete the forms. They were able to do so with just a few questions. The 7 year old completed the forms with the investigator reading and explaining each question. Following completion of all forms, the children were asked to evaluate the difficulty in completing the forms and whether they understood each question. From their responses and evaluation of the results by the investigator, slight changes were made to the questionnaires and scenarios.

A fourth pilot study was conducted to evaluate the final draft of all questionnaires and scenarios and to evaluate the procedures for collection of data. This pilot study was conducted in a public school, with a third grade class. All questionnaires and procedures were found to be acceptable.

CHAPTER IV

Results and Discussion

Results and discussion for this chapter are presented in two sections: Phase One and Phase Two. In the first section, Phase One results are organized in order of individual hypothesis. Results for each hypothesis are presented followed by further exploratory analysis when appropriate. All analyses were conducted at the $p < .05$ level of significance. A summary table of all significance tests can be found in Appendix N. In the second section, the qualitative results for Phase Two are presented for each research question.

Phase One

Level of Self-Efficacy

Hypothesis 1 stated that children in the high self-efficacy condition would attribute their failure more often to lack of effort than to lack of ability, whereas; the children in the low self-efficacy condition would attribute their failure to lack of ability more often than to lack of effort. This hypothesis was fully supported. A 2 x 2 (Self-Efficacy Group x Attribution) repeated measures MANOVA was conducted to test attribution differences within each efficacy group. In addition, Effect Sizes (ES) were calculated to test the strength of the difference. Results indicated there was a significant efficacy group by attribution interaction, $F(1, 287) = 41.76$, $p < .001$, (see Figure 2). High self-efficacy children attributed their failure to lack of effort more so than lack of ability, ES = .71. Low self-efficacy children attributed their failure to lack of ability more so than lack of effort, ES = .39. Means and standard deviations for ability and effort attributions are reported in Table 3.

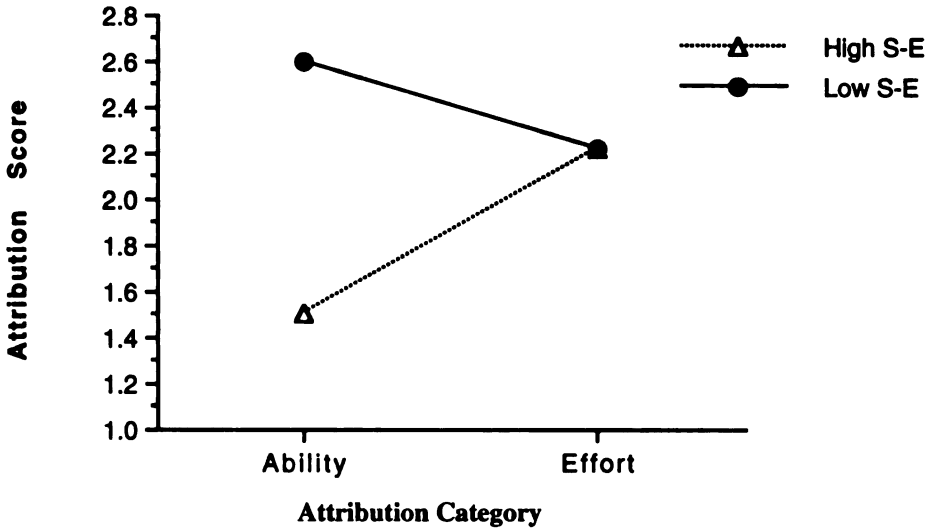


Figure 2. Self-efficacy group by attribution for failure interaction.

Table 3

Means and Standard Deviations for Attributions for Failure by Self-Efficacy Group and Age Group

Groups	Ability		Effort		Task		Luck	
	M	SD	M	SD	M	SD	M	SD
High Self-Efficacy	1.51	0.77	2.22	1.07	2.05	0.91	1.51	0.84
8 to 9 Year Olds	1.53	0.82	2.02	1.11	1.46	0.68	1.30	0.73
10 to 11 Year Olds	1.30	0.71	2.05	1.01	2.13	1.04	1.41	0.80
13 to 14 Year Olds	1.58	0.76	2.35	1.07	2.26	0.85	1.64	0.88
Low Self-Efficacy	2.60	1.05	2.22	1.04	2.55	0.99	1.47	0.86
8 to 9 Year Olds	2.78	1.16	2.35	1.06	2.71	1.15	1.60	1.06
10 to 11 Year Olds	2.31	1.07	2.28	1.15	2.45	1.01	1.45	0.85
13 to 14 Year Olds	2.69	0.95	2.10	0.94	2.53	0.91	1.42	0.75

Further exploratory analysis also examined self-efficacy group differences for all attributions: effort, ability, luck, and task difficulty. A 2 x 4 (Self-Efficacy Group x Attribution) MANOVA was conducted to test attribution differences between efficacy groups. Results indicated there was a significant between efficacy group main effect, Wilks $\underline{F}$ (4, 284) = 29.45, $\underline{p} < .001$. Follow-up univariate tests were significant for task difficulty, $\underline{F}$ (1, 287) = 19.45, $\underline{p} < .001$, and ability, $\underline{F}$ (1, 287) = 102.88, $\underline{p} < .001$. Tukey post hoc tests revealed that the low self-efficacy group had higher task difficulty attribution scores ($\underline{ES}$ = .48) and ability attribution scores for failure ($\underline{ES}$ = 1.11), than the high self-efficacy children. Post hoc DFA confirmed that task difficulty ($\underline{SDFC}$ = .323) and ability ($\underline{SDFC}$ = .926) attributions for failure were more salient for low self-efficacy children than high self-efficacy children, X^2 (3, $\underline{N}$ = 289) = 99.07, $\underline{p} < .001$. Results for within group differences indicated there was a significant difference, Wilks $\underline{F}$ (3, 285) = 52.73, $\underline{p} < .001$. High efficacy children attributed their failure more to lack of effort and task difficulty than lack of ability and luck. Tukey post hoc tests revealed that task difficulty attribution scores were higher than luck attribution scores ($\underline{ES}$ = .60) and lack of ability attribution scores ($\underline{ES}$ = .63) . Lack of effort attribution scores were higher than lack of ability attribution scores ($\underline{ES}$ = .76) and luck attribution scores ($\underline{ES}$ = .73). For low efficacy children, within group differences indicated that they attribute their failure more to lack of ability, task difficulty, and lack of effort than to luck. Tukey post hoc tests revealed that lack of ability attribution scores ($\underline{ES}$ = 1.18), task difficulty attribution scores ($\underline{ES}$ = 1.17), and lack of effort attribution scores ($\underline{ES}$ = .79) were higher than luck attribution scores. Means and standard deviations for luck and task difficulty attributions are also reported in Table 3.

Self-efficacy theory states that following performance failure individuals with high self-efficacy will attribute their failure to lack of effort; whereas, individuals with low self-efficacy will attribute their failure to lack of ability (Bandura, 1986). Results from Hypothesis 1 support that statement for children as well. Self-efficacy theory does not

address other attributions for failure such as task difficulty or luck. Luck was not rated as an important attribution, in relation to the other attributes, for either group. The between group differences that were found for task difficulty and ability make sense. If individuals are low in their efficacy expectations, they probably believe that they are low in ability and that their ability level will not match the task demands. The strength of this difference between level of self-efficacy was apparent, especially for the ability attribution (ES = 1.11).

Further exploratory analysis was also conducted to examine differences by age group and self-efficacy condition. Results of a 3 x 2 x 4 (Age Group x Self-Efficacy Group x Attributions) MANOVA indicated there was a significant age group by self-efficacy group interaction, F (8, 560) = 2.48, p = .012, (see Figure 3). Follow-up univariate tests were significant for task difficulty, F (2, 283) = 6.83, $p < .001$. Tukey post hoc tests revealed that for 8 to 9 year olds the low self-efficacy group had higher task difficulty attribution scores (ES = 1.37) than the high self-efficacy children. Means and standard deviations for attributions by age group and self-efficacy group are reported in Table 3.

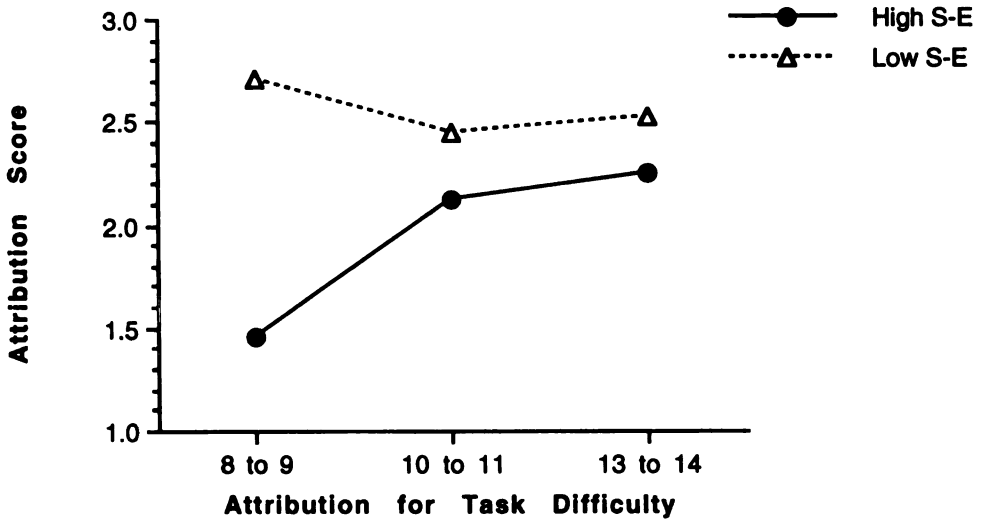


Figure 3. Age group by self-efficacy group interaction for attribution for failure.

Hypothesis 2 stated that children in the high efficacy condition would choose to participate in the activity in the future more often than children in the low self-efficacy condition. As expected, the result of a Chi-square analysis indicated there was a significant level of self-efficacy association, X^2 (1, N = 289) = 13.01, p < .001. Sixty-four percent of the children in the high efficacy condition choose to participate in the future compared to 36% of the low efficacy children. Figure 4 illustrates the association for choice to participate by self-efficacy group.

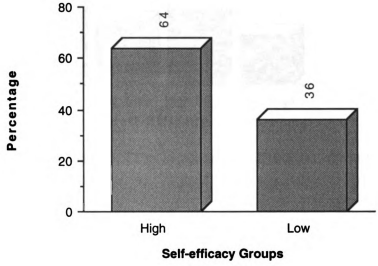


Figure 4. Choice to participate for each self-efficacy group.

For further exploratory analyses for choice to participate, six Chi-square analyses were conducted for each age group by efficacy condition and gender. Results indicated there were significant levels of self-efficacy associations in 13 to 14 year old girls, X^2 (1, N = 85) = 8.14, p = .004 and boys, X^2 (1, N = 66) = 19.38, p < .001. Sixty-nine percent of the high self-efficacy girls chose to participate in the future compared to 31% of the low self-efficacy girls. Seventy-six percent of the high self-efficacy boys chose to participate in the future compared to 24% of the low self-efficacy boys. Figure 5 illustrates the association for choice to participate for 13 to 14 year olds. Table 4 lists the frequencies

with which high and low efficacy girls and boys chose to participate by age group. Results of non-significant Chi-square analyses are listed in Appendix N.

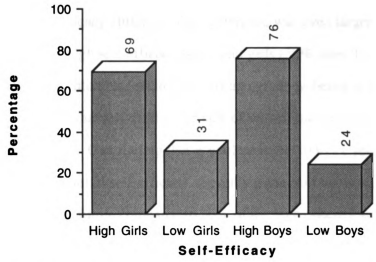


Figure 5. Choice to Participate for 13 to 14 year old high and low efficacy girls and boys.

Table 4

Frequency for Choice to Participate by Efficacy Group, Gender, and Age.

Age and Gender	High Self-Efficacy		Low Self-Efficacy	
	n	%	n	%
8 to 9 Year Olds				
Girls	12	56%	14	44%
Boys	27	62%	14	38%
10 to 11 Year Olds				
Girls	15	30%	16	70%
Boys	25	63%	14	37%
13 to 14 Year Olds				
Girls	54	69%	32	31%
Boys	42	76%	24	24%

Results from Hypothesis 2 were as expected and confirmed the self-efficacy literature which states level of one's self-efficacy will influence choice to participate (Bandura, 1986). For level of self-efficacy, the difference in the percentage of children who chose to participate was substantial. High self-efficacy children chose to participate 28% more often than low self-efficacy children. This difference was even larger for 13 to 14 year old boys (52% more for high self-efficacy boys) and girls (38% more for high self-efficacy girls). The youth sport literature often cites this age group as being at high risk for dropout. This finding suggests that self-efficacy or lack of self-efficacy is a factor influencing their choice to not participate. One finding that is unclear is the 10 to 11 year old girls' choice to participate by level of self-efficacy. Seventy percent of the low efficacy girls chose to participate in the future compared to 30% of the high efficacy girls (a difference of 40% in favor of low efficacy girls). While this finding was not statistically significant, it is practically significant and surprising.

Hypothesis 3 tested whether children in the high self-efficacy condition would have higher intended persistence, higher intended effort, and higher future self-efficacy than children in the low self-efficacy condition. Because persistence, effort, and future self-efficacy were correlated (see Table 5), all dependent variables were included in a 2 x 3 (Efficacy Condition x Motivation) Multivariate Analysis of Variance (MANOVA). As expected, results of the MANOVA revealed a significant main effect for efficacy condition, Wilks $\underline{F}$ (3, 284) = 13.67, $\underline{p} < .001$. Follow-up univariate tests were significant for effort $\underline{F}$ (1, 286) = 13.74, $\underline{p} < .001$, ($\underline{ES}$ = .43), persistence, $\underline{F}$ (1, 286) = 12.37, $\underline{p} = .001$, ($\underline{ES}$ = .41), and future self-efficacy, $\underline{F}$ (1, 286) = 35.98, $\underline{p} < .001$, ($\underline{ES}$ = .67). High efficacy children had higher effort, persistence, and future self-efficacy than low efficacy children. Post hoc discriminant function analyses (DFA) found effort, persistence, and future self-efficacy were more salient for high self-efficacy children than low self-efficacy children, X^2 (2, $\underline{N}$ = 289) = 38.24, $\underline{p} < .001$. Table 6 displays the means, standard deviations, and

standard discriminate function coefficients for each dependent variable by self-efficacy condition.

Table 5

Correlations for Effort, Persistence, and Future Self-Efficacy.

	Effort	Persistence
Effort	1.0000	
Persistence	.3844**	1.0000 .
Future Self-Efficacy	.4871**	.2706**

** - Signif. $p < .01$

Table 6

Means, Standard Deviations, and Standard Discriminate Function Coefficients for Effort, Persistence, and Future Self-Efficacy by Self-Efficacy Condition.

	High Self-Efficacy n = 169		Low Self-Efficacy n = 119		
Measures	M	SD	M	SD	SDFC
Effort	9.44	0.94	8.88	1.86	.087
Persistence	27.98	4.52	25.71	6.46	.336
Future Self-Efficacy	8.33	1.75	6.93	2.18	.820

Results for Hypothesis 3 were as expected and support self-efficacy theory. As with choice, level of self-efficacy is believed to influence individuals' amount of effort put forth,

persistence, and future efficacy expectations. The most influential difference between level of self-efficacy seems to be for future self-efficacy beliefs, as indicated by the strength of this difference (ES = .67) and the SDFC = .820.

Hypothesis 4 examined whether children in age group 8 to 9 would have higher effort, persistence, and future self-efficacy expectations than children in age groups 10 to 11 and 13 to 14. This hypothesis was partially supported. Results of a 3 x 3 (Age Group x Motivation) MANOVA found a significant age main effect, Wilks F (6, 566) = 4.93, $p < .001$. Follow-up univariate tests were significant for effort, F (2, 285) = 8.52, $p < .001$, and future self-efficacy, F (2, 285) = 5.08, $p = .007$. Tukey post hoc tests revealed that children 8 to 9 years had higher effort (ES = .33) and future self-efficacy (ES = .39), than children 10 to 14 years. Post hoc DFA confirmed that effort and future self-efficacy were more salient for 8 to 9 year olds than 10 to 14 year olds, X^2 (6, N = 289) = 28.96, $p < .001$. However, persistence was more salient for 10 to 14 year olds than 8 to 9 year olds. Table 7 shows the means, standard deviations, and standard discriminate function coefficients for effort, persistence, and future efficacy expectations for each age group.

Table 7

Means, Standard Deviations, and Standard Discriminate Function Coefficients for Effort, Persistence, and Future Self-Efficacy for Each Age Group.

	Age Groups						
	8 to 9 n = 67		10 to 11 n = 71		13 to 14 n = 150		
Measures	M	SD	M	SD	M	SD	SDFC
Effort	9.74	.72	9.25	1.11	8.90	1.70	.847
Persistence	26.26	6.29	27.42	5.19	27.21	5.29	-.672
Future Self-Efficacy	8.40	2.23	7.76	1.98	7.45	1.95	.383

For intended effort and future self-efficacy scores, there was an inverse relationship with age. This finding is typical in the educational literature, especially for self-efficacy beliefs. Children become more accurate in their beliefs (tested in hypothesis 9) and their perception of competence is lower as they become older. The decrease in intended effort scores is speculated to be influenced by children's conception of ability. As children age they are able to differentiate between effort and ability more clearly. So, the older child, who understands that success depends upon ability not just effort, may not be willing to put forth as much intended effort as the child who does not understand the difference. The difference in persistence scores by age were statistically significant, however, the difference is not practically significant. The 8 to 9 year old children still indicated that they would persist 26 out of 30 minutes, compared to the 10 to 14 year olds selecting 27 out of 30 minutes.

To further examine age differences in intended effort, persistence, and future self-efficacy between self-efficacy groups, a 3 x 2 x 3 (Age x Self-Efficacy Group x Motivation) MANOVA was conducted. Results indicated that there was not an age by self-efficacy group interaction, Wilks F (6, 560) = 1.26, p = .273. Therefore, the age differences that were found were not influenced by level of self-efficacy.

Hypothesis 5 stated that boys would attribute their failure more often to lack of effort than lack of ability; whereas, girls would attribute their failure to lack of ability more often than lack of effort. This hypothesis was not supported. A 2 x 2 (Gender x Attribution) repeated measures MANOVA was conducted to test attribution differences for girls and boys. Results indicated there was a significant attribution effect, F (1, 287) = 8.11, p = .005. As expected, boys attributed their failure to lack of effort more so than lack of ability, ES = .36. However, girls also attributed their failure to lack of effort more so than lack of ability, ES = .10. Means and standard deviations for ability and effort attributions are reported in Table 8.

Table 8

Means and Standard Deviations for Ability and Effort Attributions for High and Low Self-Efficacy Group by Gender.

	Ability		Effort		Task		Luck	
Efficacy Groups	M	SD	M	SD	M	SD	M	SD
Girls	2.09	0.99	2.20	0.99	2.39	0.88	1.48	0.80
High Self-Efficacy	1.60	0.71	2.31	0.98	2.18	0.84	1.51	0.80
Low Self-Efficacy	2.65	0.97	2.07	0.99	2.64	0.88	1.44	0.80
Boys	1.84	1.08	2.23	1.12	2.12	1.04	1.52	0.89
High Self-Efficacy	1.44	0.81	2.13	1.14	1.94	0.96	1.52	0.87
Low Self-Efficacy	2.53	1.14	2.40	1.07	2.44	1.12	1.51	0.93

Further exploratory analysis also examined between group gender differences for each efficacy group for all attributions: effort, ability, luck, and task difficulty. Results of 2 x 2 x 4 (gender x self-efficacy level x attribution) MANOVA revealed there were no gender differences or interaction effects. Means and standard deviations for luck and task difficulty attributions are also reported in Table 8.

For girls it was surprising that they attributed their failure more to lack of effort than lack of ability, although the strength of this difference was not large (ES = .10). Most of the literature in sport and educational research cites girls as attributing their failure to lack of ability more often than lack of effort. This is often due to teacher/coach feedback and expectations that reinforce girls failure is due to lack of ability; whereas, boys failure is due to lack of effort. The lack of differences when examining attributions between genders was

unexpected. Since gender differences were expected in level of self-efficacy, it was assumed that girls would attribute their failure to lack of ability and task difficulty more so than boys because they would have lower self-efficacy than boys. However, results for Hypothesis 6 (lack of gender differences) provide a possible explanation for lack of attribution differences.

Hypothesis 6 stated that boys would have higher intended effort, persistence, and future self-efficacy expectations than girls. This hypothesis was not supported. A 2 x 3 (Gender x Motivation) MANOVA analyses revealed no significant differences between boys and girls, Wilks F (3, 284) = 1.47, p = .221. Means and standard deviations are reported in Table 9.

Table 9

Means and Standard Deviations for Effort, Persistence, and Future Self-Efficacy for Girls and Boys.

	Girls n = 143		Boys n = 146	
Measures	M	SD	M	SD
Effort	9.13	1.15	9.24	1.65
Persistence	27.26	4.85	26.83	6.11
Future Self-Efficacy	7.54	1.85	7.96	2.23

While the differences between girls and boys were not significant, they were in the right direction for effort and future efficacy expectations. Boys were higher in both of these assessments. Interestingly, girls indicated that they would persist longer than boys, although the difference was small. Perhaps allowing children to choose their own high and

low self-efficacy task accounted for the non-significant results. In the literature, tasks that are sex-typed as masculine are often selected for study and this explains some of the gender differences that are found. Girls typically have lower self-efficacy and therefore may choose to extend less effort and persist a shorter amount of time in "sex in-appropriate" tasks. This would not be the case in this study because girls probably chose the task they considered "appropriate."

Further exploratory analysis examined whether there were gender differences by self-efficacy group. Results of a 2 x 2 (Gender x Self-Efficacy Group) MANOVA indicated there was no interaction, Wilks F (3, 282) = 1.23, p = .298. And, lastly, there was not a three-way interaction effect for a 2 x 2 x 3 x 3 (Self-Efficacy Group x Gender x Age x Motivation) MANOVA, Wilks F (6, 548) = 1.53, p = .164.

Accuracy of Self-Appraisal

Hypothesis 7 examined whether within each age group, boys would show greater over-estimation of ability than girls. This hypothesis was partially supported. A 3 x 2 (Age Group x Gender) ANOVA indicated there was an age by gender interaction, F (2, 279) = 4.20, p = .016. Tukey post hoc tests revealed that 8 to 9 year old boys overestimated their ability more so than 8 to 9 year old girls (ES = .47), while 13 to 14 year old girls overestimated their ability more so than 13 to 14 year old boys (ES = .34) (see Figure 6). See Table 10 for means and standard deviations for accuracy of self-appraisal of ability scores within each age group for boys and girls.

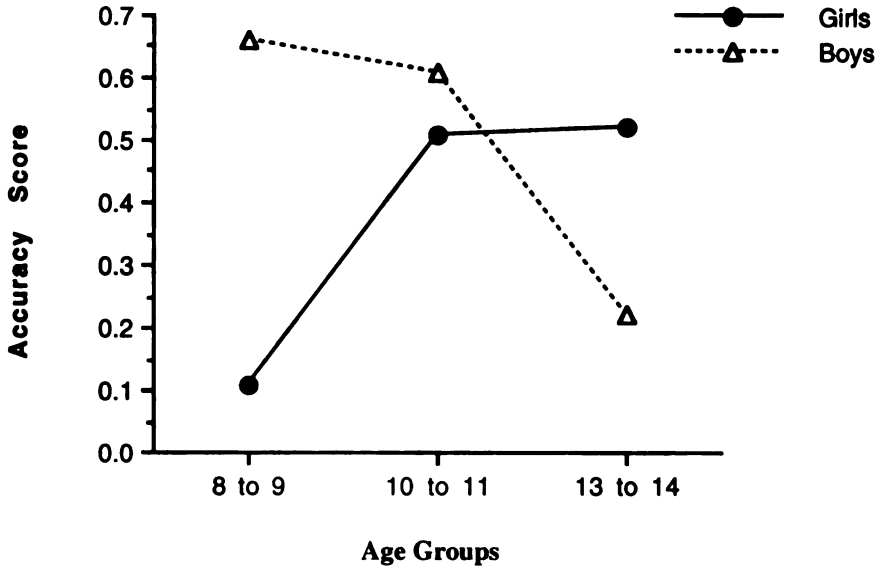


Figure 6. Age by gender interaction for accuracy of self-appraisal.

Table 10

Means and Standard Deviations for Accuracy of Self-Appraisal, Student, and Teacher Perception of Ability Scores Within Each Age Group for Girls and Boys.

Group and measure	Self-Appraisal Mean	SD	n
8 to 9 Years			
Girls			
Accuracy score	.11	1.26	25
Student score	3.62	.82	
Teacher score	3.51	.98	
Boys			
Accuracy score	.66	1.08	40
Student score	4.18	.53	
Teacher score	3.52	.93	
10 to 11 Years			
Girls			
Accuracy score	.51	.91	32
Student score	3.80	.47	
Teacher score	3.29	.94	
Boys			
Accuracy score	.61	1.10	37
Student score	3.89	.52	
Teacher score	3.28	1.14	
13 to 14 Years			
Girls			
Accuracy score	.52	.89	85
Student score	3.68	.61	
Teacher score	3.16	1.00	
Boys			
Accuracy score	.22	.84	66
Student score	3.71	.77	
Teacher score	3.49	.96	

* $p < .05$

Further analysis examined differences for accuracy scores within each gender across age groups. Tukey post hoc analysis indicated that for girls and boys there were no significant differences across ages. However, the strength of the differences was moderate as indicated by the effect sizes for girls comparing 8 to 9 year olds with 10 to 11 year olds (ES = .37) and 8 to 9 year olds with 13 to 14 year olds (ES = .38) and for boys comparing 8 to 9 year olds with 13 to 14 year olds (ES = .46) and 10 to 11 year olds with 13 to 14 year olds (ES = .40).

The between gender difference for 13 to 14 year olds was contrary to the expected results. To further explain these results, analyses were conducted to examine the student's and teacher's perceptions of physical competence. Two 3 x 2 (Age x Gender) ANOVA's for students' and teachers' perceptions of student physical ability were conducted. For students' perceptions, results indicated there was a significant age group by gender interaction, F (2, 283) = 3.25, $p < .040$. Tukey post hoc tests revealed that 8 to 9 year old boys had higher perceptions of ability than 8 to 9 year old girls (ES = .82) (see Figure 7). There were no gender differences at the other age groups. Within each gender, Tukey post hoc tests revealed that for girls there were no differences across age groups and the effect sizes when comparing 8 to 9 year olds with 10 to 11 year olds (ES = .28) and 10 to 11 year olds with 13 to 14 year olds (ES = .22) were low. There were differences for boys across age groups. The 8 to 9 year old boys had higher perceived ability than the 10 to 11 year olds (ES = .56) and the 13 to 14 year olds (ES = .74). This finding suggests that boys' perceptions of ability declined with age, whereas, girls' perceptions did not. This was an unexpected result.

Results indicated there were no significant differences for teachers' perceptions for gender, F (1, 279) = 2.17, p = .140, or age, F (2, 279) = .967, p = .381. For 13 to 14 year olds, there were no significant differences between girls and boys in their own perceptions of ability. However, the teacher's rating of actual physical competence by gender was different. Teachers rated boy's actual competence (M = 3.49, SD = .96)

higher than they rated girl's actual competence (M = 3.16, SD = 1.00). This low rating of girl's competence by teachers probably explains why girls were found to be higher than boys in their overestimation of their ability and probably reflects teacher bias more than girls' overestimation of ability. Means and standard deviations for students' and teachers' perception of student ability are also reported in Table 10.

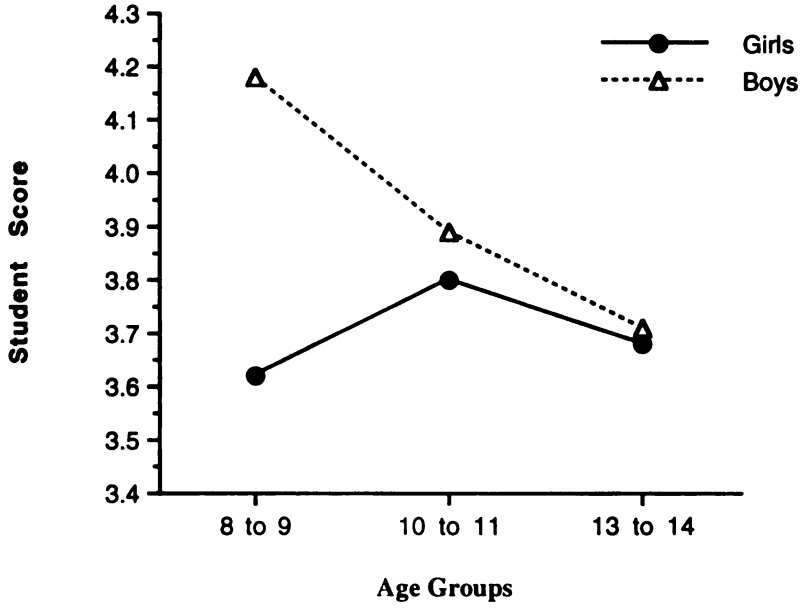


Figure 7. Age by gender interaction for students' perception of ability.

Hypothesis 8 stated that children's age would positively correlate with their accuracy appraisal of physical ability. This hypothesis was not supported. A Pearson product moment correlation was calculated for age and accuracy of appraisal. A low correlation of -.06 was found. This finding was surprising. Previous research in academic and sport areas have found that as children grow older their perceptions of their ability becomes more accurate. Again, this finding may be due to using the teacher's rating as the standard against which to measure the child's accuracy.

Hypothesis 9 stated that children's accuracy of self-appraisal of physical ability would positively correlate with intended effort, persistence, and future self-efficacy. This hypothesis was partially supported. Correlations were in the right direction, with correlations between accuracy and effort, and accuracy and future self-efficacy significant at $p < .01$. However, correlations were rather low. See Table 11 for correlations.

Table 11

Correlations for Accuracy of Self-Appraisal, Effort, Persistence, and Future Self-Efficacy.

	Accurate	Effort	Persistence
Accurate	1.0000		
Effort	.1733**	1.0000	
Persistence	.0674	.3844**	1.0000
Future Self-Efficacy	.2281**	.4871**	.2706**

** - Signif. $p < .01$

Further exploratory analysis examined whether the student's perceptions of their physical competence would correlate as predicted with intended effort, persistence, and future self-efficacy. It is possible that it is students' perceptions of their physical competence that relate better to motivation than an accuracy rating that is influenced by a teacher's rating of the student's physical competence. Results indicated that the students' perceptions did significantly correlate with effort and future self-efficacy. These correlations were higher with student perceptions than with accuracy of self-appraisal. See Table 12 for correlations.

Table 12

Correlations for Student Perception of Ability, Effort, Persistence, and Future Self-Efficacy.

	Student	Effort	Persistence
Student	1.0000		
Effort	.2637**	1.0000	
Persistence	.1497	.3844**	1.0000
Future Self-Efficacy	.4228**	.4871**	.2706**

** - Signif. p < .01

Hypothesis 10 examined whether children's accuracy of self-appraisal of physical ability would positively correlate with perceived internal control, and negatively correlate with perceived external control and perceived unknown control. This hypothesis was not supported as all correlations with accuracy of appraisal were in the predicted direction but not significant. See Table 13 for correlations.

Table 13

Correlations for Accuracy of Self-Appraisal, Internal, External, and Unknown Control.

	Accurate	Internal	External
Accurate	1.0000		
Internal	.0315	1.0000	
External	-.1090	.1396*	1.0000
Unknown	-.0333	.1520*	.3241**

* - Signif. p < .05 ** - Signif. p < .01

Further exploratory analysis also examined whether students' perceptions of their physical competence would correlate as predicted with internal, external, and unknown perceptions of control. Results indicated that student perceptions of competence were significantly correlated with external and unknown control, in the expected direction. See Table 14 for correlations.

Table 14

Correlations for Student Perception of Ability, Internal, External, and Unknown Control.

	Student	Internal	External
Student	1.0000		
Internal	.0679	1.0000	
External	-.3318**	.1396*	1.0000
Unknown	-.1632*	.1520*	.3241**

* - Signif. $p < .05$ ** - Signif. $p < .01$

Summary of All Hypotheses Testing

1). Hypothesis 1 stated that children in the high self-efficacy condition would attribute their failure more often to lack of effort than to lack of ability; whereas, the children in the low self-efficacy condition would attribute their failure to lack of ability more often than to lack of effort. This hypothesis was fully supported.

2). Hypothesis 2 stated that children in the high efficacy condition would choose to participate in the activity in the future more often than children in the low self-efficacy condition. This hypothesis was fully supported.

3). Hypothesis 3 tested whether children in the high self-efficacy condition would have higher intended persistence, higher intended effort, and higher future self-efficacy than children in the low self-efficacy condition. This hypothesis was fully supported.

4). Hypothesis 4 examined whether children in age group 8 to 9 would have higher effort, persistence, and future self-efficacy expectations than children in age groups 10 to 11 and 13 to 14. This hypothesis was partially supported. Children 8 to 9 years had higher effort and future self-efficacy than children 10 to 14 years. However, persistence was more salient for 10 to 14 year olds than 8 to 9 year olds.

5). Hypothesis 5 stated that boys would attribute their failure more often to lack of effort than lack of ability; whereas, girls would attribute their failure to lack of ability more often than lack of effort. This hypothesis was not supported. As expected, boys attributed their failure to lack of effort more so than lack of ability. However, girls also attributed their failure to lack of effort more so than lack of ability.

6). Hypothesis 6 stated that boys would have higher intended effort, persistence, and future self-efficacy expectations than girls. This hypothesis was not supported.

7). Hypothesis 7 examined whether within each age group, boys would show greater over-estimation of ability than girls. This hypothesis was partially supported. The 8 to 9 year old boys overestimated their ability more so than 8 to 9 year old girls, while 13 to 14 year old girls overestimated their ability more so than 13 to 14 year old boys.

8). Hypothesis 8 stated that children's age would positively correlate with their accuracy appraisal of physical ability. This hypothesis was not supported.

9). Hypothesis 9 stated that children's accuracy of self-appraisal of physical ability would positively correlate with intended effort, persistence, and future self-efficacy. This hypothesis was partially supported. Correlations were in the right direction, with significant correlations between accuracy and effort, and accuracy and future self-efficacy.

10). Hypothesis 10 examined whether children's accuracy of self-appraisal of physical ability would positively correlate with perceived internal control, and negatively correlate with perceived external control and perceived unknown control. This hypothesis was not supported.

Summary of Further Analysis

Attributions. Further exploratory analysis also examined differences for attributions of effort, ability, luck, and task difficulty by self-efficacy group, by gender, and by age group. The low self-efficacy group had higher task difficulty attribution scores and ability attribution scores for failure than the high self-efficacy children. There were no gender differences. The 8 to 9 year olds in the low self-efficacy group had higher task difficulty attribution scores than the 8 to 9 year olds in the high self-efficacy group.

Choice. Further exploratory analysis for choice to participate by efficacy condition, gender, and age group indicated there were significant levels of self-efficacy associations in 13 to 14 year old girls and boys. For the 13 to 14 year olds, high self-efficacy girls chose to participate more often than low self-efficacy girls. High self-efficacy boys chose to participate more often than low self-efficacy boys.

Effort, Persistence, Future Self-Efficacy. There was not an age by self-efficacy group interaction. Therefore, the age differences that were found were not influenced by level of self-efficacy. Further exploratory analysis found there were no gender by self-efficacy group differences or a gender by self-efficacy group by age group 3-way interaction effect.

Sources of Efficacy Information

Due to the exploratory nature of this area, research questions were posed instead of hypotheses. Research question 11 inquired about the type of information children would select as important sources in determining their self-efficacy expectations. The top three most important sources children selected from the Efficacy Source of Information Questionnaire were "I work hard at practicing," "I like sports," and "I can improve easily." Table 15 presents the means and standard deviations for all items on the Efficacy Source of Information Questionnaire in order of importance score.

The order of importance of sources was somewhat surprising. Bandura (1986) and others have cited past performance as the most dependable source of efficacy information. However, these results have effort (e.g., I work hard at practice) and preference (e.g., I

like sports) as the top two sources. The second source, "I like sports," is surprising because this is not a source that has been reported in previous research by adult subjects. Lastly, it is interesting that of the six verbal persuasion sources on the questionnaire, the "coach says I am good" received the highest rating.

Table 15

Means and Standard Deviations for Each Item of the Efficacy Source of Information Questionnaire.

Item	M	SD
1. I work hard at practicing.	3.59	.72
2. I like sports.	3.52	.82
3. I can improve easily.	3.24	.78
4. Skill is difficult and I can do it.	3.18	.84
5. Coach says I am good.	3.16	.96
6. I am really good.	3.13	.85
7. Skill is easy and I can do it.	3.12	.90
8. It is easy to learn.	3.10	.88
9. Teacher or coach helps me.	3.08	.93
10. Dad says I am good.	3.03	1.04
11. Friends say I am good.	2.95	.96
12. I practice more than others.	2.94	.95
13. I usually win.	2.84	1.05
13. Mom says I am good.	2.84	1.05
15. I am better than kids my age.	2.69	1.04
16. Teacher says I am good.	2.65	1.03
17. I almost never lose.	2.63	1.06
18. Better than brother or sister.	2.62	1.19
19. Do not have to work hard to be good.	2.45	1.04
20. I do not need help from anyone.	2.24	1.06

Research question 12 explored whether the sources of information would differ by age and gender. To analyze these differences a Principal Axis Factor Analysis (PFA) with Varimax rotation was conducted because the factors were believed to be uncorrelated. Results indicated that the PFA produced three factors. See Table 16 for factor eigenvalues, percent of variance accounted for, and individual factor loadings. See Appendix O for individual factor loadings for items that were eliminated or did not meet the factor requirements.

Table 16

Sources of Self-Efficacy Factor Eigenvalues, Percent of Variance Accounted For, and Individual Factor Loadings.

Factor	Eigenvalue	% of Variance	Factor Loading
Factor 1 - Significant Others	5.10	25.5%	
Dad says I'm good			.806
Mom says I'm good			.788
Teacher says I'm good			.741
Coach says I'm good			.643
Friends say I'm good			.614
Factor 2 - Ability	1.62	8.1%	
I almost never lose			.725
I usually win			.656
I'm better than kids my age			.583
I am really good			.581
Factor 3 - Effort	1.25	6.3%	
I practice more than others			.636
I can improve easily			.596
I work hard at practicing			.509

To examine if the sources of information would differ by age and gender, factor scores were computed by averaging the scores of each item. The three factors were analyzed in a 3 x 2 x 3 (Factor x Gender x Age) MANOVA. Results indicated there was a gender main effect, Wilks F (3, 246) = 4.57, p = .004. Follow-up univariate tests were significant for ability, F (1, 284) = 12.50, p < .001, ES = .60. Boys rated ability sources higher than girls rated ability sources in determining their efficacy expectations. Post hoc discriminant function analyses (DFA) also found significant others and ability sources were more salient for boys than girls, X^2 (2, N = 289) = 13.41, p < .001.

There was also an age main effect, Wilks F (6, 490) = 2.31, p = .032. Follow-up univariate tests were significant for effort, F (2, 247) = 3.66, p = .027. Tukey post hoc tests revealed that children 8 to 9 years rated effort sources higher than children 10 to 11 years (ES = .44) and 13 to 14 years (ES = .43). Post hoc DFA confirmed that ability and effort sources were more salient for 8 to 9 year olds than 10 to 14 year olds, X^2 (6, N = 289) = 13.76, p = .03. Table 17 shows the means, standard deviations, and standard discriminate function coefficients for sources of self-efficacy factors by gender and age groups.

Table 17

Means, Standard Deviations, and Standard Discriminate Function Coefficients for Sources of Self-Efficacy Factors by Gender and Age.

	Factor Sources					
	Significant Others		Ability		Effort	
Groups and SDFC	M	SD	M	SD	M	SD
Girls	2.92	.75	2.68	.75	3.25	.55
Boys	2.97	.87	3.02	.78	3.32	.66
SDFC	.341		-1.091		.003	
8 to 9 Year Olds	3.03	.87	3.06	.79	3.49	.57
10 to 14 Year Olds	2.97	.77	2.79	.79	3.23	.62
SDFC	.374		-.596		-.750	

Gender and age differences in the sources children select in forming their efficacy beliefs were not completely as expected. Although there has not been research conducted in this area prior to this study, intuitively it seemed that girls would rate messages from significant others higher than boys would rate these messages. The sources regarding significant others were more salient for boys than girls; however, the difference in means are not practically significant. Ability sources certainly did discriminate between genders (SDFC = -1.091) and supports previous research (Ewing, 1981; Lee, 1995; Tully, 1995). This Factor also included items relating to social comparison and competition. These are

two sources typically believed to be more masculine. It was not surprising that 8 to 9 year olds rated ability and effort sources more salient than the older children. Perhaps the 8 to 9 year olds were not able to distinguish the importance between various sources and therefore, they were all important. Whereas, the 10 to 14 year olds could distinguish between effort and ability, which accounted for the difference in those two ratings. It is still unexpected that they would rate effort sources as more important than ability sources.

Phase Two

The purpose of this phase of the study was to explore in more detail two research questions: do children combine sources of information to form their efficacy beliefs and how do internal standards interact with motivation in children of differing levels of accuracy in self-appraisal of ability. After transcription, the data were read and searched for common themes and assertions. A second reading was conducted to search for confirming and disconfirming evidence. For each research question, once the assertions were refined, I marked supportive quotes for possible use. These quotes were reread and sorted an additional time. The results of this qualitative analysis are organized by specific research questions. Assertions are printed below in bold, questions that I asked are in quotation marks, and supportive quotes are italicized.

Research Question One

For Research Question One, I was interested in whether children combined sources of information to form their efficacy beliefs and whether the types of sources they selected would differ from those on the questionnaire. From the children's responses, I developed three assertions.

Assertion #1: Children use a combination of sources of efficacy information and the two they described most often were verbal persuasion and performance accomplishments sources.

When I asked the children how they knew they were good at a sport or physical activity only a few said they didn't know or had trouble verbalizing their thoughts. Most of the children would mention a combination of 2 to 3 sources. A combination of sources suggests that they would respond with more than one. How children combine sources, the weighting or heuristics that Bandura (1986) hypothesized, I was not able to discover. None of the children could explain how or why they selected their sources. Based on these interviews, the predominant source was verbal persuasion or feedback from others. The important "others" were coaches/teachers, parents, and teammates/friends.

Well, if I'm playing a sport, like basketball for instance, my teammates will give me confidence to do stuff. They say, "David, go out there and do a good job because you're a good player."

David - 5th Grader, Overestimator

If I'm self-confident at something, then I think I'm pretty good. I usually go on what my parents think of me and how long I've been doing this sport. And, like, if my teachers tell me I'm good at it. And my peers tell me I'm good at it. Usually, if I see somebody doing it and another person thinks it's hard and I can do it then I'm pretty happy about it because I can do that and most people couldn't.

Roxanne - 8th Grader, Overestimator

My coach and my parents say I'm good at this sport. I practice a whole lot. And I reach goals in the sport. And .... I practice more. I play the sport a lot: every Saturday, Sunday and sometimes Thursday.

Jason - 5th Grader, Underestimator

Performance based accomplishments were also mentioned as an important source of efficacy. Performance was judged during games and/or practices. Some of the children

mentioned that their efficacy was based on improvement and the amount of practice time that they spent to get better.

Like, I played for a soccer team, like six years or something, since I was a little kid and everybody's like ..... Because every time I've played, I've always been one of the best player. Well, because I, like scored a lot of goals and stuff. In football -- I make a lot of touchdowns and in soccer I make a lot of goals, and.. I just, like do good in all those sports.

Neil - 3rd Grader, Underestimator

Because I practice hard. Sometimes I practice for a real long time. I practice hard .... That's about it.

Angie - 5th Grader, Overestimator

Because one of my next door neighbors had a basketball hoop and I was, like, better at shooting because when I went over there -- when I made my first shot, I got it. With basketball -- when I'm shooting, I normally make a lot of my baskets.

Jennifer - 5th Grader, Underestimator

There were two reasons mentioned that have not been described in Bandura's work; however, they have been mentioned as sources in another study (Chase et al., 1994). These sources were (a) the belief that they were good, and (b) positive affect for the activity (e.g., they just liked sports). The first one suggests that children describe their self-efficacy as a source of their self-efficacy, which means the children could not explain the original source. They just knew they were good because they believed they were good.

When I feel like I'm going to do something or go out and just do it without any questions.

Jennifer - 5th Grader, Underestimator

Well, all my coaches told me that I'm good and..... well, I think I'm good. Because it makes you feel good and then the next game, you think you're good and then you'll play better.

Ben - 5th Grader, Overestimator

Well, football, They say I'm okay, but I think I'm okay, but I'm better than I think I am. I know I am, but I don't want to say it.

"Who says you're okay?"

My mom and some of the other people on the team. Coach.

"Is this important to you?"

Well, kind of, yeah. Because you want to hear it from somebody else. You don't want to hear it from just yourself. You want to hear it from somebody else because if you just say you're good, no one might believe you until they hear from somebody else.

Ben - 3rd Grader, Underestimator

The affective source, "I like sports," was also rated as important in the results from the Sources of Efficacy Questionnaire. The children had a difficult time explaining why this was important or why they liked the sport. When I tried to probe why this was a source the answer was typically "just because I like it."

Um, dancing.... I like a lot. I'm always -- at home-- practicing dancing. I'm always twirling.

Angie - 5th Grader, Overestimator

Assertion #2: Effort was described as a source of efficacy information and also a technique to improve performance and self-efficacy.

Following the first few interviews, I noticed that effort was emerging as a source of efficacy and also as a method in which they believed they could improve performance and their efficacy. So I incorporated questions addressing effort directly into the interviews.

"Do you think how hard people work at sports has anything to do with how confident they are?"

Well, if you do a lot of work, but ... practice makes you do better. Because even if you're really not that good at something, you start. Like, I wasn't that good at hockey but I got practicing and I got better.

Ben - 5th Grader, Overestimator

The harder I work the more confident I get because I know that if I can go out there and work harder than some of these other people, then I know I can do better than them. The main reason is you can become good at a sport through a lot of hard work, some natural skill, basically a lot of discipline in how you play.

Steve - 8th Grader, Underestimator

If you work harder and you get better at it, then you're going to be self-confident about that and you're going to be able to do it in front of people and be happy about it. But if you don't, like, in volleyball I don't try really that hard, so I'm not really confident. I wouldn't want to go and play in front of all these people.

Roxanne, 8th Grader, Overestimator

The concept of improvement through hard work was also suggested as a technique for improving performance and self-efficacy.

Well, yeah. Because usually the more you work at it, the better you get at it. Then the better you are, the better you feel about it. Sometimes you have less confidence like when you get discouraged about it. But then if you get good at the game, then you have a lot of confidence because you know that you've tried hard and that you were really bad at the beginning but now you're good at it.

Kerry (male) - 8th Grader, Overestimator

Yeah, usually. I mean, if I go out and I practice for, like, an hour, my confidence goes up more than if I went out for fifteen minutes because the more time I spend practicing, I can actually gradually see myself improve. Like in the three pointer case, sometimes -- like last summer -- I went out for fifteen minutes and I really didn't see myself improve. But then when I practiced, like, for forty-five minutes over the summer, I could see that I was hitting more of them. So that I could see, like a gradual improvement if I practice more and more.

Adam - 8th Grader, Underestimator

This assertion suggests that effort, more so than ability for these children was an important source of their efficacy. This was surprising, especially from the older children. From this discussion, I realized that how children differentiate between effort and ability is important. I do not know how the children I interviewed conceptualized or if they were able to distinguish between effort and ability. However, it was interesting that of the quotes I selected, 4 of the 5 were 8th Graders and 1 was a 5th Grader. By age alone, one could speculate that they should be in Level 3 or Level 4 of Nicholl's (1984) theory of conception of ability-as-a-current-capacity, which means they should differentiate between effort and ability. However, this would just be speculation.

Assertion #3: Fear of injury and failure were important sources for low self-efficacy.

In addition to asking the children for reasons why they knew they were good at some sports, I asked them how they knew they were not good. Almost all of the responses were performance based. If they could not make a basket, catch a ball, or score a goal, then they were "not good" and had low self-efficacy. Very few comments reflected "negative" verbal persuasion or social comparison of performance. One re-occurring theme for low self-efficacy was fear of injury. The children I interviewed tended to use fear as a source of non-efficacious beliefs. This fear was from risk of injury, sometimes based on worried thoughts and/or past accidents or mishaps.

Cuz I don't like running around and stuff. I'm afraid I'm going to fall down and stuff.
Jacob - 3rd Grader, Overestimator

Well, sometimes. If we play a team that's harder, and there's bigger people than me, I get kind of worried. Well, I mean, like, "Will I get hurt real bad? Or will I .... if I go up for the basket, will I get pushed down?"
David - 5th Grader, Overestimator

Like in soccer, I know that I'm not very good at it because I'm afraid of the ball hitting me somewhere. In softball, I mean, when you go to catch, you have gear on. But with soccer, you only have skin guards. So when the ball comes to me, I'm always jumping away from it. And in swimming, I learned to swim when I was about five and I don't swim very often so whenever I go, I'm afraid that I can't swim in the deep end. Because I'm afraid I'm going to drown. That's about it.
Angie - 5th Grader, Overestimator

I just have this fear. I have a fear of going swimming. So I have to wear my life jacket, else I will not go off the diving board. I will never try to go off the diving board. Going under is one of my biggest fears. I'm afraid I'm going to drown. Because when we was in Florida, my dad said, "Go under." And I went under and he held me under for, like, two minutes.

Jodi - 5th Grader, Overestimator

Jodi mentioned fear throughout her interview when describing her confidence. She also described an incident when she was able to overcome her fear of riding a bicycle and become confident. She explained to me how she was involved in a bike accident and then became confident.

Well, when I was, like eight I started bike riding with training wheels. And then, the next summer I wouldn't even try it because I thought I was going to fall. And then I was ten. That's when I learned how to ride a bike. There was this girl who we know -- who my mom and dad know. It's Bob's daughter -- I think, Ashley. And she ran into the back of my bike. And ever since then, I've been making sure.... I've been telling people to not ride behind me because I'm afraid that somebody's going to hit me and I ran into a tree with my bike. And it.. and my tire on my old banana seat bike, it.... So, I got a new bike for my birthday -- my 10th birthday. I got it in February. I've been riding every since. I ride every day. If there's snow on the driveway, there's no way I'll ride because I'm afraid I'm going to slip and fall. But I'm confident in myself that I can ride a bike.

"Even after someone hit you in the back of the tire and you ran into a tree, how were you able to become confident?"

I went over my fear. Of going out there by myself and riding my bike. And my dad -- he got people over, and they're all outside and just talking. And I'm just riding my bike up

and down the driveway, up and down the streets. And I do it when I have free time in the summer and it ... that's how I lost my fear.

Jodi - 5th Grader, Overestimator

Research Question Two

For Research Question Two, I was interested in how internal standards or goals interact with motivation in children of differing levels of accuracy in self-appraisal of ability. I discussed four questions with the children. "Do you use goals?" "What happens if you do not reach your goal?" "Would you change your goal following failure?" "Following failure, would you put forth more effort on skills in which you have high self-efficacy or skills in which you have low self-efficacy?" I read through the transcripts for overestimators and underestimators, searching for differences in themes between these two groups. Only one difference was evident and is presented under Assertion 4. The remaining assertions, since there were no differences, relate to all children interviewed.

Assertion #4: Overestimators will keep the same goal or lower their goal following failure; whereas, underestimators tend to just lower their goal.

Sometimes. If like I say, "Oh, I want to make five baskets in this game," maybe, I'll limit it to 2 or 1 or something. Like if I didn't get any. Then maybe I'd try to go lower and try to get, say, "Oh, I'll try for 2" and then if I got 2, I'd raise it every time I played.

Kerry (boy) - 8th Grader, Overestimator

Yeah. I'd probably, like, make it a little bit lower so then I wouldn't have to feel bad about not reaching goals. So I could reach at least one goal.

Lindsay - 8th Grader, Underestimator

Self-efficacy theory would suggest that people with high self-efficacy would retain the same goal following failure, whereas, people with low self-efficacy would lower their goal following failure (Bandura, 1986). Whether these same actions are true for overestimators and underestimators has not been tested in previous studies. The difference I found between goals of overestimators and underestimators does make sense. If you are someone who underestimates your ability to perform a physical activity, in a failure situation, you probably would lower your goals because you would not believe that you have the ability to meet the standard.

Assertion #5 - Most children set goals in the sports and physical activities in which they participate.

Well, like, I've been getting my back flip on the beam and I have a meet coming up on Sunday. And I wasn't really confident about it and I couldn't do it and I was having the worst time with it. And then, like, I'm like, on Sunday, I was like, you know, "I'm going to have to get this. I know I have to get this." So, I went to practice on Monday with that goal. I was like, "I'm going to get this." So I went there and did it. So... that was like a really big goal for me. So I was really proud of that.

Lindsay - 8th Grader, Underestimator

Well, I have like, a thing with my family, like, in a soccer game -- if I score two or more goals, then that's like, then my brother has to, like, wash the dishes and stuff. So it's like, it helps me to encourage me. Well, like, I don't know. I want to play soccer in like, High School or something.

Luva (girl) - 8th Grader, Underestimator

When I don't set goals, it means I'm probably not really focusing on what I'm doing. When I'm setting the goal, I'm focusing on something and I know that I have to get this done, I have to get that done. I set small goals the first time. If not, I'm going out there just for fun.

Steve - 8th Grader, Underestimator

Of the 24 children I interviewed, only 2 mentioned that they did not set goals in sport or physical activities. Some research has been conducted on intervention techniques such as goal setting; however, the research on children's self-set goals is limited. Bandura has suggested that people do set internal standards for performance and whether their performance meets those standards, which results in satisfaction or dissatisfaction, is a motivating force for future performance. And, this relationship is mediated by one's self-efficacy expectations. This finding suggests that most children regardless of age do set goals or internal standards for performance. With children, it is possible that an adult will also set standards and goals for them. In one case, a child discussed how a parent had set a goal for the child and attached to the goal was a reward.

Mm-yeah. Like I'm trying to land my axle, like. If, okay, I'm having a real hard time at it, okay, and I change it to, like right now, it's like, if I make it by Christmas I get $100. And if I don't make it by Christmas my mom said if I make it by my birthday, she'll give me $200 on my birthday. Plus landing the axle.

How do you feel about this idea of winning some money?

I need it.

Do you think it helps you?

Definitely. Basically, it gives me the confidence. Like, I'll do it. Not really the confidence, but the strength to know I'll do it, sometime. Not necessarily now but sometime.

How do you know you'll do it?

The money. I need the money so.... yeah, if I try real hard, I'll get the money. If I don't , I don't.

Brian - 8th Grader, Overestimator

Assertion #6 - If children do not reach their goal, most of them would practice harder so that they could achieve their goal.

I wouldn't feel bad because I knew I was good at it and I just said "Okay, I missed a few so I'll just practice harder next time."

Jennifer - 5th Grader, Underestimator

The children's overwhelming response to failure to meet their goal was to work harder. Only two children indicated that they would quit and that was if the activity was not "fun" anymore. There were no obvious differences between responses for overestimators and underestimators. I believe that answers were in relation to sports and activities in which the children had high self-efficacy, because the question was not directed toward low efficacy activities. Therefore, their responses support Bandura's (1986) theory that children will choose to participate and put forth more effort following failure.

Assertion #7 - When given the choice for which skill they would work harder at following failure, a high efficacy or low efficacy skill, the responses were evenly mixed.

If I have more confidence for something I usually work harder on it. So, I'm not as worried about failing. I think I enjoy it (the one I'm good at) more because I'm better at it. I think that's probably why. Because I've been doing it for a lot longer.

Roxanne - 8th Grader, Overestimator

Probably dribbling now. Because I know that's a weaker part of my basketball game and I have to work more at it. Partially because I know that I may have a bad day on rebounding, but I still know that I have the ability to get a lot of rebounds, where I need more practice at dribbling because I'm not as good at that.

Steve - 8th Grader, Underestimator

Both overestimators and underestimators indicated that they would work harder on their high efficacy skill, while some would work harder on their low efficacy skill. The latter I found surprising. There has not been any research conducted on children's intended effort for high or low efficacy skills; however, I assumed children would select the skill in which they had high self-efficacy. This is based on Bandura's theory that self-efficacy mediates the relationship between performance failure and effort expended in future performance. If accuracy of self-appraisal does not influence this choice, it would be interesting to investigate further why some children chose the high efficacy skill and some chose the low efficacy skill and what implications does this have on future efficacy expectations and motivation.

CHAPTER FIVE

General Discussion and Future Directions

The purpose of this study was to examine children's utilization of self-efficacy information in their motivation in sport skills or physical activities, accuracy of self-appraisal, and sources of self-efficacy information. Chapter 4 presented the quantitative results by hypothesis with discussion of the findings and a detailed description of the qualitative results. This chapter reflects a discussion of the most important findings from either phase, how they interact to enhance our knowledge of this topic and provide a guide for future research. This discussion is organized into the following sections: (a) motivation, (b) sources of self-efficacy, (c) goals/standards, (d) measures, and (e) implications.

Motivation

Self-efficacy theory states that people's level of self-efficacy will influence their choice to participate, effort put forth, and persistence in the face of failure (Bandura, 1986). Previous research had not confirmed these beliefs with children in sport skills and physical activities. Results from this study support Bandura's theory. The quantitative results, indicated that children with high self-efficacy, especially the 13 to 14 year olds, would choose to participate more frequently following failure than the low efficacy children. The intended persistence results also supported the theory and were more salient for the 10 to 14 years olds than the 8 to 9 year olds. There were no gender differences.

The quantitative results for intended effort also supported self-efficacy theory. Children with high self-efficacy would put forth more effort following failure than children with low self-efficacy. Age differences were found, with 8 to 9 year olds having the highest intended effort scores and 13 to 14 year olds having the lowest. However, in the qualitative results, childrens' responses were mixed regarding whether they would choose to work harder at a skill in which they had high efficacy expectations or a skill in which

they had low efficacy expectations, although, effort was clearly an important variable in the relationship between self-efficacy and motivation. One possible explanation for age differences and the mixed results may be developmental differences that occur in children's capacity to differentiate between effort and ability with children below the age of 12 not being able to differentiate between the two attributions (Nicholls, 1978, 1984). In addition, as children age they become more realistic in their perceptions. Developmentally, Piaget's (1972) work would suggest that these children are moving from concrete operations, in which they can recognize that more than one dimension of an event will produce an outcome, to formal operations, where they can imagine the event conditions and draw deductions about possible outcomes.

Bandura's writings on conception of ability and effort are very different from Nicholl's developmental analysis of conception of ability. Bandura does not predict that developmental differences occur in self-efficacy as children develop and form opinions regarding their physical ability. In fact, Nicholl's theory on conception of ability-as-a-current capacity and Bandura's theory on self-efficacy have been studied independently of each other. If self-efficacy refers to people's judgment about their capability to successfully perform a task, it would seem that an understanding of how they conceptualize their ability would be critical.

As stated earlier, self-efficacy theory predicts that people with high self-efficacy would put forth more effort than people with low self-efficacy, regardless of age (Bandura, 1986). In children, the relationship between self-efficacy and effort may not be that simple. Based on the results of the present study and Nicholl's theory, the following conceptual model is proposed regarding children's conception of ability and the relationship among self-efficacy beliefs, motivational intentions, and attributions for failure (see Figure 8).

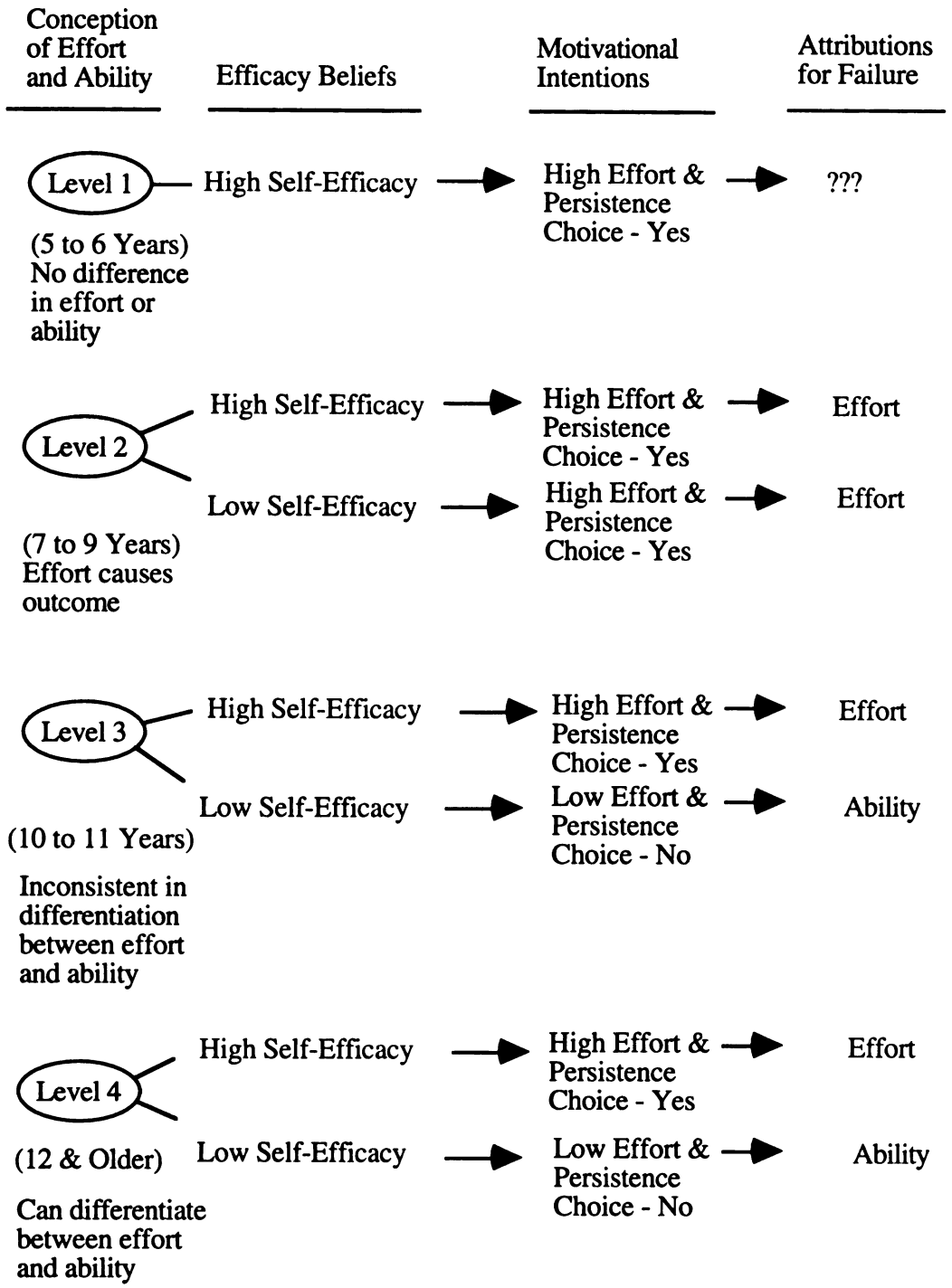


Figure 8. The proposed interaction between conception of ability, self-efficacy beliefs, motivational intentions, and attributions for failure.

Beginning with individuals at Level 4, the relationship between efficacy, motivational behaviors (e.g., choice, effort, and persistence), and attributions for failure would be as predicted by Bandura. This is the level in which most children 12 years and older (including adults) are able to conceptualize differences between effort and ability. Cognitively, this age group is more accurate and realistic in their perceptions of their ability. Therefore, the research that has been conducted with adults on efficacy, motivation, and attributions would generalize to children over 12 years of age. At Level 3, children can begin to differentiate between effort and ability, as in Level 4; however, they are inconsistent. The model predicts the same relationships for Level 3 as Level 4, however, in some cases or situations when children are inconsistent, they may revert back to Level 2. The differences and where research is most needed is with children who are in Level 2 and Level 1. At Level 2, children believe that effort is the cause of the outcome. The results of this study suggest that children at this age (typically 7 to 9 years) know that there are some skills in which they perform well and some in which they do not perform well. Therefore, they do possess high and low efficacy toward skills. However, because they believe that effort is the solution to performing better, the model predicts they will put forth more effort, persist longer, and choose to participate in the activity regardless of their efficacy. Their attributions for failure will be lack of effort because they believe that effort is the cause of the outcome. At Level 1, children believe that winning and completing a task are the same thing, which means they do not distinguish between effort and ability. Because they do not understand these differences, children at this level and this age (typically 5 and 6 years) may think they can do everything. They have high self-efficacy for every task. Therefore, in terms of motivation, they should have high effort and persistence and choose to participate. However, at this young age there may be several other variables that influence motivated behavior (e.g., low attention span). Because children at this level can not differentiate between effort and ability, it is unclear the attributions they may make for failure.

Future research is needed to test the predicted relationships in this model. This research would require expanding the age groups to include 5 to 14 year olds and classifying children by their developmental level in their conception of ability and effort. Results of the present study did not include 5 to 7 year olds nor a classification of their conception of ability. However, with caution, some of these relationships could be examined by assuming children are at the developmental level that corresponds to their chronological age (Nicholls, 1978). Results from the present study for these relationships are illustrated in Figure 9. For motivational intentions, the mean scores and frequencies are listed by the high and low efficacy groups by age group. The attribution for failure listed represents the attribution with the highest score for the high and low efficacy groups by age group.

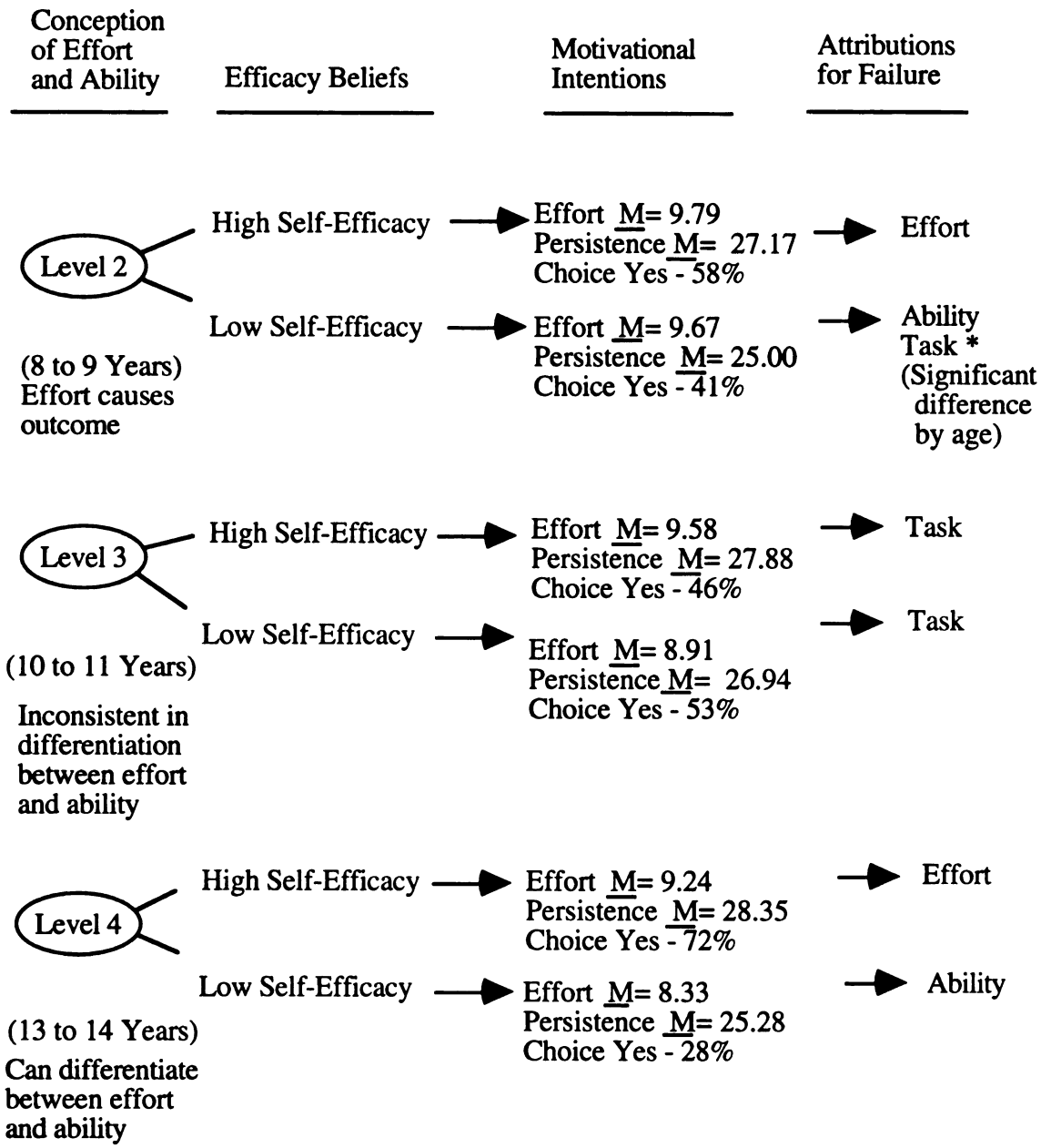


Figure 9. The results of tested relationships between conception of ability, self-efficacy beliefs, motivational intentions, and attributions for failure.

The predicted relationships were confirmed for Level 4 children. Although the means for effort and persistence were not significantly different by efficacy group, they were in the predicted direction. Choice was clearly in favor of the high efficacy group and attributions were as expected. For Level 3, the means for effort and persistence were not significantly different by efficacy group, however, they were in the predicted direction. Choice and attributions were not as expected. One explanation for these mixed results may be because this age group is believed to be inconsistent in their classification as Level 2 or Level 4. Some cognitive differences may exist among children at this age as they move into the later stages of concrete operations (Piaget, 1972). Some children may understand the cause of physical events and relationships; while, others have not reached that developmental stage. For Level 2, effort means for the high and low efficacy groups were high and comparable, as expected. Persistence score for the low efficacy group was lower than the high efficacy group and did not support the predicted trend for this relationship. The frequency of choice percentages were comparable between groups, however, neither were high. The effort attribution for the high efficacy group was as expected. The ability and task difficulty attributions for the low efficacy group were surprising, especially with the task difficulty attribution being significantly different for the high and low efficacy groups. It is possible that at this young age children do not have the experience with a task or the cognitive ability to understand how they can meet task demands. Therefore, if they have low efficacy they believe it is because the task is too difficult.

Attributions. The findings for attributions that high and low self-efficacy children make following failure support the research conducted by Collins (1982). Children with high self-efficacy attributed their failure to low effort, whereas, children with low self-efficacy attributed their failure to low ability. The present study extended Collins' research to include attributions for task difficulty and luck and gender differences in attributions. The low self-efficacy children had higher attribution scores for task difficulty and ability than the high self-efficacy children indicating that they did not believe they had the capability of

meeting the task demands. The strength of this difference was large as illustrated by an effect size of 1.11. There were no differences in luck attributions or gender differences in attributions.

One interesting finding was that the means for all attributions were not high. On a scale of 1 to 4, all means were below a score of 3. This may suggest that none of the attributions (i.e., effort, ability, task difficulty, luck) were important reasons for children's failure. However, an examination of the frequencies suggests that a considerable portion of the children rated the attributions at 3 or 4 (high efficacy - effort 16%, low efficacy - ability 24% and task difficulty 19%). Future research should, nonetheless, examine the potential for other attributions. To assess this, an open-ended questionnaire or interview should be incorporated. Future research should also examine how attributions for success and failure effect future efficacy expectations in children, in sport and physical activities. Schunk and his colleagues (Schunk & Cox, 1986; Schunk & Gunn, 1986) have been able to demonstrate that effort attributions in arithmetic performance increased future self-efficacy, which positively influenced performance.

Accuracy of self-appraisal. The results for relationship between accuracy of self-appraisal and motivation, in the quantitative and qualitative results, found no practically significant differences between overestimators and underestimators. An explanation for this probably lies in the assessment method of determining overestimators and underestimators. The method used in this study was similar to the assessment used by Weiss and Horn (1990). One problem may have been that teachers rated students' competence based on activities performed in their physical education classes, whereas, students may have based their own competence ratings on activities outside of school. This became apparent by the wide range of activities chosen by the students. Another possibility may be teacher bias. The lowest teacher ratings for any students were for the 13 to 14 year old girls. This low rating caused this group to be assessed as overestimators relative to the 13 to 14 year old boys, which is contrary to the literature in academics and sports.

Future research that plans to examine accuracy of self-appraisal should use a performance based assessment. A measure of actual physical competence in relation to a measure of students' perceived competence, for a specific skill, would be more valid. Corrections in assessment methods would allow better testing of the relationships proposed in this study.

Sources of self-efficacy

Self-efficacy theory (Bandura, 1977, 1986) states there are four sources of self-efficacy: performance accomplishments, verbal persuasion, vicarious experiences, and physiological responses. These are not considered to be mutually exclusive but rather result from a complex self-persuasion process that relies on cognitive processing of all sources of information. Bandura (1986) and others (Chase, et al., 1994; Feltz & Riessinger, 1990) have suggested that past performance accomplishments are the most dependable source of efficacy information. Results of a factor analysis of the Sources of Efficacy Information Scale indicated that significant others sources accounted for more of the variance than an ability or effort factor. In the interviews, significant others, in combination with performance accomplishments, were frequently mentioned by the children as a source of high self-efficacy and rarely as a source of low self-efficacy. This finding is somewhat contrary to what Bandura predicts. He suggests that it is more difficult to raise efficacy beliefs with verbal information from others than it is to lower beliefs. An explanation for this is likely due to Bandura's lack of research with children. Harter's (1978) research has shown that as children age they rely less on feedback from others. Adults are less affected by feedback from others than children, especially younger children who typically rely on the feedback of significant others for their perceptions of competence (Harter, 1978).

Results of the interviews provide more support for the importance of performance accomplishments in the formation of efficacy beliefs than the Sources of Efficacy Information questionnaire. However, the children described performance accomplishments

as being more than just successfully completing the task. In both the interviews and the questionnaires, children provided evidence of the importance of effort in performance as a source of efficacy information and as a technique to improve performance. This was a positive finding. As mentioned previously, effort is a controllable, internal attribution that has a positive influence on future self-efficacy. Effort is not a "fixed capacity" so that all children can put forth more effort and likely see improvements in performance. Future research needs to investigate effort as a source of self-efficacy in more detail. More specifically, in what type of situation is effort a source of efficacy, how much effort is enough, what other task demands must be considered, and does conceptualization of effort and ability impact this process?

One of the most interesting findings was fear being cited as a source for low self-efficacy expectations. Previous research in children's perceived competence (Horn & Hasbrook, 1987; Horn & Weiss, 1991) has not explored sources of low physical competence. Information pertaining to how children form inefficacious beliefs is just as valuable as information regarding the formation of efficacious beliefs. In fact, self-efficacy theory originated with Bandura's work with coping behavior and phobics (Bandura, 1977), so it seems appropriate to also explore low self-efficacy beliefs. Most of the reasons the children provided for low efficacy beliefs involved performance failure and fear of injury. Bandura's theory would support previous performance (failure) as a dependable source of efficacy information. This finding is not surprising. Future research should explore fear as a source of efficacy information in sport and also investigate how children cope with and learn to overcome their fears in sport skills and physical activities.

Some recent research by Tully (1995) and Lee (1995) have incorporated an insightful approach to examining sources of confidence and success and failure in sport. Their approach would suggest that instead of examining sources of efficacy information as a causal influence on the formation of efficacy expectations, the definition or subjective meaning of perceptions involved with the determination of self-efficacy would be more

helpful to understanding the self-efficacy and behavior relationship. This approach may provide an explanation for why children in this study indicated that affective reasons (e.g., I like sports) and self-efficacy (e.g., I just know I'm good) were listed as sources for self-efficacy. Perhaps, these responses could be better categorized as definitions of self-efficacy.

Goals or internal standards

This section of results was included in the present study because this is one future direction of research. In the relationship between self-efficacy and motivation, when a discrepancy occurs between performance and one's goals and whether this serves as a motivator to increase effort is partly influenced by the person's satisfaction or dissatisfaction with the performance and their self-efficacy. People with high self-efficacy will increase their effort and persistence in the face of a negative discrepancy between performance and the performance goal, whereas, people with low self-efficacy may choose to quit (Bandura, 1986). This relationship had not been investigated with children. Therefore, the interviews did provide some new and interesting information. One surprising result was that the children in this study did set goals for the sport skills and physical activities in which they participate. More amazing was the finding that failure to meet their goal was an effort producer and motivator regardless of their level of self-efficacy beliefs for a skill. This contradicts Bandura's thoughts about low self-efficacy individuals, their dissatisfaction with performance, and future goals. The children in this study indicated that if they did not reach their goals they would work harder and temporarily lower their goal. Future research needs to investigate to what extent self-efficacy beliefs mediate this relationship between goals and motivation. What self-regulatory processes are being used by children in these situations? And, would the same findings occur if an experiment was devised (e.g., like Bandura & Cervone, 1983, 1986) in which actual behavioral measures of performance and effort were taken in children?

Measures

Results of this study stimulated knowledge and new research questions in the area of measurement of motivation as it relates to self-efficacy and sources of self-efficacy beliefs. Future research should incorporate behavioral measures in addition to or instead of questionnaires. One limitation with the findings in the present study was that choice, persistence, and effort were assessed as intended behaviors. The social cognition literature suggests that intentions influence people's engagement in behavior (Eagly & Chaiken, 1993). However, intentions do not always predict behavior. Therefore, the intended effort, persistence, and choice responses may not be as reliable and valid as behavioral measures. It is possible that in children, this correlation may be lower because of social desirability influences on their responses to questionnaires.

In regards to investigating the relationship between motivation and self-efficacy, a scenario was used in this study instead of an actual performance measure to create performance dissatisfaction. The manipulation check asking children to indicate whether they were happy or unhappy with the results of the scenario provided some security that performance dissatisfaction was present. However, future research should also examine this relationship following actual performance. If there were differences, the effects might attenuate the results of the scenario, suggesting that actual performance would enhance the differences or relationships hypothesized in this study.

In addition, future research should consider incorporating the method of children selecting their own high and low efficacy skills. The wide range of sport skills and activities selected by the children reinforce this need. A critical piece of self-efficacy theory Bandura proposes that is often over-looked by researchers is the presence of proper incentives. Selection of one's own skill would help to insure incentive; however, a manipulation check for strength of importance of successfully completing the task (e.g., see Appendix D) must be included with measures of self-efficacy.

Future research that attempts to identify sources of information, definitions, or subjective meanings of self-efficacy with children should carefully consider the method of data collection. Previous research in related perceptions (e.g., perceived competence, sport-confidence, individual and team efficacy) have used questionnaires with their subjects (Chase, et al., 1994; Horn & Hasbrook, 1987; Horn & Weiss, 1991; Walter & Vealey, 1994). In comparing the quality of information from the questionnaires to the information received through interviewing in this study, the interview method was much more informative, especially for younger children. Interviewing allowed children to describe the combination of sources they utilized, which Bandura (1986) predicts is the method used in forming of one's efficacy beliefs. The present study was not able to uncover the heuristics children use to form these beliefs but future research should pursue this. As with all research, the research question should dictate the method. It seems that future research questions should move beyond mere identification of sources of information and into how these sources are processed and utilized. With this information, researchers and educators could begin to implement valuable intervention methods and teaching strategies that would serve to enhance the self-efficacy of children.

Implications

Implications from the results of this study are directed toward educators, teachers and coaches, in regards to motivation, attributions for failure, teacher/coach bias and feedback, sources of efficacy information, controlling fear as a source of low self-efficacy, and lack of gender differences. The quantitative results, indicated that children with high self-efficacy, especially the 13 to 14 year olds, would choose to participate more frequently following failure than the low efficacy children. The intended persistence results also supported the theory and were more salient for the 10 to 14 year olds than the 8 to 9 year olds. There were no gender differences. This result implies that intervention methods to maintain or increase children's self-efficacy beliefs in the sports and physical activities in which they participate could help lower attrition rates. Adolescents, ages 13 to 14, who

have low self-efficacy may be an important age group to target. The results which indicated that boys had decreasing perceptions of ability with increasing age also support this need for intervention.

Research suggests that as educators we must consider self-efficacy expectations and attributions as reciprocal determinants of each other, and therefore, as two distinct processes (McAuley, 1992). In this study, the effect of level of efficacy expectation on attributions was examined and results showed that high efficacy children made controllable, internal, and unstable attributions for failure (i.e., lack of effort). Educators should encourage this type of attribution. Attributions for failure that are related to lack of ability or task difficulty for low efficacy children will only continue to produce low efficacy expectations. Educators should try to change internal, stable, and uncontrollable attributions (i.e., lack of ability) and external, stable, and uncontrollable attributions (i.e., task difficulty).

One explanation for the lack of accuracy of self-appraisal of ability findings were teacher bias in the rating of students, especially 13 to 14 year old girls. If teachers have low expectations for girl's physical competence in their physical education classes then this issue should be addressed in the schools. The teacher expectancy literature suggests that students will tend to have a "self-fulfilling prophecy" in development of motor skills and psychosocial components (Brophy & Good, 1974; Martinek & Johnson, 1979; Rosenthal & Jacobson, 1968). Therefore, girls more so than boys may experience less success in physical education which can lead to low efficacy beliefs and skill development.

In both phases, information from significant others were found to be important sources of children's efficacy beliefs. Therefore, it is important for teachers, coaches, and parents to realize that as significant others the messages they send to children will impact children's efficacy expectations. One of the most important findings from the Sources of Efficacy Information questionnaire was that "coach says I'm good" received a higher importance rating than parents, teachers, or peers verbal persuasion. Coaches need to be aware of the

importance children place on coaches' feedback. Educators should encourage children to rely less on external sources of information and more on internal sources when forming their efficacy beliefs. Information based on their own definitions of success and failure, improvement and/or more mastery experiences would be more functional sources from which children derive their efficacy beliefs.

One source of low efficacy beliefs describe by the children was fear of injury as a result of performance failure or unsafe environment. Most educators realize that maximizing success will enhance self-efficacy and we should strive for those situations. Examples of fear of injury entailed pain (i.e., the ball hitting you), potential injury (i.e., playing against bigger, stronger opponents who may push you down), and previous "scary" situations (i.e., almost drowning because someone held you under the water). These situations could be controlled by educators by modifying equipment and game rules so that the potential for injury is reduced, considering developmental differences in children's physical size when organizing groups or teams, and providing safer environments when children are learning.

Results from this study indicated that slight differences were found for importance of significant others and ability sources among boys and girls. However, there were no gender differences in attributions, intended choice, effort, persistence, future self-efficacy, or self-efficacy for selected sports skills or physical activities. These lack of differences may reflect that this study incorporated suggestions by Lenney (1977) and Lirgg (1991) when devising the experiment. Gender differences in confidence have typically been found when the task involves a competitive situation, is viewed by the participants as masculine, and ambiguous feedback is provided. None of these conditions existed in this study. Choice of high and low efficacy skills by the children was especially important, as children most likely chose skills they believed were "sex-appropriate."

Conclusion

Duda (1992) states that moreover, the psychological prominence of perceived ability is held to be the distinguishing feature of motivation. Duda and Walling (1994) have

suggested that the majority of motivational theories have not considered developmental or age differences in their predictions. In the study of motivation and perceptions of self-efficacy in sport skills and physical activities, research must include the study of children as opposed to continually generalizing results from adults to children. Because Bandura has not provided an explanation of age-related differences in his theory and/or research, much more research with children is needed in order to better predict and explain thoughts and behavior. The goal of this study was to test some aspects of self-efficacy theory with children in sport and physical activities and provide the impetus for future research in this area.

APPENDICES

APPENDIX A

Teacher's Rating of Child's Physical Competence

Child's Name _____ Class/grade _____

1. How good is this student at all kinds of sports and physical activities?

1	2	3	4	5
Not Good		Sort of Good		Very Good

2. How good is this student at new games right away?

1	2	3	4	5
Not Good		Sort of Good		Very Good

3. How good is this student at sport skills and physical activities that he/she has never tried before?

1	2	3	4	5
Not Good		Sort of Good		Very Good

4. How good is this student compared to other students his/her age at sports and physical activities?

1	2	3	4	5
Not Good		Sort of Good		Very Good

5. In games and sports, how much does this student usually play instead of watch?

1	2	3	4	5
Plays Very Little		Sort of Plays		Plays A Lot

APPENDIX B

Perceived Competence Scale for Children - Physical Subscale

1. How good are you at playing all kinds of sports and physical activities?

1	2	3	4	5
Not Good		Sort of Good		Very Good

2. How good are you at new games right away?

1	2	3	4	5
Not Good		Sort of Good		Very Good

3. How good do you think you are at sport skills and physical activities that you have never tried before?

1	2	3	4	5
Not Good		Sort of Good		Very Good

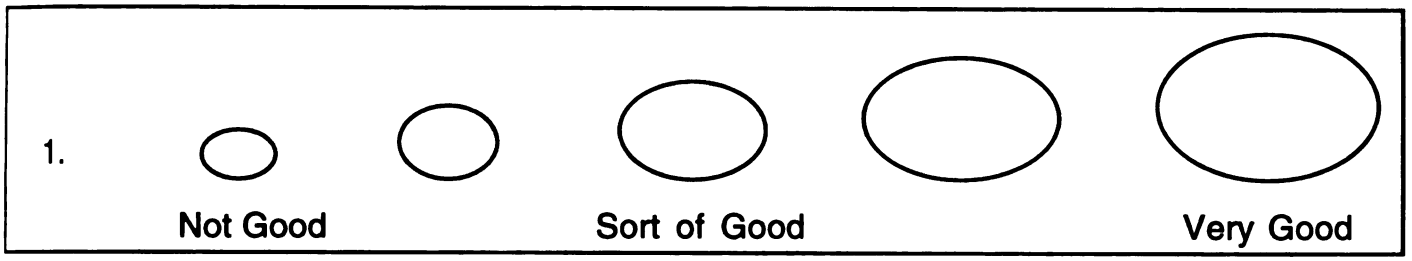
4. How good are you compared to other kids your age at sports and physical activities?

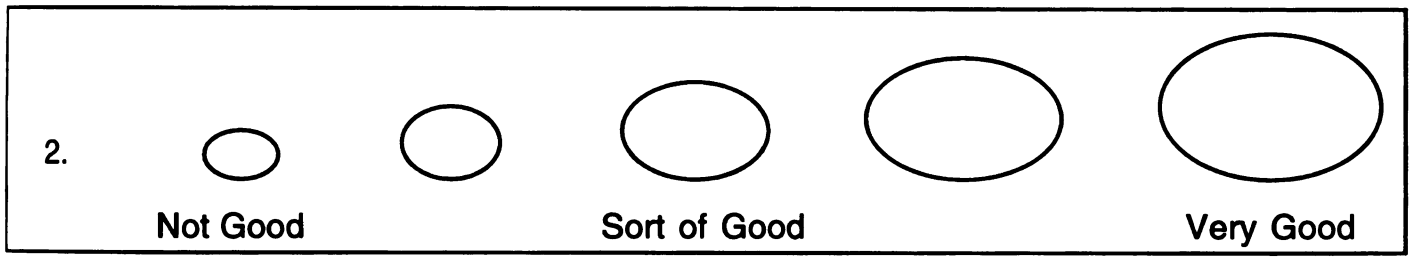
1	2	3	4	5
Not Good		Sort of Good		Very Good

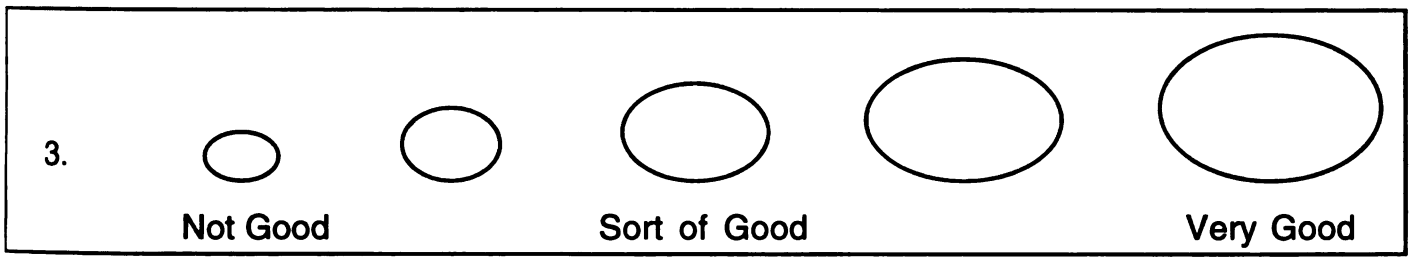
5. In games and sports, how much do you usually play instead of watch?

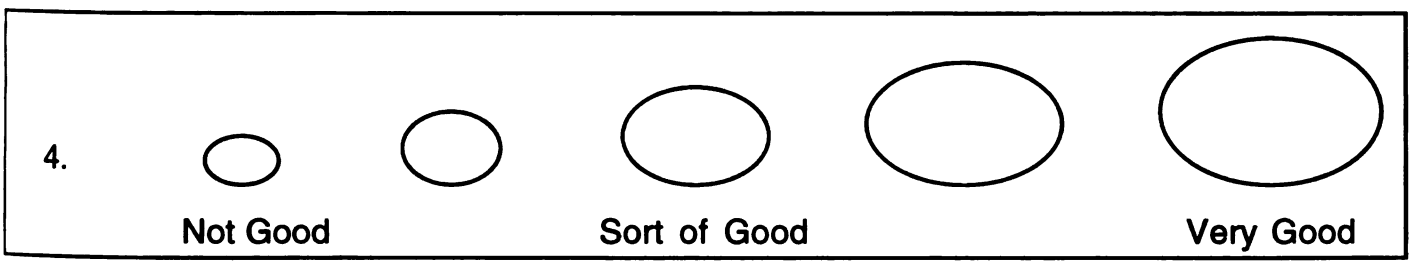
1	2	3	4	5
Play Very Little		Sort of Play		Play A Lot

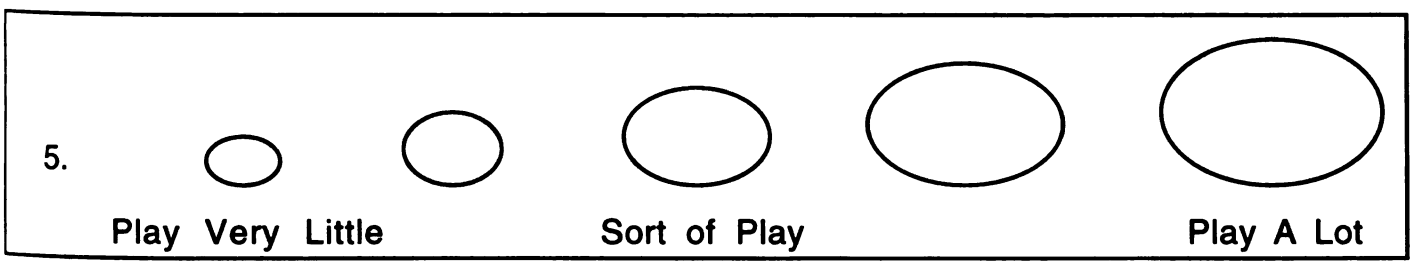
Children's Physcial Scale











APPENDIX C

Multidimensional Measure of Children's Perceptions of Control - Physical Subscale

1. When I win at a sport, a lot of times I can't figure out why I won.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

2. I can be good at any sport if I try hard enough.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

3. When I win at a sport, it's usually because the person I was playing against played badly.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

4. Most of the time when I lose a game in athletics, I can't figure out why I lost.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

5. If I try to catch a ball and I don't, it's usually because I didn't try hard enough.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

6. When I lose at an outdoor game, it is usually because the kid I played against was much better at that game to begin with.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

7. When I win at an outdoor game, a lot of times I don't know why I won.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

8. I can be good at any sport if I work on it hard enough.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

9. When I play an outdoor game against another kid, and I win, it's probably because the other kid didn't play well.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

10. When I don't win at an outdoor game, most of the time I can't figure out why.

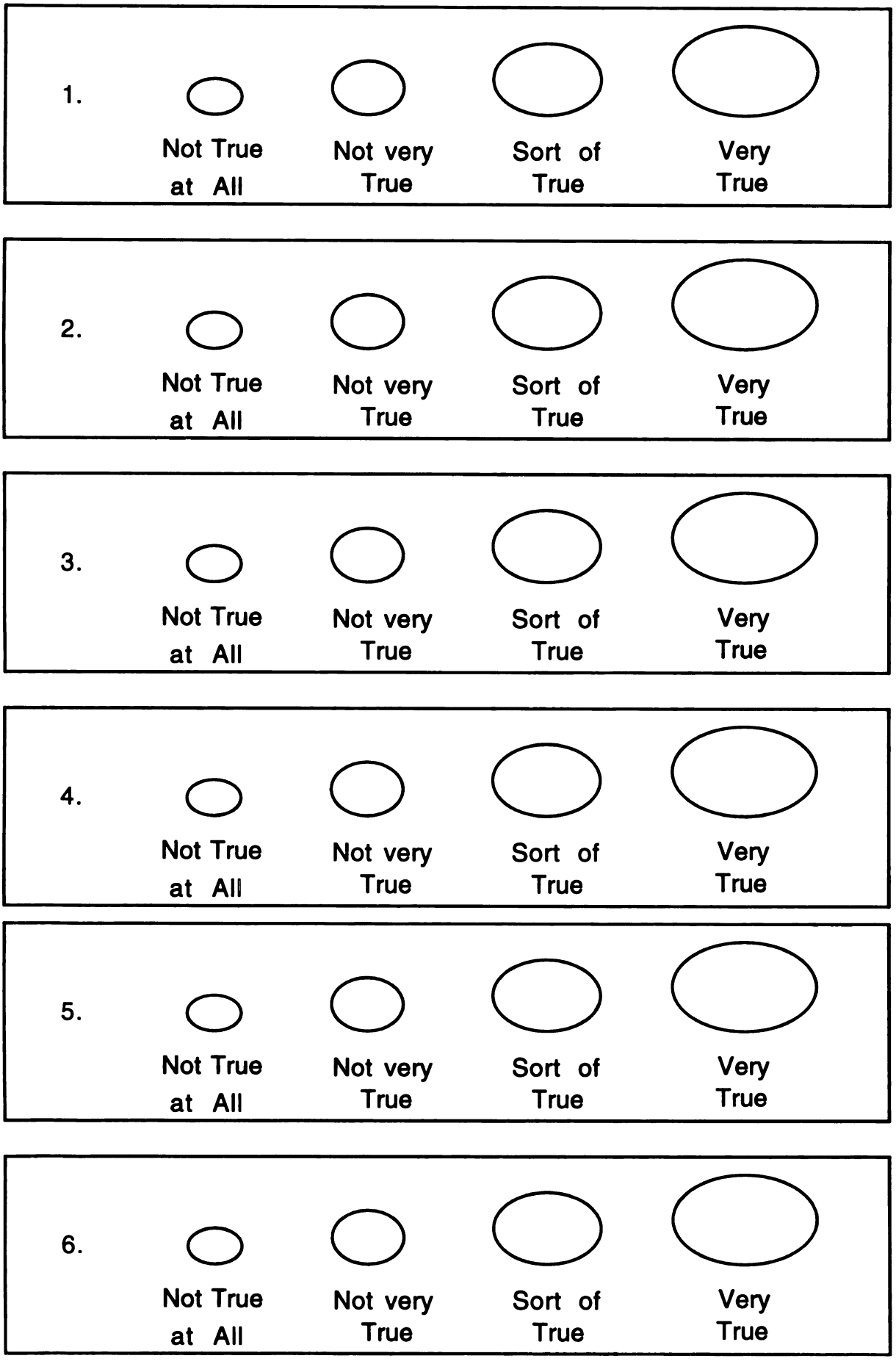
1	2	3	4
Not True at All	Not very True	Sort of True	Very True

11. If I try to catch a ball and I miss it, it's usually because I didn't try hard enough.

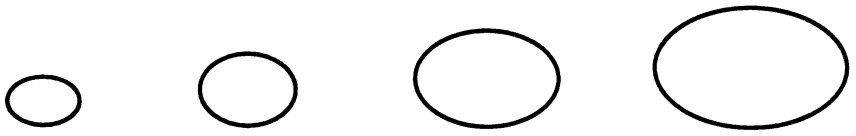
1	2	3	4
Not True at All	Not very True	Sort of True	Very True

12. When I don't win at an outdoor game, the person I was playing against was probably a lot better than I was.

1	2	3	4
Not True at All	Not very True	Sort of True	Very True

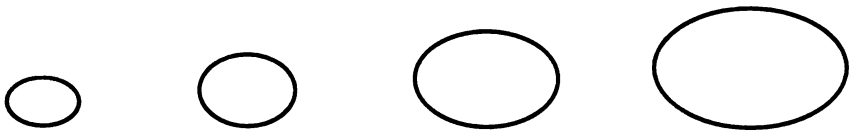

1.
Not True at All
Not very True
Sort of True
Very True
2.
Not True at All
Not very True
Sort of True
Very True
3.
Not True at All
Not very True
Sort of True
Very True
4.
Not True at All
Not very True
Sort of True
Very True
5.
Not True at All
Not very True
Sort of True
Very True
6.
Not True at All
Not very True
Sort of True
Very True

7.



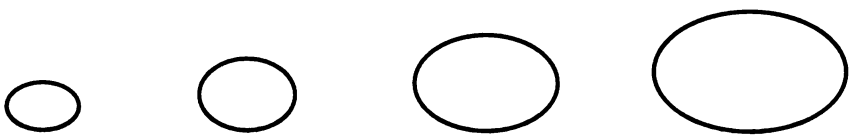
Not True at All | Not very True | Sort of True | Very True

8.



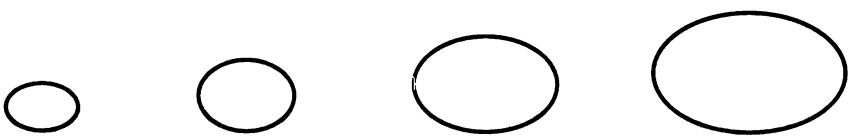
Not True at All | Not very True | Sort of True | Very True

9.



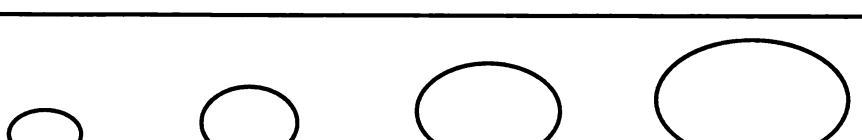
Not True at All | Not very True | Sort of True | Very True

10.



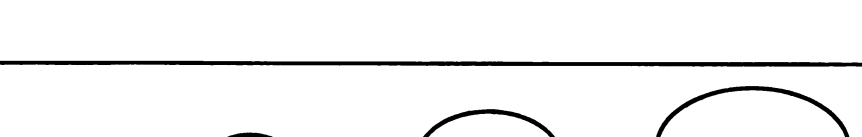
Not True at All | Not very True | Sort of True | Very True

11.



Not True at All | Not very True | Sort of True | Very True

12.



Not True at All | Not very True | Sort of True | Very True

APPENDIX D

Pre Self-Efficacy for High or Low Efficacy Sport Skill Question

Name _____ School _____

Age: _____ Grade: _____ Circle: Girl Boy

1. Write down a sport skill or physical activity that **you are good at:** Pick a skill that is **important to you** and you're good at.

_____

a. How sure are you that you are good at this sport skill or activity?

0	1	2	3	4	5	6	7	8	9	10
Not Sure at All					Sort of Sure					Very Sure

b. How important is it to you that you are good at this sport skill or activity?

0	1	2	3	4	5	6	7	8	9	10
Not Important at All					Sort of Important					Very Important

2. Write down a sport skill or physical activity that **you are not good at:** Pick a skill that is **important to you** even though you're not good at it.

_____

a. How sure are you that **you are not good** at this sport skill or activity?

0	1	2	3	4	5	6	7	8	9	10
Not Sure at All					Sort of Sure					Very Sure

b. How important is it to you that you are good at this sport skill or activity?

0	1	2	3	4	5	6	7	8	9	10
Not Important at All					Sort of Important					Very Important

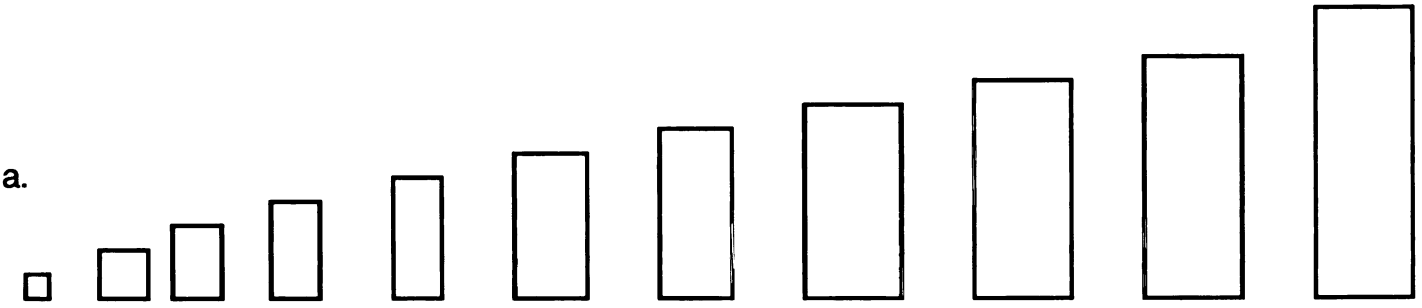
Name: _____ School: _____

Age: _____ Grade: _____ Circle: Girl Boy

1. Write down a sport skill or physical activity that you are good at:

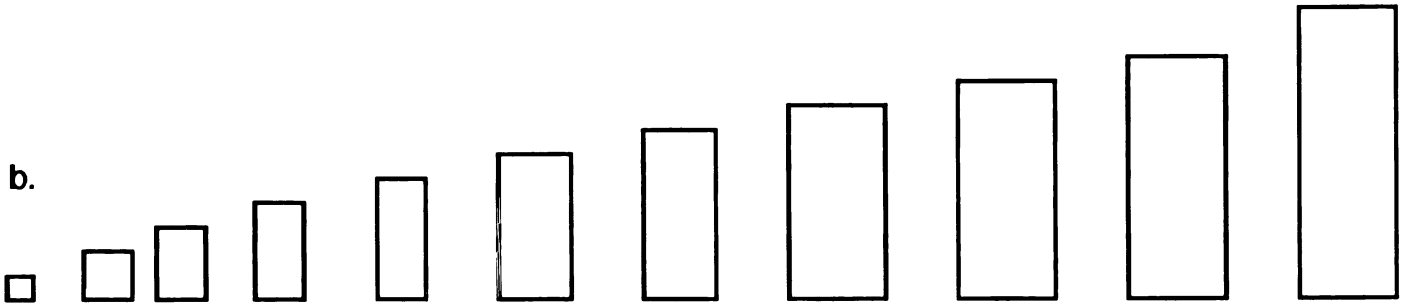
_____

a.



Not Sure at All — Sort of Sure — Very Sure

b.

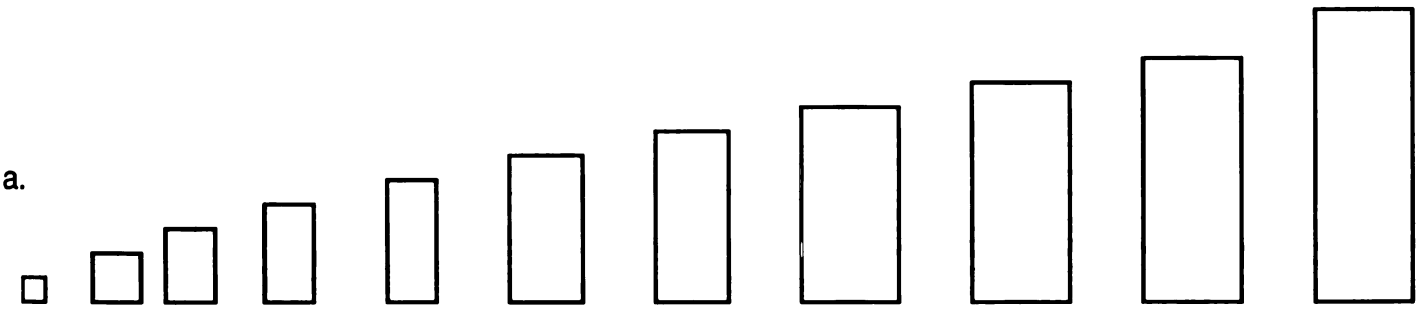


Not Important at All — Sort of Important — Very Important

2. Write down a sport skill or physical activity that you are NOT GOOD AT:

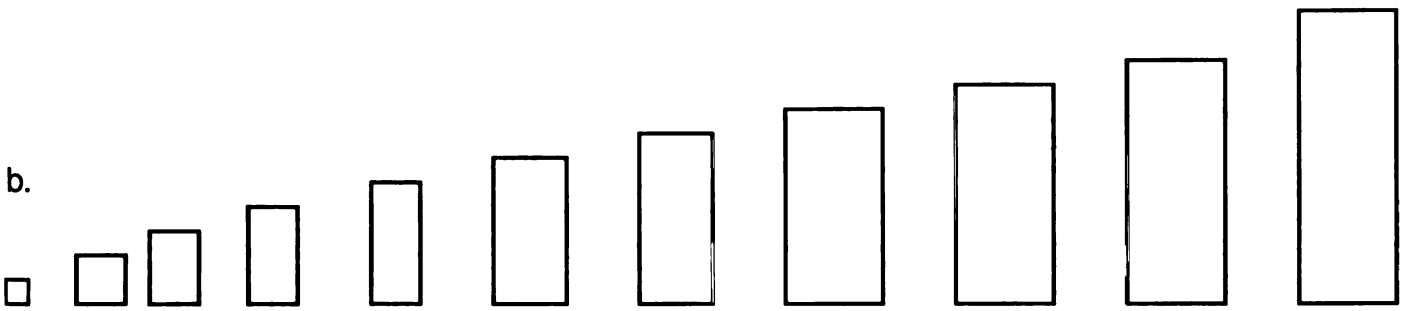
_____

a.



Not Sure at All — Sort of Sure — Very Sure

b.



Not Important at All — Sort of Important — Very Important

APPENDIX E

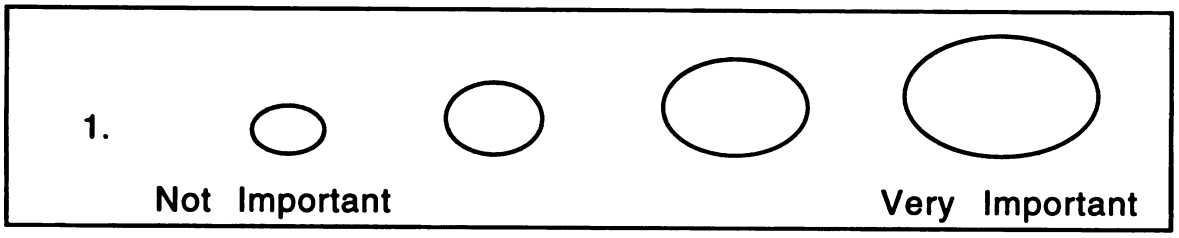
Source of Self-Efficacy Information Questionnaire

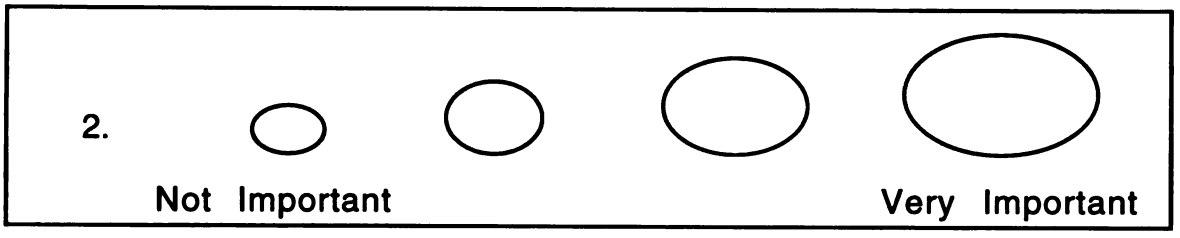
There are lots of reasons why people feel that they are good at sports and other activities. How important is each reason listed below to you?

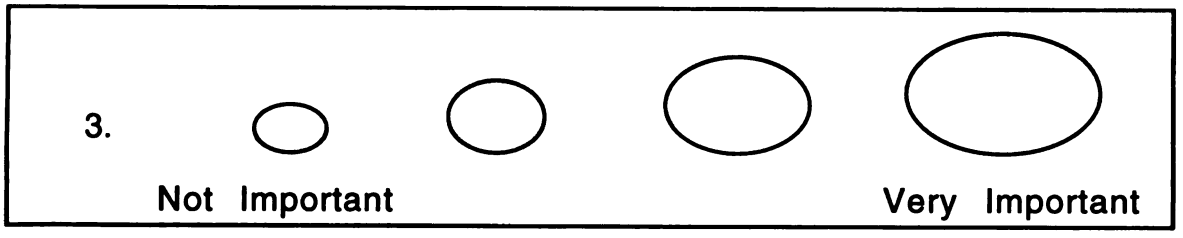
I know I'm good at sports because:	Not Important			Very Important
1. My friends say I'm good.	1	2	3	4
2. I work very hard at practicing.	1	2	3	4
3. My teacher or coach helps me.	1	2	3	4
4. The skill is very easy and I can do it.	1	2	3	4
5. My coach says I'm good.	1	2	3	4
6. I usually win.	1	2	3	4
7. I practice more often than other kids.	1	2	3	4
8. When I play I'm really good.	1	2	3	4
9. The skill is very difficult and I can do it.	1	2	3	4
10. My mom says I'm good.	1	2	3	4
11. I almost never lose.	1	2	3	4
12. I'm better than kids my age.	1	2	3	4
13. I can improve my skills easily.	1	2	3	4
14. My teacher says I'm good.	1	2	3	4
15. I like sports.	1	2	3	4
16. I don't have to work hard to be good.	1	2	3	4
17. My dad says I'm good.	1	2	3	4
18. It's easy for me to learn new skills.	1	2	3	4
19. I'm better than my brother or sister.	1	2	3	4
20. I don't need help from anyone.	1	2	3	4
21. _____	1	2	3	4
22. _____	1	2	3	4
23. _____	1	2	3	4

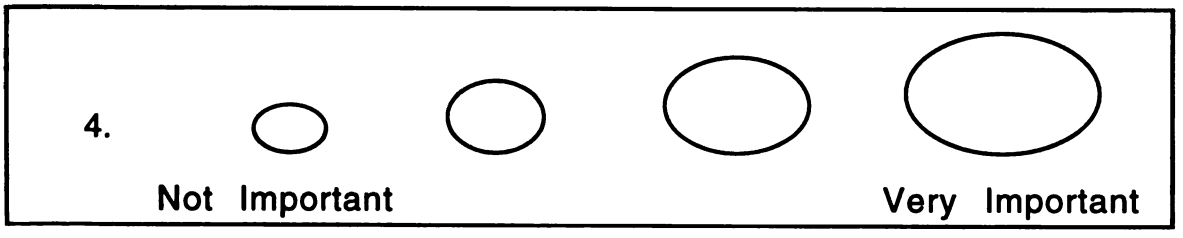
*** Circle the most important reason why you know you are good.**

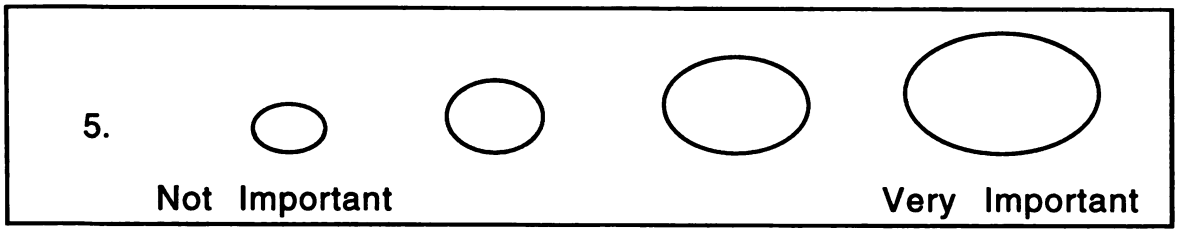
Reasons Why I'm Good at Some Sports

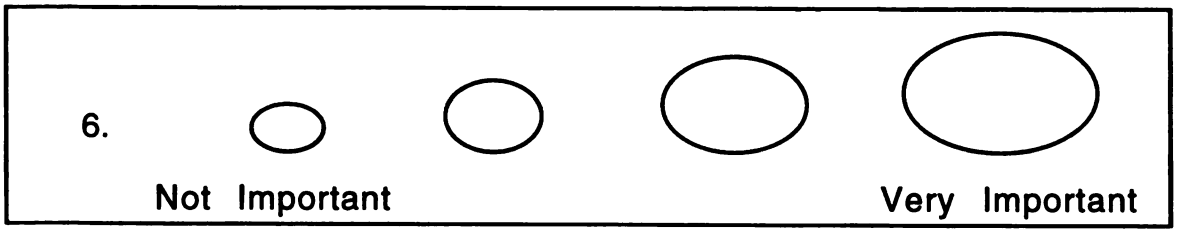


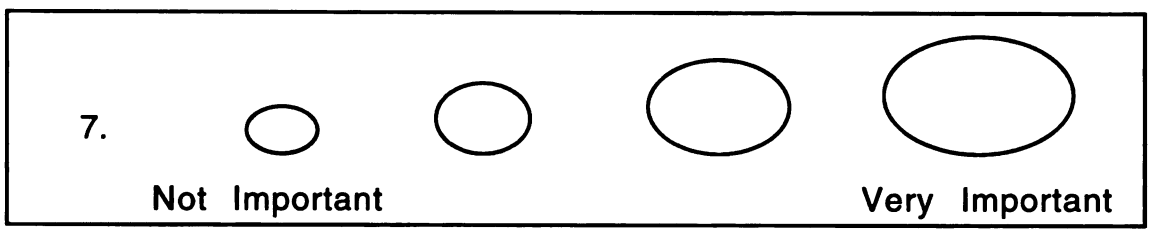


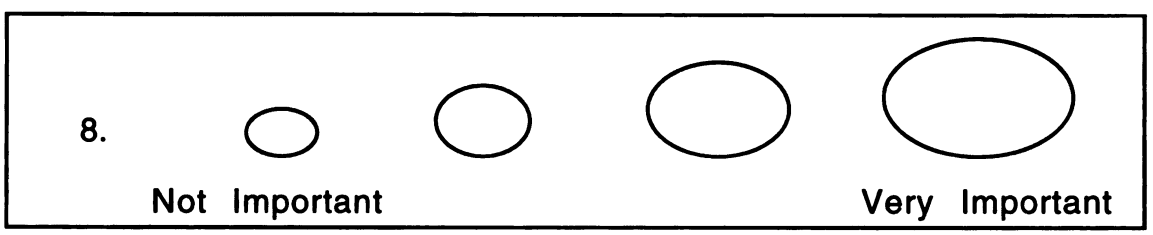









7.
Not Important
Very Important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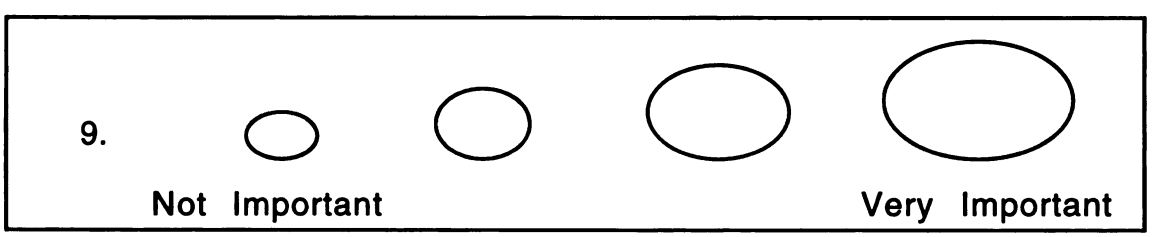
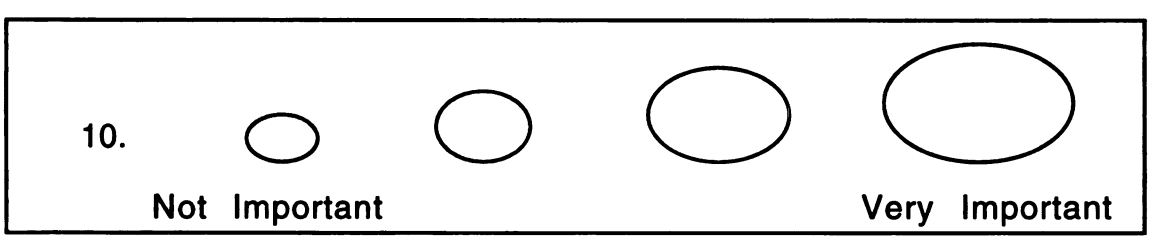
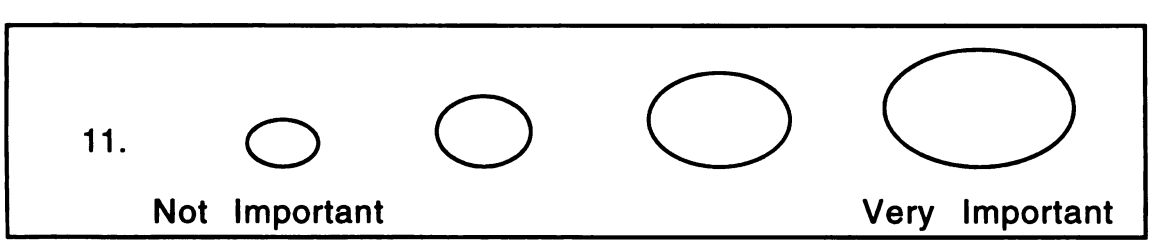
Not Important
Very Important


9.
Not Important
Very Important


10.
Not Important
Very Important


11.
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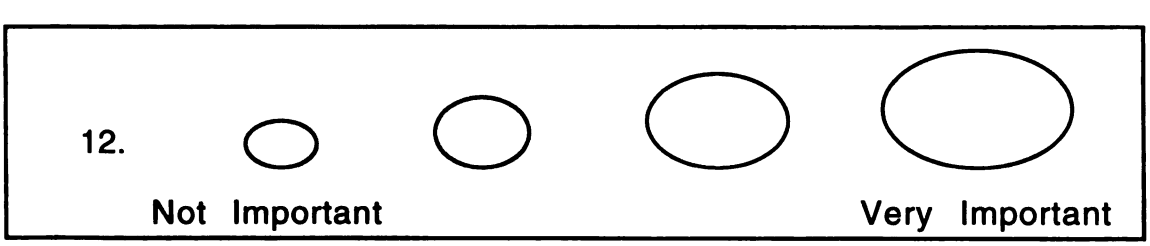
Very Important


12.
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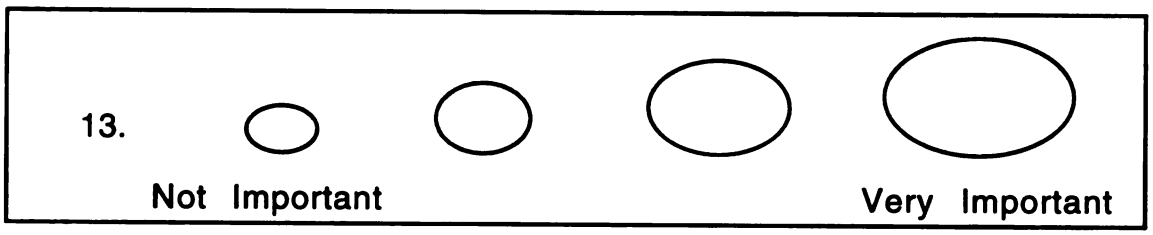
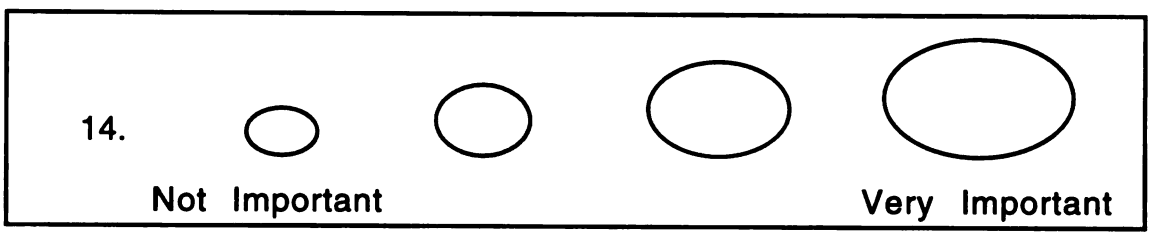
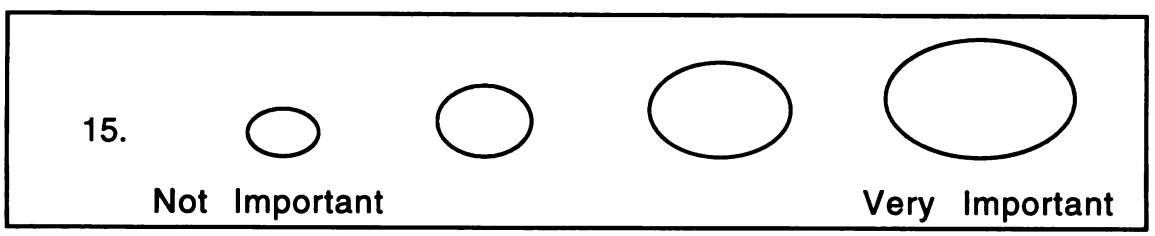
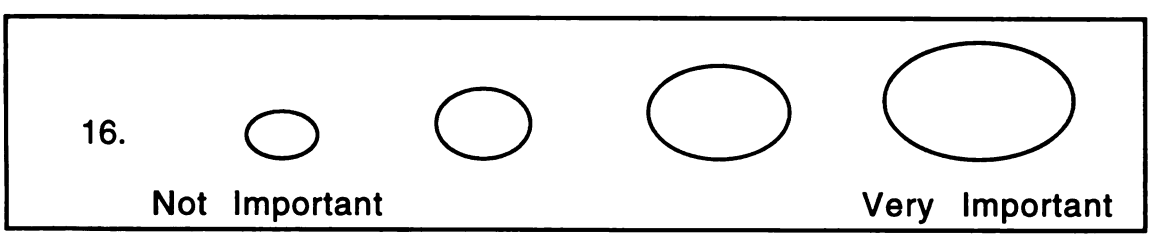
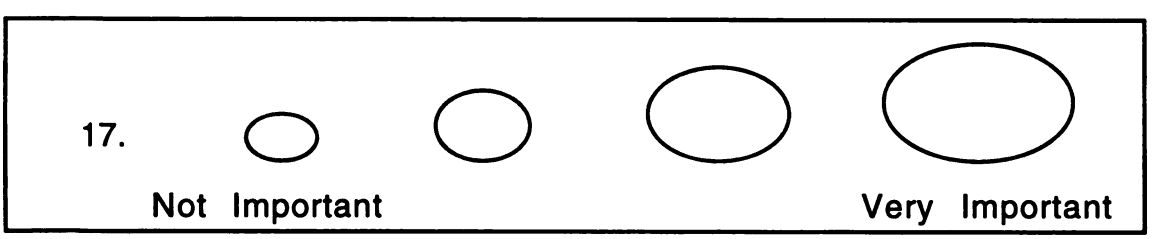
Very Important

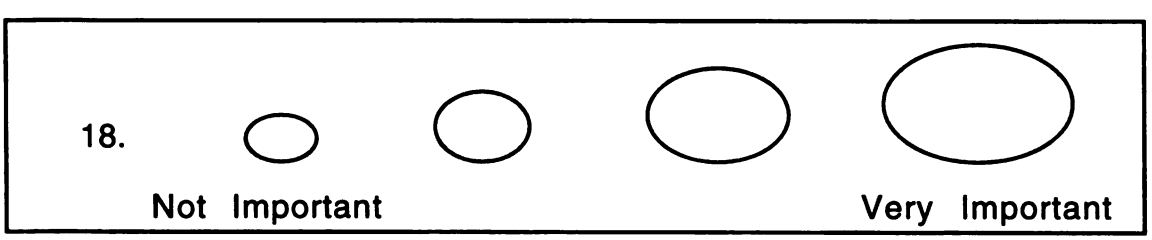

13.
Not Important
Very Important

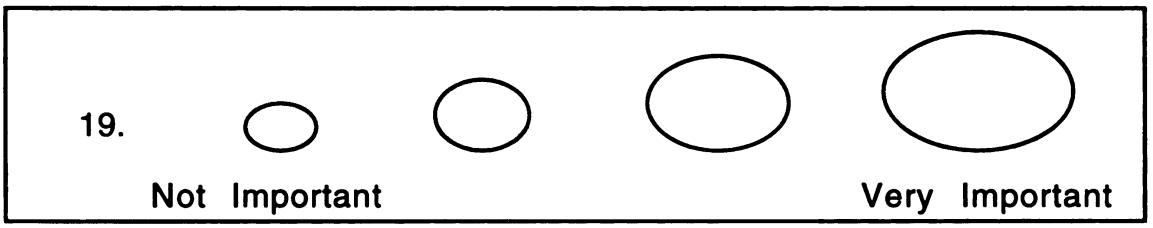

14.
Not Important
Very Important

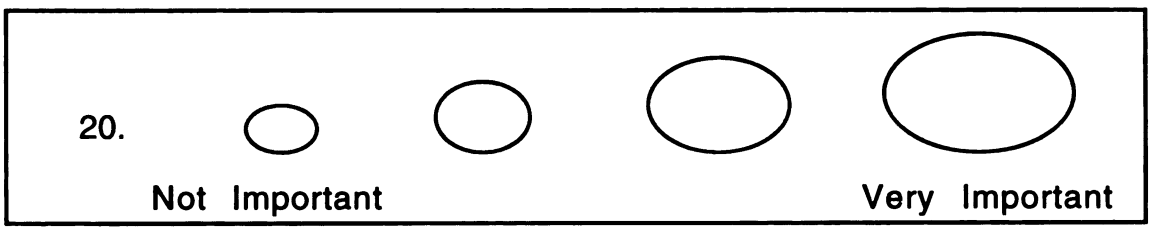

15.
Not Important
Very Important


16.
Not Important
Very Important


17.
Not Important
Very Important


18.
Not Important
Very Important


19.
Not Important
Very Important


20.
Not Important
Very Important

APPENDIX F

Manipulation Check for Dis-Satisfaction with Performance

Answer the following questions as if the story you just read REALLY happened to you.

1. If you had really performed your skill and failed, would you be happy with the results in the story you read (or I read to you)?

   Yes, I would be happy _____

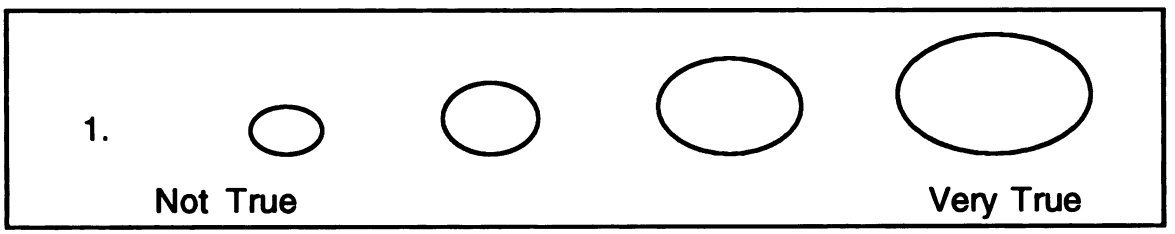
   No, I would not be happy ____

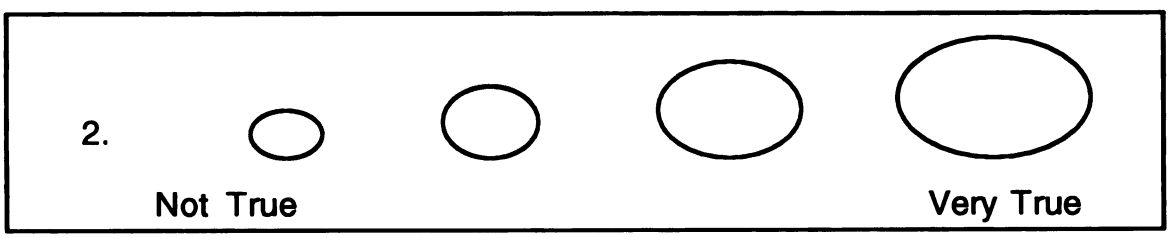
1. Were you happy with the results of your performance on your sport skill in the situation I read to you?

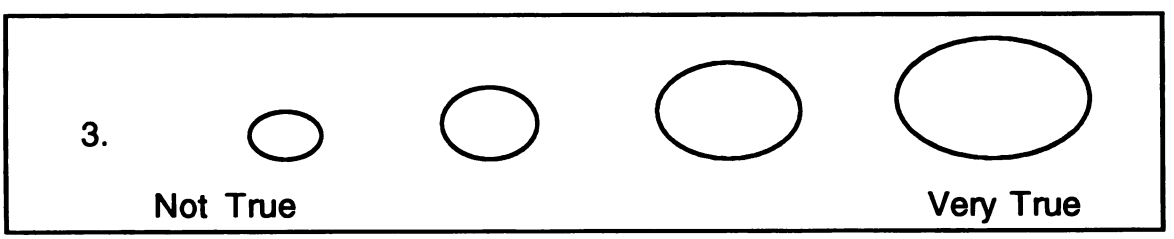
Yes, I was happy _____

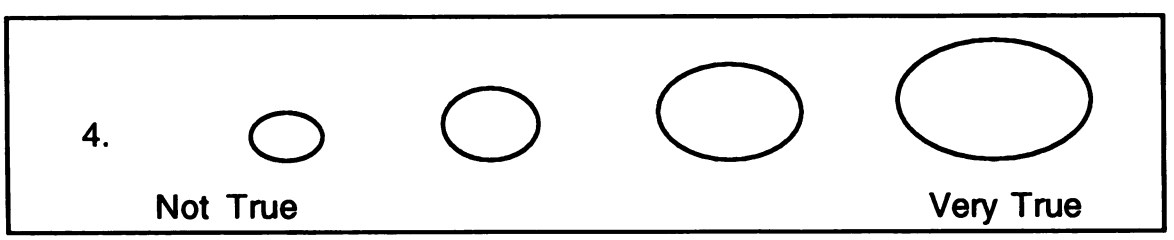
No, I was not happy _____

Reasons:









APPENDIX G

Attribution for Failure Questionnaire

Reasons for Failure

In the story you read, if that really happened to you why do you think you failed?

I would have failed because:

	Not true			Very true
1. I didn't try hard enough.	1	2	3	4
2. I'm not very good.	1	2	3	4
3. I was not lucky.	1	2	3	4
4. The new skill was too hard.	1	2	3	4

APPENDIX H

Intended Effort, Persistence,
Choice to Participate, and Future Self-Efficacy

Write down the skill you selected._____

1. How much effort or how hard would you work the next time you practice this sport skill?

0	1	2	3	4	5	6	7	8	9	10
Not Much Effort at All					Some Effort					A lot of Effort

2. The next time you practice your sport skill if you had 30 minutes to practice, how long would you practice?

   Minutes: (circle the number of minutes you would practice).

   0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

   17 18 19 20 21 22 23 24 25 26 27 28 29 30

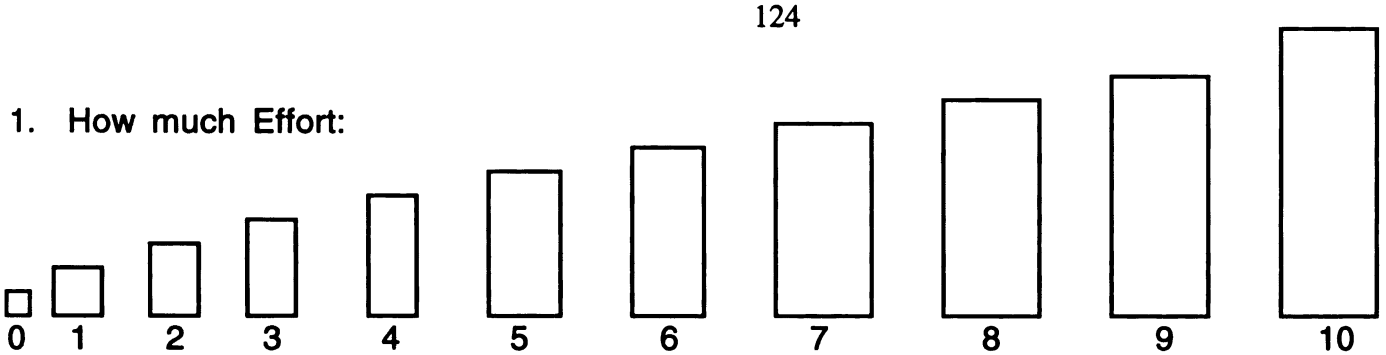
3. If you had a choice, would you choose to practice this sport skill or a different sport skill next time?

   I would practice this sport skill. _____
   I would practice a different sport skill. _____

4. How sure are you that you could successfully perform this sport skill the **next time** you practice this skill?

0	1	2	3	4	5	6	7	8	9	10
Not Sure at All					Sort of Sure					Very Sure

1. How much Effort:



Not Much Effort at All

Some Effort

A Lot of Effort

2. Minutes to practice:

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

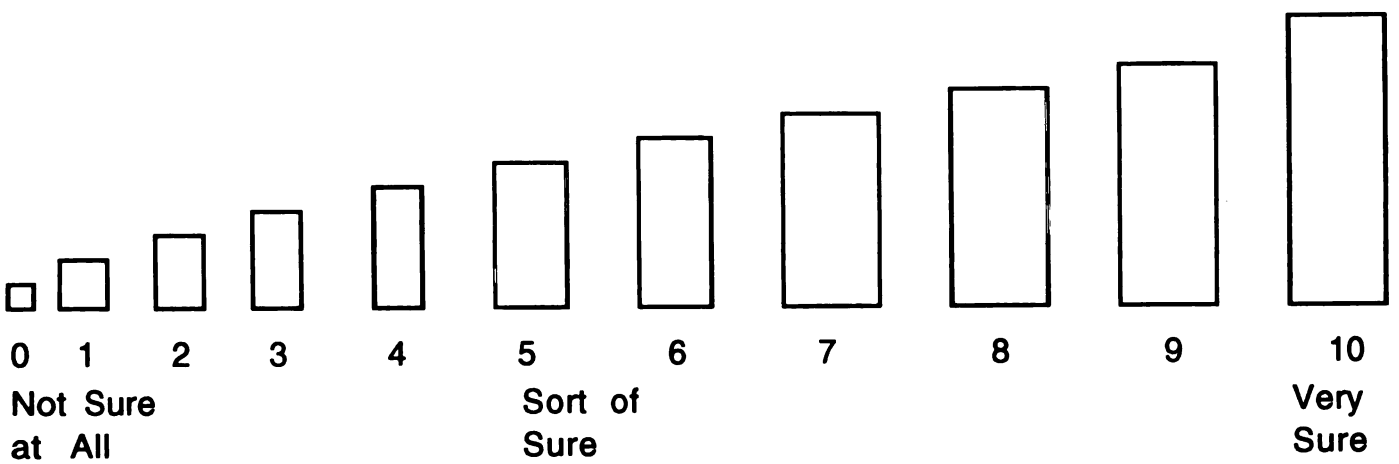
3.

I would practice this sport skill. _____

I would practice a different sport skill. _____

4. Write down the skill you selected.

_____



APPENDIX I

Background Questionnaire

School: _____ Name: _____

Girl _____ Boy _____

Grade: _____ Age : _____ Birthdate: _____

Race: White ____ African-American (Black) ____ Hispanic ____

Asian-American _____ American Indian ___ Interracial ____

1. How many days during the week do you usually play some kind of sport?

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days

2. Place a check mark by each sport that you play a lot (more than 1 day per week). You may pick more than 1 sport. Or check none if you do not play any sports.

Basketball _____	Baseball/Softball _____
Football _____	Swimming _____
Volleyball _____	Gymnastics _____
Soccer _____	Tennis _____
Hockey _____	Other _____
Track/Jogging _____	None _____

3. How many years have you been involved with playing sports? _____

4. Would you be interested in talking with me again on another day during school?

Yes _____ No ____

Appendix J

University Committee on Research Involving Human Subjects Approval Letter

MICHIGAN STATE
UNIVERSITY

November 18, 1994

TO: Melissa A. Chase
138 IM Circle Bldg.

RE: IRB#: 94-462
TITLE: CHILDREN'S USE OF EFFICACY INFORMATION: A DEVELOPMENTAL APPROACH
REVISION REQUESTED: 11/02/94
CATEGORY: 1-A,C
APPROVAL DATE: 10/20/94

The University Committee on Research Involving Human Subjects'(UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

RENEWAL: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must use the green renewal form (enclosed with the original approval letter or when a project is renewed) to seek updated certification. There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB # and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/ CHANGES: Should either of the following arise during the course of the work, investigators must notify UCRIHS promptly: (1) problems (unexpected side effects, complaints, etc.) involving human subjects or (2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of any future help, please do not hesitate to contact us at (517)355-2180 or FAX (517)336-1171.

Sincerely,

David E. Wright

David E. Wright, Ph.D.
UCRIHS Chair

DEW:pjm

cc: Deborah L. Feltz

OFFICE OF
RESEARCH AND GRADUATE STUDIES

University Committee on Research Involving Human Subjects (UCRIHS)

Michigan State University
225 Administration Building
East Lansing, Michigan
48824-1046

APPENDIX K

Cover Letter to Parents and Consent Form

Dear Parent/Guardian

I am writing to you to enlist your help. My name is Melissa Chase and I am a doctoral student in the Department of Physical Education and Exercise Science at Michigan State University.

I am presently working on my dissertation which involves studying children's use of self-confidence in physical education Your child's school district has given me permission to ask for your permission to allow your son/daughter to help with my study.

I realize how busy you are. However, your cooperation would enable me to better understand children's self-confidence. Enclosed you will find a consent form. If you agree to participate, please sign the consent form and return it in the envelope in which you received this information to your child's teacher.

All information from this study will be treated with strictest confidence and your child's answers will remain confidential. Of course, your participation is completely voluntary.

I would appreciate receiving your response as soon as possible. Thank you for your assistance.

Sincerely,

Melissa Chase
Michigan State University
202 IM Circle
East Lansing, MI 48824
517-432-1416

Consent Form

Department of Physical Education and Exercise Science
Michigan State University

Children's Use of Self-Confidence Information

I have freely consented to allow my son/daughter to participate in this study conducted by Melissa Chase, doctoral student in the Department of Physical Education and Exercise Science, at Michigan State University.

The study is concerned with children's use of self-confidence information in physical education.

I understand that my son/daughter is free to refuse to participate in certain procedures, answer certain questions, or discontinue participation at any time without penalty.

I understand that my son/daughter's participation in this study does not guarantee any beneficial effects.

I understand that if I choose to allow my son/daughter to participate in the study, it will take about twenty minutes or less to complete these surveys. Questions will be completed in a group, as a class, during a portion of your child's school day.

I understand that all information from this study will remain anonymous in any report of research findings.

I agree to participate voluntarily in this study.

_____ _____

Parent/Guardian's Signature Date

_____ _____

Child's Signature Date

Appendix L

Listing of Students for Interviews

Grade 3

* = Students Interviewed

ID	SCHOOL	GENDER	INTERVW	ACCURATE
333	4	1	2	2.80
318	4	1	1	2.60*
302	4	2	1	2.60*
308	4	2	1	2.40*
303	4	2	1	2.20
328	4	2	2	2.20
358	3	2	1	2.00
361	3	2	1	2.00
322	4	2	2	2.00
307	4	2	1	1.80
312	4	2	2	1.80
351	3	1	2	1.80
348	3	2	2	1.80
310	4	1	1	1.60*
366	3	2	1	1.40
367	3	2	2	1.40
321	4	1	1	1.20
359	3	2	2	1.20
330	4	2	2	1.20
347	3	2	1	1.20
341	3	2	1	1.20
309	4	2	2	1.00
304	4	1	1	1.00
332	4	1	1	.80
315	4	2	1	.80
362	3	2	1	.80
360	3	1	1	.60
337	3	2	2	.60
354	3	2	2	.60
326	4	2	2	.40
319	4	1	1	.40
355	3	1	1	.40
349	3	2	2	.40
329	4	2	2	.20
317	4	1	1	.20
301	3	1	1	.20
325	4	2	2	.20
331	4	2	2	.00
311	4	2	1	.00
339	3	2	1	.00
313	4	2	1	-.20
327	4	2	2	-.20

324	4	2	2	-.20
320	4	1	1	-.20
316	4	2	1	-.20
306	4	1	1	-.20
353	3	1	1	-.20
343	3	1	2	-.40
344	3	1	1	-.40
356	3	2	2	-.40
365	3	1	2	-.40
314	4	2	1	-.60
342	3	2	1	-.60
340	3	2	1	-.60*
323	4	2	2	-.60
335	4	1	2	-.80
346	3	1	2	-.80
334	4	1	2	-1.00
364	3	1	1	-1.00*
368	3	2	1	-1.00*
305	4	2	2	-1.20
357	3	1	2	-1.20
345	3	2	2	-1.40
363	3	1	2	-1.60
350	3	1	1	-2.60*

Grade 5

ID	SCHOOL	GENDER	INTERVW	ACCURATE
543	4	2	2	3.00
534	4	2	2	2.40
510	4	1	1	2.40
540	4	2	2	2.40
533	4	2	2	2.40
502	4	2	1	2.20*
550	4	1	1	2.20*
554	4	1	1	2.00*
552	4	1	2	2.00
514	3	2	2	2.00
563	3	2	1	1.80*
564	3	2	1	1.60
535	4	2	2	1.60
523	3	1	1	1.60
503	4	2	1	1.40
559	4	1	1	1.20
527	3	1	2	1.20
519	3	1	2	1.20
562	3	2	2	1.20
506	4	1	1	1.20
517	3	2	2	1.00
551	4	1	2	1.00
566	3	2	1	1.00
565	3	2	1	1.00
570	4	2	1	1.00

548	4	2	1	.80
561	3	1	2	.80
549	4	1	1	.80
530	3	1	2	.80
513	3	1	1	.80
553	4	2	1	.60
521	3	2	2	.60
539	4	1	1	.40
532	3	1	1	.40
528	3	1	1	.40
520	3	2	2	.40
541	4	2	2	.40
546	4	2	2	.20
536	4	2	2	.20
531	3	1	1	.20
505	4	1	1	.20
504	4	1	1	.20
557	4	2	1	.20
556	4	2	1	.00
529	3	1	1	.00
512	3	1	1	.00
567	3	2	1	.00
511	4	1	2	-.20
508	4	1	2	-.20
544	4	1	2	-.20
525	3	2	2	-.20
524	3	2	2	-.20
518	3	1	1	-.20
537	4	1	1	-.20
509	4	2	1	-.40
507	4	2	2	-.40
547	4	2	1	-.40
568	3	2	2	-.40
515	3	2	1	-.40
501	4	1	1	-.60*
555	4	1	1	-.60
522	3	2	1	-.60
545	4	1	2	-.80
542	4	2	1	-.80*
516	3	2	1	-.80*
569	3	2	2	-1.00
558	4	2	2	-1.20
560	3	1	1	-1.20*

Grade 8

ID	SCHOOL	GENDER	INTERVW	ACCURATE
844	1	1	1	2.60*
929	2	1	1	2.40
859	1	1	1	2.20*
886	1	1	1	2.20
848	1	1	1	2.00
896	2	2	1	2.00

902	2	1	1	2.00
909	2	1	1	2.00
897	2	2	2	1.80
887	1	1	1	1.80
860	1	1	1	1.60
857	1	1	1	1.60
947	2	2	1	1.60
854	1	1	1	1.60
805	1	2	1	1.40*
808	1	2	1	1.40*
823	1	2	1	1.40
855	1	1	1	1.40
863	1	1	1	1.40
903	2	1	1	1.40
913	2	1	1	1.40
911	2	1	1	1.40
824	1	2	1	1.20
825	1	2	1	1.20
839	1	1	1	1.20
862	1	1	1	1.20
870	1	1	1	1.20
877	1	1	2	1.20
950	2	2	2	1.20
820	1	2	1	1.20
846	1	1	1	1.20
927	2	1	1	1.20
804	1	2	2	1.00
801	1	1	1	1.00
826	1	2	1	1.00
850	1	1	1	1.00
871	1	1	1	1.00
888	2	2	1	1.00
924	2	1	1	1.00
942	2	2	1	1.00
806	1	2	2	1.00
869	1	1	1	.80
891	2	2	1	.80
938	2	2	1	.80
822	1	2	2	.80
836	1	1	1	.80
849	1	1	1	.80
851	1	1	1	.80
853	1	1	1	.80
873	1	1	1	.80
885	1	1	1	.80
912	2	1	1	.80
921	2	1	1	.80
925	2	1	1	.80
940	2	2	1	.80
809	1	2	1	.60
821	1	2	1	.60
861	1	1	1	.60
875	1	1	2	.60
881	1	1	1	.60

917	2	1	2	.60
932	2	2	1	.60
939	2	2	1	.60
948	2	2	1	.60
803	1	2	1	.60
819	1	2	1	.60
865	1	1	2	.60
882	1	1	1	.60
814	1	2	1	.40
838	1	1	1	.40
930	2	1	1	.40
811	1	2	1	.40
815	1	2	9	.40
879	1	1	1	.40
883	1	1	1	.40
884	1	1	1	.40
894	2	2	2	.40
919	2	1	2	.40
922	2	1	1	.40
923	2	1	1	.40
946	2	2	1	.40
915	2	1	1	.40
802	1	2	1	.20
828	1	2	2	.20
831	1	2	1	.20
852	1	2	2	.20
878	1	1	1	.20
899	2	1	2	.20
905	2	1	1	.20
916	2	1	1	.20
926	2	1	1	.20
937	2	2	1	.20
944	2	2	1	.20
817	1	2	1	.20
847	1	1	1	.20
920	2	1	1	.20
813	1	2	1	.00
829	1	2	1	.00
833	1	2	2	.00
837	1	1	1	.00
872	1	1	1	.00
874	1	1	1	.00
892	2	2	2	.00
893	2	2	2	.00
895	2	2	2	.00
900	2	1	1	.00
908	2	1	1	.00
910	2	1	1	.00
914	2	1	1	.00
928	2	1	1	.00
936	2	2	1	.00
807	1	2	1	-.20
858	1	1	1	-.20
934	2	2	1	-.20

840	1	1	1	-.20
866	1	1	1	-.20
868	1	1	2	-.20
889	2	2	1	-.20
906	2	1	1	-.20
935	2	2	1	-.20
842	1	1	1	-.40
864	1	1	1	-.40
898	2	1	1	-.40
904	2	1	1	-.40
816	1	2	1	-.40
827	1	2	1	-.40
876	1	1	1	-.40
945	2	2	2	-.40
890	2	2	1	-.60
931	2	1	1	-.60
810	1	2	2	-.60
841	1	1	1	-.60
918	2	1	2	-.60
933	2	2	1	-.60
832	1	2	2	-.80
867	1	1	1	-.80
812	1	2	1	-.80
943	2	2	2	-.80
949	2	2	2	-.80
830	1	2	1	-1.00*
835	1	2	1	-1.00*
856	1	1	1	-1.00*
880	1	1	2	-1.00
951	2	2	2	-1.00
818	1	2	2	-1.20
843	1	1	2	-1.20
845	1	1	1	-1.20*
941	2	2	1	-1.20
952	2	2	2	-1.40
901	2	1	1	-1.60
907	2	1	1	-1.60
834	1	2	2	-2.20

APPENDIX M

Interview Guide

Thank you for agreeing to help me with my school project again. I'd like to ask you some questions similar to the questions I asked you before. I'm going to need to tape record this interview so we can talk now and I can write down your answers later. Is it OK with you if I tape your interview? If there are any questions you don't want to discuss, let me know. And if at any time you'd like to stop, please say so. Do you have any questions?

Research Question One

How do you know you are confident? What are the reasons that help you know you're good at sports?

On your list from the survey, you said _____ was the most important reason why you were sure you were good. Why is that?

Does it matter how hard you work in how confident you are? If you're confident in a sport is it because you work really hard or because you are just good?

Research Question Two

Do you usually set a goal for how well you would like to do in sports or activities?

What happens if you do not reach your goal?
Would you change your goal following failure?
Following failure, would you put forth more effort on skills that you have high self-efficacy or skills that you have low self-efficacy? Why?

Let's say you do set a goal, like make 7 out of 10 baskets. How do you feel when you don't make 7 baskets and you only make 2 or 3? How would you feel?

Additional Questions for Future Research

Do you know what self-confidence means?

Is it important to have confidence? What kind of influence does confidence have on you when you play sports?

How do you know you are successful in sports? How do you define failure in sports? What does it mean to be successful in sport?

APPENDIX N

Summary Table for All Significance Tests

Test	df	F	Probability Level
Attributions - Effort, Ability			
(within groups)			
Attribution	1, 287	3.48	.063
Efficacy Level x Attribution	1, 287	41.76	.001
Attributions - Effort, Ability, Luck, Task			
(within groups)			
Attribution	3, 285	52.73	.001
(between groups)			
Efficacy Level	4, 284	29.45	.001
Task Difficulty	1, 287	19.45	.001
Ability	1, 287	102.89	.001
Effort	1, 287	0.00	.995
Luck	1, 287	0.14	.704
Gender	1, 287	1.82	.179
Age Group	8, 566	1.54	.140
Efficacy Level x Age Group	8, 560	2.48	.012
Task Difficulty	2, 283	6.83	.001
Ability	2, 283	0.32	.723
Effort	2, 283	2.23	.109
Luck	2, 283	2.57	.078
Efficacy Level x Gender	4, 274	0.97	.423
Age x Gender	8, 548	0.79	.603
Age x Efficacy Level x Gender	8, 548	1.02	.416

Test	df	F	Probability Level
Motivation			
Efficacy Level	3, 284	13.67	.001
Effort	1, 286	13.74	.001
Persistence	1, 286	12.37	.001
Future S-E	1, 286	35.98	.001
Age Group	6, 566	4.93	.001
Effort	2, 285	8.52	.001
Persistence	2, 285	0.89	.410
Future S-E	2, 285	5.08	.007
Gender	3, 284	1.47	.221
Efficacy Level x Age	6, 548	1.46	.189
Efficacy Level x Gender	3, 274	0.50	.676
Gender x Age	6, 548	1.87	.084
Efficacy Level x Age x Gender	6, 548	1.53	.164

Test	df	X^2	Probability Level
Choice to Participate			
Girls - 8 to 9	1	2.08	.149
Boys - 8 to 9	1	2.29	.129
Girls - 10 to 11	1	0.56	.453
Boys - 10 to 11	1	0.19	.655
Girls - 13 to 14	1	8.14	.004
Boys - 13 to 14	1	19.38	.001

Test	df	F	Probability Level
Sources			
Gender	3, 246	4.57	.004
Significant Other	1, 248	0.15	.691
Ability	1, 246	12.50	.001
Effort	1, 246	0.85	.355
Age Group	6, 490	2.31	.032
Significant Other	2, 247	1.94	.145
Ability	2, 247	2.23	.109
Effort	2, 247	3.66	.027
Gender x Age Group	6, 484	0.65	.684

APPENDIX O

Summary Table for Items that were Eliminated from Efficacy Source of Information Questionnaire

Factor	Mean	SD	Factor Loading	Factor
Eliminated Factors				
I like sports	3.52	0.82	.392	3
Skill is difficult and I can do it	3.18	0.84	.298	3
Skill is easy and I can do it	3.12	0.90	.328	4
It is easy to learn	3.10	0.88	.398	3
Teacher or coach helps me	3.08	0.93	.412	1
Better than brother or sister	2.62	1.19	.473	5
Do not have to work hard to be good	2.45	1.04	.620	4
I do not need help from anyone	2.24	1.06	.471	4

LIST OF REFERENCES

LIST OF REFERENCES

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SPSS Command File for Phase One Data

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DATA LIST FILE 'CHASE:ANALYSIS:DISSDATA' RECORDS 2 FIXED
/1  ID 1-3 SCHOOL 4 AGE 5-6 GRADE 7 GENDER 8 HISKILL 9-10 HISURE 11-12
    HIIMP 13-14 LOSKILL 15-16 LOSURE 17-18 LOIMP 19-20 HARTER1 21
    HARTER2 22 HARTER3 23 HARTER4 24 HARTER5 25 CONTRL1 26 CONTRL2 27
    CONTRL3 28 CONTRL4 29 CONTRL5 30 CONTRL6 31 CONTRL7 32 CONTRL8 33
    CONTRL9 34 CONTRL10 35 CONTRL11 36 CONTRL12 37 SOURCE1 38 SOURCE2 39
    SOURCE3 40 SOURCE4 41 SOURCE5 42 SOURCE6 43 SOURCE7 44
    SOURCE8 45 SOURCE9 46 SOURCE10 47 SOURCE11 48 SOURCE12 49
    SOURCE13 50 SOURCE14 51 SOURCE15 52 SOURCE16 53 SOURCE17 54
    SOURCE18 55 SOURCE19 56 SOURCE20 57 MOSTIMP 58-59 MANIPUL 60
/2  BIRTHDAT 1-5 (2) RACE 6 NUMDAYS 7 PBBALL 8 PFBALL 9 PVBALL 10
    PSOCCER 11 PHOCK 12 PTRACK 13 PSBALL 14 PSWIM 15 PGYM 16 PTENNIS 17
    PNONE 18 PYEARS 19-20 INTERVW 21 HAPPY 22 NOTHARD 23 NOTGOOD 24
    NOTLUCKY 25 NOTTASK 26 EFFORT 27-28 PERSIST 29-30 CHOICE 31
    FUTURESE 32-33 TEACHER1 34 TEACHER2 35 TEACHER3 36 TEACHER4 37
    TEACHER5 38

VARIABLE LABELS ID 'SUBJECT ID'
HISKILL  'HIGH EFFICACY SKILL'
HISURE 'EFFICACY FOR HIGH EFF SKILL'
HIIMP  'IMPORTANCE FOR HIGH EFF SKILL'
LOSKILL  'LOW EFFICACY SKILL'
LOSURE  'EFFICACY FOR LOW EFF SKILL'
LOIMP  'IMPORTANCE FOR LOW EFF SKILL'
HARTER1 'HOW GOOD AT ALL SPORTS'
HARTER2 'HOW GOOD AT NEW GAMES'
HARTER3 'HOW GOOD SKILLS NEVER TRIED'
HARTER4 'HOW GOOD COMPARED TO OTHER KIDS'
HARTER5 'HOW MUCH PLAY INSTEAD OF WATCH'
CONTRL1 'CAN NOT FIGURE WHY I WON'
CONTRL2 'GOOD IF I TRY HARD ENOUGH'
CONTRL3 'WIN WHEN OTHER PLAYED BADLY'
CONTRL4 'CAN NOT FIGURE WHY I LOST'
CONTRL5 'CAN NOT CATCH DID NOT TRY HARD'
CONTRL6 'LOSE WHEN KID BETTER THAN I'
CONTRL7 'WIN DO NOT KNOW WHY'
CONTRL8 'BE GOOD IF TRY HARD'
CONTRL9 'WIN WHEN OTHER KID DID NOT PLAY WELL'
CONTRL10 'DO NOT WIN CAN NOT FIGURE WHY'
CONTRL11 'TRY CATCH NOT HARD ENOUGH'
CONTRL12 'DO NOT WIN OTHER WAS BETTER'
SOURCE1 'FRIENDS SAY I AM GOOD'
SOURCE2 'I WORK HARD AT PRACTICING'
SOURCE3 'TEACHER OR COACH HELPS ME'
SOURCE4 'SKILL IS EASY AND I CAN DO IT'
SOURCE5 'COACH SAYS I AM GOOD'
SOURCE6 'I USUALLY WIN'
SOURCE7 'I PRACTICE MORE THAN OTHERS'
SOURCE8 'I AM REALLY GOOD'
SOURCE9 'SKILL IS DIFFICULT AND I DO IT'
SOURCE10 'MOM SAYS I AM GOOD'
SOURCE11 'I ALMOST NEVER LOSE'
SOURCE12  'I AM BETTER THAN KIDS MY AGE'
SOURCE13  'I CAN IMPROVE EASILY'
SOURCE14  'TEACHER SAYS I AM GOOD'
SOURCE15 'I LIKE SPORTS'
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SOURCE16 'DO NOT HAVE TO WORK HARD TO BE GOOD'
SOURCE17  'DAD SAYS I AM GOOD'
SOURCE18  'IT IS EASY TO LEARN'
SOURCE19 'BETTER THAN BROTHER OR SISTER'
SOURCE20  'I DO NOT NEED HELP FROM ANYONE'
MOSTIMP 'MOST IMPORTANT SOURCE'
MANIPUL  'HIGH OR LOW EFFICACY SKILL SCENARIO'
BIRTHDAT 'BIRTHDATE IN TOTAL MONTHS'
RACE 'ETHNIC BACKGROUND'
NUMDAYS 'NUMBER OF DAYS PLAY SPORTS'
PBBALL 'PLAY BASKETBALL'
PFBALL  'PLAY FOOTBALL'
PVBALL  'PLAY VOLLEYBALL'
PSOCCER  'PLAY SOCCER'
PHOCK  'PLAY HOCKEY'
PTRACK  'PLAY TRACK'
PSBALL  'PLAY BASEBALL SOFTBALL'
PSWIM  'PLAY SWIMMING'
PGYM  'PLAY GYMNASTICS'
PTENNIS  'PLAY TENNIS'
PNONE  'PLAY NO SPORTS'
PYEARS 'NUMBER OF YEARS PLAYING SPORTS'
INTERVW  'WOULD LIKE TO INTERVIEW WITH ME'
HAPPY  'HAPPY WITH RESULTS OF SCENARIO'
NOTHARD 'REASON FOR FAILURE EFFORT'
NOTGOOD 'REASON FOR FAILURE ABILITY'
NOTLUCKY 'REASON FOR FAILURE LUCK'
NOTTASK 'REASON FOR FAILURE TASK DIFFICULTY'
EFFORT 'EFFORT EXPENDED NEXT TIME'
PERSIST 'NUMBER OF MINUTES TO PERSIST'
CHOICE 'CHOICE OF ACTIVITY NEXT TIME'
FUTURESE  'FUTURE RATING OF SELF EFFICACY'
TEACHER1 'HOW GOOD AT ALL SPORTS'
TEACHER2 'HOW GOOD AT NEW GAMES'
TEACHER3 'HOW GOOD SKILLS NEVER TRIED'
TEACHER4 'HOW GOOD COMPARED TO OTHER KIDS'
TEACHER5 'HOW MUCH PLAY INSTEAD OF WATCH'

VALUE LABELS  SCHOOL  1 'FROST MIDDLE' 2 'KENEWA HILLS MIDDLE'
      3 'TAYLOR ELEMENTARY' 4 'ALPINE ELEMENTARY'/
GENDER  1 'GIRL' 2 'BOY'/
HISKILL  1 'BASKETBALL DRIBBLING' 2 'BASKETBALL SHOOTING'
      3 'BASKETBALL PASSING' 4 'SOCCER SHOOTING' 5 'BASKETBALL'
   6 'HOCKEY' 7 'BASEBALL POSITIONS' 8 'BOWLING' 9 'FIGURE SKATING'
   10 'THROWING' 11 'FOOTBALL RUNNING' 12 'FOOTBALL' 13 'TENNIS'
   14 'HUNTING' 15 'RUNNING' 16 'PULL UPS' 17 'BASKETBALL RUNNING'
   18 'HOCKEY SHOOTING' 19 'BASEBALL HITTING' 20 'SWIMMING'
   21 'BASEBALL' 22 'GOLF' 23 'BASKETBALL DEFENSE' 24 'SOCCER DEFENSE'
   25 'BIKING' 26 'SOCCER' 27 'HOCKEY DEFENSE' 28 'TENNIS SERVING'
   29 'FOOTBALL CATCHING' 30 'SOCCER DRIBBLING' 31 'BASEBALL FIELDING'
   32 'DIVING' 33 'FOOTBALL THROWING' 34 'CHEERLEADING' 35
     'FLOOR HOCKEY'
   36 'SOFTBALL CATCHING' 37 'DANCING' 38 'VOLLEYBALL' 39 'SOFTBALL'
   40 'BALLET' 41 'GYMNASTICS BARS' 42 'GYMNASTICS' 43 'JAZZ DANCE'
   44 'HANDBALL' 45 'SKIING' 46 'SOCCER GOALIE' 47 'DANCE TAP'
   48 'VOLLEYBALL SPIKE' 49 'FIELD HOCKEY' 50 'FOOTBALL DEFENSE'
   51 'WRESTLING' 52 'BADMITTON' 53 'KARATE' 54 'HORSEBACK RIDING'
   55 'SOFTBALL BATTING' 56 'SOFTBALL PITCHING' 57 'INLINE SKATING'
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   58 'BASEBALL PITCHING' 59 ' SOCCER PASSING' 60 'FOOTBALL KICKING'
   61 'KICKING WITH LEFT FOOT' 62 'HOCKEY SKATING' 63 'KICKBALL'
   64 'ROPE CLIMBING'/
HISURE   0 'NOT SURE AT ALL'  5 'SORT OF SURE' 6 'SORT OF SURE' 10
       'VERY SURE'/
HIIMP  0 'NOT IMPORTANT AT ALL' 5 'SORT OF IMPORTANT' 6
     'SORT OF IMPORTANT'
    10 'VERY IMPORTANT'/
LOSKILL 1 'BASKETBALL DRIBBLING' 2 'BASKETBALL SHOOTING'
      3 'BASKETBALL PASSING' 4 'SOCCER SHOOTING' 5 'BASKETBALL'
   6 'HOCKEY' 7 'BASEBALL POSITIONS' 8 'BOWLING' 9 'FIGURE SKATING'
   10 'THROWING' 11 'FOOTBALL RUNNING' 12 'FOOTBALL' 13 'TENNIS'
   14 'HUNTING' 15 'RUNNING' 16 'PULL UPS' 17 'BASKETBALL RUNNING'
   18 'HOCKEY SHOOTING' 19 'BASEBALL HITTING' 20 'SWIMMING'
   21 'BASEBALL' 22 'GOLF' 23 'BASKETBALL DEFENSE' 24 'SOCCER DEFENSE'
   25 'BIKING' 26 'SOCCER' 27 'HOCKEY DEFENSE' 28 'TENNIS SERVING'
   29 'FOOTBALL CATCHING' 30 'SOCCER DRIBBLING' 31 'BASEBALL FIELDING'
   32 'DIVING' 33 'FOOTBALL THROWING' 34 'CHEERLEADING' 35
     'FLOOR HOCKEY'
   36 'SOFTBALL CATCHING' 37 'DANCING' 38 'VOLLEYBALL' 39 'SOFTBALL'
   40 'BALLET' 41 'GYMNASTICS BARS' 42 'GYMNASTICS' 43 'JAZZ DANCE'
   44 'HANDBALL' 45 'SKIING' 46 'SOCCER GOALIE' 47 'DANCE TAP'
   48 'VOLLEYBALL SPIKE' 49 'FIELD HOCKEY' 50 'FOOTBALL DEFENSE'
   51 'WRESTLING' 52 'BADMITTON' 53 'KARATE' 54 'HORSEBACK RIDING'
   55 'SOFTBALL BATTING' 56 'SOFTBALL PITCHING' 57 'INLINE SKATING'
   58 'BASEBALL PITCHING' 59 ' SOCCER PASSING' 60 'FOOTBALL KICKING'
   61 'KICKING WITH LEFT FOOT' 62 'HOCKEY SKATING' 63 'KICKBALL'
   64 'ROPE CLIMBING'/
LOSURE  0 'NOT SURE AT ALL'  5 'SORT OF SURE' 6 'SORT OF SURE' 10
       'VERY SURE'/
LOIMP  0 'NOT IMPORTANT AT ALL' 5 'SORT OF IMPORTANT' 6
     'SORT OF IMPORTANT'
    10 'VERY IMPORTANT'/
HARTER1 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
HARTER2 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
HARTER3 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
HARTER4 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
HARTER5 1 'NOT PLAY'  3 'SORT OF PLAY' 5 'PLAY A LOT'/
CONTRL1 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL2 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL3 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL4 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL5 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL6 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL7 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL8 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL9 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL10 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
        'VERY TRUE'/
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CONTRL11 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
CONTRL12 1 'NOT TRUE AT ALL' 2 'NOT VERY TRUE' 3 'SORT OF TRUE' 4
       'VERY TRUE'/
SOURCE1 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE2 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE3 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE4 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE5  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE6 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE7 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE8 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE9 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE10 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE11 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE12  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE13  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE14 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE15 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE16 1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE17  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE18  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE19  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
SOURCE20  1 'NOT IMPORTANT' 4 'VERY IMPORTANT'/
MOSTIMP 1 'FRIENDS SAY GOOD' 2 'I WORK HARD AT PRACTICING'
       3 'TEACHER COACH HELPS ME'
      4 'SKILL IS EASY ' 5 'COACH SAYS I AM GOOD'  6 'I USUALLY WIN'
      7 'I PRACTICE MORE' 8 'I AM REALLY GOOD' 9 'SKILL IS DIFFICULT'
      10 'MOM SAYS GOOD' 11 'I ALMOST NEVER LOSE' 12
      'I AM BETTER KIDS MY AGE' 13  ' IMPROVE EASILY' 14
           'TEACHER SAYS GOOD' 15 'I LIKE SPORTS' 16 'DO NOT HAVE TO WORK
       HARD' 17  'DAD SAYS GOOD' 18   EASY TO LEARN'
      19 'BETTER BROTHER SISTER' 20  'NO HELP FROM ANYONE'/
MANIPUL 1 'HIGH EFFICACY SCENARIO' 2 'LOW EFFICACY SCENARIO'/
RACE 1 'CAUCASION' 2 'AFRICAN AMERICAN' 3 'HISPANIC' 4 'ASIAN AMERICAN'
    5 'AMERICAN INDIAN'  6 'INTERRACIAL' 7 'OTHER'/
PBBALL  1 'YES' 0 'NO'/
PFBALL  1 'YES' 0 'NO'/
PVBALL  1 'YES' 0 'NO'/
PSOCCER  1 'YES' 0 'NO'/
PHOCK  1 'YES' 0 'NO'/
PTRACK  1 'YES' 0 'NO'/
PSBALL 1 'YES' 0 'NO'/
PSWIM  1 'YES' 0 'NO'/
PGYM  1 'YES' 0 'NO'/
PTENNIS  1 'YES' 0 'NO'/
PNONE  1 'YES' 0 'NO'/
INTERVW   1 'YES' 2 'NO'/
HAPPY  1 'YES' 2 'NO'/
NOTHARD  1 'NOT TRUE'  4 'VERY TRUE'/
NOTGOOD 1 'NOT TRUE'  4 'VERY TRUE'/
NOTLUCKY 1 'NOT TRUE'  4 'VERY TRUE'/
NOTTASK 1 'NOT TRUE'  4 'VERY TRUE'/
EFFORT 0 'NOT MUCH EFFORT AT ALL' 5 'SOME EFFORT' 10 'A LOT OF EFFORT'/
CHOICE 1 'YES THIS SKILL'  2 'NO DIFFERENT SKILL'/
FUTURESE  0 'NOT SURE AT ALL' 5 'SORT OF SURE'  10 'VERY SURE'/
TEACHER1 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
TEACHER2 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
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TEACHER3 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
TEACHER4 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/
TEACHER5 1 'NOT GOOD'  3 'SORT OF GOOD' 5 'VERY GOOD'/

MISSING VALUE HISKILL TO LOIMP (99).
MISSING VALUE HARTER1 TO SOURCE20 (9).
MISSING VALUE MOSTIMP (99).
MISSING VALUE MANIPUL TO NOTTASK (9).
MISSING VALUE PYEARS (99).
MISSING VALUE EFFORT (99).
MISSING VALUE CHOICE (9).
MISSING VALUE FUTURESE (99).
MISSING VALUE TEACHER1 TO TEACHER5 (9).
MISSING VALUE BIRTHDAT (99999).


COMPUTE VERBALP =MEAN.5 (SOURCE1, SOURCE5, SOURCE10, SOURCE14, SOURCE17).
COMPUTE ABILITY = MEAN.4(SOURCE6, SOURCE11, SOURCE12, SOURCE8).
COMPUTE HARDWORK =MEAN.3(SOURCE2, SOURCE7, SOURCE13).
RECODE AGE (8=1) (9=1) (10=2) (11=2) (12=2) (13=3) (14=3) (15=3).
COMPUTE STUDENT =MEAN.5 (HARTER1, HARTER2, HARTER3, HARTER4,HARTER5).
COMPUTE TEACHER = MEAN.5(TEACHER1, TEACHER2, TEACHER3, TEACHER4,
TEACHER5).
COMPUTE ACCURATE = (student - TEACHER).


COMPUTE INTERNAL = MEAN.4(contrl2, contrl5, contrl8, contrl11).
COMPUTE EXTERNAL = MEAN.4(contrl3, contrl6, contrl9, contrl12).
COMPUTE UNKNOWN = MEAN.4(contrl1, contrl4, contrl7, contrl10).
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