INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
An examination of self-concept and academic achievement in a newly coeducational environment

Broyles, Jim, Ph.D.
The Ohio State University, 1992
AN EXAMINATION OF SELF CONCEPT
AND ACADEMIC ACHIEVEMENT IN A
NEWLY COEDUCATIONAL ENVIRONMENT

DISSERTATION

Presented in Partial Fulfillment
of the Requirements for the
Degree Doctor of Philosophy in
the Graduate School of the Ohio
State University

by

Jim Broyles B.S. Ed., M.A.

*****

The Ohio State University

1992

Dissertation Committee:
Judy L. Genshaft, Ph.D.
Antoinette Miranda, Ph.D.
Linda Perosa, Ph.D.

Approved by

Adviser
College of Education
To my parents Frank and Ruth Broyles
for their love and support
ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to Dr. Judy Genshaft for her time and assistance throughout the course of this project. In addition, I would like to thank Dr. Linda Perosa for her advice and assistance. Thanks also to my friend and colleague Dr. Karen Johnston for her help on many levels, and my friend Jeffery Kelly for numerous hours of reading and editing.
Vita

December 14, 1958 ....... Born - Middlesboro, Kentucky

1982 .................... B.S.Ed. The Ohio State University Columbus, Ohio

1986-1987 ............... Graduate Research Associate, The Ohio State University. Program Assistant, Great Lakes Area Regional Resource Center Columbus, Ohio.


1988-1989 ............... Graduate Research Associate, The Ohio State University. Psychoeducational Clinic Supervisor

1989-1990 ............... Graduate Research Associate, The Ohio State University. Assistant to Department Chairperson

1990-preset .............. Psychology Assistant, Private Practice, Dr. Jolie Brams and Associates, Columbus, Ohio.

Major Field: Education
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>DEDICATION</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>VITA</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
</tbody>
</table>

## CHAPTER

| I. INTRODUCTION | 1 |
| Research in Self Concept | 3 |

## II. REVIEW OF THE LITERATURE | 8 |

### Theoretical Developments in Self Concept | 9
### History of Psychology | 9
### Social Political Trends in Education | 11
### Current Theoretical Models | 12
### Research on the Multifaceted Hierarchical Nature of the Model | 16
### Internal/External Frame of Reference Model | 21
### Achievement and Self Concept | 23
### Gender Differences | 35
#### Single Sex vs. Coeducational Environment | 39
### Summary | 45
### Need for the Present Study | 49
### Purpose of the Study | 49
### Research Question | 50

## III. METHOD | 53

### Subjects | 53
### Research Setting | 54
### Instruments | 55
### Procedure | 57
### Data Analysis | 60
IV. RESULTS .................................................. 64

  Development of the Self Concept
    Scale Scores ........................................ 64
  Comparison of Self Concept to
    Achievement ........................................... 67
  Changes in Self Concept
    Over Time ........................................... 72
  Gender Differences in
    Self Concept ......................................... 75
  Summary .................................................. 79

V. DISCUSSION ................................................. 80

  The Population of this Study ...................... 81
  Self Concept and Achievement .................... 82
  Changes in Self Concept over Time ............... 85
  Gender Differences in Self Concept ............ 87
  Summary .................................................. 89
  Limitations of the Study ......................... 90
  Directions for Further Research ................ 91

VI. APPENDICES .................................................. 93

  A. Stratification of Students
    by School Level ..................................... 93
  B. Self Description Questionnaire
    Results: Number of Students,
    Scale Means, Standard Deviations,
    and Comparisons to Norm Group ............... 96
  C. Self Description Questionnaire
    Items by Scale ................................... 105

LIST OF REFERENCES ............................................. 114
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Correlation Coefficients Comparing Grades To Self Concept-- Middle School</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Correlation Coefficients Comparing Grades To Self Concept-- Upper School</td>
<td>71</td>
</tr>
<tr>
<td>3.</td>
<td>Number of Subjects by Sex and School Level, Whole Group</td>
<td>94</td>
</tr>
<tr>
<td>4.</td>
<td>Number of Subjects by Sex and School Level, From Single Sex Environment</td>
<td>94</td>
</tr>
<tr>
<td>5.</td>
<td>Subjects by Race and School Level</td>
<td>95</td>
</tr>
<tr>
<td>6.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Middle School Males, Fall Testing</td>
<td>97</td>
</tr>
<tr>
<td>7.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Middle School Males, Spring Testing</td>
<td>98</td>
</tr>
<tr>
<td>8.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Middle School Females, Fall Testing</td>
<td>99</td>
</tr>
<tr>
<td>9.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Middle School Females, Spring Testing</td>
<td>100</td>
</tr>
<tr>
<td>10.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Upper School Males, Fall Testing</td>
<td>101</td>
</tr>
<tr>
<td>11.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Upper School Males, Spring Testing</td>
<td>102</td>
</tr>
<tr>
<td>12.</td>
<td>Self Concept Scores: Number, Mean, SD and Norm Comparison of Upper School Females, Fall Testing</td>
<td>103</td>
</tr>
</tbody>
</table>
13. Self Concept Scores: Number, Mean, SD and Norm Comparison of Upper School Females, Spring Testing...104
LIST OF FIGURES

Figure PAGE

1. Mean Self Concept Scores By Testing Time-- Middle School.............73

2. Mean Self Concept Scores By Testing Time-- Upper School.............74

3. Mean Self Concept Scores By Sex-- Middle School.......................76

4. Mean Self Concept Scores By Sex-- Upper School........................78
CHAPTER I

INTRODUCTION

The purpose of the present study was to test for changes in measures of self concept over time among students in a unique situation. These students formerly attended a single sex (all male) school environment. This year the school admitted females, thus they attended a coeducational environment for the first time. This introduction briefly reviews the importance of self concept as a psychological construct.

Since psychology's beginnings as a science, self concept has been an important topic. The vast number of studies found in the scientific journals attests to this fact (Wylie, 1979). The topic is important for three reasons: It is an important part of human psychological functioning, it has been found to have an influence on other psychological constructs, and it is a strong determinant of human behavior (Fitts, 1972; Shavelson, Hubner, & Stanton, 1976; Parsons, Koezala, Goff, & Futterman, 1982). Fitts (1972) suggests that the area of self concept is worthy of study for its own
sake due to its prominence and stability as a psychological variable.

The importance of self concept is illustrated by the fact that not only is the self the most prominent aspect of the individuals phenomenal world, but it also tends to be its most stable feature...Thus, self concept is a powerful influence in human behavior. (Fitts, 1972, p. 2).

Other researchers have suggested that even if self concept as a construct were not valued for its own sake, its influence on other important constructs such as academic achievement cannot be ignored (Shavelson, Hubner & Stanton, 1976). "Self concept, then,... is a critical variable in education and in educational evaluation and research" (Shavelson, Hubner, & Stanton, 1976, p. 408).

A number of theorists have used self concept as an explanation for certain patterns of human behavior. For example, female students, due to low self concept in mathematics, tend not to take advanced math courses, and therefore tend not to choose careers which require a high level of math competence (Meece, Parsons, Koezala, Goff, & Futterman, 1982). Researchers have suggested self concept plays a key role in explaining this behavior. Parsons et al. (1985), in a study which examined this behavior, concluded that self concept had
an important influence on female students' choices. "Intentions to continue in math are indeed affected by expectancies for success and assessment of the personal value of math. These, in turn, are mediated by perceptions of one's own math ability" (Parsons et al., 1985, p. 111). Clearly, then, a more thorough scientific understanding of self concept is needed.

Research in Self Concept

This study used a model of self concept developed by Shavelson, Hubner, & Stanton (1976). The development of this model and its relationship to other variables will be described. During the earlier stages of self concept research, an important task was to develop a model of self concept which described its functioning and its influence on human behavior. Byrne (1984) pointed out that as data on the topic were gathered and after a number of theories were refined, four major models emerged: the nomothetic, taxonomic, compensatory, and hierarchical models. These are each described in more detail in chapter two. Of these, the hierarchical model, which was proposed by Shavelson, Hubner, and Stanton (1976) has received the most study and held up most consistently across time (Marsh &
Shavelson, 1985). This model proposed that self concept could be described as being both hierarchical and multifaceted. It is multifaceted in the sense that, as an individual grows toward adulthood, self concept can be divided into specific areas, corresponding to important areas of experience. Individuals hold different ideas about themselves for these different areas of functioning rather than holding a single, overall self concept. For example, most adolescents need to establish friendships, get along well with parents, and do well in school. These areas of experience, therefore, correspond to peer relations self concept, parent relations self concept, math self concept, and reading self concept. Self concept's hierarchical nature may be seen as the existence of specific subareas of self concept at the base of the model, more general areas over this, and finally a general overriding self concept at the top. For example, an individual may have a sense of math self concept, which contributes to their academic self concept, which in turn, contributes to general self concept. A good deal of research has been aimed at verifying this model (Marsh, Barnes, & Shavelson, 1988; Marsh, 1986).
The study of this model has left a number of important questions unresolved. For example, how does self concept relate to academic achievement? Do any gender differences in self concept exist? What is self concept’s relationship with educational environment? Research which addresses these three issues follows.

Many studies have explored the relationship between self concept and academic achievement. A number of studies have found that self concept, though a separate and distinct construct, is strongly correlated with academic achievement (Marsh, Parker & Barnes, 1985). Other studies sought to establish that self concept strongly influenced achievement (Kubinec, 1970; Jones & Grieneeks, 1970; and Shavelson & Bolus, 1982). Later studies attempted to define the relationship between achievement and self concept in more detail. A model was proposed to explain the formulation of self concept using the understanding of this self concept-achievement relationship (Marsh, Byrne, & Shavelson, 1988; Marsh & Shavelson, 1985). This new theory was termed the internal/external frame of reference model. It proposed that self concept was formed as persons made two types of comparisons: (a) between their abilities and those of others and (b)
between their ability in one area and their abilities in others. For example, people would compare their reading skills to those of their peers and make a judgment, then further refine that judgment by comparing their reading skills to their skills in math. The net result would be their reading self concept. Data resulted from these studies which supported the model (Marsh & Shavelson, 1985).

Important findings on gender differences in self concept have also emerged, though far less research in that area has been done. Specifically, differences in self concept which support traditional sex role stereotypes have emerged (i.e. males have higher math self concepts while females have higher verbal/reading self concepts) (Marsh, 1989; Byrne & Shavelson, 1987). A second finding has been that a coeducational environment exaggerates these stereotyped tendencies (Marsh, Relich, & Smith, 1983).

A third area of importance has been in the area of relationship of self concept to the larger educational environment. Specifically, researchers identified a frame of reference model. This model pertained specifically to schools in which the mean level of academic achievement and ability was high. Researchers
found that students of comparable levels of achievement tended to have lower self concepts in higher ability schools, and higher self concepts in lower ability schools (Marsh, 1987; Marsh, 1989; Marsh & Parker, 1984; Soares & Soares, 1969).

Given the above trends in the research, many questions remain regarding the patterns of self concept data. The present study examined a school which became coeducational for the first time this past school year. Many of the females being introduced to this environment previously attended an all female school. Most of the males attended this school during the previous school year, when it was an all male environment. In light of the studies on gender differences in self concept and achievement-self concept relationship, a number of important questions became evident. Did the same gender differences in self concept exist here? Did they grow stronger over time? Did these differences relate to academic achievement? This study intended to shed light on these issues.
CHAPTER II

REVIEW OF THE LITERATURE

This literature review is divided into four main sections. First, the theoretical origins of the study of self concept are traced. Examples of early research are also presented in this section. A specific theory of self concept proposed by Shavelson, Hubner, and Stanton (1976) is then presented, and its relationship to other theories is described. Subsequent research on this viewpoint is also reviewed here. Next, research on a new theory of the formation of self concept is summarized. This is called the frame of reference model. This is followed by a description of research which defines the relationship of self concept to academic achievement. The next section examines the literature on gender differences and self concept based on the hierarchical model. Finally, studies which compare single sex to coeducational environments are discussed.
Theoretical Developments of the Study of Self Concept

Theories of self concept have developed over a considerable period of time. Interest in the construct has been influenced by: a) the history of psychology, b) social and political changes in the field of education, and c) the work of specific researchers who study self concept. A brief description of each of these factors follows.

History of Psychology

Interest in the area of self concept emerged early in psychology's history. Theorists at the turn of the century considered the study of self important. For William James (1890) the concept of self figured prominently in his understanding of human consciousness. The introspectionists considered the study of self valuable (Wylie, 1961). However, during the 1920's, 30's, and 40's, the behaviorist and functionalist school of thinking began to dominate American psychology. The functionalists no longer incorporated the idea of self in their thinking. At the same time the behaviorists confined their area of study to human behavior and considered variables such as self too "mentalistic." Since neither theory
allowed for the construct of self, very little research on self concept was performed during this period (Hilgarde, 1949). In addition, Freud and his followers created new theories of human psychological functioning. For two reasons, however, these new theories did not encourage research in the area of self concept. First, Freudian theory focused more on the id, its functioning and less on the ego. The ego as a construct was more closely related to the idea of self. Secondly, many researchers ignored Freud's theoretical ideas since they did not lend itself easily to empirical examination (Wylie, 1961).

Developments during the 1950's led to a renewed interest in the idea of self (Wylie, 1961). First, Freud's later writings began to stress ego development and place less emphasis on the id. Neo-Freudians discussed the importance of self picture and ego ideal. At the same time many clinical psychologists were finding it difficult and limiting to strictly adhere to behavioral principles. Often the phenomena they observed could not be accounted for by the behaviorist's theories. Revised versions of Freudian theory became more attractive for them. From the beginning of the century, Gestalt psychology and its
phenomenological methodology was drawing increasing interest. This point of view focused more on the individual's perception of reality than on elements of objective reality. At the same time, many researchers in psychology had expanded behavioral theory to include cognitive and motivational variables. The self as a construct was included among these variables. All these changes renewed interest and stimulated research in the area of self concept (Wylie, 1961).

**Social Political Trends in Education**

In addition to these historical trends in psychology, certain changes in the field of education focused interest in the area of self concept. Shavelson, Hubner and Stanton (1976) pointed out that the 1960's witnessed an emphasis on developing children's cognitive abilities in our schools. This was followed by a shift toward emphasizing "humanistic" aspects of education during the 1970's. Schools expanded their curricula to include the goal of increased self concept as a part of the more humanistic approach. Increased self concept was an integral goal of the Head Start program which emerged at this time. According to Zirkel (1971):
It has become increasingly clear in light of the school's attempt to serve the disadvantaged that the schools have a fundamental responsibility to enhance the self concepts of their students (p. 211).

As a result of these trends, a sharp increase occurred in self concept research.

As the construct of self concept received more attention, research on the topic increased. Most of this research fell into one of three categories: (a) measures of mean self concept of various populations (Hishiki 1969; Soares & Soares 1969), (b) studies which examined the relationship of self concept to other constructs (Sears 1972), and (c) treatment approaches which attempted to influence self concept (Herbert, Gelford, and Hartmann, 1969). Many of these early studies contained methodological problems and lacked a clear definition of self concept (Shavelson, Hubner, and Stanton, 1976).

**Current Theoretical Models**

Byrne (1984) pointed out that in addition to the work of Shavelson, Hubner, and Stanton (1976) three other theoretical perspectives of self concept emerged: the nomothetic, taxonomic and compensatory models. These three models are briefly described here, followed
by a more detailed review of the literature on the Shavelson et al. hierarchical model.

The nomothetic model (Soares & Soares, 1983) conceived of self concept as a unitary construct. Supporters of this view did not recognize any individual and separate facets of self concept, but used a single entity to justify and describe behavior. For example, the hierarchical model proposed that academic self concept is separate and distinct from physical appearance self concept, while the monothetic model asserted that only one, general self concept existed.

The taxonomic model (Soares & Soares, 1983) conceived of a number of individual facets of self concept organized by areas of experience, similar to the hierarchical model. In this view, however, each facet is relatively independent of the others. For example, this model may recognize math self concept or reading self concept. However, no broader categories such as academic self concept or general self concept exist in this framework.

The compensatory model (Wayne & Marx, 1981) supported the notion of individual facets of self concept, but saw these facets as being inversely
related to one another, rather than proportionally. For example, studies in this area have found that people who hold poor academic self concepts are more likely to hold higher physical and social self concepts. The original model proposed by Shavelson et. al. suggested that all facets of self concept were interrelated and positively correlated. Each of these models presented a viable alternative to Shavelson's work. The hierarchical model will be explored next.

Shavelson, Hubner, and Stanton (1976) criticized other definitions and approaches to measurement in the area of self concept. These authors pointed out that definitions used at that time were imprecise and varied considerably from one study to the next. They argued that since no data existed on the extent to which currently used measures of self concept were equivalent, they all may actually be measuring quite different constructs.

Having made this observation, Shavelson, Hubner and Stanton (1976) went on to develop a formal definition of self concept which would help "integrate empirical evidence on the validity of self concept interpretations" (p. 411). This definition was described by the authors as "a person's perceptions of
himself. These perceptions are formed through his experience with his environment...and are influenced especially by environmental reinforcements and significant others" (p. 411).

According to this concept, seven key features were associated with the definition of self concept. Self concept was described as: organized, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable. It is organized in that it is influenced by an individual's experiences in specific areas, and is therefore structured according to those experiences. For example, participation in academic activities at school and interaction with peers are two major areas of experience for a child. Therefore self concept is organized into the areas of academic self concept and relationship with peers self concept. Its multifaceted nature is a result of the organization. The specific areas identified by these researchers were self concept of school, social acceptance, physical attractiveness, and ability. It is hierarchical because the various facets of self concept exist on a number of levels. On the bottom level there exists a separate self concept for various situations in which the individual has participated, such as math self
concept and physical ability self concept. However, on a middle level more general facets of self concept are found. These are comprehensive and include the more specific facets within them. For example, academic self concept and nonacademic self concepts are found at this level. At the top level there is a singular general self concept which influences lower levels. Self concepts stability means that it tends to remain the same over time. Its developmental quality refers to its tendency to become increasingly differentiated into finer areas from infancy to adulthood. It is evaluative in the sense that an individual's description of himself tends to include a comparison either to other individuals or to some standard.

After Shavelon et al. initially proposed the model, a significant body of research emerged to test its validity. This research will be reviewed next.

Research on the Multifaceted and Hierarchical Nature of the Model

Most of the initial research in the area focused on verifying the multifaceted and hierarchical nature of the construct. The research attempted to demonstrate that self concept is divided into
individual area self concepts on the lower level, but these were linked at a higher level by general self concept. Many studies used a factor analysis to establish the existence of the individual areas of self concept and their relationship to one another. Fleming and Courtney's (1984) data yielded five factors or five areas of self concept (self regard, social confidence, school abilities, physical appearance, and physical abilities) and a global self concept. A correlation between the individual areas and the global self concept was found. These two findings supported the idea that self concept is both multifaceted and hierarchical. Marsh, Barnes, Cairnes, and Tidman (1984) used the recently developed **Self Description Questionnaire** to gather data which also yielded results of separate factors emerging to correspond to the individual areas of self concept. Similarly, Byrne and Shavelson (1986) verified both the multifaceted and hierarchical nature of self concept, as did Marsh and O'Neill (1984). In addition these latter authors established the validity of the construct's measure by comparing it to both grades and objective ratings of self concept.
In a review of the literature, Marsh and Shavelson (1985), described a number of studies which support the multifaceted quality of self concept. While the studies did not necessarily carry as their main intent the aim of demonstrating the multifaceted nature of the construct, the results of the studies could be seen to support the notion. Marsh and Shavelson (1985) stated, "Each of the studies provided clear support for the multifaceted nature of self concept" (p. 122).

A number of studies have attempted to define the relationship of the more global levels of self concept to the more specific areas. While a few have found, as predicted by the Shavelson et al. model, a correlation among the various levels (Byrne, 1986; Shavelson & Bolus, 1982), others found little or no correlation among them (Marsh, 1987a; Marsh & O’Neill, 1984). As a result, the hierarchical nature of the model was left in question.

Almost all the validity studies of this model were performed using subjects from Australia. Watkins and Gutierrez (1989) attempted to broaden the validity of the Shavelson model by applying it to a cultural group significantly different from those of previous studies. Unfortunately, no other studies of this type have been
done. The Self Description Questionnaire was administered to 194 Filipino students who attended a public high school in Manila. All were fluent in English. A factor analysis supported the specific facets the model predicted in addition to a general self concept factor. Furthermore, specific subject area facets were positively correlated with grades. This study, then, lent stronger support to the model.

New results from a series of subsequent studies led to a revision of the original Shavelson model (Marsh & Shavelson, 1985; Marsh, Shavelson & Byrne, 1988). Marsh and Shavelson found that not only did an analysis of their data reveal that Math and Verbal self concepts were uncorrelated, but that they did not combine in the appropriate manner to form the higher level academic self concept factor. Instead, it was found that two factors at this level fit the data better. The model was then revised. The more comprehensive academic self concept was eliminated and replaced with a verbal/academic self concept and a math/academic self concept. Support for this revision was found in subsequent research (Marsh, 1990a; Marsh, Shavelson, & Byrne, 1988). The Marsh study, however, found that a good portion of the variance at the level
of the subject specific self concepts could not be accounted for by the higher order factors. This latter finding weakened the idea that a factor such as general academic self concept can predict self concept in certain subject specific areas.

"Thus, support for the theoretical model should not be interpreted to mean that academic self concept in subjects like computer studies, handwriting, geography, history, foreign languages, and commerce can be well represented by more general components of academic self concept" (Marsh, 1990; p. 635).

In summary, overall findings from general research with the Shavelson et al. model have tended to reveal: a) the multifaceted quality of the model is demonstrated consistently (Marsh, Barnes, Cairnes, & Tidman, 1984), b) the hierarchical nature of the model as originally proposed holds up less consistently (Marsh, 1987; Marsh & O’Neill, 1984), and c) a revision of the model at the middle level which replaces academic self concept with math/academic and verbal/academic self concepts appears to fit the data better (Marsh & Shavelson, 1985).
Internal/External Frame of Reference Model

The internal/external frame of reference model was originally proposed to explain how verbal and math self concepts are formed (Marsh, Byrne, & Shavelson, 1988). It demonstrated how measures of self concept may not correspond directly to measures of achievement in specific subject areas, and how achievement may even have a negative effect on self concept in certain subject areas. A second purpose of the previously mentioned study by Marsh, Byrne, and Shavelson (1988), was to propose and test the internal/external frame of reference model. According to this model, facets of self concept are initially influenced by external comparisons, or comparisons between the individual’s own level of skill and the skills of others. Self concept is then further influenced by an internal comparison process, or a comparison between the individual’s skill in one area with their skill in another. For example, a student may find his/her math skills are better than those of his/her peers (external comparison). This strengthens the student’s math self concept. The student may then find his/her math skills are slightly better than his/her own reading or writing skills (internal comparison) which further strengthens
the students math self concept and weakens the verbal self concept. These researchers found a number of results which support their model. An analysis of the results from measures of self concept revealed that verbal and math self concepts were uncorrelated (even though verbal and math achievement were strongly correlated). In addition, verbal achievement positively affected verbal self concept and negatively affected math self concept. The same relationship held true for math achievement. Math achievement positively affected math self concept and negatively affected verbal self concept (Marsh, Byrne, & Shavelson, 1988).

Further support for this process was found by Marsh (1986). He performed an analysis on all existing data collected using the Self Description Questionnaire I, the Self Description Questionnaire II and the Self Description Questionnaire III. Findings consistent with the I/E frame of reference model emerged. Specifically, verbal and math self concepts were not correlated even though verbal and math achievement were. In addition, verbal and math self concept were correlated with achievement in their respective subject areas. Verbal and math self concept were each
negatively correlated with achievement in their opposite subject area.

This line of research has lent significant support to both the Marsh/Shavelson revision of the self concept model and the internal/external frame of reference model of self concept formation (Marsh, Byrne, & Shavelson, 1988; Marsh, 1986). Future research with this model should continue to make comparisons between self concept and achievement to determine whether the relationship described here continues to hold true.

Achievement and Self Concept

A significant portion of the literature examined the relationship between self concept and academic achievement. As mentioned in chapter one, many theorists have proposed that self concept strongly influences academic achievement. This idea has led to a number of studies on academic achievement and self concept. These studies have attempted to meet a number of objectives, from simply examining the relationship between self concept and academic achievement to establishing a causal relationship between the two. Researchers have hoped to demonstrate that self concept
strongly influences academic achievement. In general, it has been demonstrated that if the multifaceted nature of self concept is taken into consideration, a relationship between achievement and self concept can be established (Marsh, Parker, & Barnes, 1985). In addition, it has also been shown that the average ability level among students in the larger school environment has a negative impact on the individual's academic self concept (Marsh, 1984). The following is a review of this literature.

Early research comparing self concept to achievement was performed by Kubinec (1970), who analyzed self concept and self evaluation data from a group of freshmen college students. The data were compared to criteria for academic success established for the freshman year. The results indicated that the self concept measures accurately predicted success during the year. Unfortunately, this study made no attempt to control for achievement level or ability among students at the beginning of the school year.

Another early study which examined the relationship between achievement and self concept was conducted by Jones and Grieneeks (1970). In this study a number of self concept measures were given to 877
college students. The instruments included the Self Expectation Inventory and the Identity Rating Scale. The results were compared to the student's grades during the semester in question. In this study, Scholastic Aptitude Test scores were used to control for academic aptitude. The results indicated that self concept was a good predictor of the students' school performance. Brookover's Scale (Self Expectation Inventory, 1962) as a self concept of ability measure proved to be the most effective and consistent predictor, even better than the SAT.

The Self Concept of Ability Scale (1965, 1967) was also used in a similar study. However, the results contradicted previous findings. Caslyn and Kenny (1977) did an analysis of self concept and achievement data existing for 556 adolescents in 8th through 12th grades. They performed a special procedure called cross lagged parallel analysis in an effort to support either a self enhancement or skill development theory of academic achievement. Self enhancement theory suggests that self concept strongly influences achievement. Skill development theory argues that self concept develops as a result of feedback from the environment, including a student's level of
achievement. The results of the analysis supported this latter view. The authors did not give credence to theorists who assert the importance of self concept in education.

A more detailed and well designed study conducted by Maryana, Rubin and Kingsbury (1981), yielded similar results. These researchers collected data on self concept using the Self Esteem Inventory (Coopersmith, 1967) from 715 children ages 4 through 15. In addition, measures were taken of socioeconomic status, ability, and achievement. Causal modeling techniques were used to examine the relationship among the variables. It was found that ability and SES were strongly related and caused both achievement and self concept. Similarly, achievement and self concept were not causally related to one another. They point out, however, that one reason for this latter finding may have been that the majority of the children were at an age when achievement and self concept had stabilized. They concede the possibility that self concept may influence achievement at an earlier age.

Shavelson and Bolus (1982) included an analysis which also attempted to examine the relationship between self concept and achievement. In addition to
the data collected using the 6 measures of self concept, a standardized achievement test was given. The results were compared using an analysis of covariance in an attempt to establish causal predominance of self concept and achievement. In this case, the results suggested that self concept is indeed causally predominant over achievement, contradicting previously mentioned studies.

In a simpler but more comprehensive study, Hansford and Hattie (1982) performed a meta-analysis of the results of 128 studies involving both measures of self concept and achievement. In each of the studies, the two constructs were correlated. It was found that the correlations ranged from $r = -0.77$ to $r = 0.96$ and the average correlation was $0.21$. The authors point out that while the level of association was small, it remains significant. "It could be that self is as strongly linked with performance /achievement as any other personological variable" (Hansford & Hattie, 1982, p. 139).

Further support for a relationship between the two constructs was found by Marsh, Parker, and Barnes (1985). These researchers used the Self Description Questionnaire II (1985) to collect data on self concept
from 910 students ages 11 to 18. In addition, achievement was measured using standardized achievement tests. An analysis of the results revealed that verbal achievement was most highly correlated with verbal self concept, and math achievement was most highly correlated with math self concept. The authors point out these results may in part be due to their recognition of the fact that self concept is multifaceted, and they used an instrument which measures the various areas of self concept. The relationship between self concept and achievement may be very difficult to understand, they state, if self concept's multifaceted nature is ignored.

Marsh, Smith, and Barnes (1985) performed a similar study with younger children. In this instance, self concept data was collected from 559 fifth-grade students. Achievement tests were also administered. These researchers found that academic achievement scores were not correlated with nonacademic self concept scales and positively correlated with academic self concept scales. The correlation was especially strong between a subject area self concept and its corresponding academic area. These findings support the view asserted in the previously mentioned study:
the relationship between self concept and achievement becomes clearer when self concept's multifaceted nature is taken into account.

Byrne (1986), using two measures of self concept, provided some support for the self concept-achievement relationship. Here achievement test results and grade averages were used as measures of achievement. The researchers found a moderate correlation between academic self concept and academic achievement. It is important to point out however, that the instruments used in this study did not take into account the multidimensional nature of self concept to the degree that the Self Description Questionnaire does. In general, this line of research has demonstrated that the relationship between self concept and achievement is a complex one. Self concept may be seen as having an important influence on achievement as long as the multidimensional nature of self concept is considered.

An examination of the complex relationship between self concept and achievement would be incomplete without a discussion of a line of inquiry pursued predominantly by Marsh (Marsh 1984; Marsh & Parker, 1984; Marsh, 1987b). This body of research examines what Marsh terms as the frame of reference model.
Essentially this model states that self concept depends not only on a student's ability, but on the immediate context in which the student functions. Specifically, two students with equivalent levels of ability may attend class in a school with very different average levels of ability. The student in the low ability class would have a higher academic self concept than the student in the high ability class. This research has important implications for schools which draw on socioeconomic disadvantage and advantaged environments alike and will be reviewed next.

An early study in the area of self concept which discovered the effect in question was conducted by Soares and Soares (1969). These researchers developed a measure of self perception, ideal concept, reflected self in the eyes of classmates, reflected self in the eyes of teachers, and reflected self in the eyes of parents. This measure was administered to 514 subjects in an urban school system who attended one of two schools. Two hundred twenty nine attended a school in a socially and economically disadvantaged area, and 285 attended school in a more advantaged area. An analysis of the results revealed that students in the disadvantaged environments had significantly higher
scores in all areas than the advantaged students. The authors explain the results by hypothesizing that the disadvantaged children were functioning in an environment in which the adults held lower expectations of the children. Since they were functioning according to expectations, they had higher self concepts.

In a further refinement of this concept, Marsh (1984) proposed the model for understanding the development of self concept. It hypothesizes that students: (a) compare their own academic ability (more or less objectively perceived) with ability levels of other students within their own reference group, and (b) use this relativistic impression of their academic ability as one basis for forming their academic self concept. Similar to the previous study, the author collected data on self concept using the Self description Questionnaire (1985) from five different schools: three high ability/SES schools and two low ability/SES schools. A number of criteria were used to classify the schools, including property value of the area, occupational status of the principal wage earners in the family, and mean IQ of students. An analysis of Self description Questionnaire results revealed that being in a high ability group had the effect of
lowering academic self concept. When academic ability and family SES were controlled for statistically, the negative correlation between academic self concept and ability grouping increased significantly, verifying Marsh's initial hypothesis.

A further test of this model was conducted by Marsh and Parker (1984). Here 305 sixth-grade students were administered the Self description Questionnaire. These students attended one of five schools, two in a high SES area and three in a low SES area. Data was also collected on family SES. An analysis was conducted to determine the relationship between family SES, school SES, and self concept. This relationship was revealed to be a complex one. Within a given school SES, the higher the family SES, the higher the academic self concept. However, at a given level of family SES, the higher the school SES, the lower the level of self concept. It would appear that family SES has a positive influence on self concept but the influence of the larger environment is negative, supporting Marsh's theory.

Marsh attempted to draw data from a large, comprehensive data set from a project called youth in transition to further support the effect of the frame
of reference model (Marsh, 1987b). This data set was collected as a part of a longitudinal study. Data were available on socioeconomic status, academic ability, grade point average, academic self concept (using a set of questions specifically created for the project) and self esteem (Rosenberg's self esteem scale). The power of this study exists in the comprehensiveness of the data set. The data was collected from 2,213 students from 87 high schools, drawing on a very diverse population. An analysis of all variables was performed to determine their relation and whether the frame of reference model held true here. An important finding here was that the effect of the model became larger with the size of the difference in ability of the two schools being considered. So if the two were reasonably close in ability level the negative correlation between the average level of ability among students in the school and academic self concept was relatively small. However, the opposite was true when a school from the low end of the ability/SES continuum was compared to a school at the high end. Two other important findings emerged from this study. First, it was found that academic self concept had a significant predictive effect on long term achievement, and that
the effect of the frame of reference model accounted for one quarter of self concept's impact. It was also found that academic ability had a stronger influence on self concept than did grade point average. This latter finding suggested that students base self concept decisions on more than just formal teacher feedback.

"High school students in the present investigation have a broader basis for evaluating their academic self concept than just their relative standing within their own high school" (Marsh, 1987, p.291).

Overall, research in this area has clearly demonstrated two important phenomena: a) when the multifaceted nature of self concept is taken into account a clear relationship between self concept and achievement emerges (Marsh, Smith, & Barnes, 1985), and b) the mean level of ability among students in the individual's larger school environment is negatively associated with self concept (Marsh, 1987). Further studies in the area of self concept should be careful to make comparisons between achievement and self concept to determine whether the achievement-self concept relationship defined here continues to hold true.
Gender Differences

An important component of the present study was to examine, among other things, gender differences in self concept. These differences have emerged in past studies, although infrequently, and have an important history. The most important findings have been that the differences in self concept between males and females have reflected the traditional sex role stereotypes commonly held in our society. A review of these studies follows.

One study which examined gender differences was a test of the factor structure of the Self Description Questionnaire II (Marsh, Parker, & Barnes, 1985). Here the Self Description Questionnaire II was administered to 901 students in grades 7 through 12. Analysis of the data included a factor analysis and correlations of subsequent factors with age, sex, and achievement measures. The researchers found the expected 11 factors, and all were significantly correlated with age and sex. The correlations, however, were small and the direction of the sex effect varied with the particular scale. There was no correlation between sex and the sum of all the Self Description Questionnaire II
scales. The authors concluded the effects of sex on self concept were minimal.

An interesting finding emerged from a study by Marsh, Relich, and Smith (1983) which had as its purpose the construct validation of self concept using the Self Description Questionnaire. This study attempted to validate the construct of self concept by, among other things, administering the instrument to two very diverse populations. These included 655 fifth-and sixth grade students in a public school and 498 sixth-grade students in a private school setting. An important finding resulted from the fact that while the public school contained coeducational classrooms, the students at the private school attended single sex classrooms. An analysis of the results revealed that certain significant differences between boys and girls emerged. In both settings, the boys tended to be higher in physical abilities and math self concept while the girls tended to be higher in reading self concept. The size of the differences, however, was smaller in the single sex classroom setting. The authors use this to point out that traditional sex role stereotypes become magnified in a coeducational setting, and they significantly influence self concept.
"The findings do suggest that when self concepts are formed relative to a reference group containing both boys and girls, sex differences are accentuated in the direction of traditional sexual stereotypes" (Marsh, Relich & Smith, 1983, p. 184).

Important differences were also found by Byrne and Shavelson (1987) in their efforts to compare the structure of adolescent self concept across gender. These authors gathered self concept data from 832 students in grades 11 and 12. A number of measures of self concept were employed, including the Self Description Questionnaire III. The various facets of self concept measured included general self concept, academic self concept, English self concept, and math self concept. The results of an analysis of the interrelationship of these constructs revealed a difference in the structure of the construct across gender. General self concept and academic self concept correlated higher with English self concept than with math self concept for females. The reverse was true for males. The study also included a comparison of self concept with grades. It was found that academic self concept correlated higher with English grades for females and the reverse was true for males.
Marsh (1989a) performed an analysis on the normative archives for the Self Description Questionnaire I, the Self Description Questionnaire II, and the Self Description Questionnaire III. He made important findings in the area of gender differences. This study used 12,266 responses to these instruments from individuals in second grade through adulthood. Sex differences were found across all ages and reflected common sex role stereotypes. Specifically, boys had significantly higher physical ability, appearance, and math self concepts. On the other hand, girls had significantly higher general school and verbal self concepts.

Clearly these studies revealed important differences in the structure of self concept between males and females. Not only do stereotyped attitudes exist, but they appear to be exacerbated by a coeducational environment. It is important to point out that no study has ever examined the changes in self concept which occur for students who are new to a coeducational school environment. It would be important to examine the changes over time in the self concept of students who were formerly from a single sex
school environment and newly introduced to a coeducational environment.

**Single Sex vs. Coeducational Environments**

A significant amount of research has been devoted to examining the differences between single sex and coeducational school environments on a variety of psychological variables. In general some important and surprising differences have emerged, including many academic, social, and emotional advantages for single sex schools.

In a study using data from a large survey of secondary schools, Lee and Bryk (1986) compared 1,807 students from 75 high schools, 45 of which were single sex institutions, on a number of variables. Overall, single sex institutions were found to be significantly better in a number of important areas including levels of academic achievement, gains in achievement over two years, future educational plans, sex role stereotyping, and attitudes and behaviors related to academics. The strengths of single sex schools were particularly favorable for students in girls schools "where students were generally more interested in academics and showed significantly greater gains in reading, science and
educational ambition over the course of their high school years" (p. 394).

Phelps (1987) summarized a number of qualitative studies which examined the effect of becoming coeducational on previously single sex environments. This researcher included information differences in many areas, but of particular importance were the differences found between the students expectations for girls and those for boys. The students themselves seemed to view high achievement in science, math, sports, and leadership as being essential for boys but not for girls. Teachers viewed academic expectations as the same for both sexes, but tended to hold different behavioral expectations. While girls were expected to be compliant and lady like, boys were permitted to be boisterous and disruptive as long as they were successful students. This study pointed out differences in students' expectations of themselves according to gender as well differential expectations from teachers.

Another comparison of single sex and coeducational private schools was performed using a large data set from a longitudinal study (Riordan, 1985). Achievement and aptitude data were collected from 22,652 students.
in 1,318 schools. Fifty percent of these schools were single sex. An analysis of the results revealed that the single sex schools had significantly higher scores on all measures than coeducational schools. In this instance, it would appear that traditional sex role stereotyping was exacerbated by the single sex environment. Females in single sex environments performed better on measures of vocabulary and reading than females in coeducational environments, while males in single sex environments performed better in math and had a higher educational attainment than their coeducational counterparts.

Marsh (1989b) performed a study which responded to the trends found in the above research. He examined data from 2,332 high school students who attended 47 single sex or 33 coeducational schools. He compared the students on measures of achievement, attitudes, and behaviors. While he found gender differences on these measures, none of these were affected by school type. He points out that studies which compare single sex to coeducational environments frequently fail to control for a variety of factors.

Once pre-existing characteristics such as intelligence, prior academic achievement, motivation, and social class are controlled, however, the differences (in these environments)
tend to be much smaller or non significant (p. 71).

Measures of students' perceptions of their environments also differ significantly, according to Trickett, Trickett, Castro, and Schaffner (1982). These researchers used the Moo's Classroom Environment Scale (1974) and Student Experience Questionnaire (1974) to gather information from 458 students from 15 independent schools, approximately half of which were single sex schools. When the results from the single sex schools were compared to coeducational schools it was found that students from single sex schools perceived their environments as having a greater academic orientation, stronger task emphasis and more competition than coeducational schools. Students from single sex environments perceived themselves as spending more time on homework, less time on extracurricular activities, and having less free time in general than students from coeducational schools. The results may partially explain the differences in achievement and aptitude found in the previous study.

Schneider and Coutts (1982) found results which agreed in part with the findings of the above study. These researchers collected data from 2,029 students
from five coeducational, four all female, and four all male high schools. They measured environmental climate factors using The High School Characteristics Index (1982). The results indicated that coeducational schools, relative to single sex schools, were perceived by the students as placing greater emphasis on affiliation and pleasurable, nonacademic activities and less emphasis on control and discipline. The authors also predicted that coeducational students would perceive their environment as placing less emphasis on scholarship and achievement than the other students, but these differences were not found.

An important issue in single sex vs. coeducational environment research has been the effect of the environment on mathematics competence in women. Many theories have suggested that women improve their math competence in single sex environments. In an effort to test this theory, Rowe (1988) administered a measure of math achievement and a measure of attitude toward math to a group of 7th and 8th grade Australian students. These students were divided among twelve single sex and four mixed sex classes. A comparison of the results from the two types of environments revealed that no achievement differences emerged. However, students in
single sex environments showed greater math confidence and increased likelihood to choose math courses in the future.

Similar but weaker results were found by MacFarland and Crawford (1985). These researchers studied the effects of placing all grade 10 advanced math students in single sex classes in a given school. A total of 278 students participated. Measures of math achievement, math attitudes, participation rates, and reactions of students were gathered. Slight improvements in achievement and attitude were noted, although the treatment occurred only over an eight month period.

Research in this area has demonstrated, then, that newly creating a coeducational environment where a single sex environment formerly existed may have the effect of making certain sex role stereotypes apparent (Phelps, 1987). However, advantages of single sex environments become consistently apparent. Measures of achievement, aptitude, sex role stereotyping, attitudes and behaviors pertaining to academics all indicate specific academic advantages for students in single sex environments, particularly females (Riordan, 1985; Schneider & Coutts, 1982). This continues to hold true
for research specific to single sex math classes (Rowe, 1988). Marsh (1989) disputes many of these findings on the basis that many important factors are not controlled for. Measures of this type have been predominantly confined, however, to making comparisons between single sex schools and coeducational schools. A comparison of attitude and achievement measures from students who are new to a coeducational environment would yield important information about the impact of coeducational environments on students.

**Summary**

Interest in self concept has been influenced by a number of important trends in the history of psychology (Wylie, 1961). The rise of behaviorism and the prominence of Freud’s psychoanalytic theory focused attention away from the study of self concept during the early part of the century (Hilgarde, 1949). Later, changes in Freudian theory and the emergence of other new theories brought new interest in the topic (Wylie, 1961).

During the 1970’s certain shifts in the goals of education increased interest in self concept (Shavelson, Hubner, & Stanton, 1976). Whereas many educators thought self concept had a strong impact on
academic achievement, others felt good self concept was necessary in its own right. At the time, research in self concept consisted of identifying levels of self concept for various groups, self concepts relationship to other groups, and treatments which influence self concept. Shavelson, Hubner, and Stanton (1976) criticized approaches to self concept research existing at that time because there was no standard definition nor approach to measurement. They proposed a model of self concept which had a number of important features. Chief among these was that self concept was both multifaceted and hierarchical. Byrne (1984) pointed out that the monothetic, taxonomic, and compensatory models exist as alternatives to the Shavelson, et al. model. However, this review focuses on this latter model.

Subsequent research verified the existence of both the multifaceted and hierarchical natures of self concept (Fleming & Courtney, 1984; Marsh, Barnes, Cairnes, & Tidman, 1984; Byrne & Shavelson, 1984). Some research, however, failed to confirm the hierarchical nature of self concept (Marsh & O’Neill, 1984; Marsh, 1987b). Eventually the model was revised, (Marsh & Shavelson, 1985; Marsh, Shavelson, & Byrne,
1988) and a model for self concept formation was proposed and tested (Marsh, Byrne, & Shavelson, 1988; Marsh, 1986). Some evidence weakened the hierarchical nature of the revised model (Marsh, 1990a).

A number of studies have attempted to define the relationship between self concept and academic achievement. While many found evidence to support the assertion that self concept influences achievement (Kubinec, 1970; Jones & Grieneeks, 1970; Shavelson & Bolus, 1982), others conducted studies which contradicted this notion (Caslyn & Kenney, 1977; Maruyana, Rubin & Kingsbury, 1981). A group of studies (Byrne, 1986; Marsh, Parker, & Barnes, 1985; Marsh, Smith & Barnes, 1985) asserted and verified that when the multifaceted nature of self concept was taken into account, the relationship between self concept and achievement became stronger. One line of research developed in which it was demonstrated that schools with high mean levels of academic achievement among students had lower self concept scores, and in turn influenced achievement (Marsh, 1989a; Marsh, 1987a; Marsh & Parker, 1984; Soares & Soares, 1969).
A few studies have found gender differences in self concept. Marsh, Parker and Barnes (1985) identified slight differences but declared them minimal. Marsh, Relich, and Smith (1983), however, found self concept patterns which were congruent with traditional sex role stereotypes, and that these were exaggerated in coeducational environments. Byrne and Shavelson (1987) found that among females, academic self concept correlated more highly with English self concept, while among males the same factor correlated more highly with math self concept.

Important research has also emerged in the examination of single sex vs. coeducational environments. Many studies suggest that single sex environments have a greater advantage over coeducational environments (Lee & Bryk, 1986). Measures of individual perception indicate that students in single sex environments feel the climate is more rigorously academic than students from coeducational environments (Schneider & Coutts, 1982; Trickett, Castro, & Schaffner, 1982). Single sex environments also contributed to increased math competence among women (Rowe, 1988).
Need For The Present Study

This review of the literature has found, among other things, that gender based differences exist between the self concept profiles of girls and boys. These differences are consistent with traditional sex role stereotypes. Other studies suggest that coeducational environments may exaggerate these differences. These conclusion have been drawn by comparing students in the two types of environments. Clearly, a study is needed which measures changes in self concept over time of students moving from a single sex environment into a coeducational one. Since other literature reviewed here finds certain patterns of relationship between self concept and achievement, this study also compared self concept measures to measures of achievement.

Purpose of the Study

The purpose of the present study was to measure changes in self concept over time among students in a unique situation. These students, many of whom formerly attended single sex environments, attended a coeducational environment for the first time during the past school year. A second purpose was to compare
self concept measures to academic achievement and examine the nature of that relationship. The literature suggested that specific differences between the self concept profiles of boys and girls would be found. However, since this study is being performed using a unique situation, the hypothesis about gender differences will be at a more general level.

Research Questions

1) Will there be a relationship between self concept measures and achievement measures?
   a) Will verbal self concept be correlate positively with English/reading achievement?
   b) Will math self concept correlate positively with math achievement?
   c) Will a negative correlation exist between math self concept and English/reading achievement?
   d) Will a negative correlation exists between verbal self concept and math achievement?

2) Will there be any significant differences between the self concept profiles of males and females from the initial testing at the beginning of the school year?
3) Will there be any significant differences between the self concept profiles of males and females from the final testing at the end of the school year?

4) Will there be any changes in self concept profiles among males over time?

5) Will there be any changes in self concept profiles among females over time?

**Hypotheses:**

1) There will be no significant relationship between self concept measures and achievement measures.
   a) Verbal self concept will not correlate with English/reading achievement.
   b) Math self concept will not correlate with math achievement.
   c) No correlation will exist between math self concept and English/reading achievement.
   d) No correlation will exist between verbal self concept and math achievement.

2) There will be no significant differences between the self concept profiles of males and females from the initial testing at the beginning of the
school year.

3) There will be no significant differences between the self concept profiles of males and females from the final testing at the end of the school year.

4) There will be no changes in self concept profiles among males over time?

5) There will be no changes in self concept profiles among females over time?
CHAPTER III

METHOD

This chapter describes the method used to execute this study. Specifically, the subjects and research setting is described, followed by a description of the instruments. Next, the procedure used to collect data is reviewed. Finally, the statistical analyses used to test the hypothesis are presented.

Subjects

The population consisted of 400 students in grades 5 through 11 (337 males and 63 females). Students from grade 12 were not used since there were no females within this group. The specific stratification by school level is available in Appendix A. Information on race of students is listed there also. All subjects were chosen from a private school located in suburban Columbus, Ohio. The general achievement level of the students was above average. The average SAT scores for the 1992 graduating class was 689 Math and 563 Verbal. Using the Hollingshead 4 factor index of social classification (Hollingshead, 1958), it was determined
that 95% of the students are from families which fall in the upper social class strata. Although data were collected from all students in the school from grades 5 through 11, only data from those who reported attending a single sex school last school year were used. Students were eliminated based on their response to an item on the questionnaire which asked about their previous educational environment. Their response choices were, "all male, all female, or coeducational." The final set of subjects consisted of a total of 311 students (278 males and 33 females).

Research Setting

The research setting was a small private school encompassing students from kindergarten through twelfth grade. For 75 years the school had been an all male environment. In September 1991 the school became coeducational, enrolling female students. The change was the result of a choice made by the school administration. In general, the students are high ability, above average in achievement, middle to upper socioeconomic status, and are from families where one or both parents have college degrees. Fifty five percent of the teachers in the school were female.
Instruments

The Self Description Questionnaire

The Self Description Questionnaire II (Marsh, 1990b) contains 102 items distributed across 11 scales. Three of these scales measure academic self concept (Reading, Mathematics, and General School), seven measure nonacademic self concept (Physical Abilities, Physical Appearance, Same-Sex Relations, Opposite-Sex Relations, Parent Relations, Honesty-Trustworthiness, and Emotional Stability). In addition, there is a General Self scale. All the scales can be summed to yield a Total Self Concept score. The measure itself reflects the subjects self ratings in the various areas of self concept. The instrument is designed for use with pre and young adolescents. Each subject is asked to respond to a number of statements about themselves (e.g. "I enjoy things like sports, gym, and dance," and, "I make friends easily with boys") with one of six responses: False; Mostly False; More False Than True; More True Than False; Mostly True; True. There are 8 to 10 items for each scale, and half are worded negatively in order to avoid a positive word bias. The individual items are listed in Appendix C.
The reliability of the SDQII has been established. Internal consistency of item responses in each SDQII Scale have been calculated using the normative sample (Marsh, 1990b). Internal consistency for this total self concept score was a coefficient alpha estimate of .94. The same estimate for total scaled scores ranged from .83 for Emotional Stability to .91 for Physical Appearance (median=.86). Standard error of measurement estimates were computed for each scale using raw scores from the normative sample. Standard errors of measurement vary from 2.9 to 4.2 for individual scales, and the standard error of measurement for the Total Self Concept score is 16.6.

Construct validity for the instrument has also been established (Marsh, 1990b). Here the results show that each of the eleven factors correspond to the eleven scales of the SDQII. For each item variable, the target scale loadings range from .48 to .80 (median=.68). Nontarget loadings range from -.12 to .27 (median=.03). Correlations among factors are modest, ranging from -.03 to .39. Other studies compare results from the SDQII measures to related constructs and trends in general self concept research.
(Marsh, 1990b; Marsh, Parker, & Barnes, 1985; Marsh & Peart, 1988; Thomas, 1984).

The normative sample consisted of 5,494 students from schools in metropolitan Sydney Australia (2,658 males and 2,836 females) from grades 7 through 12. There are proportionally fewer students from grades 11 and 12 than from grades 7 through 10. The data collectors were careful to include students from a variety of socioeconomic backgrounds; both public and private schools; and single sex and coeducational schools.

**Grades**

Grades were obtained from the student files at the end of the year. The year average grades for each subject area were used for this study. Grades ranged from A+ to F, and these were translated to numerical values using a scale ranging from 12 to 0. All Math, English, and reading grades were used.

**Procedures**

A proposal for this study and a number of others was initially submitted to the headmaster, and permission was obtained. The data for this study are a
subset of a larger set of data collected for this research project. After permission was granted, several presentations were made to the teachers explaining the study. Testing times, dates, and places were established. The data collectors were nine graduate students and one faculty member from the College of Education. After times and places were established, the data collectors developed the specific logistics for implementing the testing (room numbers, specific times, etc.)

Materials were administered over two separate 35 minute periods on two consecutive days. The Self Description Questionnaire (Marsh, 1990b) did not always appear in the same order relative to the other instruments used in the project. Two different testing forms were created in order to counterbalance the order in which the instrument appeared. The instrument was administered once at the beginning of the year in September, and once again at the end of the year in April. The initial administration occurred in a small group setting for grades 5 through 8 and in a larger group setting for grades 9 through 11. The second administration occurred in a small group setting for all students. The small group setting consisted of the
students home room classes. The large group setting consisted of the entire grade of students assembled in the school auditorium for grades 10 and 11, and the school cafeteria for grades 9 and 10. Standardized instructions were read for all students, by a single proctor for each group, and all testing situations were monitored for questions and procedural difficulties. All test proctors were advanced graduate students and one assistant professor specifically trained to administer the Self Description Questionnaire II. The data collected for this study was part of a larger study implemented by researchers at the Ohio State University. The purpose of the study was to assess the impact of the change in environment from single sex to coeducational. In addition to self concept, measures were taken of math anxiety, sex role perception, work and family orientation, and math self efficacy. Data on achievement was gathered from the students' records at the end of the school year. While standardized achievement data was available on these students, grades were used for two reasons. First, there was considerable more variability among the grades than the achievement test results. Secondly, previous studies
suggest that grades influence self concept more than achievement test results and are used more frequently.

**Data Analysis**

The following is a list of hypotheses followed by a description of the statistical analysis to be performed on the data to obtain the appropriate results.

1) There will be no significant relationship between self concept measures and achievement measures.
   a) Verbal self concept will not correlate with English/Reading achievement.
      
      **Analysis:** A correlation was performed between Verbal self concept scores and English/Reading grades.

   b) Math self concept will not correlate with math achievement.
      
      **Analysis:** A correlation was performed between Math self concept scores and Math grades.

   c) No correlation will exist between math self concept and English/reading achievement.
Analysis: A correlation was be performed between Math self concept scores and English/Reading grades.

d) No correlation will exist between verbal self concept and math achievement.

Analysis: A correlation was be performed between Verbal self concept scores and Math grades.

2) There will be no changes in self concept profiles among males over time.

Analysis: A profile analysis was performed to determine any main effect interaction of self concept scores by sex and time. A post hoc analyses was used to determine whether specific differences emerged when comparing scores from males at the beginning of the school year with scores from males at the end of the school year.

3) There will be no changes in self concept profiles among females over time.

Analysis: A profile analysis was performed to determine any main effect interaction of self
concept scores by sex and time. A post hoc analyses was used to determine whether specific differences emerged when comparing scores from females at the beginning of the school year with scores from females at the end of the school year.

4) There will be no significant differences between the self concept profiles of males and females from the initial testing at the beginning of the school year.

Analysis: A profile analysis was performed to determine any main effect interaction of self concept scores by sex and time. A post hoc analyses was used to determine whether specific differences emerged when comparing scores from males and females at the beginning of the school year.

5) There will be no significant differences between the self concept profiles of males and females from the final testing at the end of the school year.

Analysis: A profile analysis was performed to determine any main effect interaction of self concept scores by sex and time. A post hoc analyses was used to determine whether specific differences
emerged when comparing scores from males and females at the end of the school year.

All the above analyses were performed using the BMDP computer program.
CHAPTER IV
RESULTS

This chapter provides results of the analysis of the self concept measures. Specifically, the chapter will describe the procedure used in developing self concept scores and the results of comparisons of self concept with achievement measures. Following this, the results of comparisons of male and female self concept scores will be reviewed, as will changes in these scores over time.

Development of Self Concept Scale Scores

Since the Self Description Questionnaire (Marsh, 1990) subtest scores are important to this study, the development of these scores is described here. First, a factor analysis was performed on the raw data to determine the factor structure. This procedure was important for two reasons. First, this instrument was chosen because it is the best available measure of the multidimensional nature of self concept. The
factor analysis established that the instrument was measuring the specific facets of self concept it claimed to. Secondly, previous research with the instrument has been performed on Australian populations, and it has not been established that the multidimensional nature of self concept holds true for American populations. It was found that the factor structure was consistent with the scales of the instrument. Next, the individual items were summed to find the subtest scores. These subtest sums were divided by the number of items in the scale in order to find the mean item score for each subtest. This was performed in order to correct for the uneven number of items in each subtest. The mean subtest item scores were grouped separately for grades 5 through 8 (middle school) and grades 9 through 11 (upper school) in order to look for differences between the two. The data were also separated by gender. These data are described by number of students, mean, and standard deviation in Appendix B. The results are also compared to the norm group within these tables. The mean item scores ranged from 3.2423 (Math Self Concept, upper school females, fall
testing) to 5.4857 (Same Sex Relations Self Concept, middle school females, fall testing).

A comparison of results from this group to the norm group reveals several unique findings. While a number of mean subtest scores emerged as greater than one half standard deviation above the norm group mean for the middle school, the opposite was true for the upper school. At the time of the fall testing, middle school males were above the norm in Math, Honesty and Trustworthiness, General School, Same Sex Relations, and Opposite Sex Relations self concepts. During the same period middle school females were above the norm in Hath, Physical Appearance, Honesty and Trustworthiness, Physical Abilities, Emotional Stability, General School, Same Sex Relations, and Opposite Sex Relations self concept. During the spring testing, middle school males were above the norm only in Opposite Sex Relations self concept. During the same time middle school females were above the norm in Hath, Physical Appearance, Honesty and Trustworthiness, Physical Abilities, Verbal, Emotional Stability, General School, and Opposite Sex Relations self concept.
A number of subtest scores for the upper school emerged as lower than one half standard deviation from the mean of the norm group. During the fall testing upper school males were lower on General Self, Physical Abilities, Emotional Stability, and Parent Relations self concept than the norm group. Females in the fall showed no subtest score below the norm. Males in the spring were lower on General Self, Physical Abilities, Emotional Stability, Parent Relations, and Same Sex Relations self concept than the norm group. Females in the spring were lower than normal on General Self, Emotional Stability, and Parent Relations self concept. The only strength relative to the norm group for upper school students emerged for females during both fall and spring. In both these instances, Opposite Sex Relations was higher than the norm group.

Comparison of Self Concept to Achievement

Research Question 1 addressed the relationship between achievement and self concept. Specifically, it was asked whether verbal self
concept would correlate with English/reading grades and whether math self concept would correlate with math grades. In addition, it was hypothesized that no correlation would exist between self concept and math achievement, and between math self concept and English/reading achievement. To determine the nature of these relationships, a Pearson product-moment correlation was performed comparing the appropriate subtest scores to grades from the appropriate subject areas.

At the middle school level, using the Pearson product-moment critical value of .2301 ($p < .01$), English grades were positively correlated with Verbal Self Concept scores from both fall and spring. In addition, a positive correlation existed between math grades and math self concept scores form the spring. English grades also correlated positively with spring math self concept. No other correlations existed for this group.

At the upper school level, math grades correlated positively with both math self concept scores. English grades correlate positively with
both verbal self concept scores as well. The results are given by school group in Tables 1 and 2.
Table 1

Correlation Coefficients Comparing Grades to Self Concept--Middle School

<table>
<thead>
<tr>
<th>Self Concept Area</th>
<th>Math1</th>
<th>Math2</th>
<th>Verb1</th>
<th>Verb2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>.076</td>
<td>.271</td>
<td>.319</td>
<td>.362</td>
</tr>
<tr>
<td>Reading</td>
<td>.119</td>
<td>-.073</td>
<td>.072</td>
<td>.053</td>
</tr>
<tr>
<td>Math</td>
<td>.147</td>
<td>.495</td>
<td>.143</td>
<td>.163</td>
</tr>
</tbody>
</table>

*P > .05 for all coefficients.*
Table 2

**Correlation Coefficients Comparing Grades to Self Concept—Upper School**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Self Concept Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math1</td>
</tr>
<tr>
<td>English</td>
<td>.044</td>
</tr>
<tr>
<td>Math</td>
<td>.260</td>
</tr>
</tbody>
</table>

*P > .05 for all coefficients.*
Changes in Self Concept Over Time

The second and third questions addressed the changes in self concept over time. Specifically, it was hypothesized that there would be no changes in self concept profiles of males over time. The same was hypothesized for females. In order to test for any changes, a split-plot repeated measures analysis of variance was performed. As with the correlation, a separate analysis was performed for the middle school group and the upper school group. The results of the analysis indicated no significant changes in self concept over time at the middle school level, $F(1, 141) = .04, p > .05$. Similarly, no significant changes in self concept over time were found at the upper school level, $F(1, 166) = 0.0$. The means from these analyses are graphed in figures 1 and 2. Since this study is more exploratory in nature a .05 level of confidence was chosen.
Figure 1. Mean Self Concept Scores by Testing Time -- Middle School.

No significant changes were found.
Figure 2. Mean Self Concept Scores by Testing Time—Upper School.

No significant changes were found.
Gender Differences

The fourth and fifth questions addressed differences in self concept profiles between males and females. It was hypothesized that no differences between males and females would exist at either testing time. In order to test for these changes sex was included as a variable in the above split-plot repeated measures ANOVA. The analysis at the level of the middle school revealed no significant scale differences between males and females, $F(10, 1410) = 1.63, p > .05$. The specific results are graphed in figure 3.
Figure 3. Mean Self Concept Scores by Sex—Middle School.
However, a significant scale by sex interaction occurred at the upper school level, $F (10, 1660) = 6.78, p < .01$. A post hoc analysis was performed on the individual subtest score means to determine where these differences existed. Since no significant differences existed between time one and time two, scale means were collapsed across time and the post hoc analysis was performed on these overall means. A follow up analysis revealed that males were significantly higher than females on Math Self Concept, while females were significantly higher than males in Verbal, Same Sex Relations, and Opposite Sex Relations Self Concept. The results are graphed in figure 4.
Figure 4. Mean Self Concept Scores by Sex--Upper School.
Summary

A comparison of self concept scale scores with achievement measures yielded a positive correlation between achievement and self concept in the appropriate subject area, with one exception. At the middle school level, English correlated with Math Self Concept in the spring. No other correlation existed between self concept and opposite subject areas. An analysis of changes in self concept over time revealed no significance. However, differences in self concept profiles were found between males and females at the upper school level.
The purpose of the present study was to test for changes in measures of self concept over time among students in a unique situation. These students formerly attended a single sex (all male) school environment. This year, the school admitted females, thus they attended a coeducational environment for the first time. The literature in this area has suggested that certain changes in self concept would be found as a result of this transition. It was also expected that differences between male and female self concept profiles would be found. The second purpose of this study was to examine the nature of the relationship between self concept measures and academic achievement. The literature in this area also suggested a specific pattern of correlations would emerge. In this chapter, findings for all research questions are discussed. Specifically, this section discusses the uniqueness of this group, the relationship between self concept and
achievement, changes in self concept over time, gender differences in self concept, limitations of the present study and implications for future research.

The Population of this Study

A comparison of the results from this study with the norm group reveals a number of unique findings. Several subtest scores are greater than one half standard deviation above the mean for the middle school students. On the other hand, a significant number of scores are greater than one half standard deviation below the mean for the upper school students. The finding of slightly lower scores for the upper school is consistent with the literature. This private school environment had students who are higher than average in ability and achievement. Marsh (1987), Marsh (1989), Marsh and Parker (1984), and Soares and Soares (1969), have all suggested that this type of environment has the effect of suppressing self concept. However, the higher than normal scores at the middle school level were surprising and difficult to explain. It is important to note
that the middle school students in this study were 10 to 13 years of age. According to Erikson (1963), these individuals are in the "industry vs. inferiority stage." This means that they define themselves according to what they can do or produce. It may well be that this group's relative success with this task increased their self concept.

Self Concept and Achievement

The present study found positive correlations between math self concept and math achievement, as well as verbal self concept and English achievement. These findings are consistent with the literature which shows that self concept is associated with achievement in corresponding subject areas (Marsh, Parker, & Barnes, 1985; Marsh, Smith, & Barnes, 1985; Byrne, 1986). This supports the notion that self concept, especially as defined by the Shavelson et al. model, is strongly associated with academic achievement. This adds support to the construct validity of the Shavelson model. The results also support the notion that the relationship between achievement
and self concept becomes clearer when self concept’s multidimensional nature is taken into account.

The findings in this area, however, were not in complete agreement with previous studies. At the middle school level one measure of math self concept was correlated positively with English grades, and no correlation was found between reading grades and measures of verbal self concept. It is important to point out, however, that a stronger correlation existed between math self concept and math grades than for math self concept and English grades. In addition, of the numerous English-math comparisons, this is the only one which emerged. Finally, although it seems logical that Verbal self concept is related to reading achievement, a review of similar studies reveals no such specific comparison.

These findings also partially contradict the internal/external frame of reference model (Marsh, Byrne, & Shavelson, 1988). This model hypothesized that a positive correlation would be found between self concept and achievement in the corresponding subject area, while a negative
relationship would be found between self concept and achievement in the opposite subject areas. These results generally showed a positive relationship between self concept and achievement, but no negative relationships were evident. This weakened the support for the internal/external frame of reference model for this group. In other words, while these students may be comparing their abilities to external criteria (thus the positive correlation), they may not be making the internal comparisons between their skills in one area and those in another. This situation would produce the lack of negative correlation and opposite subject area found here. One reason for this may be the fact that this population consisted predominantly of high achieving students. It is not unusual for gifted students to be multi-talented, and this may in turn influence their self concept. These students, therefore, may not make clear cut negative judgments about their abilities. Instead, they may recognize the fact that they have talents in a number of areas. This may lead them to recognize that good performance in one area does not necessarily force them to
make negative judgments about their relatively moderate performance in another area.

Changes in Self Concept Over Time

In this study measures of self concept taken at the beginning of the school year were compared with the same measures at the end of the year. No significant changes were found. These results also contradict current theories in the field of self concept. Specifically, the studies have suggested that traditional sex role stereotypes exist in patterns of self concept scores (Byrne & Shavelson, 1987) and they may be exacerbated by coeducational environment (Marsh, Relich, & Smith, 1983). It would be expected that these students, who are new to a coeducational environment this year, would be affected by the change. The research has shown, for example, that differences in math self concept, (with males being higher) and Verbal Self Concept (with females being higher) are greater in coeducational environments (Marsh, Relich, & Smith, 1983). Researchers suggest that coeducational environments influence these differences. Therefore, it would be expected that certain self concept scale scores
would change over time for this group, yet this did not happen.

An explanation for this fact may be that the influence of the environment needs a period of years before it is measurable. Previous research which found greater differences in coeducational environments used subjects who had been influenced by their environments over a number of years. Other studies which tested for changes in self concept over time used longer time periods between pre and post testing. In addition, it is important to note that school personnel in this environment were exposed to considerable inservice training before the transition. During this training the individual's were sensitized to potential difficulties in changing from an all male to a coeducational school. This training likely had the effect of minimizing the impact many coeducational environments have on self concept. In summary, no differences were found in self concept over time, and the time period as well as inservice training may account for this.
Gender Differences in Self Concept

This study compared gender differences in self concept. Two important findings emerged. While at the middle school level, no significant self concept differences were found between males and females, a number of changes were found at the upper school level. Specifically, males had significantly higher Math self concepts, while females had significantly higher Verbal, Same Sex Relations, and Opposite Sex Relations self concept. All other scales were equivalent.

A number of these findings are consistent with the literature. Marsh, Relich, and Smith (1983); Byrne and Shavelson (1987); Marsh (1989); and Marsh, Parker, and Barnes (1985), have all found Math self concept to be relatively higher for males while Verbal self concept was relatively higher for females. These results support the notion of the existence of certain gender differences in self concept, many of which reinforce traditional sex role stereotypes. In addition, Marsh, Parker, and Barnes (1985) found females to be relatively higher in Same Sex Relations self concept. The finding of higher
Opposite Sex Relations self concept among upper school females is unique and likely represents the fact that females are few in number in this environment. Therefore, they may find it easier to establish positive relationships with a number of males.

One result in this area contradicts previous research. Few previous studies have found no underlying gender differences among a group of subjects. Yet these results indicate that subjects from the middle school showed no differences in self concept. It is important to point out that differences between scaled scores of males and females did emerge. However, the number of females in this group was small (n=14) and this may have prevented the finding of statistical significance. In conclusion, a number of gender differences emerged from the results which are consistent with the literature among the upper school students. However, among middle school students no differences were found.
Summary

Overall, many of the findings of this study have been remarkably consistent with the literature. Comparisons of achievement with self concept have demonstrated a positive relationship in the appropriate areas. Support for the internal/external frame of reference model, however, was not found. Gender differences in self concept profiles emerged. Most of these were both consistent with the literature and supportive of traditional sex role stereotypes.

Although the literature suggests that the situation examined in this study should have produced changes in self concept over time, these results were not found. This latter result was likely due to two phenomena. First, the influence of environment on self concept may take a number of years before it is measurable. Secondly, school personnel in this environment received significant training which aimed to minimize any negative impacts the environment would have.
Limitations of the Study

One limitation of the study concerns the length of time involved. Although no change in self concept over time was measured, it is unlikely that the transition to a coeducational environment made no impact whatsoever. It seems more likely that such a transition makes its impact slowly, and may require a number of years before it can be measured. If a period of years were allowed between the first and second data collection, there would be an increased likelihood that significant changes in self concept would be found.

A second limitation of the present study is the lack of a control group. This study sought in part to demonstrate that a coeducational environment exacerbates traditional sex role stereotypes. Even if significant changes in self concept were found over time, it would not have been clear that the environment was the sole determinant. The use of a control group that consisted of students from a similar single sex school would make an important improvement. Comparison between these groups would have
clarified the extent to which a coeducational environment influences self concept.

A third limitation of this study was the number of females at the middle school level. The comparison of male and female self concept profiles at this level yielded no significance. These results may have been in part due to the number of female students in this group.

**Directions for Further Research**

Only a moderate amount of research has been done which examines the relationship between self concept and coeducational environment. Some studies suggest that a coeducational environment exacerbates traditional sex role stereotypes in self concept. This study does not necessarily support this notion. Future studies similar to this one, including a number of additional components, would shed more light on this area. Specifically, a study using a control group from a single sex school would allow direct comparisons to be made between it and schools in transition. This would make the cause of any differences found more apparent. A qualitative component which
gathered interview data from school personnel would also shed light on the quantitative results. It would also be important to compare schools whose students represent a broader range of ability, as opposed to this one which is more representative of high ability and achievement students. A number of studies of this nature would yield important information. Finally, results from this study contradict the internal/external frame of reference. One explanation for this may be that the population of this study consisted predominantly of gifted students, and this model may not be applicable to them. Therefore, more self concept studies specifically on gifted individuals may be in order.
APPENDIX A

STRATIFICATION OF STUDENTS BY SCHOOL LEVEL
Table 3

**Number of Subjects by Sex and School Level, Whole Group**

<table>
<thead>
<tr>
<th>School Level</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper School</td>
<td>165</td>
<td>43</td>
<td>208</td>
</tr>
<tr>
<td>Middle School</td>
<td>172</td>
<td>20</td>
<td>192</td>
</tr>
</tbody>
</table>

Table 4

**Number of Subjects by Sex and School Level, From Single Sex Environment**

<table>
<thead>
<tr>
<th>School Level</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper School</td>
<td>142</td>
<td>26</td>
<td>168</td>
</tr>
<tr>
<td>Middle School</td>
<td>136</td>
<td>7</td>
<td>143</td>
</tr>
</tbody>
</table>
Table 5

**Subjects by Race and School Level**

<table>
<thead>
<tr>
<th>Race</th>
<th>Middle School</th>
<th>Upper School</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>147</td>
<td>161</td>
</tr>
<tr>
<td>African American</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>American Indian</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Asian</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>
APPENDIX B

SELF DESCRIPTION QUESTIONNAIRE RESULTS:
NUMBER OF STUDENTS, SCALE MEANS,
STANDARD DEVIATIONS, AND COMPARISONS
TO NORM GROUP
Table 6

Self Concept Scores: Number, Mean, SD and Norm
Comparison of Middle School Males, Fall Testing

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean 1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>136</td>
<td>4.5684</td>
<td>1.3075</td>
<td>3.75 +</td>
</tr>
<tr>
<td>Phy App</td>
<td>136</td>
<td>4.4191</td>
<td>1.3696</td>
<td>4.28</td>
</tr>
<tr>
<td>Gen Self</td>
<td>136</td>
<td>4.7919</td>
<td>1.1148</td>
<td>4.91</td>
</tr>
<tr>
<td>Hon Tru</td>
<td>136</td>
<td>4.8199</td>
<td>1.2392</td>
<td>4.81 +</td>
</tr>
<tr>
<td>Phy Abl</td>
<td>136</td>
<td>4.8735</td>
<td>1.2968</td>
<td>4.75</td>
</tr>
<tr>
<td>Verbal</td>
<td>136</td>
<td>4.1191</td>
<td>1.4095</td>
<td>3.92</td>
</tr>
<tr>
<td>Emot</td>
<td>136</td>
<td>4.2199</td>
<td>1.2918</td>
<td>4.15</td>
</tr>
<tr>
<td>Par Rel</td>
<td>136</td>
<td>4.8684</td>
<td>1.4242</td>
<td>4.89</td>
</tr>
<tr>
<td>Gen Schl</td>
<td>136</td>
<td>4.8831</td>
<td>1.2946</td>
<td>4.33 +</td>
</tr>
<tr>
<td>Same Sex</td>
<td>136</td>
<td>5.0860</td>
<td>1.2226</td>
<td>4.60 +</td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>136</td>
<td>4.1059</td>
<td>1.4870</td>
<td>3.52 +</td>
</tr>
</tbody>
</table>
### Table 7

**Self Concept Scores: Number, Mean, SD and Norm**

**Comparison of Middle School Males, Spring Testing**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>136</td>
<td>4.1316</td>
<td>1.4589</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Phy App</td>
<td>136</td>
<td>4.4301</td>
<td>1.4339</td>
<td>4.28</td>
<td></td>
</tr>
<tr>
<td>Gen Sel</td>
<td>136</td>
<td>4.6387</td>
<td>1.2040</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>Hon Tru</td>
<td>136</td>
<td>4.5750</td>
<td>1.3745</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Phy Abl</td>
<td>136</td>
<td>4.8691</td>
<td>1.3647</td>
<td>4.75</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>136</td>
<td>4.1551</td>
<td>1.3128</td>
<td>3.92</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>136</td>
<td>4.1096</td>
<td>1.3495</td>
<td>4.15</td>
<td></td>
</tr>
<tr>
<td>Par Rel</td>
<td>136</td>
<td>4.6757</td>
<td>1.4474</td>
<td>4.89</td>
<td></td>
</tr>
<tr>
<td>Gen Schl</td>
<td>136</td>
<td>4.5963</td>
<td>1.4564</td>
<td>4.33</td>
<td></td>
</tr>
<tr>
<td>Same Sex</td>
<td>136</td>
<td>4.9566</td>
<td>1.3732</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>136</td>
<td>4.2993</td>
<td>1.5450</td>
<td>3.52</td>
<td>+</td>
</tr>
</tbody>
</table>
Table 8

Self Concept Scores: Number, Mean, SD and Norm

Comparison of Middle School Females, Fall Testing

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>7</td>
<td>4.0429</td>
<td>1.4234</td>
<td>3.45</td>
<td>+</td>
</tr>
<tr>
<td>Phy App</td>
<td>7</td>
<td>5.0857</td>
<td>0.7647</td>
<td>3.55</td>
<td>+</td>
</tr>
<tr>
<td>Gen Sel</td>
<td>7</td>
<td>4.9571</td>
<td>0.6579</td>
<td>4.74</td>
<td></td>
</tr>
<tr>
<td>Hon Tru</td>
<td>7</td>
<td>5.0571</td>
<td>0.9108</td>
<td>4.59</td>
<td>+</td>
</tr>
<tr>
<td>Phy Abl</td>
<td>7</td>
<td>5.4714</td>
<td>0.4152</td>
<td>4.36</td>
<td>+</td>
</tr>
<tr>
<td>Verbal</td>
<td>7</td>
<td>4.5857</td>
<td>1.1052</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>7</td>
<td>4.8429</td>
<td>1.1356</td>
<td>3.85</td>
<td>+</td>
</tr>
<tr>
<td>Par Rel</td>
<td>7</td>
<td>5.0714</td>
<td>1.1543</td>
<td>4.79</td>
<td></td>
</tr>
<tr>
<td>Gen Schl</td>
<td>7</td>
<td>4.9429</td>
<td>0.8715</td>
<td>4.31</td>
<td>+</td>
</tr>
<tr>
<td>Same Sex</td>
<td>7</td>
<td>5.4857</td>
<td>1.0238</td>
<td>4.91</td>
<td>+</td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>7</td>
<td>4.9857</td>
<td>1.3631</td>
<td>3.33</td>
<td>+</td>
</tr>
</tbody>
</table>
Table 9

**Self Concept Scores: Number, Mean, SD and Norm**

*Comparison of Middle School Females, Spring Testing*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>7</td>
<td>3.8143</td>
<td>1.3434</td>
<td>3.45</td>
<td>+</td>
</tr>
<tr>
<td>Phy App</td>
<td>7</td>
<td>5.0143</td>
<td>0.7010</td>
<td>3.55</td>
<td>+</td>
</tr>
<tr>
<td>Gen Sel</td>
<td>7</td>
<td>5.1714</td>
<td>0.3450</td>
<td>4.74</td>
<td></td>
</tr>
<tr>
<td>Hon Tru</td>
<td>7</td>
<td>5.2429</td>
<td>0.6680</td>
<td>4.59</td>
<td>+</td>
</tr>
<tr>
<td>Phy Abl</td>
<td>7</td>
<td>5.3143</td>
<td>1.1231</td>
<td>4.36</td>
<td>+</td>
</tr>
<tr>
<td>Verbal</td>
<td>7</td>
<td>4.9000</td>
<td>0.7659</td>
<td>4.18</td>
<td>+</td>
</tr>
<tr>
<td>Emot</td>
<td>7</td>
<td>4.6429</td>
<td>0.7678</td>
<td>3.85</td>
<td>+</td>
</tr>
<tr>
<td>Par Rel</td>
<td>7</td>
<td>4.7857</td>
<td>1.4577</td>
<td>4.79</td>
<td></td>
</tr>
<tr>
<td>Gen Schl</td>
<td>7</td>
<td>4.9714</td>
<td>0.7588</td>
<td>4.31</td>
<td>+</td>
</tr>
<tr>
<td>Same Sex</td>
<td>7</td>
<td>5.2786</td>
<td>1.2984</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>7</td>
<td>5.2143</td>
<td>0.7081</td>
<td>3.33</td>
<td>+</td>
</tr>
</tbody>
</table>
Table 10

**Self Concept Scores: Number, Mean, SD and Norm**

**Comparison of Upper School Males, Fall Testing**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>142</td>
<td>3.9113</td>
<td>1.7740</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Phy App</td>
<td>142</td>
<td>3.8789</td>
<td>1.6605</td>
<td>4.28</td>
<td></td>
</tr>
<tr>
<td>Gen Self</td>
<td>142</td>
<td>4.1141</td>
<td>1.6505</td>
<td>4.91</td>
<td>-</td>
</tr>
<tr>
<td>Hon Tru</td>
<td>142</td>
<td>3.9845</td>
<td>1.7128</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Phy Abl</td>
<td>142</td>
<td>4.2035</td>
<td>1.7226</td>
<td>4.75</td>
<td>-</td>
</tr>
<tr>
<td>Verbal</td>
<td>142</td>
<td>3.5570</td>
<td>1.7129</td>
<td>3.92</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>142</td>
<td>3.4599</td>
<td>1.5819</td>
<td>4.15</td>
<td>-</td>
</tr>
<tr>
<td>Par Rel</td>
<td>142</td>
<td>4.0718</td>
<td>1.7985</td>
<td>4.89</td>
<td>-</td>
</tr>
<tr>
<td>Gen Schl</td>
<td>142</td>
<td>4.1049</td>
<td>1.7499</td>
<td>4.33</td>
<td></td>
</tr>
<tr>
<td>Same Sex</td>
<td>142</td>
<td>4.3669</td>
<td>1.7565</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>142</td>
<td>3.7507</td>
<td>1.7373</td>
<td>3.52</td>
<td></td>
</tr>
</tbody>
</table>
Table 11

**Self Concept Scores: Number, Mean, SD and Norm**

**Comparison of Upper School Males, Spring Testing**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>142</td>
<td>3.9035</td>
<td>1.8117</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Phy App</td>
<td>142</td>
<td>3.7021</td>
<td>1.7432</td>
<td>4.28</td>
<td></td>
</tr>
<tr>
<td>Gen Sel</td>
<td>142</td>
<td>3.9986</td>
<td>1.7670</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>Hon Tru</td>
<td>142</td>
<td>3.8303</td>
<td>1.7816</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Phy Abl</td>
<td>142</td>
<td>3.9599</td>
<td>1.8481</td>
<td>4.75</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>142</td>
<td>3.5662</td>
<td>1.7503</td>
<td>3.92</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>142</td>
<td>3.2880</td>
<td>1.5951</td>
<td>4.15</td>
<td></td>
</tr>
<tr>
<td>Par Rel</td>
<td>142</td>
<td>3.7930</td>
<td>1.7975</td>
<td>4.89</td>
<td></td>
</tr>
<tr>
<td>Gen Schl</td>
<td>142</td>
<td>3.9880</td>
<td>1.8405</td>
<td>4.33</td>
<td></td>
</tr>
<tr>
<td>Same Sex</td>
<td>142</td>
<td>4.0796</td>
<td>1.8467</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>142</td>
<td>3.7261</td>
<td>1.8010</td>
<td>3.52</td>
<td></td>
</tr>
</tbody>
</table>
Table 12

Self Concept Scores: Number, Mean, SD and Norm

Comparison of Upper School Females, Fall Testing

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>26</td>
<td>3.2423</td>
<td>1.5224</td>
<td>3.45</td>
<td></td>
</tr>
<tr>
<td>Phy App</td>
<td>26</td>
<td>4.1885</td>
<td>1.4836</td>
<td>3.55</td>
<td></td>
</tr>
<tr>
<td>Gen Sel</td>
<td>26</td>
<td>4.3000</td>
<td>1.4294</td>
<td>4.74</td>
<td></td>
</tr>
<tr>
<td>Hon Tru</td>
<td>26</td>
<td>4.2846</td>
<td>1.4380</td>
<td>4.59</td>
<td></td>
</tr>
<tr>
<td>Phy Abl</td>
<td>26</td>
<td>4.3500</td>
<td>1.5436</td>
<td>4.36</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>26</td>
<td>4.0346</td>
<td>1.5735</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>26</td>
<td>3.3308</td>
<td>1.3062</td>
<td>3.85</td>
<td></td>
</tr>
<tr>
<td>Par Rel</td>
<td>26</td>
<td>4.3308</td>
<td>1.7701</td>
<td>4.79</td>
<td></td>
</tr>
<tr>
<td>Gen Schl</td>
<td>26</td>
<td>4.3846</td>
<td>1.4595</td>
<td>4.31</td>
<td></td>
</tr>
<tr>
<td>Same Sex</td>
<td>26</td>
<td>4.8385</td>
<td>1.5769</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>26</td>
<td>4.4923</td>
<td>1.5947</td>
<td>3.33</td>
<td></td>
</tr>
</tbody>
</table>
### Table 13

**Self Concept Scores: Number, Mean, SD and Norm**

**Comparison of Upper School Females, Spring Testing**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Norm Mean</th>
<th>1/2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>26</td>
<td>3.2500</td>
<td>1.7779</td>
<td>3.45</td>
<td></td>
</tr>
<tr>
<td>Phy App</td>
<td>26</td>
<td>3.9000</td>
<td>1.6774</td>
<td>3.55</td>
<td></td>
</tr>
<tr>
<td>Gen Sel</td>
<td>26</td>
<td>4.2115</td>
<td>1.6691</td>
<td>4.74</td>
<td>-</td>
</tr>
<tr>
<td>Hon Tru</td>
<td>26</td>
<td>4.1654</td>
<td>1.6795</td>
<td>4.59</td>
<td></td>
</tr>
<tr>
<td>Phy Abl</td>
<td>26</td>
<td>4.0192</td>
<td>1.7904</td>
<td>4.36</td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>26</td>
<td>3.9654</td>
<td>1.6985</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Emot</td>
<td>26</td>
<td>3.0962</td>
<td>1.4482</td>
<td>3.85</td>
<td>-</td>
</tr>
<tr>
<td>Par Rel</td>
<td>26</td>
<td>4.0000</td>
<td>1.9281</td>
<td>4.79</td>
<td>-</td>
</tr>
<tr>
<td>Gen Schl</td>
<td>26</td>
<td>4.1967</td>
<td>1.7340</td>
<td>4.31</td>
<td></td>
</tr>
<tr>
<td>Same Sex</td>
<td>26</td>
<td>4.6577</td>
<td>1.8478</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>Oppo Sex</td>
<td>26</td>
<td>4.5846</td>
<td>1.8620</td>
<td>3.33</td>
<td>+</td>
</tr>
</tbody>
</table>
APPENDIX C

SELF DESCRIPTION QUESTIONNAIRE ITEMS BY SCALE
PLEASE NOTE

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

106-113

University Microfilms International
REFERENCES


114


