1986

Self-concept,academic achievement,and sex as correlates of human figure drawings.

Deborah Grubb
Indiana State University

VITA

NAME: Deborah Jean Grubb

PLACE OF BIRTH: Richmond, Kentucky

DATE OF BIRTH: February 24, 1952

EDUCATIONAL HISTORY:

Indiana State University, Terre Haute, Indiana--currently enrolled
Morehead State University, Morehead, Kentucky--M. A. Clinical/School Psychology, 1977
University of Louisville, Louisville, Kentucky--B. A. Psychology, 1975

EMPLOYMENT HISTORY:

Rowan County Public Schools, Morehead, Kentucky, School Psychologist and Special Education Coordinator, 1982-83, 1984-85, current
Fayette County Public Schools, Lexington, Kentucky, Special Education Consultant, 1983-84
Rowan County Public Schools, Morehead, Kentucky, Teacher of the Emotionally Disturbed, 1980-81, 1981-82
Morehead State University, Morehead, Kentucky, Adjunct Professor--Developmental Psychology, 1979-80 to present

ACADEMIC HONORS:

University Fellowship, Indiana State University
Graduate Assistantship, Morehead State University
President's Scholarship, Morehead State University

PROFESSIONAL MEMBERSHIPS:

Kentucky Association of Psychology in the Schools
National Association of School Psychologists
Kentucky Association of School Administrators
Kentucky Coordinators of Area Special Education

PUBLICATIONS:

Handbook on Individual Learning Styles, a cooperative project with the Kentucky Department of Education, published by Morehead State University, 1980

SELF-CONCEPT, ACADEMIC ACHIEVEMENT, AND SEX AS CORRELATES OF HUMAN FIGURE DRAWINGS

A Dissertation

Presented to

The School of Graduate Studies

Indiana State University

Terre Haute, Indiana

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

EPSY

---

by

Deborah Grubb

May 1986

APPROVAL SHEET

The dissertation of Deborah Grubb, contribution to the School of Graduate Studies, Indiana State University, Series III, Number 374, under the title Self-Concept, Academic Achievement, and Sex as Correlates of Human Figure Drawings is approved as partial fulfillment of the requirements for the Doctor of Philosopy Degree.

February 5, 1986
Date

Karl B. Zucker
Chairperson

[illegible]
Committee Member

[illegible]
Committee Member

[illegible]
Committee Member

[illegible]
Committee Member

February 27, 1986
Date

Matthew C. Brennan
For the School of Graduate Studies

ABSTRACT

The purpose of the study was to determine whether or not there is a relationship between children's human figure drawings (HFDs), self-concept measured by the Piers-Harris Children's Self-Concept Scale (CSCS), academic achievement, and sex. The HFDs were analyzed using the Koppitz (1984) scoring system for emotional indicators (EIs), a global rating of "pathological" or "not pathological," critical items drawn from past research, and the Goodenough-Harris (1963) scoring system. The subjects were 120 middle school students matched for sex and drawn from high or low achievement levels on the Comprehensive Test of Basic Skills (CTBS).

The results indicated that each of the HFD scoring methods was related to self-concept on the Piers-Harris CSCS. However, when achievement, sex, Koppitz EIs, critical features, global score, and the Goodenough-Harris score were all included in a stepwise multiple regression analysis, achievement was by far the best single predictor of self-concept.

The results indicated that three of the four HFD scoring methods used in the study were significantly related to achievement level on the CTBS. These were Koppitz EIs, critical features, and the Goodenough-Harris score. A comparison of male and female performance revealed sex differences on Koppitz EIs, one critical feature, and the Goodenough-Harris HFD score. There were no sex differences on the global HFD score or the Piers-Harris CSCS.

The intent of the study was to determine if HFDs could be validated as a measure of self-concept and to determine their relationship to academic achievement and sex. The present research indicates that both global score and individual HFD features are related to self-concept for adolescents. It also indicates that there are significant sex and achievement level differences in HFD performance. It appears that the prudent use of HFDs is as an adjunct to other forms of evaluation.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

INTRODUCTION

STATEMENT OF PURPOSE

The purpose of this study was to determine whether or not there is a relationship between children's human figure drawings (HFDs), self-concept measured by the Piers-Harris Children's Self-Concept Scale (CSCS), academic achievement, and sex. In order to accomplish this, the Koppitz (1984) scoring system for adolescent human figure drawings, a global rating system of "pathological" or "not pathological," critical items drawn from past research, and the Goodenough-Harris (1963) scoring system were compared to a self-report measure of self-concept.

STATEMENT OF THE PROBLEM

A primary part of a school psychologist's work in a school system is to determine why a particular student is not achieving at a level commensurate with classmates. Often this consultation leads to individual evaluation of the child. A frequent comment from the referring teacher, aside from academic information, is that the student appears to be troubled by the academic difficulties and appears to have a poor self-concept. Research has borne out this relationship. A review of self-concept literature between 1955 and 1968 revealed a moderate correlation between self-concept and academic achievement (Leviton, 1975). More recent studies have also demonstrated that self-concept and academic achievement are positively related (Bridgeman & Shipman, 1978; Mintz & Muller, 1977; Muller, Chambliss, & Wood, 1977; Rubin, Dorle, & Sandridge, 1977; and Stenner & Katzenmeyer, 1975) with an interaction of age and sex (Rubin, 1978).

When a child is referred for an individual evaluation, the psychologist designs a test battery to answer questions specific to that child's presenting problem. However, certain tests are usually considered the core of the battery with other tests selected as needed. Research has shown that HFDs are usually a part of the test battery. Sundberg (1961) reported that the Draw-A-Person (DAP) test was the second most frequently used psychological test throughout the country in clinics and hospitals at the time of his survey. Klopfer and Taubee (1976) ranked the DAP as the fifth most frequently used psychological test in the United States. Seventy-three percent of school psychologists were found to use the House-Tree-Person projective drawing technique, and 45 percent used the Draw-A-Person Test, while 44 percent used self-report self-concept scales (Goh & Fuller, 1983). Self-report measures of self-concept do not, therefore, appear to be as widely used as projective drawing techniques.

Aside from the problem of not being used frequently, self-report self-concept scales have also demonstrated questionable reliability and validity (Wylie, 1974). However, recent investigations by Byrne (1983), Marsh, Relics, and Smith (1983) and by Shavelson, Hubner, and Stanton (1976) have found various self-report self-concept scales to be both reliable and valid.

There has been some concern that self-report measures of self-concept are confounded with a social desirability factor with a person presenting himself as he would like others to see him or trying to mark the "right" answer (Ziller, Hagey, & Smith, 1969). This complication of using self-report measures could be overcome if a person's self-concept could be inferred from a projective technique such as a human figure drawing.

Human figure drawings have been commonly used as measures of mental maturity and as projective techniques. They have been found to be related to academic achievement as well. Kellogg (1959) postulated that the structure of a young child's drawing is determined by his age and level of maturation, but the style of the drawing reflects his attitudes and concerns that are important to him at that time. Goodenough (1926) studied the cognitive aspects of children's drawings and developed a scale that measures children's intelligence from HFDs. Harris (1963) revised the test and extended its use to adolescents. Koppitz (1968) devised a scale for estimating mental maturity that was a revision of the Goodenough-Harris scoring system. Koppitz (1984) indicated that HFDs are good measures of overall mental maturity for young children but are questionable for use with adolescents.

Buck (1948) developed the use of children's drawings as a projective technique. He specified a house, tree, and person be drawn because they are items familiar to children and generate richer verbal spontaneity than other items. Machover began using the HFD with adults as a projective measure but later extended the use to children's drawings (1949, 1953).

The popularity of HFDs as a projective technique has not been supported by consistent research findings. Two reviews of the literature of human figure drawing interpretation ended with contradictory conclusions. Roback's (1968) review emphasized that there is a great need for standardized scales for estimating personality adjustment from figure drawings. He emphasized the need for determining which specific features are related to personality patterns. Swenson (1968) conducted a review of the same literature and came to the conclusion that global ratings are the most reliable and, therefore, the most useful aspects of HFDs. Other investigations have also yielded positive results when employing a global rating system as opposed to item analysis (Burton & Sjoberg, 1964; Hiler & Nesvig, 1965; and Stricker, 1967).

Several researchers have found a positive relationship between HFDs and academic achievement or attitudes about achievement (Silvern, Brooks, Griffin, & Lee, 1980; and Brooks, 1978). However, Silvern and Brooks (1980) found that there may be an interaction between size of figure drawn, achievement level, and frustration level.

Several studies have revealed a significant relationship between students with learning problems and atypical HFDs (Bachara, Zaba, & Raskin, 1978; DiLeo, 1973; and Eno, Elliott, & Woelke, 1981). Wagner (1980) proposed that learning disabled students show secondary emotional reactions to their primary disability.

Besides her developmental scale, Koppitz (1968, 1984) developed a list of Emotional Indicators (EIs) for use with children and adolescents. Koppitz viewed the presence of two or more EIs on a child's HFD as highly suggestive of emotional problems and poor interpersonal relationships.

HFDs have also been used to examine normal personality development, particularly as an indicator of a child's self-concept. Buck (1948) proposed that a person's self-image was projected through HFDs. Harris (1963) proposed that the distortion found in self-drawings may be literal or symbolic representations of the artist's self-image. Machover (1949) indicated that the drawing of a person involves a projection of body-image and is a vehicle for expressing one's body needs and conflicts. However, the research comparing children's HFDs to self-concept yields inconsistent and often contradictory results. This lack of consistent findings appears, at least in part, to be due to inadequate research designs and broad generalizations made from limited results. For example, global scoring compared to scoring for specific features (formal characteristics) has found more consistent results using the global scoring system. Part of this may be due to most researchers using only one formal feature (e.g. size) instead of a comprehensive system of feature scoring. Other possibly confounding variables are whether the tests were administered individually or in groups, whether the sample consisted of all normal or abnormal groups, the specific measure of self-concept used, and sex differences in HFD performance.

RATIONALE FOR THE STUDY

The present study was an attempt to explore the complexity of HFD interpretation by utilizing a more comprehensive approach to HFD analysis than previous studies. Specifically, a comparison was made of four HFD scoring systems to determine their relationship to a self-report measure of self-concept (Piers-Harris CSCS) for middle school students of differing academic levels. Adolescents were chosen because self-concept becomes more stable with age and the Koppitz (1984) scoring system is geared to that age. Sex differences on the HFD scoring systems and the self-concept scale were also explored due to the lack of research in this area. These scoring systems were Koppitz' new scoring system for emotional indicators in adolescents' HFDs, a global scoring system of "pathological" or "not pathological," various critical features identified from a review of HFD literature, and the Goodenough-Harris scoring system.

An attempt was made to explore the following issues:

1. Is the 1984 Koppitz HFD scoring system for EIs (Appendix A) related to the self-concept of adolescents using the Piers-Harris CSCS?
2. Is a global rating scale of HFDs (pathology versus no pathology) related to self-concept as measured by the Piers-Harris CSCS?
3. Are other critical features (Appendix B) of HFDs related to self-concept as measured by the Piers-Harris CSCS?
4. Is the Goodenough-Harris HFD scoring system related to self-concept on the Piers-Harris CSCS?
5. Do students of differing academic achievement levels (using stanine scores from the CTBS) score differently on any HFD scoring system in the present study or the Piers-Harris CSCS?
6. Is there a sex difference on any HFD scoring system in the present study or the Piers-Harris CSCS?

Chapter 2

REVIEW OF THE LITERATURE

SELF-CONCEPT

Definition. Self-concept is an individual's perception of self. It is a multidimensional perception of self, formed through experience with the environment, interaction with significant others, and attributions of his or her own behavior (Shavelson et al., 1976). The early work of Lecky (1945) identified self-concept as the nucleus of one's personality. Byrne (1983) defined self-concept as one's total perception of one's self, including one's attitudes, feelings, and knowledge about one's abilities, skills, appearance, and social acceptability. Epstein (1973) developed a summary of the nature of self-concept:

1. It is a subsystem of internally consistent hierarchically organized concepts contained within a broader conceptual system.
2. It contains different empirical selves, such as a body self, a spiritual self, and a social self.
3. It is a dynamic organization that changes with experience. It appears to seek out change and exhibits a tendency to assimilate increasing amounts of information, thereby manifesting something like a growth principle.
4. It develops out of experience, particularly out of social interaction with significant others.

5. It is essential for the functioning of the individual that the organization of self-concept be maintained. When the organization of the self-concept is threatened, the individual experiences a threat.
6. There is a basic need for self-esteem which relates to all aspects of the self-system, and, in comparison to which, almost all other needs are subordinate.
7. The self-concept has at least two basic functions. First, it organizes the data of experience, particularly experience involving social interaction, into predictable sequences of action and reaction. Second, the self-concept facilitates attempts to fulfill needs while avoiding disapproval and anxiety. (page 6)

Epstein claimed that self-concept is actually a self-theory with the fundamental purpose of optimizing the pleasure/pain balance of the individual over the course of a lifetime. Rosenberg (1979) defined self-concept as all of the thoughts and feelings an individual has with reference to himself as an object.

William James (1918) defined self-esteem as the relationship between actual achievement and aspirations or values in a given area. If achievements compare favorably with aspirations in a valued area, the result is high self-esteem. If there is a large discrepancy between achievement and aspiration, the result is low self-esteem. Marsh et al. (1983) noted that self-concept is both evaluative and descriptive; therefore, there is little or no empirical support for a distinction between self-esteem and self-concept.

For the purposes of the present study, self-concept will be defined as one's total perception of one's self. It has developmental aspects and is the result of a dynamic relationship between the individual, the environment, and significant others. Self-concept, self-esteem, and self-image will be used interchangeably in the remainder of the present research.

A person's perception of himself has been reported to be an interactive process between attributes of self, environment, and significant others. Consequently, it has been viewed as a relatively stable but continually changing construct. Many studies have attempted to outline the developmental aspects of self-concept.

Development of self-concept. Epstein (1973) proposed that there are three developmental components of self-concept. The development of a body self, an inferred inner self, and a moral self. Children begin to develop a sense of body self when they recognize that their own body is one of a larger subset of all human bodies and that one's body is uniquely one's own. Epstein proposed an inferred inner self develops following the development of a body self. Sources for inferring an inner self include a feeling of continuity of experience, awareness of the need to defend some inner aspect of one's being against threat, and an awareness of a tendency to automatically evaluate oneself.

After the inferred inner self is established, an individual develops what Epstein (1973) termed a moral self. The moral self develops because of the need to obtain approval and to avoid disapproval. Children internalize standards and feel pleased with themselves and love worthy when they behave according to their internalized standards, and feel guilt-ridden and unworthy of love when they violate these standards. Epstein stated that a sudden drop in self-esteem is more distressing than a chronically low level of self-esteem. He theorized that individuals who anticipate that they are in a situation where their self-esteem will be lowered will tend to chronically devaluate themselves in order to prevent being exposed to sudden decreases in self-esteem.

In a review of theories, Coopersmith (1967) concluded that there are four factors likely to affect development of self-esteem: the treatment a person receives from significant others, the person's history of success and status in the world, the individual's values and aspirations, and the way the individual responds to devaluation by others--whether it is rejected or internalized. He identified four sources of self-esteem: power--the ability to influence and control others; significance--acceptance, attention, and affection by others; virtue--adherence to moral and ethical standards; and competence--successful achievement.

Marsh et al. (1983) support the assumption that self-concept is multidimensional and that it becomes increasingly multifaceted as an individual moves from infancy to adulthood. They found two independent factor structures in self-concept: academic and nonacademic. They demonstrated that academic achievement is not correlated with self-concept in nonacademic areas and is significantly correlated with self-concept in academic areas.

Piers and Harris (1964) attempted to overcome the lack of longitudinal studies of self-concept by studying a cross section of children in grades three, six, and ten. They found that children in grades three and ten showed significantly higher self-concepts than children in the sixth grade, although they were not significantly different from each other. It appears the neo-pubertal period is a time of decreased general self-concept.

Rubin (1978) conducted a cross-sectional study of nine year olds, twelve year olds, and fifteen year olds and found that self-esteem became more stable as the children grew older. She proposed that younger children's self-perceptions are less firmly established and, therefore, may be more responsive to intervention at earlier ages. Zingale (1982) also found that older children have more stable self-concepts than younger children and that children with high self-esteem have more stable self-concepts than their peers with lower self-esteem.

In summary, the literature related to self-concept development suggests that the development of a stable and multidimensional self-concept is an important factor in the transition from childhood to adulthood.

Self-concept and academic achievement. A number of theorists have proposed a relationship between self-esteem and academic achievement (Brookover, LePere, Hamacheck, Thomas, & Erickson, 1965; Coopersmith, 1967; Purkey, 1970). Leviton (1975) reviewed the self-concept literature between 1955 and 1968 and found a consistent moderate correlation between self-concept and academic achievement. This relationship was stronger for males than females and was often determined from studies on children with learning problems.

Rubin (1978) found that self-esteem became more stable and more highly correlated with school achievement as the children grew older. She also found that self-esteem ratings at earlier ages (age nine compared to age fifteen) are more closely related to academic achievement for girls than for boys. Rubin, Dorle, and Sandridge (1977) found a significant relationship between self-esteem and achievement in a normal school population, as did Bridgeman and Shipman (1978), Mintz and Muller (1977), Muller, Chambliss, and Wood (1977), and Stenner and Katzenmeyer (1975). Piers and Harris (1964) found a consistent but low correlation between self-concept and achievement. The relationship was considerably greater at the sixth grade than at the third grade level. Diesterhaft and Gerken (1983) found a positive relationship between a student's self-concept, locus of control, and academic achievement and overachievement or under-achievement. The relationships were stronger for females than males.

Shavelson et al. (1976) stated that self-concept is a critical variable in education and that the improvement of a student's self-concept seems to be valued as an educational outcome in its own right. This is true whether self-concept is viewed as an outcome of academic achievement or as a moderator variable that can influence academic achievement (Benner, Frey, & Gilberts, 1983). Brookover et al. (1965) emphasized the importance of this relationship when they found that people seldom perform beyond the upper limits of their own self-evaluation. Students who have academic difficulty may begin to view themselves as failures, setting up a self-fulfilling prophecy.

Although research findings dealing with the relationship between self-concept and academic achievement differ in some respects, there appears to be general agreement that there is a significant relationship between a positive self-concept and successful academic achievement. Therefore, it is crucial to have a measurement of self-concept that is both reliable and valid.

Measurement of self-concept. Wylie (1974) reported that many instruments used to measure self-concept lack any evidence of reliability and/or validity and leave the reader to infer what he or she will, based on face validity. Recent investigations by Byrne (1983), Marsh et al. (1983) and by Shavelson et al. (1976) have attempted to address this problem.

Byrne (1983) found the Coopersmith Self-Esteem Inventory (SEI) (Coopersmith, 1967), the Self-Esteem Scale (SES) (Rosenberg, 1965), and the Self-Concept of Ability Scale (SCA) (Brookover, 1962) met the criteria for convergent and discriminant validity. The scores on each were also reliable on a test-retest correlation over a six-month period.

Marsh et al. (1983) investigated the validity of interpretations based on the Self-Description Questionnaire (SDQ). Their findings provided support for the Shavelson et al. (1976) multidimensional model, the construct validity of self-concept, and the validity of interpretations based upon the SDQ. Shavelson et al. (1976) investigated the construct validity of five self-report measures of self-concept (the Michigan State Self-Concept of Ability Scale, the Coopersmith Self-Esteem Inventory, the How I See Myself Scale, the Piers-Harris Children's Self-Concept Scale, and the Self-Concept Inventory). All five were considered to warrant self-concept interpretations and to support a multidimensional view of self-concept.

The Piers-Harris CSCS was selected in the present study as the self-report measure of self-concept due to a positive relationship to academic achievement and an inconsistent relationship to HFD performance. A factor analysis revealed a subfactor of academic self-concept within the general self-concept on the Piers-Harris CSCS (Piers and Harris, 1964). A relationship of the Piers-Harris CSCS to HFDs was not supported in a study by Gramlich (1984). She found no relationship between the Piers-Harris CSCS score and Koppitz EI HFD performance of normal elementary school age children. She recommended an exploration of the relationship with an abnormal population. Ottenbacher (1981) found the Piers-Harris CSCS related to size of HFD in residential mentally retarded individuals. No studies have compared the Piers-Harris CSCS to a comprehensive HFD scoring procedure using an academically abnormal population.

Self-report measures of self-concept, like the previously mentioned questionnaires, are possibly confounded with a social desirability factor (Ziller et al., 1969). Individuals may present themselves as they would like others to see them instead of how they really see themselves. Also, children in an academic setting may try to mark the "right" answer--the answer they feel the examiner prefers. This complication of using self-report measures could be overcome if a person's self-concept could be inferred from a projective technique such as a human figure drawing.

HUMAN FIGURE DRAWINGS

Human figure drawings are usually viewed as either a measure of mental maturity or as a projective technique. Kellogg (1959) postulated that the structure of a young child's drawing is determined by age and level of maturation, but the style of the drawing reflects the attitudes and concerns that are important to the child at that time.

Developmental measure. A review of the literature reveals consistent relationships between HFDs and child development. Goodenough (1926) studied the cognitive aspects of children's HFDs. She reported that Ebenezer Cooke wrote an article in 1885 in England that described developmental stages in children's drawings. Goodenough developed a scale that measures children's intelligence from HFDs. Harris (1963) revised the test and extended its use to adolescents. The literature on the reliability and validity of HFDs to estimate a child's developmental level has upheld its use (Brown, 1977; Pihl & Nimrod, 1976). Pikulski (1972) found a significant correlation between both the Goodenough and Goodenough-Harris HFD scoring systems and intelligence quotient scores on the Wechsler Intelligence Scale for Children. However, there was a stronger correlation for Performance than Verbal subscale scores for disabled readers. Wysocki and Wysocki (1973) found that seven aspects of HFDs significantly differentiated mildly retarded from average intelligence children. These aspects were size, erasure, clothing, fingers, detail, symmetry, and arm position.

Koppitz (1968) devised a scale for estimating mental maturity that was a revision of the Goodenough-Harris scoring system. She hypothesized that the presence or absence of developmental items on an HFD is related to the age and mental maturity of the child and is not a product of artistic ability, school learning, the instructions given, or the drawing medium used. Gayton, Tavormina, Evans, and Schuch (1974) compared Harris' and Koppitz' developmental scoring systems and concluded that the Koppitz scale is as reliable as the Harris scale even though it has half the number of items. Koppitz (1984) indicated that HFDs are good measures of overall mental maturity for young children but are questionable for use with adolescents. She theorized that the absence of expected items on HFDs by adolescents is more often associated with emotional problems than with limited mental ability.

Academic measure. Several researchers have found a positive relationship between HFDs and academic achievement or attitudes about achievement. Silvern et al. (1980) and Brooks (1978) found that height of HFD was significantly correlated with achievement level, with high achievers drawing significantly taller pictures than low achievers. Silvern and Brooks (1980) followed up on this research because they noted that the variance in the size of the drawing was extremely large for low achievers. They found that there may be an interaction between size of figure drawn, achievement level, and frustration level. Low achievers who had a negative attitude toward school drew larger pictures than low achievers who had a positive attitude toward school. They explained this as a frustration effect and indicated there could be a bimodal distribution for size of drawing and achievement.

Studies of children with learning problems have revealed a significant relationship between students identified as learning disabled and Koppitz' Emotional Indicator (EI) scoring system. Raskin and Beatty (1973) compared the HFDs of children referred for testing who were later identified as learning disabled. They reported significantly more emotional indicators in the drawings of the clinic group than a control group. Eno et al. (1981) also used the Koppitz scoring system and found the results of a discriminant function analysis suggested that learning disabled students could be distinguished from other groups on the basis of the type of emotional indicators present in the HFD. The significant factor was omission of body parts.

DiLeo (1973) also noted significant differences between HFDs of children with and without learning problems. He found that the difficulty with HFDs was not a result of visual problems, but was an indication of a lag in development or an emotional disturbance. Bachara et al. (1978) also compared the emotional functioning on HFDs of children with and without learning problems. They found the children with learning problems displayed a significantly higher frequency of figures with feet and hands omitted and excessive attention to the eyes. Their results supported the assumption that the children with learning problems have more signs of emotional involvement than children without learning difficulties. Wagner (1980) studied the HFDs of learning disabled students and provided data to support the hypothesis that learning disabled students show secondary emotional reactions to their primary disability.

Projective measure. Studies using HFDs as projective techniques do not yield the consistent relationships seen between HFDs, development, and academic achievement. Buck (1948) developed the use of children's drawings as a projective technique. He specified a house, tree, and person to be drawn because they are items familiar to children and generate richer verbal spontaneity than other items. Machover began using the HFD with adults as a projective measure but later extended the use to children's drawings (1949, 1953).

The popularity of HFDs as a projective technique has not been supported by consistent research findings. Two reviews of the literature of human figure drawing interpretation ended with contradictory conclusions. Roback's (1968) review emphasized that there is a great need for standardized scales for estimating personality adjustment from figure drawings. He was critical that, in the clinical setting, interpretations based on figure drawings are usually impressionistic and based upon a global assessment of the data. He indicated that this is actually just a reflection of the artistic quality of the drawing.

Swenson (1968) conducted a review of the same literature and came to the conclusion that global ratings are the most reliable and, therefore, the most useful aspects of HFDs. He found the reliability of global measures are, for the most part, over .80, but that the reliability of the various structural and formal aspects generally varied between .30 and .51. He attributed the lack of consistency in the research of HFDs to the lack of reliability of the scoring factors used. He concluded that structural and content variables have reliabilities that are probably too low for making reasonably reliable clinical judgments. Other investigations have also yielded positive results when employing a global rating system as opposed to item analysis. Burton and Sjoberg (1964) used naive observers (artists and surgeons) as well as clinical psychologists to evaluate the drawings of schizophrenics. The judges found an impaired holistic integration of the person reflected in their drawings. Hiler and Nesvig (1965) found four valid criteria of pathology: bizarre, distorted, incomplete, and transparent. The valid criteria for normals were happy expression and nothing pathological. Stricker (1967) found that clinicians who used Hiler and Nesvig's global scoring system were more accurate in predicting psychopathology than persons using systems scoring for specific items.

However, another comparison of the efficiency of various scoring systems applied to children's HFDs concluded that the discriminatory potential of HFD scales is largely accounted for by the inclusion of certain critical items (Hall & Ladriere, 1970). These critical items involve gross omissions, major distortions, or fragmentation of the drawing. They found three scoring systems that contained a high percentage of the critical items which are useful in screening and prediction relative to emotional and school adjustment. However, they concluded that no system gave any evidence of differential diagnostic potential because item analysis revealed no item from any of the scales capable of distinguishing between the HFDs of different diagnostic groups.

Wanderer (1969) and Watson (1967) found that HFDs can be used to identify mental defectives but cannot be used to differentiate schizophrenics, neurotics, homosexuals, or normals. Hammer (1969) rebutted Wanderer's study on the basis of methodological errors and clinical considerations. He stated that it is unfair to use such a small projective sample (one drawing) in making a blind interpretation. He equated this to being limited to using only one or two Rorschach cards or the first few questions on the MMPI with the task of placing an individual in a diagnostic category. Hammer proposed that drawing techniques needed to be expanded to more samples to provide more clinical data.

Falk (1981) provided a defense of the use of HFDs and made suggestions for future research. He stated that HFDs are a useful tool when they are used in conjunction with other tests to help in better understanding an individual's internal conflicts and aiding in prediction of behavior and choice of therapy. He complained that most HFD research has equated validity with the ability of HFD analysis to classify groups of patients as abnormal or normal. Falk also reported that most HFD research has been done on adult populations even though children are the most appropriate target. Drawing is a natural activity for children; they become absorbed in doing drawings, and they have a greater tendency than adults do to communicate clues about how they feel and think through nonverbal channels. On the other hand, many adults feel foolish doing a drawing or are overly preoccupied with trying to determine what the psychologist is going to read into their drawings. Falk suggested future research should establish exactly which aspects of HFDs are valuable and how they can be standardized and employed for greater utility.

In summary, both global scoring methods and item analysis of specific HFD factors have yielded inconsistent results for the use of HFDs as projective measures. Much of the discrepancy appears to be due to methodological differences in the research designs. Due to the positive findings of a substantial number of studies attempting to use HFDs as projective measures, it seems justifiable to view HFD analysis as a useful aid in understanding the dynamics of an individual personality, particularly when used in conjunction with other forms of evaluation.

HFDs and self-concept. The relationship between self-concept and HFDs has been the focus of considerable research and theorizing in recent years. There have been many attempts to classify a child's self-concept using various aspects of HFDs. Buck (1948) proposed that a person's self-image was projected through HFDs. Harris (1963) proposed that the distortion found in self-drawings may be literal or symbolic representations of the artist's self-image. Machover (1949) indicated that the drawing of a person involves a projection of body-image and is a vehicle for expressing one's body needs and conflicts:

> The human figure drawn by an individual who is directed to "draw a person" relates intimately to the impulses, anxieties, conflicts, and compensations characteristic of that individual. In some sense, the figure drawn is the person, and the paper is the environment. (p. 35)

The popularity of HFDs as a measure of self-concept has not been supported by consistent research findings. A survey of the literature comparing HFDs with various self-report self-concept measures yields inconsistent and often contradictory results. Much of this inconsistency appears to be due to differences in research designs. When global scoring has been compared to scoring for specific features (formal characteristics), more consistent results have been found using the global scoring system. Part of this may be due to most researchers' using only one formal feature (e.g. size) instead of a comprehensive system of feature scoring. Other possible confounding variables are whether the tests were administered individually or in groups, whether the sample consisted of all normal or abnormal groups, and which specific measure of self-concept was used.

Normal versus abnormal populations of the studies may also be related to whether significant results were obtained with HFDs. Fu (1981) found self-concept unrelated to HFDs in a large sample of normal girls age 9 to 11. It was hypothesized that the lack of significant findings may have been related to the students' lack of total involvement in the HFD task. Koppitz (1968) asserted that normal children tend not to be emotionally involved in their production of HFDs. Gramlich (1984) also found self-concept unrelated to HFDs in a sample of normal students. She suggested further research on an abnormal population.

Sex differences on HFDs. Very few studies report any sex differences on HFD performance. Craddick (1963) found a sex difference in HFDs in terms of drawing same or opposite sex first. Males drew males first significantly more often than females drew females first. Cohen, Money, and Uhlenhuth (1972) found a sex difference in size of HFDs. They reported that females drew taller self-drawings and males more accurately depicted their height relationships with self-drawings and friend-drawings. Delatte and Hendrickson (1982) also identified a sex difference in HFD performance. They found a bimodal distribution of size of HFD drawings with males but not females.

Koppitz (1968) did not report sex differences on HFD performance as a correlate of emotional difficulty and her EI scoring approach to adolescents' HFDs (1984) does not mention sex differences. However, she reported a developmental aspect to HFD production emphasizing that the drawings of females in the primary grades are superior to those of males, but that males catch up and often surpass the females by age nine. She also reported that at all age levels there are masculine and feminine items that occur more often on the HFDs of males or females respectively. Masculine items included the following: profile drawing, knees and ears present, and figures engaged in physical activity. Feminine items included the following: hair, pupils, eyebrows, two lips, and clothing (1968).

Some of the inconsistency of results on HFD research may be due to sex differences that the model did not control. The present study will attempt to explore sex differences on various HFD scoring methods.

Global scoring systems. It has already been mentioned that Swenson (1968) found global scoring systems more reliable than systems using formal characteristics. Because of this, it could be expected that global measures would more consistently be correlated with a variety of variables, including self-concept. Coopersmith, Sakai, Beardslee, and Coopersmith (1976) found that global-interpretative categories proved more differentiating between self-esteem groups than did formal characteristics. They used a simple plus (nonpathological) or minus (pathological) global rating. Two other investigations found a positive relationship between HFDs and global scoring on real, ideal, or least-liked self ratings (Van Dyne & Carskadon, 1978; Kamono, 1960).

Arkell (1976) compared the accuracy of five groups of judges (trained psychologists and laymen) in inferring HFD pathology. He found no significant differences between groups and suggested that intuition gained through unsystematic observation over a number of years played the major role in interpretation. Regardless of training background, the judges were approximately 80 percent accurate in classifying drawings as from a normal or an emotionally disturbed population.

Thus, some research has indicated that global impressions gained from the overall HFD appear to be more reliable than specific HFD features and more consistently correlated with self-concept. This global HFD interpretation does not seem to be a function of specific training in HFD analysis. It appears to be a product of developing an expectation of what HFDs should look like through unsystematic observation of people drawing pictures of people.

Formal scoring systems. Numerous researchers have used a formal scoring system for specific features approach. Bodwin and Bruck (1960) attempted to validate a Self-Concept Scale Draw-A-Person (SCS-DAP) test. Of thirteen characteristics measured, item analysis revealed opposite sex drawn first, sketchy lines, incompleteness, transparency, immaturity, primitiveness, reinforcement of lines, erasures, and distortion all were related to poor self-concept. Asymmetry, detail in figure, shading, and mixed age were unrelated. Prytula and Thompson (1973) also found transparencies related to self-concept.

Bennett (1966) measured 27 variables of HFDs and found five of them were significantly related to the drawer's self-concept. The items were normal or abnormal page placement, buttons present or absent, ears present or absent, relative size of head to body (normal or abnormal), and heels present or absent. She emphasized that these traits in combination may give some cues about self-concept but that a cookbook approach of "this item in a drawing equals this in a drawer's personality" is not appropriate.

Calhoun, Whitley, and Ansolabehere (1978) used a more comprehensive approach and compared Goodenough-Harris Drawing Test scores and scores on the Coopersmith Self-Esteem Inventory with educable mentally retarded students. There was a significant relationship for secondary but not primary grade students. Fu (1981) did not find self-concept related to omission of the following major body parts: head, neck, trunk, arm, hand, leg, or foot. However, all were non-clinical preadolescents.

Analysis of specific features of HFDs have found the following to be related to self-concept: drawing qualities (sketchy lines, incompleteness, transparency, primitiveness, reinforcement of lines, erasures, distortions), omissions of buttons, heels, and ears (but not major body parts), opposite sex drawn first, abnormal page placement, and relative size of head to body. However, presence or absence of specific HFD features have not proved as reliable as overall global scoring techniques and may not be appropriate for direct interpretation without other supporting data.

Size of drawing. The single most widely researched factor of HFDs compared to self-concept is the size of the figure drawn. Results have been very inconsistent. Prytula and Thompson (1973) found that ten- to thirteen-year-old children with high or low self-esteem on the Coopersmith SEI did not differ in terms of the size of the figure drawn. Dalby and Vale (1977) studied the critical dimensions of absolute height of self-figures of fifth graders in relation to their drawn figures of two peers and found self-esteem (as measured by the Coopersmith SEI) unrelated to either.

Prytula, Phelps, Morrissey, and Davis (1978) did not find a correlation between size of drawing and scores on the Piers-Harris CSCS or the Coopersmith SEI. Bennett (1964) used a self-concept Q sort and found no correlation between self-esteem of sixth graders and size of figure.

However, many researchers have found a significant relationship between size of HFD and self-concept measured by a variety of scales. Ottenbacher (1981) found size of self-drawing was significantly related to the score on the Piers-Harris CSCS in residential mentally retarded individuals. Schaefer (1975) used a Semantic Differential technique and found it significantly related to size of HFD. Prytula and Leigh (1972) also found a relationship between size of figure drawn and self-concept. However, the results were in the opposite direction of what would be expected. They found institutionalized orphans (presumed lower self-concept) to have larger HFDs than noninstitutionalized children from intact families. There was no test for self-concept administered.

Delatte and Hendrickson (1982) identified a possible confounding factor in examining size of HFD compared to self-concept. They found a bimodal distribution with respect to size for males only. There was a significant linear relationship between self-esteem (Rosenberg Self-Esteem Scale) and width of HFD, and a significant curvilinear relationship between self-esteem and height and self-esteem and area of HFD. For females, there was no relationship between self-esteem and any measure of size of HFD. Previous studies that have used statistical methods involving arithmetic means may have been affected by the possibility of a bimodal distribution.

Another possibly confounding variable in size of HFD studies is whether the subjects were tested individually or in groups. Hollings (cited in Wilee and Davis, 1976) and Wilee and Davis (1976) found that significant relationships may be obtained with individual administration of the HFD but not in a group setting. Hollings reviewed the literature and found more significant results between HFD size and self-esteem when subjects were tested individually. That hypothesis is supported by the negative findings of Dalby and Vale (1977), Prytula et al. (1978), and Prytula and Thompson (1973) who all used group administration of the HFD. Of the studies already cited reporting a significant relationship between self-concept and HFD size, Ottenbacher (1981) and Wilee and Davis (1976) used individual HFD administration, whereas Prytula and Leigh (1972) and Schaefer (1975) used group HFD administration. It was not possible to determine from the remainder of the studies whether the testing had been done individually or in groups.

Only one study was located using an experimental design as opposed to correlational design in exploring HFD size and self-esteem. Ludwig (1969) gave negative feedback in the form of criticism of the subject's physical abilities between pre-tests and post-tests of self-concept and HFDs. Students with lowered self-esteem following negative feedback demonstrated a constriction of the height of the person drawn when the pre-test and post-test HFDs were measured.

In summary, size of drawing is the most widely studied feature of HFDs. Many studies purport to determine whether or not there is a relationship between HFDs and self-concept. The majority of these studies used the size of the drawing as the only HFD feature analyzed. There have been inconsistent findings with positive, negative, and no relationships reported. There has been great variability in the research methodology, which probably accounts for much of the inconsistency of results. Factors that have been found to be significant confounding variables include abnormal population of subjects, sex of subjects, group versus individual test administration, and bimodal distribution of size of drawing compared to self-concept.

Koppitz scales. Koppitz has developed three scales for the evaluation of HFDs (1968, 1984). She derived the Developmental Items from the Goodenough-Harris (Harris, 1963) scoring system and her own clinical experience. At any age level there are items that are "expected," "not unusual," and "exceptional." Drawings are scored for the presence or absence of expected and exceptional items and IQ estimates derived. Exceptional items are hypothesized to be present only on the drawings of children with above-average intelligence (Koppitz, 1968).

Koppitz (1968) also developed a 30-item scale of Emotional Indicators (EIs) for use with children 5 to 12 years of age. For the scale, Koppitz chose items that met the following criteria: clinical validity--differentiates between the HFDs of children with and without emotional problems; infrequency in normal children--occurs less than 16 percent of the time in normal children; and is unrelated to age or maturational level. Koppitz viewed the presence of two or more EIs on an HFD as highly suggestive of emotional problems and poor interpersonal relationships.

Most recently, Koppitz (1984) developed a scoring system for emotional indicators on the HFDs of adolescents. She identified 28 items which she found differentiate students with and without emotional problems. Again, the presence of two or more EIs on an HFD is indicative of emotional difficulty. Koppitz identified five factors in the present scoring system: impulsivity, insecurity and feelings of inadequacy, anxiety, shyness and timidity, and anger and aggressiveness. To date, there has been no outside research to validate the scale or the factors she identified in the 1984 scale.

The research on the 1968 Koppitz scoring system for EIs reveals mixed findings. Dieffenbach (1978) was not able to replicate Koppitz' findings on the validity and reliability of the EIs. Fuller, Preuss, and Hawkins (1970), however, did replicate Koppitz' findings that EIs occur more often in the HFDs of disturbed children.

Koppitz (1968) proposed that six of the EIs differentiated between matched groups of shy and aggressive children. Lingren (1971) attempted to replicate that finding and found no significant differences. Lingren concluded that, with 75 percent of shy children and 90 percent of aggressive children producing HFDs not scorable for EIs, one is forced to wonder about their practical significance. However, Handler and McIntosh (1971) found that Koppitz' indicators did correctly identify aggressive and withdrawn children. They found that 67 percent of the children were correctly classified by the aggressive indicators and 45 percent were correctly identified by the shyness indicators. Hall and LaDriere (1970) found that problem and nonproblem children could be distinguished using Koppitz' emotional indicators and Koppitz' scoring for developmental items. However, neither scale could distinguish between emotionally disturbed and perceptually handicapped students.

Gramlich (1984) specifically compared Koppitz' (1968) scoring for EIs to a self-report measure of self-concept, the Piers-Harris CSCS. She measured the differences between high and low self-concept groups in total number of EIs, total number of EIs in each factor category, and presence of each EI. She found no differences between the high and low self-concept groups on any one of the variables or any combination of them. However, her study was limited to nonclinical students and the testing was performed in a group setting.

As previously reported, several investigators have found a relationship between academic achievement and Koppitz' scoring for EIs on HFDs (Bachara et al., 1976; Eno et al., 1981; Raskin & Beatty, 1973).

Due to the inconsistency of results using the Koppitz' scales and other formal and informal scoring techniques for HFD interpretation, there is a need for further study to clarify which factors are significantly related to achievement and emotional integrity, including self-concept.

Chapter 3

RESEARCH METHODOLOGY

RESEARCH QUESTIONS

The present research was an attempt to determine if any of the 28 Koppitz' EIs, the Goodenough-Harris score, the pathological versus non-pathological global score, or any of five critical HFD features are, by themselves or in combination, predictors of self-concept, as measured by the Piers-Harris CSCS. The investigation was also done to determine if there is a difference in Piers-Harris CSCS scores due to the sex or achievement level of the subject. Furthermore, the four HFD scoring scales mentioned above were examined to determine whether there was a relationship between sex or achievement level and HFD performance. The following research questions were addressed in this study:

1. Which of the independent variables are the best predictors of self-concept as measured by the Piers-Harris CSCS?
2. Is the Koppitz adolescent HFD scoring system for EIs (Appendix A) related to self-concept as measured by the Piers-Harris CSCS?
3. Is a global rating scale of HFDs (pathology versus no pathology) related to self-concept as measured by the Piers-Harris CSCS?
4. Are other critical features (Appendix B) of HFDs related to self-concept as measured by the Piers-Harris CSCS?
5. Is the Goodenough-Harris HFD scoring system related to self-concept as measured by the Piers-Harris CSCS?

6. Do students of differing academic achievement levels (CTBS) score differently on the Piers-Harris CSCS?
7. Do students of differing academic achievement levels (CTBS) score differently on any of the HFD scoring systems in the present study?
8. Is there a sex difference on any of the HFD scoring systems in the present study?
9. Is there a sex difference on the Piers-Harris CSCS?

DEFINITION OF TERMS

For the purpose of this study, terms were defined as follows:

1. Self-Concept/Self-Esteem. Marsh et al. (1983) reported there is little or no support for a distinction between self-esteem and self-concept. For the purposes of this study, the constructs are interchangeable.
2. Self-Report Measure of Self-Concept. An instrument that requires the subject to assign traits to himself or herself is a self-report measure of self-concept. It usually consists of either forced-choice format or a yes/no scale of attribution.
3. HFD Developmental Level. The HFD developmental level is the level of mental maturity an individual attains, as it is reflected in the presence of certain features in their HFDs. The number of items present are added to derive a mental age score, which can then be compared to chronological age or used to derive an estimated IQ.

4. Developmental Item on HFD. Koppitz (1968) defined a developmental item as an item that occurs on only a few HFDs of younger children and increases in frequency as age increases.
5. Projective Technique. A projective technique is an evaluation technique based on the observation of how an individual defines and gives meaning to more or less meaningless stimuli or situations, thus projecting one's own personality onto external stimuli (Tallent, 1980).
6. Global Rating of HFDs. A global rating scale is a score for the overall quality of the drawing. For example, "pathological" versus "nothing pathological" is a global rating, and the one used in the present study.
7. Structural/Formal Scoring of HFDs. Structural and formal characteristics of HFDs include general characteristics such as size, position on page, line quality, etc. The Koppitz and Goodenough-Harris scoring systems are also examples.

NULL HYPOTHESES

The research questions previously mentioned are stated here in the form of null hypotheses:

1. There is no relationship between self-concept as measured by the Piers-Harris CSCS and any of the 37 independent variables (Appendix E).
2. There is no significant relationship between self-concept as measured by the Piers-Harris CSCS and the Koppitz adolescent HFD scoring system.

3. There is no significant difference between low, medium, and high self-concept group levels on the global scoring system of HFDs used in the present study.
4. There is no significant relationship between self-concept as measured by the Piers-Harris CSCS and the presence of HFD critical features (Appendix B).
5. There is no significant difference between low, medium, and high self-concept group levels on the Goodenough-Harris HFD scoring system.
6. There is no significant relationship between academic achievement (CTBS) and self-concept as measured by the Piers-Harris CSCS (Appendix D).
7. There is no significant relationship between academic achievement (CTBS) and any HFD scoring system used in the present study.
8. There are no significant sex differences on any HFD scoring system used in the present study.
9. There are no significant sex differences on the Piers-Harris CSCS.

METHOD

Subjects. A sample of 120 sixth grade through eighth grade students was drawn from a general enrollment of 760 students from a rural Appalachian Kentucky middle school. The school is located in a small university town (Morehead, Kentucky). The enrollment of the county school system represents a socioeconomic cross-section with low socioeconomic status more heavily represented and made up predominantly of white Anglo-Saxons. The Comprehensive Test of Basic Skills is given yearly to all students in this school system. The scores used were for total battery and are composed of reading, spelling, language, and mathematics components. Ten male and ten female students at each grade level were randomly drawn from the middle school population from each of the following academic levels: those attaining CTBS Total Battery Stanines of 1 to 3 or 7 to 9 (see Table 1).

Table 1

Subjects

Achievement Level	Grade Level		
	6	7	8
Low (CTBS stanines 1 - 3)	10 females 10 males	10 females 10 males	10 females 10 males
High (CTBS stanines 7 - 9)	10 females 10 males	10 females 10 males	10 females 10 males

Middle school subjects were chosen for this study because the new Koppitz (1984) scoring system is specifically geared to this population and numerous researchers have reported that self-concept becomes more stable with age.

After selection of the 60 students (30 male and 30 female) at each academic achievement level (on the CTBS), they were administered the Piers-Harris CSCS and divided into low, middle, and high self-concept groups.

Measures. The Piers-Harris CSCS (Appendix D) was chosen as the self-report measure of self-concept for the reasons stated in

Chapter 2. It consists of 80 simple declarative statements related to the individual's perception of appearance, popularity, behavior, intellectual and school status, anxiety, happiness, satisfaction, and interpersonal relationships. It is normed for ages 8 through 18. The Piers-Harris CSCS manual (1969) reported a test-retest reliability coefficient of .77 for both two-month and four-month retests and internal consistency coefficients ranged from .78 to .93. The validity research for this instrument was discussed more completely in Chapter 2.

HFDs, administered according to Koppitz' (1984) instructions, were used for the measure of children's drawings. Swenson (1968) reported interjudge and test-retest reliabilities of global scoring measures are, for the most part, in the .80s and .90s. His review of structural and formal aspects of drawings had interjudge and test-retest reliabilities varying predominantly between .30 and .50.

Fuller et al. (1970) found inter-rater reliabilities of .84 for normal children's HFDs and .71 for emotionally disturbed children's HFDs using Koppitz' scoring system. Koppitz indicated a 95 percent agreement on all items scored by two judges on adolescent HFDs. Harris (1963) reported interjudge reliability coefficients above .90 for HFDs scored by the Goodenough-Harris scoring system, on which the Koppitz developmental scoring is based.

Procedures. The procedures will be presented in two parts: data collection and data scoring.

1. Data collection. The Piers-Harris CSCS was administered to groups of 20 students. Each student was given the Piers-Harris CSCS

booklet and a number 2 pencil. The examiner read the instructions on the form aloud while the students read them silently. Because of possible reading difficulty on the part of some students, the examiner read aloud, twice, every item on the test as students circled "yes" or "no" on their answer sheets. Each child was seated at a separate desk a sufficient distance apart to avoid copying or reluctance to mark certain items.

The HFD was administered on an individual basis according to Koppitz' (1984) instructions. Individual administration was chosen so the child would enter a nonverbal communication with the examiner and become emotionally involved in the drawing (Koppitz, 1984). Also, as previously reported, more studies finding significant results have used an individual administration of HFDs (Wilee and Davis, 1976).

For the HFD, each child was given an 8 1/2" by 11" sheet of blank paper and a number 2 pencil and told, "Draw one whole person. You may draw any kind of person you want to draw, but not a stick figure."

A master identification number list was developed with the numbers 1 through 120. The list had the CTBS stanine scores and sex of subject listed with the identification number. Piers-Harris CSCS booklets were numbered 1 through 120 and distributed to the child with that identification number. Paper for the HFD also had the identification number recorded on the back of the page. After all data were collected and assigned to the identification number, names of the students were deleted from the test records and all analyses were conducted using only identification numbers.

2. Data Scoring. The Piers-Harris CSCS was scored according to the manual instructions. The students at each CTBS achievement level were divided according to their score on the Piers-Harris CSCS. At each achievement level, students were divided into top, middle, and lowest third for the score on the Piers-Harris CSCS.

The HFDs of the students were scored for Koppitz' (1984) EIs, a global score of "pathological" versus "not pathological," critical features (excessive attention to the eyes, hands drawn clearly and correctly, arms drawn two-dimensionally, legs drawn two-dimensionally, and less than two pieces of clothing), and the Goodenough-Harris developmental score (Appendixes A, B, and C).

All HFD scoring was done by one scorer, a master's level psychologist. The scores had only the identification number; no identifying information was available. The scorer did not have access to the master identification list or know the results of the students' Piers-Harris CSCS, sex, or achievement level.

STATISTICAL METHODOLOGY

The data were analyzed using the Statistical Analysis System (SAS) computer program. First, an intercorrelational matrix was formulated, and then the nine null hypotheses were analyzed using the stated statistical procedure.

Ho 1 - a multiple regression analysis (forward and backward stepwise and MAXR) was used to determine the best regression model to determine the best predictors of self-concept (Cohen and Cohen, 1975).

Ho 2 - a multiple regression anaylsis was used to determine the relationship between self-concept on the Piers-Harris CSCS and the Koppitz adolescent HFD EIs.

Ho 3 - a 3 x 2 chi square was used to determine the differences between self-concept levels and a global HFD scoring system.

Ho 4 - a multiple regression analysis was used to determine the relationship between self-concept on the Piers-Harris CSCS and critical features of HFDs (Appendix B).

Ho 5 - an ANOVA was used to compare self-concept groups on the Goodenough-Harris HFD scoring system.

Ho 6 - a *t* test was used to compare academic achievement (CTBS) and self-concept on the Piers-Harris CSCS.

Ho 7 - a chi square analysis was used to determine the differences between academic achievement groups and the Koppitz and critical feature HFD scoring systems. A chi square analysis was used to compare achievement and global score. A *t* test was used to compare achievement level and the Goodenough-Harris score.

Ho 8 - a chi square analysis was used to determine the differences between the sexes on the Koppitz and critical feature HFD scoring systems. A chi square analysis was used to compare sex and the global score. A *t* test was used to compare the sexes on the Goodenough-Harris score.

Ho 9 - a *t* test was used to compare sex differences on the Piers-Harris CSCS.

Chapter 4

RESULTS

The results of the investigation relevant to the hypotheses identified in Chapter 3 are addressed in this chapter. Also, various descriptive statistics from univariate analyses are presented.

GENERAL DESCRIPTIVE STATISTICS

Of the 120 students evaluated, the mean score on the Piers-Harris CSCS was 55 out of a possible score of 80. The mode was 62 and the median score was 58.5. The range was from 21 to 77 with a normal distribution of scores represented. The Piers-Harris CSCS scores were also divided into low, medium, and high self-concept groups for some statistical analyses.

The frequency count for each item on the Koppitz EI scale is presented in Table 2 by EI and EI category. The only indicator not present in any drawing was clouds, rain, or flying birds. The most frequent indicators represented omissions (omission of feet = 20, hands cut off = 19) and shading of the drawing. The cumulative shading frequency was 56, combining shading of face (21), shading of body/limbs (29), and shading of hands/neck (6).

The Goodenough-Harris scores ranged from 48 to 135 with a normal distribution. The mean of the scores was 86, the median was 85.5, and the mode was 72. The global scoring factor was a dichotomy of pathological versus nothing pathological. Of the 120 drawings, 39 were judged pathological. The frequency counts of the five critical

Table 2

Frequency Count of Koppitz Emotional Indicators

EI Category	Emotional Indicator	Frequency
Impulsivity	Poor integration of parts	12
	Gross asymmetry of limbs	10
	Transparencies	8
	Big figure	8
	Omission of neck	12
Insecurity, Feelings of Inadequacy	Slanting figure	4
	Tiny head	1
	Hands cut off	19
	Monster, grotesque figure	8
	Omission of arms	2
	Omission of legs	4
	Omission of feet	20
Anxiety	Shading of face	21
	Shading of body and/or limbs	29
	Shading of hands and/or neck	6
	Legs pressed together	10
	Omission of eyes	4
	Clouds, rain, flying birds	0
Shyness, Timidity	Tiny figure	9
	Short arms	7
	Arms clinging to body	6
	Omission of nose	7
	Omission of mouth	4
Anger, Aggressiveness	Crossed eyes	1
	Teeth	14
	Long arms	3
	Big hands	1
	Nude figure, genitals	5

features are listed in Table 3. The features were all represented as dichotomies of feature present or feature absent. The critical feature that occurred most often was the drawing having less than two pieces of clothing.

Table 3

Critical Features Frequency Count

Critical Feature	Frequency
Excessive attention to the eyes	23
Hands drawn clearly and correctly	11
Arms drawn two-dimensionally	34
Legs drawn two-dimensionally	25
Less than two pieces of clothing	55

ANALYSIS OF HYPOTHESIS 1

In order to determine whether or not there is a relationship between self-concept as measured by the Piers-Harris CSCS and HFD scoring method, achievement level, or sex, a multiple regression analysis was performed. Using the maximum R square improvement option of the stepwise multiple regression analysis of the Statistical Analysis System (SAS), the best four variable model for predicting the score on the Piers-Harris CSCS included achievement, Koppitz EI of shading of hands or neck, global score of pathology, and Koppitz EI of omission of eyes. This four-variable model accounted for 36 percent of the variance ($R^2 = .35959$, $p = .0001$). Using the same procedure, the best twelve-variable model included the following: achievement level, Koppitz EI of omission of eyes, global score of pathology, Koppitz EI of shading of hands or neck, critical feature of excessive attention to the eyes, Koppitz EI of omission of the nose, Koppitz EI of big hands, Koppitz EI of nude figure or genitals, Koppitz EI of omission of feet, critical feature of legs drawn two-dimensionally, Koppitz EI of tiny figure, and shading of face (R^2 = .43705, $\underline{p}$ =.0001). Including twelve instead of four predictors increased the amount of variance explained from 36 percent to 44 percent. This twelve variable model had the lowest mean square error of any model. Including all 35 variables in the regression model did not appreciably increase the amount of variance explained (R^2 = .47142, $\underline{p}$ = .0001).

Using the forward selection procedure of the stepwise multiple regression analysis, 17 variables met the .50 significance level for entry into the model. The variables are listed in the order they were entered into the model in Table 4. The resulting 17 variable model explained 46 percent of the variance (R^2 = .45565, $\underline{p}$ = .0001).

Using the backward elimination procedure of the multiple regression analysis yielded a good regression model containing 16 variables (R^2 = .45212, $\underline{p}$ = .0001). Table 5 lists the 16 variables in descending order of significance. A continuation of the backward elimination procedure left seven variables in the model, all significant at least at the .10 level (R^2 = .39415, $\underline{p}$ = .0001). The seven variables remaining in the model are listed in Table 6.

Table 4

Variables in Forward Selection Procedure of 17 Variable Multiple Regression Model

Achievement
Koppitz EI--shading of face
Koppitz EI--teeth
Critical feature--excessive attention to the eyes
Koppitz EI--omission of eyes
Koppitz EI--big hands
Global score of pathology
Koppitz EI--shading of hands or neck
Koppitz EI--omission of nose
Koppitz EI--nude figure or genitals
Koppitz EI--omission of feet
Critical feature--legs drawn two-dimensionally
Koppitz EI--tiny figure
Koppitz EI--long arms
Koppitz EI--arms clinging to body
Koppitz EI--omission of neck
Sex

Table 5

Variables Remaining in Backward Elimination Procedure of 16 Variable Multiple Regression Model

Achievement
Koppitz EI--omission of eyes
Global score of pathology
Critical feature--excessive attention to the eyes
Koppitz EI--shading of hands or neck
Koppitz EI--omission of nose
Koppitz EI--big hands
Koppitz EI--nude figure or genitals
Koppitz EI--tiny figure
Koppitz EI--omission of feet
Critical feature--legs drawn two-dimensionally
Koppitz EI--teeth
Sex
Koppitz EI--omission of neck
Koppitz EI--shading of face
Koppitz EI--long arms

Table 6

Variables Remaining in Backward Elimination Procedure of Multiple Regression Significant at the .10 Level

Achievement
Koppitz EI--omission of eyes
Global score of pathology
Critical feature--excessive attention to the eyes
Koppitz EI--shading of hands or neck
Koppitz EI--omission of nose
Koppitz EI--big hands

Table 7 lists the best 12 variables from the maximum R square improvement option with the best 12 predictors from both the forward and backward stepwise options of the multiple regression procedure.

Achievement was the best overall predictor of self-concept using all three options of the stepwise multiple regression procedure. Using the maximum R square improvement option, achievement accounted for 23 percent of the variance in the Piers-Harris CSCS score ($R^2 = .23123$, $p = .0001$).

The Koppitz feature of teeth in the drawing appeared in the top 12 variables in both the forward and backward approaches. Even though the presence of teeth was not in the top 12 variables of the maximum R square improvement option, it was entered into the model at step 3 but replaced at step 4. It was re-entered into the model at step 13.

Table 7

Variables in Maximum R Square, Forward, and Backward Procedures in Descending Order of Significance

$MAXR^2$	Forward	Backward
Achievement	Achievement	Achievement
Omission of eyes	Shading of face	Omission of eyes
Global score/pathology	Teeth	Global score/pathology
Shading hands/neck	Excessive attention to eyes	Excessive attention to eyes
Excessive attention to eyes	Omission of eyes	Shading hands/neck
Omission of nose	Big hands	Omission of nose
Big hands	Global score/pathology	Big hands
Nude/genitals	Shading hands/neck	Nude/genitals
Omission of feet	Omission of nose	Tiny figure
Legs drawn two-dimensionally	Nude/genitals	Omission of feet
Tiny figure	Omission of feet	Legs drawn two-dimensionally
Shading face	Legs drawn two-dimensionally	Teeth

Table 8 lists the top 13 variables using the maximum R square procedure with Beta weights and probability levels. There were three variables that were negatively related to high self-concept score on the Piers-Harris CSCS. The remaining ten variables were positively related to higher Piers-Harris CSCS score.

In summary, self-concept as measured by the Piers-Harris CSCS is significantly related to achievement, global score of pathology, Koppitz EIs (omission of eyes, shading of hands or neck, omission of nose, big hands, nude figure or genitals, omission of feet, tiny figure, shading of face, and teeth), and other critical features of HFDs (excessive attention to the eyes and legs drawn two-dimensionally). Further analysis will reveal that other HFD scoring features are also significantly related to self-concept on the Piers-Harris CSCS. However, they were suppressed from the overall multiple regression model due to achievement being included.

ANALYSIS OF HYPOTHESIS 2

In order to determine whether or not a significant relationship exists between self-concept on the Piers-Harris CSCS and the Koppitz adolescent HFD scoring method, a multiple regression analysis was performed. The forward, backward, and maximum R square options of the stepwise multiple regression analysis were used. The nine variables which contributed the most to the regression models were the same for each procedure used. These features are listed in descending order in Table 9.

The maximum R square procedure determined that the features of Table 9 accounted for 24 percent of the variance in the nine

Table 8

Variables from Maximum R Square Procedure with Direction of Relationship

Variable	Beta Weight	p
Achievement	10.9063	.0001
Omission of eyes	19.1694	.0016
Global score/pathology	-6.6639	.0123
Shading of hands/neck	11.5975	.0372
Excessive attention to the eyes	5.5528	.0313
Omission of nose	-8.9076	.0591
Big hands	18.3550	.1269
Nude figure/genitals	8.2860	.1206
Omission of feet	3.9411	.1731
Legs two-dimensional	3.3914	.2075
Tiny figure	4.6771	.2221
Shading of face	3.8993	.1772
Teeth	-3.2088	.3447

Table 9

Koppitz EIs Most Related to Self-Concept on the Piers-Harris CSCS

$MAXR^2$	Forward	Backward
Omission of eyes	Omission of eyes	Omission of eyes
Poor integration of parts	Poor integration of parts	Poor integration of parts
Shading hands/neck	Shading hands/neck	Shading hands/neck
Omission of nose	Omission of nose	Omission of nose
Teeth	Teeth	Teeth
Hands cut off	Hands cut off	Hands cut off
Slanting figure	Slanting figure	Slanting figure
Shading face	Shading face	Shading face
Long arms	Long arms	Long arms

variable model (R^2 = .24485, p = .0002). The ten variable model had the lowest mean square error of any of the maximum R square models. It added the feature of tiny head to the previous nine features and explained 25 percent of the variance (R^2 = .25214, p = .0003).

As can be seen in Table 10, of the first nine Koppitz EIs identified by the maximum R square procedure, six were negatively related and three were positively related to higher self-concept score on the Piers-Harris CSCS.

Adding 25 variables into the maximum R square model explained 30 percent of the variance (R^2 = .29990, p = .0528). When all 28 Koppitz EIs were included, the amount of variance explained was not appreciably increased (R^2 = .29996, p = .0944). Thus, the Koppitz EIs of poor integration of parts, shading of hands or neck, omission of eyes, omission of nose, teeth, hands cut off, slanting figure, shading of face, long arms, and tiny head contributed significantly to the explanation of the variance in Piers-Harris CSCS score, although not always in the direction Koppitz proposed (1984). Of these, poor integration of parts, hands cut off, slanting figure, and long arms were suppressed in the overall regression model with achievement, critical HFD features, global HFD score, and Goodenough-Harris HFD score included.

ANALYSIS OF HYPOTHESIS 3

In order to determine whether or not there is a significant difference between low, medium, and high self-concept group levels on the global HFD scoring procedure, a chi square analysis was used to determine the relationship between the self-concept level and the

Table 10

Variables from Maximum R Square Procedure with Direction of Relationship

Variable	Beta Weight	*p*
Poor integration of parts	-10.1091	.0086
Shading hands/neck	15.6684	.0134
Omission of eyes	19.3500	.0044
Omission of nose	-12.7942	.0155
Teeth	-7.7308	.3204
Hands cut off	-5.3554	.0882
Slanting figure	-7.6632	.2164
Shading face	3.9441	.2229
Long arms	-8.9937	.2644

rating of the HFD as pathological or not pathological. Students were divided into low, medium, and high self-concept groups on the basis of the Piers-Harris CSCS. Inspection of Table 11 indicates the low self-concept group had significantly more ratings of pathological than expected on the global score, CHISQ (2, $\underline{N}$ = 120) = 8.433, $\underline{p}$ = .0147. Thus, low self-concept appears to be significantly related to drawings rated as pathological on a global scoring method.

ANALYSIS OF HYPOTHESIS 4

In order to determine whether or not there is a significant relationship between self-concept on the Piers-Harris CSCS and any of the critical features used in the present study (Appendix B), a multiple regression analysis was performed using the forward, backward, stepwise, and maximum R square options. All of these statistical procedures identified the critical feature of arms drawn two-dimensionally as most highly related to Piers-Harris CSCS score. On the maximum R square and forward procedures, this feature was entered first into the regression model and was positively related to Piers-Harris CSCS score (Beta = 9.068). On the backward elimination procedure it was the only variable retained ($\underline{p}$ = .0006). However, it accounted for only 10 percent of the variance in the model (R^2 = .0958). Using the stepwise procedure, this feature was the only item to meet the .15 significance level for entry into the model ($\underline{p}$ = .0006).

Using the maximum R square option, the four critical features added into the model after arms drawn two-dimensionally were the following: excessive attention to the eyes, less than two pieces of

Table 11

Chi Square Table of Low, Medium, and High Self-Concept Groups by Global HFD Score

Self-concept	Global score				Total
	Not pathological		Pathological		
Low	fo = 20	fe = 27	fo = 20	fe = 13	40
	csq = 1.8148	p = .1779	csq = 3.7692	p = .0522	
Medium	fo = 31	fe = 27	fo = 9	fe = 13	40
	csq = 0.5926	p = .4414	csq = 1.2308	p = .2673	
High	fo = 30	fe = 27	fo = 10	fe = 13	40
	csq = 0.3333	p = .5637	csq = 0.6923	p = .4054	
Total	81		39		120

Chi Square = 8.433

df = 2

p = .0147

Phi = 0.265

Cramer's V = 0.265

clothing, legs drawn two-dimensionally, and hands drawn clearly and correctly. The model with the lowest mean square error included three factors: arms drawn two-dimensionally, excessive attention to the eyes, and less than two pieces of clothing. It accounted for 12 percent of the total variance ($R^2 = .1241$, $p = .0016$). Thus, the critical feature of arms drawn two-dimensionally was significantly related to self-concept and it alone accounted for 10 percent of the variance in Piers-Harris CSCS score ($R^2 = .0958$, $p = .0006$). Excessive attention to the eyes and less than two pieces of clothing also contributed to the model in the maximum R square option. However, their contribution did not meet conventional levels of significance.

ANALYSIS OF HYPOTHESIS 5

In order to determine whether or not there is a significant difference between low, medium, and high self-concept group levels on the Piers-Harris CSCS and the Goodenough-Harris HFD scoring system, a one-way analysis of variance was performed. The low self-concept group had a mean Goodenough-Harris score of 75.5750, the medium self-concept group had a mean of 85.4000, and the high self-concept group had a mean of 98.2000. Analysis of variance revealed that the Goodenough-Harris HFD score did differ across self-concept group levels. There was a highly significant difference between means of the groups, $F(2, 117) = 12.25$, $p = .0001$. A Duncan's multiple range post hoc analysis revealed significant differences between low and medium, low and high, and medium and high self-concept groups on the Goodenough-Harris HFD score at the .05 alpha level. At the .01 level of significance, the low and medium groups were significantly different from the high self-concept group. However, the low self-concept group was not significantly different from the medium self-concept group at the .01 level. The amount of variance explained by this model was 17 percent (R^2 = .17314) and indicated there is a significant difference between low, medium, and high Piers-Harris CSCS self-concept groups on the Goodenough-Harris HFD scoring system.

ANALYSIS OF HYPOTHESIS 6

In order to determine whether or not there is a significant difference between academic achievement groups on the CTBS and self-concept as measured by the Piers-Harris CSCS, a *t* test was performed. The mean Piers-Harris CSCS score for the low achievement group was 49.0333 (range from 21 to 75, standard deviation = 12.3658). The mean Piers-Harris CSCS score for the high achievement group was 61.7333 (range from 27 to 77, standard deviation = 10.9434). There was a highly significant difference between low and high achievement groups on mean Piers-Harris CSCS scores, $t(118) = -5.9574$, $p = .0001$. High achievers on the CTBS scored significantly higher than low achievers on the CTBS on the Piers-Harris CSCS.

ANALYSIS OF HYPOTHESIS 7

In order to determine whether or not there is a significant relationship between academic achievement on the CTBS and any of the HFD scoring systems used in the present study, a *t* test and chi square analyses were performed. Chi square analyses were used to identify the relationships between academic achievement groups and the Koppitz EI, critical features, and global HFD scoring methods. A *t* test was used to compare achievement groups on the Goodenough-Harris HFD score.

Separate chi square analyses were used to determine whether or not there was a significant relationship between academic achievement level on the CTBS and the frequency of presence of any of the twenty-eight Koppitz EIs. Low and high academic achievement levels were designated on the basis of stanines of one to three or seven to nine on the total CTBS test battery. Of the 28 chi square analyses performed, five attained conventional levels of significance: poor integration of parts, slanting figure, hands cut off, shading of body or limbs, and nude figure or genitals.

Inspection of Table 12 suggests that the low achievement group had more drawings with poor integration of parts than expected. Conversely, the high achievement group had fewer drawings with poor integration of parts than expected, CHISQ $(1, N = 120) = 13.3333$, $p = .0003$. Therefore, achievement level was significantly related to the Koppitz EI of poor integration of parts.

Table 13 presents the chi square comparison of achievement level and slanting figure. The low achievement group had more drawings with a slanting figure than expected. The high achievement group had fewer drawings than expected with a slanting figure, CHISQ $(1, N = 120) = 4.1379$, $p = .0419$. This table had over 20 percent of the cells with expected counts of less than 5 and must be interpreted with caution. However, the cells having an expected frequency of less than 5 did not result in a component chi square significant at the .10 alpha level with one degree of freedom. Therefore, this

Table 12

Chi Square Table of Low and High Achievement by Poor Integration of Parts

Achievement level	Poor integration of parts				
	Absent		Present		Total
Low	fo = 48	fe = 54	fo = 12	fe = 6	60
	csq = 0.6667	p = .4142	csq = 6.0000	p = .0143	
High	fo = 60	fe = 54	fo = 12	fe = 6	60
	csq = 0.6667	p = .4142	csq = 6.0000	p = .0143	
Total	108		12		120

Chi Square = 13.3333

df = 1

p = .0003

Phi = -.333

Table 13

Chi Square Table of Low and High Achievement by Slanting Figure

Achievement level	Slanting figure				
	Absent		Present		Total
Low	fo = 56	fe = 58	fo = 4	fe = 2	60
	csq = 0.0690	p = .7928	csq = 2.0000	p = .1573	
High	fo = 60	fe = 58	fo = 0	fe = 2	60
	csq = 0.0690	p = .7928	csq = 2.0000	p = .1573	
Total	116		4		120

Chi Square = 4.138

df = 1

p = .0419

Phi = -.186

analysis appears acceptable for the interpretation that achievement level was significantly related to the Koppitz EI of slanting figure.

Inspection of Table 14 indicates that the low achievement group had more drawings than expected with hands cut off. Conversely, the high achievement group had fewer drawings with hands cut off than expected, CHISQ (1, _N_ = 120) = 5.065, _p_ = .0244. Therefore, achievement level was significantly related to the Koppitz EI of hands cut off.

Table 15 presents the chi square comparison of achievement and shading of body or limbs. The low achievement group had more drawings than expected with shading of body or limbs. The high achievement group had fewer drawings than expected with shading of body or limbs, CHISQ (1, _N_ = 120) = 3.6832, _p_ = .0550. Therefore, achievement level was significantly related to the Koppitz EI of shading of body or limbs.

Table 16 presents the chi square comparison of achievement and drawing of nude figure or genitals. The low achievement group had more drawings than expected of nude figures or genitals. The high achievement group had fewer drawings than expected of nude figures or genitals, CHISQ (1, _N_ = 120) = 5.2174, _p_ = .0224. This table had over 20 percent of the cells with expected counts of less than 5 and must be interpreted with caution. However, the cells having an expected frequency of less than 5 did not result in a component chi square significant at the .10 alpha level with one degree of freedom. Therefore, this analysis appears acceptable for the interpretation that achievement level was significantly related to the Koppitz EI of drawing of nude figure or genitals.

Table 14

Chi Square Table of Low and High Achievement by Hands Cut Off

Achievement level	Hands cut off				
	Absent		Present		Total
Low	fo = 46	fe = 50.5	fo = 14	fe = 9.5	60
	csq = 0.4010	*p* = .5266	csq = 2.1316	*p* = .1443	
High	fo = 55	fe = 50.5	fo = 5	fe = 9.5	60
	csq = 0.4010	*p* = .5266	csq = 2.1316	*p* = .1443	
Total	101		19		120

Chi Square = 5.065

df = 1

p = .0244

Phi = -.205

Table 15

Chi Square Table of Low and High Achievement by Shading of Body or Limbs

Achievement level	Shading of body or limbs				
	Absent		Present		Total
Low	fo = 50	fe = 45.5	fo = 10	fe = 14.5	60
	csq = 0.4451	p = .5047	csq = 1.3966	p = .2373	
High	fo = 41	fe = 45.5	fo = 19	fe = 14.5	60
	csq = 0.4451	p = .5047	csq = 1.3966	p = .2373	
Total	91		29		120

Chi Square = 3.683

df = 1

p = .0550

Phi = .175

Table 16

Chi Square Table of Low and High Achievement by Nude Figure or Genitals

Achievement	Nude figure or genitals				
	Absent		Present		Total
Low	fo = 55	fe = 57.5	fo = 5	fe = 2.5	60
	csq = 0.1087	p = .7416	csq = 2.5000	p = .1138	
High	fo = 60	fe = 57.5	fo = 0	fe = 2.5	60
	csq = 0.1087	p = .7416	csq = 2.5000	p = .1138	
Total	115		5		120

Chi Square = 5.217

df = 1

p = .0224

Phi = -.209

Table 17 presents the chi square statistics for all of the Koppitz EIs for low and high achievement level. In summary, five of the Koppitz EIs were significantly related to achievement level.

Separate chi square analyses were used to determine whether or not there was a significant relationship between academic achievement level on the CTBS and any of the five critical features used in the present study. Of the five chi square tests performed, three were significant.

Inspection of Table 18 indicates that the low achievement group had significantly fewer drawings than expected with the arms drawn two-dimensionally. Conversely, the high achievement group had significantly more drawings than expected with the arms drawn two-dimensionally, CHISQ (1, N = 120) = 16.416, p = .0001. Therefore, achievement level was highly significantly related to HFDs with arms drawn two-dimensionally.

Table 19 presents the chi square comparison of achievement level and legs drawn two-dimensionally. The low achievement group had significantly fewer drawings than expected with legs drawn two-dimensionally. The high achievement group had significantly more drawings than expected with the legs drawn two-dimensionally, CHISQ (1, N = 120) = 14.602, p = .0001). Thus, achievement level was highly significantly related to HFDs with legs drawn two-dimensionally.

Inspection of Table 20 suggests the low achievement level group had significantly more drawings than expected with less than two pieces of clothing. Conversely, the high achievement group had significantly fewer drawings than expected with less than two pieces

Table 17

Chi Square Table of Koppitz EIs for Low and High Achievement Level

Variable present	fo: Low achievement	fo: High achievement	Chi Square	df	p
Poor integration of parts	12	0	13.333	1	.0003
Gross asymmetry of limbs	7	3	1.745	1	.1864
*Transparencies	6	2	2.143	1	.1432
*Big figure	2	6	2.143	1	.1432
Omission of neck	8	4	1.481	1	.2235
*Slanting figure	4	0	4.138	1	.0419
*Tiny head	1	0	1.008	1	.3153
Hands cut off	14	5	5.065	1	.0244
*Monster/grotesque	4	4	0.000	1	1.0000
*Omission of arms	2	0	2.034	1	.1538
*Omission of legs	3	1	1.034	1	.3091
Omission of feet	13	7	2.160	1	.1416
Shading of face	10	11	0.058	1	.8101
Shading of body/limbs	10	19	3.683	1	.0550
*Shading of hands/neck	2	4	0.702	1	.4022
Legs pressed together	3	7	1.745	1	.1864
*Omission of eyes	2	2	0.000	1	1.0000
Clouds, rain, flying birds	0	0	--	-	--
*Tiny figure	4	5	0.120	1	.7289
*Short arms	5	2	1.365	1	.2426
*Arms clinging to body	2	4	0.702	1	.4022
*Omission of nose	5	2	1.365	1	.2426
*Omission of mouth	3	1	1.034	1	.3091
*Crossed eyes	1	0	1.008	1	.3153
Teeth	5	9	1.294	1	.2553
*Long arms	2	1	0.342	1	.5587
*Big hands	1	0	1.008	1	.3153
*Nude figure/genitals	5	0	5.217	1	.0224

*--Variable has over 20 percent of the chi square cells with expected frequency counts of less than 5; chi square test may not be valid.

Table 18

Chi Square Table of Low and High Achievement by Arms Drawn Two-Dimensionally

Achievement	Arms drawn two-dimensionally				
	Absent		Present		Total
Low	fo = 53	fe = 43	fo = 7	fe = 17	60
	csq = 2.3256	p = .1273	csq = 5.8824	p = .0153	
High	fo = 33	fe = 43	fo = 27	fe = 17	60
	csq = 2.3256	p = .1273	csq = 5.8824	p = .0153	
Total	86		34		120

Chi Square = 16.416

df = 1

p = .0001

Phi = .370

Table 19

Chi Square Table of Low and High Achievement by Legs Drawn Two-Dimensionally

Achievement	Legs drawn two-dimensionally				
	Absent		Present		Total
Low	fo = 56	fe = 47.5	fo = 4	fe = 12.5	60
	csq = 1.5211	p = .2175	csq = 5.7800	p = .0162	
High	fo = 39	fe = 47.5	fo = 21	fe = 12.5	60
	csq = 1.5211	p = .2175	csq = 5.7800	p = .0162	
Total	95		25		120

Chi Square = 14.602

df = 1

p = .0001

Phi = .349

Table 20

Chi Square Table of Low and High Achievement by Less Than Two Pieces of Clothing

Achievement	Less than two pieces of clothing				
	Absent		Present		Total
Low	fo = 21	fe = 32.5	fo = 39	fe = 27.5	60
	csq = 4.0692	p = .0437	csq = 4.8091	p = .0283	
High	fo = 44	fe = 32.5	fo = 16	fe = 27.5	60
	csq = 4.0692	p = .0437	csq = 4.8091	p = .0283	
Total	65		55		120

Chi Square = 17.757

df = 1

p = .0001

Phi = -.385

of clothing, CHISQ (1, N = 120) = 17.757, p = .0001. Thus, achievement level was highly significantly related to HFDs with less than two pieces of clothing.

Table 21 presents the chi square statistics for each of the five critical features for low and high achievement levels. In summary, three of the five critical features were highly significantly related to achievement level.

A t test was used to compare low and high achievement groups on the Goodenough-Harris HFD scoring method. The low achievement group had a mean Goodenough-Harris score of 72.5833 (range from 48 to 131, standard deviation = 18.0238). The mean Goodenough-Harris score for the high achievement group was 100.2000 (range from 53 to 135, standard deviation = 17.1847). Inspection of the Goodenough-Harris means revealed there was a significant difference between low and high achievement levels on the Goodenough-Harris HFD scoring method, $t(118) = -8.5899$, $p = .0001$.

A chi square analysis was used to compare low and high achievement levels on the global score (pathology versus no pathology). Inspection of Table 22 indicates the high achievement group had more drawings rated not pathological than the low achievement group. However, the chi square analysis only approached conventional levels of significance, CHISQ (1, N = 120) = 3.077, p = 0794. Therefore, achievement level on the CTBS did not appear to be significantly related to the global scoring method.

In summary, an analysis of hypothesis 7 was conducted in order to determine whether or not there was a significant relationship between academic achievement on the CTBS and any of the HFD

Table 21

Chi Square Table of Critical Features for Low and High Achievement Level

Variable present	fo: Low achievement	fo: High achievement	Chi Square	df	p
Excessive attention to eyes	9	14	1.345	1	.2462
Hands drawn clearly/ correctly	3	8	2.502	1	.1137
Arms drawn two-dimensionally	7	27	16.416	1	.0001
Legs drawn two-dimensionally	4	21	14.602	1	.0001
Less than two pieces clothing	39	16	17.757	1	.0001

Table 22

Chi Square Table of Low and High Achievement Groups by Global HFD Score

Achievement	Global score				
	Not pathological		Pathological		Total
Low	fo = 36	fe = 40.5	fo = 24	fe = 19.5	60
	csq = 0.5000	p = .4795	csq = 1.0385	p = .3082	
High	fo = 45	fe = 40.5	fo = 24	fe = 19.5	60
	csq = 0.5000	p = .4795	csq = 1.0385	p = .3082	
Total	81		39		120

Chi Square = 3.077

df = 1

p = .0794

Phi = -0.160

scoring system used in the present study. Five of the Koppitz EIs were significantly related to achievement level: poor integration of parts, slanting figure, hands cut off, shading of body or limbs, and nude figure or genitals. Three of the critical features were significantly related to achievement level: arms and legs drawn two-dimensionally and less than two pieces of clothing. There was also a significant relationship between Goodenough-Harris HFD score and achievement level. The global score, however, was not.

ANALYSIS OF HYPOTHESIS 8

In order to determine whether there is a relationship between sex of subject and any of the HFD scoring systems used in the present study, a *t* test and chi square analyses were performed. Chi square analyses were used to determine the relationship between sex and the Koppitz EI, critical feature, and global scoring systems. A *t* test was used to compare the sexes on the Goodenough-Harris scoring system.

Separate chi square analyses were used to determine whether or not there was a significant relationship between sex of the subject and the frequency of presence of any of the Koppitz EIs. Of the twenty-eight analyses, five met the conventional levels of significance: gross asymmetry of limbs, omission of neck, slanting figure, omission of feet, and shading of face.

Inspection of Table 23 suggests that males had more drawings than expected with gross asymmetry of limbs. Conversely, females had fewer drawings than expected with gross asymmetry of limbs, CHISQ (1,

Table 23

Chi Square Table of Sex by Gross Asymmetry of Limbs

Sex	Gross asymmetry of limbs				
	Absent		Present		Total
Male	fo = 51	fe = 55	fo = 9	fe = 5	60
	csq = 0.2909	p = .5896	csq = 3.2000	p = .0736	
Female	fo = 59	fe = 55	fo = 1	fe = 5	60
	csq = 0.2909	p = .5896	csq = 3.2000	p = .0736	
Total	110		10		120

Chi Square = 6.982

df = 1

p = .0082

Phi = -.241

$N = 120) = 6.982$, $p = .0082$. Thus, males and females performed significantly differently on the Koppitz EI of gross asymmetry of limbs.

Table 24 presents the chi square comparison of sex and the Koppitz EI of omission of neck. Males had significantly more drawings than expected with the neck omitted. Females had significantly fewer drawings than expected with the neck omitted, CHISQ (1, $N = 120) = 9.259$, $p = .0023$. Thus, males and females performed significantly differently on drawing HFDs with neck omitted.

Inspection of Table 25 suggests that males had significantly fewer drawings than expected with a slanting figure. Females had significantly more drawings than expected with a slanting figure, CHISQ (1, $N = 120) = 4.138$, $p = .0419$. This table had over 20 percent of the cells with expected frequencies of less than five and must be interpreted with caution. However, the cells having an expected frequency of less than five did not result in a component chi square significant at the .10 alpha level with one degree of freedom. Therefore, this analysis appears acceptable for the interpretation that males and females performed significantly differently on the Koppitz EI of slanting figure.

Table 26 presents the chi square comparison of sex and the Koppitz EI of omission of feet. Males had significantly fewer drawings than expected with the feet omitted. Females had significantly more drawings than expected with the feet omitted, CHISQ (1, $N = 120) = 8.640$, $p = .0033$. Thus, males and females performed significantly differently on drawing HFDs with feet omitted.

Table 24

Chi Square Table of Sex by Omission of Neck

Sex	Omission of neck				
	Absent		Present		Total
Male	fo = 49	fe = 54	fo = 11	fe = 6	60
	csq = 0.4630	p = .4962	csq = 4.1667	p = .0412	
Female	fo = 59	fe = 54	fo = 1	fe = 6	60
	csq = 0.4630	p = .4962	csq = 4.1667	p = .0412	
Total	108		12		120

Chi Square = 9.259

df = 1

p = .0023

Phi = -.278

Table 25

Chi Square Table of Sex by Slanting Figure

Sex	Slanting figure				Total
	Absent		Present		
Male	fo = 60	fe = 58	fo = 0	fe = 2	60
	csq = 0.0690	p = .7928	csq = 2.0000	p = .1573	
Female	fo = 56	fe = 58	fo = 4	fe = 2	60
	csq = 0.0690	p = .7928	csq = 2.0000	p = .1573	
Total	116		4		120

Chi Square = 4.138

df = 1

p = .0419

Phi = .186

Table 26

Chi Square Table of Sex by Omission of Feet

Sex	Omission of feet				Total
	Absent		Present		
Male	fo = 56	fe = 50	fo = 4	fe = 10	60
	csq = 0.7200	p = .3961	csq = 3.6000	p = .0578	
Female	fo = 44	fe = 50	fo = 16	fe = 10	60
	csq = 0.7200	p = .3961	csq = 3.6000	p = .0578	
Total	100		20		120

Chi Square = 8.640

df = 1

p = .0033

Phi = .268

Inspection of Table 27 suggests that males had significantly more drawings than expected with shading of the face. Conversely, females had significantly fewer drawings than expected with shading of the face, CHISQ (1, $\underline{N}$ = 120) = 12.987, $\underline{p}$ = .0003. Thus, males and females differ significantly on drawing HFDs with shading of the face.

Table 28 presents the chi square statistics for all of the Koppitz EIs for males and females. In summary, five of the Koppitz EIs were significantly related to sex of the subject.

Separate chi square analyses were used to determine whether or not there was a significant relationship between sex of the subject and the frequency of the presence of any of the critical HFD features used in the present study. Of the five analyses, one met the conventional level of significance: excessive attention to the eyes.

Inspection of Table 29 suggests that males had significantly fewer drawings than expected with excessive attention to the eyes. Females had significantly more drawings than expected with excessive attention to the eyes, CHISQ (1, $\underline{N}$ = 120) = 6.508, $\underline{p}$ = .0107. Thus, males and females differed significantly on the critical feature of excessive attention to the eyes on HFDs.

Table 30 presents the chi square statistics for each of the critical features for males and females. In summary, one of the five critical features was significantly related to sex of the subject.

A $\underline{t}$ test was used to compare the sexes on the Goodenough-Harris HFD scoring method. Males had a mean Goodenough-Harris score of 90.000 (range from 50 to 135, standard deviation = 21.5160).

Table 27

Chi Square Table of Sex by Shading of Face

Sex	Shading of face				Total
	Absent		Present		
Male	fo = 42	fe = 49.5	fo = 18	fe = 10.5	60
	csq = 1.1364	p = .2864	csq = 5.3571	p = .0206	
Female	fo = 57	fe = 49.5	fo = 3	fe = 10.5	60
	csq = 1.1364	p = .2864	csq = 5.3571	p = .0206	
Total	99		21		120

Chi Square = 12.987

df = 1

p = .0003

Phi = -.329

Table 28

Chi Square Table of Koppitz EIs for Males and Females

Variable present	fo: Males	fo: Females	Chi Square	df	p
Poor integration of parts	6	6	0.000	1	1.0000
Gross asymmetry of limbs	9	1	6.982	1	.0082
*Transparencies	4	4	0.000	1	1.0000
*Big figure	5	3	0.536	1	.4642
Omission of neck	11	1	9.259	1	.0023
*Slanting figure	0	4	4.138	1	.0419
*Tiny head	0	1	1.008	1	.3153
Hands cut off	7	12	1.563	1	.2112
*Monster/grotesque figure	5	3	0.536	1	.4642
*Omission of arms	2	0	2.034	1	.1538
*Omission of legs	1	3	1.034	1	.3091
Omission of feet	4	16	8.640	1	.0033
Shading of face	18	3	12.987	1	.0003
Shading of body/limbs	18	11	2.228	1	.1355
Shading of hands/or neck	3	3	0.000	1	1.0000
Legs pressed together	6	4	0.436	1	.5089
*Omission of eyes	1	3	1.034	1	.3091
Clouds, rain, flying birds	0	0	---	-	---
*Tiny figure	3	6	1.081	1	.2985
*Short arms	3	4	0.152	1	.6969
*Arms clinging to body	3	3	0.000	1	1.0000
*Omission of nose	4	3	0.152	1	.6969
*Omission of mouth	2	2	0.000	1	1.0000
*Crossed eyes	1	0	1.008	1	.3153
Teeth	10	4	2.911	1	.0880
*Long arms	1	2	0.342	1	.5587
*Big hands	0	1	1.008	1	.3153
*Nude figure/genitals	4	1	1.878	1	.1705

*--Variable has over 20 percent of the chi square cells with expected frequency less than 5; chi square test may not be valid.

Table 29

Chi Square Table of Sex by Excessive Attention to the Eyes

Sex	Excessive attention to the eyes								
	Absent				Present				Total
Male	fo = 54		fe = 48.5		fo = 6		fe = 11.5		60
	csq = 0.6237		$\underline{p}$ = .4297		csq = 2.6304		$\underline{p}$ = .1048		
Female	fo = 43		fe = 48.5		fo = 17		fe = 11.5		60
	csq = 0.6237		$\underline{p}$ = .4297		csq = 2.6304		$\underline{p}$ = .1048		
Total	97				23				120

Chi Square = 6.508

df = 1

$\underline{p}$ = .0107

Phi = .233

Table 30

Chi Square Table of Critical Features for Males and Females

Variable present	fo: Males	fo: Females	Chi Square	df	p
Excessive attention to the eyes	6	17	6.508	1	.0107
Hands drawn clearly/correctly	4	7	0.901	1	.3426
Arms two-dimensional	14	20	1.477	1	.2242
Legs two-dimensional	16	9	2.476	1	.1156
Less than two pieces clothing	28	27	0.034	1	.8546

Females had a mean Goodenough-Harris score of 81.88333 (range from 48 to 131, standard deviation = 22.4432). Inspection of mean Goodenough-Harris scores indicate there was a significant difference between males and females on the HFD scoring system, $t(118) = 2.2464$, $p = .0265$. Males scored significantly higher on the Goodenough-Harris HFD scoring system than females.

A chi square analysis was used to compare males and females on the global score. Inspection of Table 31 suggests there was no difference between the males and females on the global scoring method. CHISQ (1, $N = 120$) = 0.038, $p = .8455$.

In summary, analysis of hypothesis 8 was conducted in order to determine whether or not there was a relationship between the sex of the subject and any of the HFD scoring systems used. Five of the Koppitz EIs were significantly related to sex of the subject: gross asymmetry of limbs, omission of neck, slanting figure, omission of feet, and shading of face. Excessive attention to the eyes was the only critical feature of HFDs related to sex of the subject. There was also a significant difference between the sexes on the Goodenough-Harris HFD score. However, there was no signifcant sex difference on the global scoring method.

ANALYSIS OF HYPOTHESIS 9

In order to determine whether or not male and female Piers-Harris CSCS mean scores differed significantly, a t test was performed. Males had a mean Piers-Harris CSCS score of 55.0167 (range from 26 to 74, standard deviation = 12.2079). The mean Piers-Harris CSCS score for females was 55.7500 (range from 21 to 77,

Table 31

Chi Square Table of Sex by Global HFD Score

Sex	Global score				
	Not pathological		Pathological		Total
Male	fo = 40	fe = 40.5	fo = 20	fe = 19.5	60
	csq = 0.0062	p = .9374	csq = 0.0128	p = .9099	
Female	fo = 41	fe = 40.5	fo = 19	fe = 19.5	60
	csq = 0.0062	p = .9374	csq = 0.0128	p = .9099	
Total	81		39		120

Chi Square = 0.038

df = 1

p = .8455

Phi = -.018

standard deviation = 14.3310). There was not a significant difference between the sexes on the Piers-Harris CSCS, $t(118) = -0.3017$, $p = .7634$.

Chapter 5

SUMMARY, DISCUSSION OF RESULTS, AND CONCLUSIONS

SUMMARY

Self-concept. The results indicate that all of the HFD scoring methods were in some way related to self-concept as measured by the Piers-Harris CSCS. However, when achievement, sex, Koppitz EIs, critical features, global score, and Goodenough-Harris score were all included in a stepwise multiple regression analysis, achievement was by far the best single predictor of self-concept. High achievement was associated with higher self-concept and low achievement was associated with lower self-concept. Table 32 presents the independent variables compared to self-concept on the Piers-Harris CSCS. They are listed within the categories in order of their relationship to Piers-Harris CSCS score with the direction of the relationship indicated.

The global scoring method appeared to be a valid indicator of self-concept. Subjects with a low self-concept had significantly more drawings rated as pathological than the high self-concept group. This conclusion is supported by both the chi square analysis of Piers-Harris CSCS level with global score and by the early entry of global score into the stepwise multiple regression model. Previous research finding global scoring techniques as significantly better predictors of self-concept than individual HFD features are supported by the present study.

Table 32

Relationship of Independent Variables to Piers-Harris CSCS

All Independent Variables	Koppitz EIs	Critical Features	Global Score	Goodenough-Harris
+Achievement	-Poor integration of parts	+Arms two-dimensional	-Pathology	+Goodenough-Harris
+Omission of eyes (K)	+Shading hands/neck			
-Global pathology score	+Omission of eyes			
+Shading hands/neck (K)	-Omission of nose			
+Excessive attention to the eyes (C)	-Teeth			
-Omission of nose (K)	-Hands cut off			
+Big hands (K)	-Slanting figure			
+Nude figure/genitals (K)	+Shading face			
+Omission of feet (K)	-Long arms			
+Legs two-dimensional (C)				
+Tiny figure (K)				
+Shading of face (K)				
-Teeth (K)				

+ indicates positive relationship between independent variable and PHCSCS score
- indicates negative relationship between independent variable and PHCSCS score
(K) = Koppitz EI (C) = Critical feature

An unexpected result was the direction of the relationship between self-concept and certain Koppitz EIs. Omission of eyes was positively related to higher self-concept and was the second best predictor in the stepwise multiple regression model (after achievement level). Shading of hands or neck, big hands, nude figure or genitals, omission of feet, tiny figure, and shading of face were also positively related to higher self-concept, contrary to the expected direction of the relationship.

Many previous research studies relating self-concept to HFDs used the size of the HFDs as the only criterion examined. It has been noted that a review of this literature reveals contradictory results. Many studies report a positive relationship between size of HFD and self-concept. A limited number of studies indicate a negative relationship of size of HFD and self-concept. The present research did not compare absolute size of the drawing to the Piers-Harris CSCS score. However, the Koppitz system included the indicators of tiny figure and big figure. Using the stepwise multiple regression technique, tiny figure was the eleventh variable entered into the model when all of the independent variables were used. Big figure was entered at step 22. A stepwise multiple regression analysis of just Koppitz EIs with Piers-Harris CSCS score indicated tiny figure and big figure were not highly related to Piers-Harris CSCS score. Ten other Koppitz EIs were found to be more predictive of self-concept than tiny figure. Fourteen other indicators were better predictors than big figure. Thus, the lack of consistent research findings comparing HFDs to self-concept may be partially due to researchers' use of a single feature of size as the only predictor. Size does not appear to contribute much to the variance in self-concept scores in the present study.

Several Koppitz EIs appear to have been suppressed in the full regression model. Achievement was significantly negatively related to poor integration of parts, slanting figure, and hands cut off on the chi square analyses. When the Koppitz EIs were the only independent variables in the stepwise multiple regression model, the EI of poor integration of parts was the best single predictor of Piers-Harris CSCS score. Poor integration of parts, slanting figure, and hands cut off were all significant predictors in this model and were negatively related to self-concept on the Piers-Harris CSCS. However, none of the three were included in the stepwise model when achievement was included.

Similarly, the critical feature of arms drawn two-dimensionally was the only critical feature to be identified as a significant predictor of Piers-Harris CSCS score in a multiple regression of critical features and Piers-Harris CSCS. The critical feature of arms drawn two-dimensionally was also found to be significantly positively related to achievement level on the chi square analysis. However, when achievement was included in the full regression model, the critical feature of arms drawn two-dimensionally was suppressed from the model.

The Goodenough-Harris score was found to be highly positively related to self-concept level and achievement level on _t_ tests. However, due to the redundancy of information in the achievement and Goodenough-Harris score, the Goodenough-Harris score appears to have been suppressed from the stepwise multiple regression model when achievement was entered.

Achievement. The chi square results indicate that three of the four scoring techniques used in the present study were significantly related to achievement level on the CTBS. Table 33 indicates which HFD features were significantly related to achievement level and the direction of the relationship. Of the five Koppitz EIs related to achievement level, poor integration of parts was the most highly related to CTBS level. Subjects with low achievement had more drawings with poor integration of parts than did high achievers. All of the significant relationships of Koppitz EIs and achievement level were in the expected direction except shading of body or limbs. This EI was positively related to achievement level. Extremes in size of HFD drawing were not related to achievement in the present study. However, this could have been due to only extreme sizes of drawings being evaluated with all moderate sizes not considered. Silvern and Brooks' (1978) findings of a bimodal distribution may have obscured a relationship between size of HFD and achievement.

Three of the five critical features used in the present study were significantly related to achievement using chi square analyses. Arms and legs drawn two-dimensionally were highly positively related to high achievement. Less than two pieces of clothing in the drawing was highly negatively related to achievement. Subjects in the low achievement group tended to draw HFDs with less than two pieces of clothing.

Achievement was found to be highly positively related to higher score on the Goodenough-Harris HFD scoring system. This is consistent with related research finding a positive relationship between Goodenough-Harris score and cognitive ability.

Table 33

Achievement Level Compared to HFDs

Koppitz EIs	Critical features	Goodenough-Harris
-Poor integration of parts	+Arms drawn two-dimensionally	+Goodenough-Harris
-Slanting figure	+Legs drawn two-dimensionally	
-Hands cut off	-Less than two pieces of clothing	
+Shading body/limbs		
-Nude figure/genitals		

Sex differences. Chi square analyses were used to compare male and female performance on the Koppitz, critical feature, and global scoring methods. A *t* test was used to compare males and females on the Goodenough-Harris scoring system. There has been little research to predict a sex difference on HFDs. However, there were sex differences on five Koppitz EIs, one of the critical features, and the Goodenough-Harris score. There were no sex differences between males and females global HFD scores or the Piers-Harris CSCS.

Of the five Koppitz EIs found to differ between the sexes, three were more likely to occur on male HFDs: gross asymmetry of limbs, omission of neck, and shading of face. Two were more likely to occur on female HFDs: slanting figure and omission of feet. Koppitz (1984) did not report sex differences on her scoring method.

The critical feature of excessive attention to the eyes was more likely to occur on female than male HFDs. Considering that the subjects were entering puberty and that females of this age are likely to begin using eye makeup, this HFD feature indicates the possible preoccupation with "made-up" eyes among females. Due to the fact that excessive attention to the eyes was not related to self-concept or achievement, it appears this is an attribute of HFDs that demonstrates a nonpathological difference between the sexes.

An unexpected finding was the significant difference between the sexes on the Goodenough-Harris HFD scoring system. Males scored significantly higher than females on Goodenough-Harris scores. Since males and females were weighted evenly on academic achievement in the sample, a difference between the sexes was not expected on this measure.

Past research has not usually included sex of subject as a critical design factor when evaluating HFDs. However, the present research indicates there may be a significant sex difference on HFD performance, which may be a confounding variable in other research. Future research designs should control for sex of the subject.

CONCLUSIONS

In summary, the original intent of the present research was to determine if HFDs could be validated as a measure of self-concept and to determine their relationship to academic achievement and sex. It can be concluded from the present research that both a global score and individual HFD features are related to self-concept. It can also be concluded that there are significant sex and achievement level differences in HFD performance.

Tentative practical application of the present research would suggest that if a child were referred for academic difficulties, lowered general self-concept might be suspected. If the child's HFD was then determined by the evaluator to appear pathological, further evaluation of self-concept would be warranted. Similarly, if a formal scoring method similar to Koppitz or the Goodenough-Harris systems deviated from what was expected, further evaluation of self-concept should be pursued.

Due to the unexpected direction of relationship and lack of consistent findings in related research of HFDs and self-concept, Bennett's (1966) admonition about using a "cookbook" approach to HFD analysis appears good advice. Falk's (1981) suggestion of using HFDs in conjunction with other evaluation methods to help in better understanding an individual's internal conflicts and aiding in prediction of behavior and choice of therapy seems particularly appropriate. The construct of self-concept is complex and does not yield to direct inspection. Thus, the self-concept of an individual must be inferred from behaviors that do lend themselves to direct inspection. It has already been mentioned that the current self-concept "tests" on the market are less than ideal due to questionable reliability and validity and the confounding issue of the social desirability factor. The prudent approach to evaluation of an individual's self-concept would include using a variety of techniques, such as direct behavioral observation, interview of the individual and significant others, self-report measures of self-concept, and the use of human figure drawings as projective techniques.

Due to the sample of subjects being chosen from only extreme ends of the academic achievement spectrum, caution is advised in generalizing the present findings to a more normal population. Caution must also be advised in the generalization of the present findings to other age groups. The present study was limited to middle school students and the findings may not apply to younger children or older adolescents. Another limitation of the present study is the use of the Piers-Harris CSCS as the only criterion of self-concept. It is an imperfect criterion because of the social desirability factor of self-report measures of self-concept.

Future research should attempt to determine whether the same findings would occur with achievement level normally distributed. It would also be desirable to determine whether or not similar results would be obtained using other general self-concept measures and measures directed specifically toward academic self-concept.

REFERENCES

REFERENCES

Arkell, R. N. (1976). Naive prediction of pathology from human figure drawings. Journal of School Psychology, 14, 114-117.

Bachara, G. H., Zaba, J. N., & Raskin, L. M. (1976). Human figure drawings and LD children. Academic Therapy, 11 (2), 217-222.

Benner, E. H., Frey, D. H., & Gilberts, R. (1983). A construct validation of academic self-esteem for intermediate grade-level children. Measurement and Evaluation in Guidance, 16, 127-134.

Bennett, V. D. C. (1964). Does size of figure drawing reflect self-concept? Journal of Consulting Psychology, 28, 285-286.

Bennett, V. D. C. (1966). Combinations of figure drawing characteristics related to the drawer's self-concept. Journal of Projective Techniques, 30, 192-196.

Bodwin, R. F., & Bruck, M. (1960). The adaptation and validation of the draw-a-person test as a measure of self-concept. Journal of Clinical Psychology, 16, 427-429.

Bridgeman, B., & Shipman, V. G. (1978). Preschool measures of self-esteem and achievement motivation as predictors of third-grade achievement. Journal of Educational Psychology, 70, 17-28.

Brookover, W. B., Paterson, A., & Thomas, S. (1962). Self-concept of ability and school achievement I (Cooperative Research Project No. 845). East Lansing, MI: Educational Publication Services.

Brookover, W. B., LePere, J. M., Hamachek, D. E., Thomas, S., & Erickson, E. L. (1965). Self-concept of ability and school achievement II (USOE Cooperative Research Report, Project No. 1636). East Lansing, MI: Michigan State University.

Brooks, D. M. (1978). Classroom contextual drawings: An unobtrusive measure of attitudes towad school. Journal of Contemporary Educational Psychology, 3, 175-182.

Brown, E. V. (1977). Reliability of children's drawings in the Goodenough-Harris "draw-a-man test." Perceptual and Motor Skills, 44, 739-742.

Buck, J. N. (1948). The H-T-P test. Journal of Clinical Psychology, 4, 151-159.

Burton, A., & Sjoberg, B. (1964). The diagnostic validity of human figure drawings in schizophrenia. Journal of Psychology, 57, 3-18.

Byrne, B. M. (1983). Investigating measures of self-concept. Measurement and Evaluation in Guidance, 16, 115-126.

Calhoun, G., Jr., Whitley, J. D., & Ansolabehere, E. M. (1978). An investigation of the Goodenough-Harris drawing test and the (Coopersmith) self-esteem inventory. Educational and Psychological Measurement, 38, 1229-1232.

Cohen, J., and Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Cohen, S. M., Money, J., & Uhlenhuth, E. H. (1972). A computer study of selected features of self-and-other drawings by 385 children. Journal of Learning Disabilities, 5, 29-39.

Coopersmith, S. (1967). The antecedents of self-esteem. San Francisco: W. H. Freeman.

Coopersmith, S., Sakai, D., Beardslee, B., & Coopersmith, A. (1976). Figure drawing as an expression of self-esteem. Journal of Personality Assessment, 40, 370-375.

Craddick, R. A. (1963). The self-image in the draw-a-person test and self-portrait drawings. Journal of Projective Techniques, 27, 288-291.

Dalby, J. T., & Vale, H. L. (1977). Self-esteem and children's human figure drawings. Perceptual and Motor Skills, 44, 1279-1282.

Delatte, J. G., Jr., & Henrickson, N. J. (1982). Human figure drawing size as a measure of self-esteem. Journal of Personality Assessment, 46, 603-606.

Dieffenbach, E. W. (1978). Koppitz' human figure drawing (HFD) test: The reliability and clinical validity of its emotional indicators. Dissertation Abstracts International, 38, 6053A.

Diesterhaft, K., & Gerken, K. (1983). Self-concept and locus of control as related to achievement of junior high students. Journal of Psychoeducational Assessment, 1, 367-375.

DiLeo, J. (1973). Young children's drawings as diagnostic aids. New York: Brunner/Mazel.

Eno, L., Elliott, C., & Woehlke, P. (1981). Koppitz emotional indicators in the human-figure drawings of children with learning problems. Journal of Special Education, 15, 459-470.

Epstein, S. (1973). The self-concept revisited or a theory of a theory. _American Psychologist_, _28_, 404-416.

Falk, J. D. (1981). Understanding children's art: an analysis of the literature. _Journal of Personality Assessment_, _45_, 465-472.

Fu, V. R. (1981). Analysis of children's self-drawings as related to self-concept. _Psychological Reports_, _49_, 941-942.

Fuller, G. B., Preuss, M., & Hawkins, W. F. (1970). The validity of the human figure drawings with disturbed and normal children. _Journal of School Psychology_, _8_, 54-56.

Gayton, W. F., Tavormina, J., Evans, H. E., & Schuh, J. (1974). Comparative validity of Harris' and Koppitz' scoring systems for human-figure drawings. _Perceptual and Motor Skills_, _39_, 369-370.

Goh, D. S., & Fuller, G. B. (1983). Current practices in the assessment of personality and behavior by school psychologists. _School Psychology Review_, _12_, 240-243.

Goodenough, F. L. (1926). _Measurement of intelligence by drawings_. Yonkers-on-Hudson, NY: World.

Gramlich, J. M. (1984). Self-concept and children's human figure drawings (Doctoral dissertation, University of Detroit, 1983). _Dissertation Abstracts International_, _44_, 2892B.

Hall, L. P., & Ladriere, M. L. (1970). A comparative study of diagnostic potential and efficiency of six scoring systems applied to children's figure drawings. _Psychology in the Schools_, _7_, 244-247.

Hammer, E. F. (1969). DAP: Back against the wall? _Journal of Consulting and Clinical Psychology_, _33_, 151-156.

Handler, L., & McIntosh, J. (1971). Predicting aggression and withdrawal in children with the draw-a-person and Bender Gestalt. _Journal of Personality Assessment_, _35_, 331-335.

Harris, D. B. (1963). _Goodenough-Harris drawing test_. New York: Harcourt, Brace & World.

Hiler, E. W., & Nesvig, D. (1965). An evaluation of criteria used by clinicians to infer pathology from figure drawings. _Journal of Consulting Psychology_, _29_, 520-529.

James, W. (1918). _The principles of psychology_. New York: Dover Publications.

Kamano, D. K. (1960). An investigation on the meaning of human figure drawing. Journal of Clinical Psychology, 16, 429-431.

Kellogg, R. (1959). What children scribble and why. Palo Alto, CA: National Press.

Klecka, W. R. (1980). Discriminant analysis. Beverly Hills: Sage Publications.

Klopfer, W. G., & Taubee, E. S. (1976). Projective tests. Annual Review of Psychology, 27, 543-567.

Koppitz, E. M. (1968). Psychological evaluation of children's human figure drawings. New York: Grune & Stratton.

Koppitz, E. M. (1984). Psychological evaluation of human figure drawings by middle school pupils. Orlando, FL: Grune & Stratton.

Leviton, H. (1975). The implications of the relationship between self-concept and academic achievement. Child Study Journal, 5, 23-24.

Lecky, P. (1945). Self-consistency: A theory of personality. New York: Island Press.

Lingren, R. H. (1971). An attempted replication of emotional indicators in human drawings by shy and aggressive children. Psychological Reports, 29, 35-38.

Ludwig, D. J. (1969). Self-perception and the draw-a-person test. Journal of Projective Techniques, 33, 257-261.

Machover, K. (1949). Personality projection in the drawing of the human figure. Springfield, IL: Charles C. Thomas.

Machover, K. (1953). Human figure drawings of children. Journal of Projective Techniques, 17, 85-92.

Marsh, H. W., Relich, J. D., & Smith, I. D. (1983). Self-concept: The construct validity of interpretations based upon the SDQ. Journal of Personality and Social Psychology, 45, 173-187.

Mintz, R., & Muller, D. (1977). Academic achievement as a function of specific and global measures of self-concept. The Journal of Psychology, 97, 53-57.

Muller, D., Chambliss, J., & Wood, M. (1977). Relationship between area-specific measures of self-concept, self-esteem, and academic achievement for junior high students. Perceptual and Motor Skills, 45, 1117-1118.

Ottenbacher, K. (1981). An investigation of self-concept and body image in the mentally retarded. Journal of Clinical Psychology, 37, 417-418.

Piers, E. V., & Harris, D. B. (1964). Age and other correlations of self-concept in children. Journal of Educational Psychology, 55, 91-95.

Pihl, R. O., & Nimrod, G. (1976). The reliability and validity of the draw-a-person test and IQ and personality assessment. Journal of Clinical Psychology, 32, 470-472.

Pikulski, J. J. (1972). A comparison of figure drawings and WISC IQs among disabled readers. Journal of Learning Disabilities, 5, 41-44.

Prytula, R. E., & Leigh, G. G. (1972). Absolute and relative figure drawing size in institutionalized orphans. Journal of Clinical Psychology, 28, 377-379.

Prytula, R. E., Phelps, M. R., Morrissey, E. F., & Davis, S. F. (1978). Figure drawing size as a reflection of self-concept or self-esteem. Journal of Clinical Psychology, 34, 207-214.

Prytula, R. E., & Thompson, N. D. (1973). Analysis of emotional indicators in human figure drawings as related to self-esteem. Perceptual and Motor Skills, 37, 795-802.

Purkey, W. W. (1970). Self-concept and school achievement. Englewood Cliffs, NJ: Prentice-Hall.

Raskin, L. M. & Beatty, N. (1973). Human figure drawings by clinic- and school-tested learning disabled children: A difference in emotional indicators. Proceedings of the Third Annual International Symposium on Learning Disabilities. Miami, FL: National Rehabilitation Training Institute.

Roback, H. B. (1968). Human figure drawings: Their utility in the clinical psychologist's armamentarium for personality assessment. Psychological Bulletin, 70, 1-19.

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton University Press.

Rosenberg, M. (1979). Conceiving the self. New York: Basic Books.

Rubin, R. A., Dorle, J., & Sandridge, S. (1977). Self-esteem and school performance. Psychology in the Schools, 14, 503-507.

Rubin, R. A. (1978). Stability of self-esteem ratings and their relation to academic achievement: A longitudinal study. Psychology in the Schools, 15, 430-433.

Schaefer, W. (1975). The relationship between self-concept and the draw-a-person test. Journal of Clinical Psychology, 31, 135-136.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. Review of Educational Research, 46, 407-441.

Silvern, S. B., & Brooks, D. M. (1980). Frustration as a factor in the height of low achievers' self-portraits. Perceptual and Motor Skills, 50, 225-226.

Silvern, S. B., Brooks, D. M., Griffin, A., & Lee, C. (1980). Classroom contextual drawings as predictors of pupils' academic achievement. Perceptual and Motor Skills, 50, 403-406.

Stenner, A. J., & Katzenmeyer, W. G. (1975). Self-concept, ability, and achievement in a sample of sixth-grade children. Journal of Educational Research, 69, 270-273.

Stricker, G. (1967). Actuarial, naive clinical, and sophisticated clinical prediction of pathology from figure drawings. Journal of Consulting Psychology, 31, 492-494.

Sundberg, N. (1961). The practice of psychological testing in clinical services throughout the United States. American Psychologist, 16, 79-83.

Swenson, C. H. (1968). Empirical evaluation of human figure drawings: 1957-1966. Psychological Bulletin, 70, 20-44.

Tallent, N. (1980). Report writing in special education. Englewood Cliffs, NJ: Prentice-Hall.

Van Dyne, W. T., & Carskadon, T. G. (1978). Relationships among three components of self-concept and same-sex and opposite-sex human figure drawings. Journal of Clinical Psychology, 34, 537-538.

Wagner, R. F. (1980). Human figure drawings of LD children. Academic Therapy, 16, 37-41.

Wanderer, Z. W. (1969). Validity of clinical judgments based on human figure drawings. Journal of Consulting and Clinical Psychology, 33, 143-150.

Watson, C. C. (1967). Relationship of distortion to draw-a-person diagnostic accuracy among psychologists. Journal of Consulting Psychology, 31, 142-146.

Wilee, C. T., & Davis, S. F. (1976). Level of self-esteem and size of human figure drawing as a function of group vs. individual administration. Psychological Reports, 39, 130.

Wylie, R. (1974). The self-concept volume I: A review of methodological considerations and measurng instruments. Lincoln, NE: University Press.

Wysocki, B. A., & Wysocki, A. C. (1973). The body-image of normal and retarded children. Journal of Clinical Psychology, 29, 7-10.

Ziller, F. C., Hagey, J., & Smith, M. D. C. (1969). Self-esteem: A self-social construct. Journal of Consulting and Clinical Psychology, 33, 84-95.

Zingale, S. A. (1982). The effects of age, level of self-esteem, and locus of control on self-concept stability from childhood through adolescence. Dissertation Abstracts International, 42, 4220B.

APPENDIXES

Appendix A

Emotional Indicator Categories and Emotional Indicators

Impulsivity	Poor integration of parts Gross asymmetry of limbs Transparencies Big figure Omission of neck
Insecurity, Feelings of Inadequacy	Slanting figure Tiny head Hands cut off Monster, grotesque figure Omission of arms Omission of legs Omission of feet
Anxiety	Shading of face Shading of body and/or limbs Shading of hands and/or neck Legs pressed together Omission of eyes Clouds, rain, flying birds
Shyness, Timidity	Tiny figure Short arms Arms clinging to body Omission of nose Omission of mouth
Anger, Aggressiveness	Crossed eyes Teeth Long arms Big hands Nude figure, genitals

These items were taken from the Koppitz (1984) book on adolescent HFD interpretation

Appendix B

Critical Features of HFDs

Excessive attention to the eyes (Bachara et al., 1978)

Hands drawn clearly and correctly versus vaguely drawn (Wysocki & Wysocki, 1973)

Arms drawn two-dimensionally (Goodenough, 1926)

Legs drawn two-dimensionally (Goodenough, 1926)

Less than two pieces of clothing (Goodenough, 1926)

Appendix C

Goodenough-Harris Scoring Guide

Draw-A-Man

1. Head present
2. Neck present
3. Neck, two dimensions
4. Eyes present
5. Eye detail: brow or lashes
6. Eye detail: pupil
7. Eye detail: proportion
8. Eye detail: glance
9. Nose present
10. Nose, two dimensions
11. Mouth present
12. Lips, two dimensions
13. Both nose and lips in two dimensions
14. Both chin and forehead shown
15. Projection of chin shown; chin clearly differentiated from lower lip
16. Line of jaw indicated
17. Bridge of nose
18. Hair I--any indication
19. Hair II--more than a scribble, nontransparent
20. Hair III--styling present
21. Hair IV--shows part in hair
22. Ears present
23. Ears present: proportion and position
24. Fingers present
25. Correct number of fingers shown
26. Detail of fingers correct
27. Opposition of thumb shown
28. Hands present
29. Wrist or ankle shown
30. Arms present
31. Shoulders I--abrupt broadening of trunk below neck
32. Shoulders II--shoulders continuous with arms/neck and square
33. Arms at side or engaged in activity
34. Elbow joint shown
35. Legs present
36. Hip I--crotch indicated
37. Hip II--rounded hip
38. Knee joint shown
39. Feet I: any indication
40. Feet II: proportion

41. Feet III: heel
42. Feet IV: perspective
43. Feet V: detail--of shoe
44. Attachment of arms and legs I--attached to trunk
45. Attachment of arms and legs II--attached to trunk at correct point
46. Trunk present
47. Trunk in proportion, two dimensions
48. Proportion: head I--not more than one-half or less than one-tenth that of trunk
49. Proportion: head II--head approximately one-fourth trunk
50. Proportion: face
51. Proportion: arms I--arms at least equal to trunk length
52. Proportion: arms II--arms taper
53. Proportion: legs
54. Proportion: limbs in two dimensions
55. Clothing I--any representation
56. Clothing II--at least two articles, nontransparent
57. Clothing III--all clothes free from transparencies
58. Clothing IV--at least four articles
59. Clothing V--costume
60. Profile I--head, trunk and feet in profile without error, may have one body transparency, legs not in profile, or arms incorrectly attached
61. Profile II--figure in true profile
62. Full face--all major body parts in proper location
63. Motor coordination: lines
64. Motor coordination: junctures
65. Superior motor coordination
66. Directed lines and form: head outline
67. Directed lines and form: trunk outline
68. Directed lines and form: arms and legs
69. Directed lines and form: facial features
70. "Sketching" technique
71. "Modeling" technique
72. Arm movement
73. Leg movement

Draw-A-Woman

1. Head present
2. Neck present
3. Neck, two dimensions
4. Eyes present
5. Eye detail: brow or lashes
6. Eye detail: pupil
7. Eye detail: proportion
8. Cheeks
9. Nose present
10. Nose, two dimensions
11. Bridge of nose
12. Nostrils shown

13. Mouth present
14. Lips, two dimensions
15. "Cosmetic lips"
16. Both nose and lips in two dimensions
17. Both chin and forehead shown
18. Line of jaw indicated
19. Hair I (same as D-A-M)
20. Hair II (same as D-A-M)
21. Hair III (same as D-A-M)
22. Hair IV (same as D-A-M)
23. Necklace or earrings
24. Arms present
25. Shoulders
26. Arms at side
27. Elbow joint shown
28. Fingers present
29. Correct number of fingers shown
30. Detail of fingers correct
31. Opposition of thumb shown
32. Hands present
33. Legs present
34. Hip
35. Feet I: any indication
36. Feet II: proportion
37. Feet III: detail
38. Shoe I: "feminine"
39. Shoe II: style
40. Placement of feet appropriate to figure
41. Attachment of arms and legs I
42. Attachment of arms and legs II
43. Clothing indicated
44. Sleeve I
45. Sleeve II
46. Neckline I
47. Neckline II: collar
48. Waist I
49. Waist II
50. Skirt "modeled" to indicate pleats or draping
51. No transparencies in figure
52. Garb feminine
53. Garb complete, without incongruities
54. Garb a definite "type"
55. Trunk present
56. Trunk in proportion, two dimensions
57. Head-trunk proportion
58. Head: proportion
59. Limbs: proportion
60. Arms in proportion to trunk
61. Location of waist
62. Dress area
63. Motor coordination: junctures
64. Motor coordination: lines
65. Superior motor coordination

66. Directed lines and form: head outline
67. Directed lines and form: breast
68. Directed lines and form: hip contour
69. Directed lines and form: arms taper
70. Directed lines and form: calf of leg
71. Directed lines and form: facial features

Appendix D

Piers-Harris Children's Self-Concept Scale

Here are a set of statements. Some of them are true of you and so you will circle the "yes." Some are not true of you and so you will circle the "no." Answer every question even if some are hard to decide, but do not circle both "yes" and "no." Remember, circle the "yes" if the statement is generally like you, or circle the "no" if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

yes no 1. My classmates make fun of me.
yes no 2. I am a happy person.
yes no 3. It is hard for me to make friends.
yes no 4. I am often sad.
yes no 5. I am smart.
yes no 6. I am shy.
yes no 7. I get nervous when the teacher calls on me.
yes no 8. My looks bother me.
yes no 9. When I grow up, I will be an important person.
yes no 10. I get worried when we have tests in school.
yes no 11. I am unpopular.
yes no 12. I am well behaved in school.
yes no 13. It is usually my fault when something goes wrong.
yes no 14. I cause trouble to my family.
yes no 15. I am strong.
yes no 16. I have good ideas.
yes no 17. I am an important member of my family.
yes no 18. I usually want my own way.
yes no 19. I am good at making things with my hands.
yes no 20. I give up easily.
yes no 21. I am good in my school work.
yes no 22. I do many bad things.
yes no 23. I can draw well.
yes no 24. I am good in music.
yes no 25. I behave badly at home.
yes no 26. I am slow in finishing my school work.
yes no 27. I am an important member of my class.
yes no 28. I am nervous.
yes no 29. I have pretty eyes.
yes no 30. I can give a good report in front of the class.
yes no 31. In school I am a dreamer.
yes no 32. I pick on my brother(s) and sister(s).
yes no 33. My friends like my ideas.
yes no 34. I often get into trouble.

yes no 35. I am obedient at home.
yes no 36. I am lucky.
yes no 37. I worry a lot.
yes no 38. My parents expect too much of me.
yes no 39. I like being the way I am.
yes no 40. I feel left out of things.
yes no 41. I have nice hair.
yes no 42. I often volunteer in school.
yes no 43. I wish I were different.
yes no 44. I sleep well at night.
yes no 45. I hate school.
yes no 46. I am among the last to be chosen for games.
yes no 47. I am sick a lot.
yes no 48. I am often mean to other people.
yes no 49. My classmates in school think I have good ideas.
yes no 50. I am unhappy.
yes no 51. I have many friends.
yes no 52. I am cheerful.
yes no 53. I am dumb about most things.
yes no 54. I am good looking.
yes no 55. I have lots of pep.
yes no 56. I get into a lot of fights.
yes no 57. I am popular with boys.
yes no 58. People pick on me.
yes no 59. My family is disappointed in me.
yes no 60. I have a pleasant face.
yes no 61. When I try to make something, everything seems to go wrong.
yes no 62. I am picked on at home.
yes no 63. I am a leader in games and sports.
yes no 64. I am clumsy.
yes no 65. In games and sports, I watch instead of play.
yes no 66. I forget what I learn.
yes no 67. I am easy to get along with.
yes no 68. I lose my temper easily.
yes no 69. I am popular with girls.
yes no 70. I am a good reader.
yes no 71. I would rather work alone than with a group.
yes no 72. I like my brother (sister).
yes no 73. I have a good figure.
yes no 74. I am often afraid.
yes no 75. I am always dropping or breaking things.
yes no 76. I can be trusted.
yes no 77. I am different from other people.
yes no 78. I think bad thoughts.
yes no 79. I cry easily.
yes no 80. I am a good person.

Appendix E

Multiple Regression Variables

Dependent Variable: Piers-Harris CSCS

Independent Variable:

Koppitz

Impulsivity	1 - poor integration of parts 2 - gross asymmetry of limbs 3 - transparencies 4 - big figure 5 - omission of neck
Insecurity	1 - slanting figure 2 - tiny head 3 - hands cut off 4 - monster, grotesque figure 5 - omission of arms 6 - omission of legs 7 - omission of feet
Anxiety	1 - shading of face 2 - shading of body and/or limbs 3 - shading of hands and/or neck 4 - legs pressed together 5 - omission of eyes 6 - clouds, rain, flying birds
Shyness, timidity	1 - tiny figure 2 - short arms 3 - arms clinging to body 4 - omission of nose 5 - omission of mouth
Anger, aggressiveness	1 - crossed eyes 2 - teeth 3 - long arms 4 - big hands 5 - nude figure, genitals

Goodenough-Harris score

Global score: pathological vs. nonpathological

Critical features	1 - excessive attention to the eyes
	2 - hands drawn clearly, correctly
	3 - arms drawn two-dimensionally
	4 - legs drawn two-dimensionally
	5 - less than two pieces of clothing

Achievement level: high or low

Sex: male or female