THE DRAW-A-PERSON: GROUP DIFFERENCES AMONG INDIVIDUALS WITH OBSESSIVE-COMPULSIVE DISORDER, ATTENTION DEFICIT HYPERACTIVITY DISORDER, TOURETTE SYNDROME, AND NORMAL CONTROLS

A Thesis

by

WENDY A. BURCH

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2004

Major Subject: Psychology

THE DRAW-A-PERSON: GROUP DIFFERENCES AMONG INDIVIDUALS WITH OBSESSIVE-COMPULSIVE DISORDER, ATTENTION DEFICIT HYPERACTIVITY DISORDER, TOURETTE SYNDROME, AND NORMAL CONTROLS

A Thesis

by

WENDY A. BURCH

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Approved as to style and content by:

Robert W. Heffer
(Co-Chair of Committee)

Gerianne M. Alexander
(Co-Chair of Committee)

William A. Rae
(Member)

Steven Rholes
(Head of Department)

August 2004

Major Subject: Psychology

ABSTRACT

The Draw-A-Person: Group Differences Among Individuals with Obsessive-Compulsive Disorder, Attention Deficit Hyperactivity Disorder, Tourette Syndrome, and Normal Controls. (August 2004)

Wendy A. Burch, B.A., State University of New York at Buffalo;

M.A., State University of New York at Brockport

Co-Chairs of Advisory Committee: Dr. Robert Heffer
Dr. Gerianne Alexander

The purpose of the present study was to investigate the differences among the human figure drawings (HFDs) of individuals diagnosed with Obsessive-Compulsive Disorder (OCD), Tourette Syndrome (TS), Attention Deficit Hyperactivity Disorder (ADHD), and Normal Controls. Males and females (*N*=161), ranging in age from 7.0 to 58.9 years, diagnosed with OCD, TS, ADHD, and individuals with no diagnosis were administered the Draw-A-Person (DAP; Machover, 1949), a human figure drawing task. Analyses were conducted to evaluate relationships between several variables: sex of participant, age, detail, emotional indicators, symptom severity, and sex of figure drawn. Results provided support for the hypothesis that males would draw a same sex figure more often than females, and that males would include more anxiety indicators than females. Results also provided support for the hypothesis that younger participants would include more unusual characteristics in HFDs, although the variance explained was minimal. The hypothesis that symptom severity would influence HFD characteristics was not supported, nor was the hypothesis that sex of participant would

influence inclusion of detail. Several of the regression analyses of the smaller clinical groups were statistically significant, yet these results should be interpreted with caution due to the small number of cases used for the analysis.

TABLE OF CONTENTS

Page

LIST OF TABLES

INTRODUCTION

Although human figure drawings (HFDs) have been in use for over 50 years, irresolution and uncertainty continue regarding appropriate, valid, and reliable applications of this assessment tool. The purpose of the present study was to investigate differences among the human figure drawings of individuals diagnosed with Obsessive-Compulsive Disorder (OCD), Tourette Syndrome (TS), Attention Deficit Hyperactivity Disorder (ADHD), and normal control participants, who were administered the Draw-A-Person (DAP; Machover, 1949), a human figure drawing task. In addition, gender and developmental differences were explored.

First, information will be presented about the use of human figure drawings and the purpose of the DAP (Machover, 1949) and other human figure drawing tasks. Scoring systems used in the evaluation of human figure drawings will be reviewed, with emphasis on the scoring systems of Koppitz (1968) and Machover (1949). The use of human figure drawings to assess intelligence and developmental differences will also be discussed. Literature regarding appropriate use of human figure drawings will then be presented. Finally, the purpose, methods, and discussion of the present study will be provided.

This thesis follows the style of *Journal of Personality Assessment.*

PURPOSE OF HUMAN FIGURE DRAWINGS

History

The use of HFDs in psychological assessment has a long, controversial history. HFDs have been used to assess intelligence, personality, aggression, emotional adjustment, developmental status, and global functioning (Aikman, Belter, & Finch, 1992; Lev-Weisel & Hershkovitz, 2000; McNeish & Naglieri, 1993). HFDs have also been used to differentiate groups of individuals diagnosed with different mental disorders from non-diagnosed individuals (Cox & Catte, 2000; Koppitz, 1968; Machover, 1949), with varying degrees of success.

Controversy exists, however, surrounding the use of HFDs. The body of HFD literature suggests that although interest in HFDs has remained constant over the past 50 years, evidence for their use is equivocal. In a review of the literature, Swenson (1968) concluded that in spite of a substantial increase in the empirical evidence and justification for the use of the DAP (Machover, 1949) as a clinical tool, evidence does not exist to support its use as a tool to improve diagnostic accuracy. Kahill (1984) also concluded that support does exist for the use of HFDs as an aid to global assessment ratings. Indeed, the controversy surrounding HFDs has been compared to that which surrounds the Rorschach and other projective tests (Lilienfeld, Wood, & Garb, 2000).

Current Use

HFDs are used in a variety of clinical settings. A review of the literature (Kahill, 1984) indicated that HFDs are among the 100 most frequently used assessment tools. In spite of this common usage, many clinicians are not adequately trained in the scoring or interpretation of the drawings (Kahill, 1984; Motta, Little, & Tobin, 1993).

Clinicians who use HFDs as part of their assessment arsenal tout the method as a way to build rapport, quickly gather a variety of information, and tap underlying psychological processes such as impulses and anxieties (Lev-Weisel & Hershkovitz, 2000).

While some authors conceptualize HFDs as a useful assessment tool, others disparage their use for anything other than play or rapport building (Joiner &Schmidt, 1997). Specifically, Joiner and Schmidt (1997) argued that the addition of projective drawings to an assessment that includes background, behavioral observations, and questionnaire measures yields little diagnostic or other useful, relevant information.

Koppitz (1983) stated that the utility and value of HFDs has much to do with the skill and experience of the people administering and evaluating them. On a similar note, Smith and Dumont (1995) cautioned clinicians against the administration of tests for which users have not been sufficiently trained. The equivocal nature of HFD research, and the fact that few populations have been studied extensively, makes for continued disagreement among researchers and clinicians regarding appropriate usage of HFDs.

Scoring Systems

While many methods are used to score HFDs, the scoring systems of Machover (1949) and Koppitz (1968) are two of the most frequently cited. Administration of HFDs typically consists of providing an individual with paper and pencil, and asking her or him to draw a picture of a person. Drawers are given no other directions. Koppitz (1968) stated that the HFD must be created in the presence of the examiner, as the HFD is conceptualized as a form of nonverbal communication between the drawer and the examiner.

Two broad categories are used in the interpretation of projective drawings, the sign and global approach methods (Lilienfeld et al., 2000). In the sign approach, rooted in Machover's (1949) theory, clinicians make inferences from individual drawing features, such as exaggerated body part size, omission of body parts, or unusual features. The characteristics of these features are linked to various emotional indicators and personality variables, thereby providing the clinician with information about the drawer (Lilienfeld et al, 2000). Although this method has been used widely, criticism has been levied at those using single signs or indicators as a method of preliminary diagnosis. General agreement has emerged that the use of single signs as indicative of pathology is unwarranted (Lilienfeld et al., 2000).

Riethmiller and Handler (1997) criticized authors for oversimplifying the approach to human figure drawings and admonished those who would base conclusions on single DAP variables. Despite sentiments such as these, some authors have found evidence that, although knowledgeable and trained in HFD use, many clinicians will nonetheless use single signs as a way of forming diagnostic hypotheses (Lilienfeld et al., 2000).

Machover's (1949) approach to using HFDs as a method of assessment stems from a projective, psychoanalytic framework. According to Machover (1949), when an individual is asked to draw a person, he or she must tap subconscious resources to complete the task. Machover (1949) stated that when drawing a picture of a person, an individual must project his or her own body image onto the drawing, which allows that individual to project his or her body needs, conflicts, and image into the drawing. The human figure drawing produced is seen as a representation of the self, and the paper it is drawn on represents the individual's environment (Machover, 1949).

Machover's (1949) scoring method assesses personality by the presence or absence of different normality or adjustment indicators, using projective methodology as a basis for interpretation (Shaffer, Duszynski, & Thomas, 1984). Although originally developed for use with children, Machover later adapted her human figure scoring method for use with adolescents and adults (Machover, 1949; Machover, 1960; Thomas & Jolley, 1998).

Within the HFD literature, criticisms of Machover's (1949) scoring system include the problematic definitions of the scored characteristics of the drawings, the degree to which an inference about a certain characteristic is made, and reliability and validity of different raters' scores (Shaffer et al., 1984). In addition, as Koppitz (1983) points out, Machover's task is not a test, and it has no formal scoring system.

Almost 20 years after Machover's (1949) work, Koppitz (1968) developed a system for analyzing human figure drawings. Koppitz (1968) described her methods for analyzing HFDs as a measure of mental maturity and as a projective technique. Both Machover and Koppitz conceptualized the drawing of a person as reflective of the subject's self, yet Koppitz (1968) created a more systematic approach to the evaluation of human figure drawings than had been seen before. The global approach to HFD interpretation stems from Koppitz' (1968) theory, identifies certain emotional indicators to provide a total maladjustment score.

Koppitz (1983) stated that when analyzing HFDS, it is useful to gather a general impression of the drawing as a whole without concern for the specific details.

According to Koppitz (1983), most children begin their HFDs by drawing the head. Koppitz (1983) also stated that children who begin the HFD with the feet or hands tend to have problems with interpersonal relationships. The rationale behind this assertion is that successful interpersonal relationships require the use of the head for talking. In contrast, the feet are used for kicking and the hands for hitting, both unacceptable interpersonal communication methods. In addition, Koppitz (1983) stated that a child who is unable to complete an HFD is likely to have negative feelings toward the person the child is attempting to draw. Similarly, a child who is unable to complete a drawing of him or herself is likely to have low self-concept (Koppitz, 1983).

Using a large normative group of 1856 children and factor analysis, Koppitz identified a group of 30 emotional indicators in human figure drawings, representative of aggressiveness, impulsivity, insecurity, anxiety, and shyness. Emotional indicators are specific details omitted, exaggerated, or included in a human figure drawing that vary from the drawings of normal individuals. These emotional indicators rarely occur in the drawings of well-adjusted individuals. While the Koppitz system for analyzing human figure drawings centers on the presence or absence of these emotional indicators, they are not scores, but rather signs that may indicate underlying attitudes and characteristics of the drawer (Koppitz, 1968).

However, Koppitz (1983) stated that the mere presence of a single emotional indicator should not be construed as clinically significant, simply reflective of a tendency or attitude. For example, three or more of these indicators present in a drawing, such as big hands, gross asymmetry of limbs, the absence of a neck, is highly suggestive of emotional difficulties (Koppitz, 1983). Koppitz also stated that individuals who include different emotional indicators in their drawings can have the same attitude. For example, anxiety may be represented by shading of the body, as well as by omitting the nose. In the same way, a single emotional indicator may have different meanings in different situations or when drawn by different individuals. In sum, Koppitz (1983) stated that the true meaning of a given emotional indicator can only be determined in the context of the HFD as a whole, in addition to other personality assessment information.

ASSESSMENT USING HFDS

Sex Differences

Several researchers have investigated sex differences in the human figure drawings of females and males. Sex differences may be complex, and the research inconsistent, yet they appear frequently enough to warrant attention (Kahill, 1984). According to Machover (1949), when drawers are asked to draw one or more figures, it is most common to draw a same-sex figure first. However, Kahill (1984) found that in the majority of studies reviewed, women drew a same sex figure much less frequently than men did.

According to Cox, Koyasu, Hiranuma, and Perara (2001), some disagreement exists among studies regarding differences in drawing between males and females. The authors stated that while some studies have found no sex differences, others have found a female advantage (i.e., females including more detail) in children.

De la Serna, Helwig, and Richmond (1979) reported the presence of sex differences in human figure drawings of children in Georgia, the Virgin Islands, and Mexico. The authors found that across all cultures males were more likely than females to draw a head and no body. In addition, whereas 11% of females from St. Thomas drew an opposite-sex figure, 41% of Mexican males did so, suggesting the presence of both cultural and sex differences.

With a sample of 120 British and 120 Japanese children, Cox, et al. (2001) investigated the effects of culture, sex and age of the participants on HFDs. Both British and Japanese samples consisted of 7-year-old and 11-year-old groups, each with 30 participants. All children were asked to complete a drawing of a man facing forward, a drawing of a man running to the side, and a drawing of a man running forward. Judges placed each drawing in one of five categories: very poor, below average, average, above average, and excellent based upon the quality of the drawing. In both the UK and Japan, girls received higher ratings than boys in all categories did. Cox et al. (2001) stated that this finding is contrary to the idea that boys are better able to depict a figure in action.

Machover (1960) also investigated sex differences in the developmental patterns of children using HFDs. Participants were middle class, white, urban children ages 5 to12 years. Results demonstrated that general developmental patterns were present in the HFDs of the children who participated. Additionally, girls were more mature, detailed, and included more realistic features in HFDs at all ages than did boys.

In an investigation of anxiety and sex differences, Rierdan, Koff, and Heller (1982) rated HFDs of 340 male and female college students and fifth, seventh and ninth graders. All drawers were tested in small groups comprised of both sexes. The authors found that males' drawings contained significantly more anxiety indicators than did females' drawings. Rierdan et al. (1982) postulated that these results could be due to male and female socialization differences. For example, while aggressive and hostile activities may be socially inappropriate for girls, they may be appropriate or normal for boys.

Developmental Differences

As in other areas of the HFD literature, findings regarding developmental differences are often mixed. Catte and Cox (1999) criticized Machover's (1949) approach to assessing HFDs as ignoring the developmental processes that likely underlie individuals' drawings of a human figure. Catte and Cox stated that when evaluating a child's drawing, one cannot necessarily attribute a poor drawing to the child's dysfunction, when in fact it may be an inability to draw well. This argument has also been levied at the assessment of the human figure drawings of adults, as there is a wide range of ability inherent in any drawing task (Cox & Catte, 2000).

Brown (1990) examined developmental differences in HFDs of children ages 5 to 11 years. The HFDs of 257 boys and 269 girls enrolled in a public school in Massachusetts were evaluated using a checklist of characteristics. Scores were based on the inclusion of checklist items in the drawing. Brown (1990) found that overall, boys and girls included approximately the same numbers of items in their drawings. Brown (1990) also found that girls aged 5, 6, and 9 years included significantly more checklist items in the heads of the drawings than did their same-age male counterparts. Brown (1990) concluded that while there were significant differences in boys' and girls' drawings at all ages, the results do not allow for interpretation of differences in boys' or girls' ability to draw.

Sitton and Light (1992) reported the results of a study that investigated differences in 4- to 6-year-olds' ability to draw men and women, adults, and children. Children (N=72), were asked to draw separate pictures of a man, a woman, a girl, and a boy. In addition, Sitton and Light (1992) investigated whether the addition of communication about the drawings had an effect on the drawn figure.

No significant differences were found in the drawings of 4-year-olds in the communication and non-communication conditions. Both 5- and 6- year-olds' drawings were significantly different in the two conditions. The authors concluded that children do have an ability to learn to use cues to differentiate between adults and children, male and female. The authors suggested a shift in focus in HFD research to a greater understanding of children's flexibility in completing HFD tasks.

Rubin, Schachter, and Ragins (1983) stated in their review of the literature that variability had not been investigated in a systematic fashion. Children (*N*=180) ages 4 to 12 years, recruited from a public school in Pennsylvania, were asked to draw four different pictures of a person on two different days. The drawings were then scored. Rubin et al. (1983) reported more score variability in boys' drawings than in girls' at all ages except nine and ten. Although overall, boys' drawings were more variable, the authors noted a similar developmental pattern for both boys and girls. The authors concluded that while the data provided evidence of developmental trends, factors other than age likely influenced these trends.

Groves and Fried (1991) recruited children ages 3 to 7 years. All drawers were from a middle class white population in Canada. The drawings obtained from participants were scored for the presence or absence of each of Koppitz' 30 developmental items. The authors found significant correlations between findings of expected and common elements of the drawings.

Expected elements were defined as elements present in at least 86% of the obtained HFDs. Common elements were defined as those present in 51% to 85% of HFDs. Some differences emerged, including the finding that 5- to 7- year-olds included more detail than the 5- to 7-year-olds in Koppitz' (1968) sample. Groves and Fried (1991) suggested that the higher intelligence scores obtained by children in their sample might explain that difference in the findings. In sum, Groves and Fried (1991) stated that from 3 to 7 years of age, the number of details included by children in drawings increased from 2 to 12. The number of exceptional, or unusual, details decreased from 19 to 4. Groves and Fried (1991) concluded that their results supported the continued use of the Koppitz (1968) developmental scoring system for children. In addition, they suggested that the scoring system might be appropriately extended to different populations, such as the authors' higher SES, Canadian sample.

Rae (1991) stated that with experience, it is possible for child health professionals to learn to identify expected qualities in drawings for specific ages. However, Rae cautioned that the ability to assign a specific age to a drawing comes only with much experience. Rae also stated that the interpretation of any child's drawing must be done with an understanding and appreciation of other factors that could influence the drawing. For example, an ill or traumatized child might produce a drawing below their expected developmental level due to emotional or physical impairment.

Developmental differences have also been researched with adults. Saarni and Azara (1977) analyzed the human figure drawings of adolescents, young adults and middle-aged adults and investigated developmental differences between the three groups. The authors reported adolescent male and female drawers were significantly more likely to obtain more anxiety signs than the young or older adult groups. However, the authors concluded that more detailed analyses would be necessary to determine the exact nature of developmental differences in this sample.

Behavior Disorders

Similar to other areas investigated in the HFD literature, researchers have attempted to determine the ability of HFDs to differentiate groups. Although little support exists for the ability of HFDs to differentiate diagnostic groups, some global ratings and sign patterns may be able to differentiate between groups more reliably than individual signs (Kahill, 1984).

To investigate the hypothesis that certain drawing indicators can be used to identify individuals with aggressive tendencies, Feyh and Holmes (1994) compared the HFDs of 20 girls and 20 boys (ages 10 to 16 years) diagnosed with Conduct Disorder, to 20 boys and 20 girls of the same ages without a Conduct Disorder diagnosis. No significant differences were found for the presence or absence of aggressive emotional indicators suggested by both Machover (1949) and Koppitz (1968). Feyh and Holmes (1994) concluded that the results of their study raise doubts about the ability of the Koppitz (1966) or the Machover (1949) methods to detect aggressive tendencies.

Fuller, Preuss, and Hawkins (1970) compared the HFDs of normal and emotionally disturbed (*N*=152) children attending a public school. The authors reported that overall, emotionally disturbed children included more emotional indicators than did normal children. However, the authors cautioned that normal children included only slightly more indicators. Therefore, Fuller et al. (1970) concluded that the presence of emotional indicators is not a valid tool for differentiating normal and emotionally disturbed children.

Lev-Weisel and Hershkovitz (2000) investigated the ability of Machover's DAP to detect aggressive behavior with adult male prisoners. Comparison of the HFDs of incarcerated violent offenders with those of nonviolent offenders revealed a significant difference in their drawings. Lev-Weisel and Hershkovitz (2000) reported that violent offenders drew significantly more obvious indicators such as eyes, eyebrows, facial hair, fingers, shoulders, and stance. The authors also reported that several indicators long thought to be particularly salient in assessing violence were not found to significantly differentiate between violent and nonviolent offenders (e.g., exposed teeth and emphasized ears). Lev-Weisel and Hershkovitz (2000) concluded that HFDs may be used to assist clinicians in predicting future aggressive behavior, with the caveat that HFDs should be considered not a lone assessment tool, but an adjunct one.

In an investigation of the utility of HFDs to screen for emotional disturbance, McNeish and Naglieri (1993) analyzed the HFDs of regular education (*N*=81) and emotionally disturbed (*N*=81) children ages 7 to 13 years. Trained raters then scored the drawings using a scoring system designed to identify items that frequently occur in the drawings of emotionally disturbed individuals. McNeish and Naglieri (1993) found that 49% of the emotionally disturbed and 68% of the regular education children were correctly identified with the screening procedure. The authors concluded that these results are an improvement over previous attempts to identify emotionally disturbed children. The authors also stated that the use of this tool is limited to screening, and should not be used as a treatment planner or diagnostic tool.

PSYCHOMETRIC PROPERTIES OF HFDS

Reliability

Thomas and Jolley (1998) stated that for drawings to be useful, two drawings by the same individual should evidence similar characteristics from one drawing to the next. However, Riethmiller and Handler (1997) stated that it is essential to recognize that specific details present in each drawing will vary between administrations. Although it is important to recognize this inherent variability, it has been argued that global traits within drawings tend to be relatively stable over time (Riethmiller & Handler, 1997).

According to Fuller, Vance, and Awadh (1997), many psychological assessments of children include some sort of projective instrument. Adequate inter-rater reliability is an important issue when using these measures. Fuller et al. (1997) compared the ratings given by two scorers using Koppitz' (1968) scoring system. The authors found an inter-rater reliability of .85 for 30 subjects. Fuller et al. (1997) concluded that this level of inter-rater reliability suggests that projective drawings are indeed a useful tool for generating hypotheses that may guide additional evaluation and treatment questions.

In direct opposition to Fuller et al. (1997), Lilienfeld et al. (2000) stated that while some reports of inter-rater reliability may be high, others can be very poor, with inter-rater reliability ranging from -0.13 to 1.0. Thus, Lilienfeld et al. (2000) cautioned against placing undue emphasis upon high inter-rater reliability scores of projective measures. Kahill (1984) reported that an overview of the extant data show the majority of inter-rater reliabilities for different HFD categories are over .80. This is an acceptable inter-rater reliability, and provides evidence for the use of the tool as a reliable one. Kahill (1984) also reported that test-retest reliability of human figure drawing scores across recent studies ranges from 0.81 to 0.99. Lilienfeld et al. (2000) stated that the internal consistencies of HFD global ratings have been acceptable, with Cronbach's alphas ranging from 0.50 to 0.86.

Validity

Lilienfeld, Wood, and Garb (2000) stated that the validity evidence for the use of human figure drawings is limited. Based upon the results of a meta-analysis, Lilienfeld et al. (2000) concluded that the effect sizes of published projective literature were substantially larger than for unpublished literature. Although this may come as no surprise, Lilienfeld et al. (2000) stated that this provides evidence for the hypothesis that "file drawer" effects may be responsible for the appearance of larger effect sizes in the published literature.

Gayton, Tavormina, Evans, and Schuh (1974) investigated the concurrent validity of the Koppitz (1968) HFD scoring system and WISC IQ scores. The authors reported a .68 ($p < .05$) correlation between full-scale IQ and HFD scores. However, the authors cautioned that the Koppitz score is a broad score, and provides little specific information with regard to intelligence. Gayton et al. (1974) stated that the Koppitz scoring system does not have a high enough concurrent validity with standardized intelligence tests to warrant its use as a measure of IQ.

NEED FOR CLARITY IN THE USE OF HFDS

When approaching the study of human figure drawings, the interested researcher is presented with several difficulties. Among these is the lack of clearly established norms for HFDs, the availability of different scoring systems, the equivocal nature of the literature, and the seemingly subjective nature of the scoring. In addition, a paucity of randomized, controlled research exists that investigates the utility of human figure drawings to differentiate among developmental levels.

The few studies that investigated the ability of HFDs to differentiate between diagnostic groups have produced equivocal findings (Feyh & Holmes, 1994; Lev-Weisel & Hershkowitz, 2000). Further investigation of HFDs drawn by individuals with different diagnoses, at different ages would be beneficial.

Riethmiller and Handler (1997) criticized Joiner and Schmidt (1997) for oversimplifying the approach to human figure drawings, and admonished those who would base conclusions on single DAP variables. As the authors pointed out, this is not sound psychological practice because any single item from an assessment battery does not have the ability to discriminate, compared to an entire test. Thomas and Jolley (1998) also concluded that in spite of over 50 years of research and use of human figure drawings, a divide exists between the clinical use of these instruments and their empirical status. Indeed, the nature of HFDs makes them difficult to score and interpret empirically, although a number of researchers have attempted to do so.

Thomas and Jolley (1998) also questioned the conceptualization of a drawing as representative of an individual’s self. According to the authors, the presumption that unconscious processes consistently influence the manner in which individuals draw a human figure seems far-fetched. In addition, Thomas and Jolly (1998) also questioned the supposition that the size of an individual feature in a drawing is of importance, or that the size of the drawing itself may relate to feelings of low self-esteem, depression, or anxiety.

Kahill (1984) stated that problems in HFD research include the variability of experimental procedures, scoring criteria, and the meaning assigned to scoring criteria. In addition, although some HFD signs are commonly investigated, the literature remains unclear as to whether the signs are investigated in the same manner. Statistical procedures used in analyses are not similar, and confounding variables may occlude the exact nature of the drawing activity.

To address these shortcomings, Kahill suggested that clinicians would be best served by using HFDs as a means to generate specific hypotheses about clients.

It is generally agreed that human figure drawings alone do not provide sufficient information for diagnosis or classification, and much of the empirical literature has borne out this conclusion. Yet the question remains, how and when do human figure drawings provide useful and valid information about an individual?

While HFDs have been used in many ways, a review of the extant literature revealed a variety of competing conclusions regarding their proper use. Although some investigations exist of individuals with different behavior disorders (Feyh & Holmes, 1994; Lev-Weisel & Hershkovitz, 2000) there remains a dearth of literature exploring the ability of HFDs to differentiate individuals with psychiatric diagnoses. In addition, although HFD drawings have been part of assessment batteries used with individuals with Attention Deficit-Hyperactivity Disorder and Tourette syndrome (O Britto, Pereria,

& Santos-Morales, 1999), no studies have investigated the differences between these groups.

PURPOSE OF PRESENT STUDY

It is important to determine the extent to which HFDs can differentiate diagnostic groups, as this may be a time and cost efficient way to screen individuals and formulate diagnostic hypotheses. Obsessive Compulsive Disorder (OCD), Tourette syndrome (TS), and Attention Deficit-Hyperactivity Disorder (ADHD) have been studied together elsewhere (Jankovic, 2003; Sheppard, Bradshaw, Purcell, & Pantelis, 1999). TS shares some common characteristics with ADHD and OCD, including weakened attention capabilities that have been observed in up to 30% of Tourette patients (Brand, Geene, Oudenhoven, Lindeborn, van der Ree, Cohen-Kettenis, & Buitelaar, 2002). This has led investigators to pursue the possibility of a common genetic link between the disorders (Leckman, 2002).

Many researchers have recommended that clinicians increase their knowledge of how to assess co-morbid disorders such as ADHD and OCD when TS is diagnosed. By remaining abreast of the current literature and being cognizant of current findings regarding TS and tic disorders, clinicians will be better able to successfully identify and treat clients with these disorders. To address this recommendation, the proposed study sought to determine the utility of the DAP task for differentiating ADHD, OCD, and TS across a wide age span. In addition, comparisons between diagnostic and no-diagnosis groups, and males and females were examined.

HYPOTHESES

Symptom Severity

Differences were hypothesized in the number of emotional and developmental indicators present in the HFDS among the ADHD, OCD, and TS groups. Based on previous equivocal research findings, it was expected that although differences would emerge among diagnostic groups, these differences would be minimal. Individuals with more severe symptomatology of TS and ADHD have been reported to exhibit poorer cognitive functioning than individuals with less severe symptomatology (specifically TS symptoms alone). Therefore, it was hypothesized that individuals with greater symptom severity would include fewer details in their HFDs than individuals with less severe symptoms.

Differences were also hypothesized in the number of emotional and developmental indicators present in the HFDs of individuals with varying levels of symptom severity. Based on previous equivocal research findings, it was expected that minimal differences among groups would be found. Due to the lack of previous research with these diagnostic groups, this hypothesis is an exploratory one.

Developmental Differences

Based on the results of earlier research (Groves & Fried, 1991; Saarni & Azara, 1977; Sitton & Light, 1992), it was hypothesized that developmental differences would be found. It was expected that younger participants would include less detail and more unusual characteristics in their drawings than would older individuals. It was hypothesized that the relationship between age and amount of detail included in drawings would be positive and linear, such that as age increased, the amount of detail included in the drawings would increase.

Sex Differences

Based on previous research findings (Cox et al., 2001; Machover, 1960; Rierdan et al., 1982), differences were hypothesized between males' and females' drawings at all ages, across diagnostic groups. Based on research conducted by Machover (1960), males were expected to include significantly more anxiety indicators and less detail than their female counterparts. In addition, males were expected to draw a same sex figure first significantly more often than females.

METHOD

Participants

Males and females (*N* =161), ranging in age from 7.0 to 58.9 years, with no psychiatric diagnoses, as well as individuals diagnosed with OCD, TS, or ADHD were administered the DAP (Machover, 1949), a human figure drawing task.

One hundred children and adults with a clinical diagnosis of TS, OCD, or ADHD were recruited from the Tic and Obsessive-Compulsive Disorders Specialty Clinic at the Child Study Center of Yale University in New Haven, CT. DSM-IV clinical diagnoses were determined by the consensus of two experienced clinicians after reviewing clinical records and semi-structured diagnostic interviews. Sixty-one unaffected children and adults were recruited as a comparison group through announcements and telemarketing lists. All participants were part of a larger study of the neurobiological basis of TS and OCD. Table 1 summarizes the characteristics of participants, and includes participant diagnosis as well as full scale IQ as measured by the Wechsler Abbreviated Scale of Intelligence (WASI, The Psychological Corporation).

Symptom severity was operationalized as the average of the standardized scores participants received on the YBOCS and the YGTSS,. Table 2 contains means and standard deviations by group for these scales. For each of these scales, severity is based on the relevant psychiatric symptoms as measured by the Yale Global Tic Severity Scale (YGTSS: Leckman, Riddle, Hardin, Ort, Swartz, Stevenson & Cohen, 1989) and the Yale-Brown Obsessive-Compulsive Scale (YBOCS: Goodman, Price & Rasmussen, 1992). For each scale, a rating is made on the basis of number of symptoms reported, with higher ratings indicating more symptomatology.

Table 1. *Sample Demographics*

Demographic variable		*n*	% of Total Sample (*N*=161)
Age in years			
M (*SD*)	22.61 (13.81)	161	
Range	7.0 - 58.5		
Sex			
Males		96	59.60
Females		65	40.40
Diagnostic Groups (*N*)			
Normal Control		61	37.90
Male/Female		31/30	19.3/18.6
Clinical		100	62.10
OCD		27	16.80
Male/Female		14/13	8.7/8.1
ADHD		21	13.00
Male/Female		17/4	10.6/2.5
TS		21	13.00
Male/Female		14/7	8.7/4.3
TS/OCD		14	8.70
Male/Female		8/6	5.0/3.7
TS/ADHD		9	5.60
Male/Female		6/3	3.7/1.9
TS/OCD/ADHD		8	5.00
Male/Female		6/2	3.7/1.2
IQ[a]			
M (*SD*)	110.43 (14.00)		
Range	64.00-139.00		

Note. NC=Normal control, OCD = Obsessive compulsive disorder, ADHD= Attention deficit hyperactivity disorder, TS= Tourette syndrome.

[a] IQ was measured using the Wechsler Scale of Abbreviated Intelligence, by D. Wechsler, 1999. New York: Psychological Corporation

Table 2. *Sample Characteristics and Symptoms by Group*

Characteristics	Clinical		TS		OCD		TS/OCD		TS/OCD/ ADHD		MD		NC	
	< 18 yrs	> 18 yrs	< 18 Yrs	> 18 yrs	< 18 yrs	< 18 yrs	>18 yrs	> 18 yrs	< 18 yrs	> 18 yrs	< 18 yrs	>18 yrs	< 18 yrs	> 18 yrs
Age range (years)	8.20 – 17.88	18.03 – 58.92	9.19-17.35	19.19-54..56	8.20-17.59	8.97-17.88	21.45-58.92	21.49-46.47	8.97-14.76	24.39-35.92	8.97-17.88	21.45-58.92	7.04-17.34	18.70 - 58.53
Age (years), mean ± SD	12.70 ± 2.87	35.63 ± 11.23	12.65± 2.63	37.52± 13.03	13.67 ±3.76	12.64± 2.56	35.29± 10.92	34.19± 10.20	12.35 ±2.87	29.84± 5.33	12.64 ±2.56	35.29± 10.92	12.35 ±3.06	36.58 ± 12.28
Male/Female	30/9	18/22	7/4	7/3	8/1	15/4	5/7	3/3	4/0	2/2	15/4	5/7	15/10	20/16
Symptoms														
motor[a]	9.82 ± 6.60	9.08± 8.41	11.45 ± 5.15	13.70± 5.58	1.33 ± 2.82	1.67± 4.24	13.38 ± 5.71	16.50± 4.28	9.25 ± 5.12	16.67± 6.03	12.89± 5.12	17.00± 4.54	0.0± 0.0	0.0± 0.0
phonic[a]	6.82 ± 6.43	5.21± 6.51	8.91 ± 6.12	6.80± 7.07	0.0± 0.0	1.22± 3.14	9.50 ± 5.26	9.50± 4.93	9.25 ± 7.89	9.33± 7.64	8.84 ± 6.02	10.27± 6.33	0.0 ± 0.0	0.0± 0.0
obsessions[b]	4.05 ± 4.63	7.68± 5.40	1.00 ± 2.72	2.30± 2.98	5.56 ± 5.10	10.11± 4.84	9.13 ± 2.70	9.33± 4.27	5.00 ± 4.16	10.33± 2.89	5.11 ± 4.65	8.70± 4.64	0.0 ± 0.0	0.86± 0.51
compulsions[b]	4.72 ± 4.81	7.89± 5.07	3.00 ± 5.22	2.30± 3.09	5.33 ± 4.47	10.11± 4.44	8.13 ± 3.94	7.67± 3.08	5.25 ± 4.27	12.33± 1.15	5.42± 4.72	9.50± 3.34	0.0± 0.0	0.11± 0.68

Note. ([a]) From the Yale Global Tic Severity Scale by J. F. Leckman, et al. (1989), ([b]) = From the Yale Brown Obsessive Compulsive Scale by W. K. Goodman, et al. (1989).

Materials

Participants were administered Machover's (1949) DAP task as part of a larger study conducted at Yale University Child Study Center. Instructions for the Draw A Person Task were "Draw a picture of a person. Draw the very best picture you can." An 8.5 x 11.0 piece of white paper and a pencil were provided for participants. Participants were given no further instructions. Drawings were scored using Machover's (1949) and Koppitz' (1968) scoring systems. The drawings were scored by two independent raters for presence or absence of characteristics included in the drawings (e.g., shading, heavy lines, omission of facial features, etc.). Table 3 contains means and standard deviations for the groups used in the following analyses. Inter-rater reliability was acceptable, and reached .90.

Table 3. *Means and Standard Deviations for Variables by Group*

	N	Emotional Indicators *M(SD)*	Detail *M(SD)*	Anxiety *M(SD)*	Unusual *M(SD)*
NC	61	.803(.872)	1.72(1.50)	.869(1.19)	1.08(1.05)
TS	21	.619(.740)	1.71(1.49)	1.29(1.90)	.952(.973)
OCD	27	.592(.797)	1.41(1.45)	1.30(1.94)	1.04(.81)
TS/ OCD	14	.786(.699)	.857(1.17)	.857(.949)	1.57(1.02)
TS/ /OCD/ ADHD	8	.375(.518)	1.25(1.49)	1.38 (1.77)	1.00(1.19)
MD	31	.807(.750)	1.03(1.32)	1.00(1.15)	1.26(1.00)
Any	100	.730(.790)	1.39(1.37)	1.19(1.60)	1.23(1.10)

Note. NC= Normal Control, TS=Tourette Syndrome, OCD = Obsessive-compulsive disorder, ADHD = Attention-deficit hyperactivity disorder, MD = Multiple Diagnosis, Any = Any diagnosis.

RESULTS

Symptom Severity

A standard multiple regression was performed to determine if the number of emotional indicators and amount of detail included in HFDs were significant predictors of symptom severity. Cases with missing data were eliminated from the analysis. Analyses were first conducted with the clinical sample. The same regression analyses were subsequently conducted with portions of the sample (i.e., normal control, clinical, TS, OCD, and TS/OCD groups). The normal group was comprised of all individuals without a diagnosis. The clinical group included all individuals with a diagnosis (e.g., TS, OCD, TS/OCD). The TS group consisted of individuals diagnosed with TS only, the OCD group consisted of individuals with an OCD diagnosis only, and the TS/OCD group consisted of individuals with co-morbid TS and OCD diagnoses. Results from these analyses follow.

One hundred sixty one cases (65 females, 96 males) were available for analysis. No cases were eliminated due to missing data. Participants ranged in age from 7.0 to 58.9 years ($M = 23.75$, $SD = 14.32$). Independent variables considered in the equation were emotional indicators and amount of detail. The dependent variable considered in the equation was symptom severity. For the following analyses, a symptom severity variable was created using the average of the standardized scores based on participant scores on the YBOCS and the YGTSS. As suggested by Tabachnik and Fidel (2001), analyses were performed using SPSS REGRESSION and SPSS FREQUENCIES for evaluation of assumptions.

When conducting a multiple regression analysis, an acceptable ratio of cases to independent variables is necessary. Tabachnik and Fidell (2001) suggested a cases to independent variables ratio of not greater than $N \geq 8$ (m), where m is the number of groups. For this analysis, 161 ≥16, which indicates an acceptable number of cases. Because the independent variables detail and number of emotional indicators were slightly positively skewed without transformation and negatively skewed with it, no transformation was conducted. With the use of $p < .001$ for Mahalanobis distance, one outlier was found, which was not eliminated due to the unique characteristics of the data set, and the fact that it was only one case. Computation of tolerance values were acceptable (*Tol.* = .98) and indicated no violations of the assumption of non-multicollinearity.

Analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the regression analyses with both clinical and normal participant subsets of these groups. In addition, the analyses were run with individuals 7-11 and 12- 18 years of age. The analyses did not yield any significant findings.

Secondary analyses were then conducted to examine the relationships between emotional indicators and diagnoses of TS and OCD. A multivariate analysis of variance was performed using TS and OCD as independent variables, and emotional indicators as the dependent variables. There were no main effects for TS or OCD, nor was there a TS by OCD interaction effect. However, univariate tests revealed an effect for TS for the variables tiny figure F (1, 99) = 5.40, $p = .022$, and no mouth F (1, 99) = 5.59, $p = .020$.

In addition univariate tests revealed an interaction effect for TS and OCD, F (1, 99) = 6.32, p =.014.

Developmental Differences

Younger participants were hypothesized to include less detail and more unusual characteristics in their drawings than older individuals. Because very little research has been conducted using the HFDs of individuals over the age of 21, the data were also analyzed to test for a curvilinear relationship between age and amount of detail included in HFDs. The regression analyses were conducted with portions of the sample (i.e., normal control, clinical, TS, OCD, and TS/OCD groups). A standard multiple regression was used to determine the extent to which age was related to the amount of detail and unusual characteristics included in HFDs. Detail and unusual characteristics were considered as continuous, independent variables. Age was considered a continuous, dependent variable. An inspection of the residuals indicated that the residuals for the dependent variable, age, were distributed approximately normally.

For this analysis, 160 cases were available, 65 females and 95 males. One case was eliminated due to missing data. Participants ranged in age from 7.0 to 58.9 years (M = 22.62, SD = 13.81). Table 4 displays the unstandardized regression coefficients (B), intercept, the standardized regression coefficients (β), correlations between the variables, the semi-partial correlations (sr^2), R^2, and adjusted R^2. The correlation between age and number of unusual characteristics included in HFDs was significant (r = -.23, p = .002), indicating that, as hypothesized, as age increased, the amount of unusual detail included in HFDs decreased. R for regression was significantly different from zero, F (2,157) =

4.55, $p = .012$. Detail accounted for 0.16% of the variance in age, and unusual characteristics accounted for 5.0% of the variance in age. Altogether, 5.5% of the shared variability of age was accounted for by detail and unusual characteristics ($R = .234$, $R^2 = .055$, Adj. $R^2 = .043$, $p = .012$). Unusual characteristics contributed more than detail, providing partial support for the hypothesis.

Table 4. *Standard Multiple Regression of Unusual Characteristics and Detail on Age*

Variables	AGE (DV)	UNUSUAL	DETAIL	B	β	sr^2
UNUSUAL	-.23*		-.14**	-2.98	-.225	.049
DETAIL	.07	-.14**		.407	.040	.002
		Intercept = 26.65				
Means	23.75	1.18	1.53			
Standard Deviations	14.33	1.08	1.42			

Note. $R^2 = .055$, Adj. $R^2 = .043$ ($N = 160$, $p = .012$)
*$p = .002$
** $p = .039$

An examination of the data was conducted to test for the possibility of a curvilinear relationship between age and detail characteristics included in drawings. This analysis was conducted to explore the possibility that at younger and older ages, amount of detail included in HFDs would be less than amount of detail included for individuals closer to the mean age of 22.62. The bulk of HFD research has been conducted with children and adolescents, leaving a gap in the research with adults.

Scatterplots were created for each of the two independent variables, the dependent variable, and for the entire model. Although the scatterplots indicated an absence of curvilinear relationships between the variables, the detail variable was inspected more closely to examine for a curvilinear relationship. A quadratic term for the detail variable was used for the analysis (regression curve estimation), and the results showed that a curvilinear relationship between age and detail did not exist, so the original linear model was maintained.

Secondary analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the regression curve estimation analyses with both clinical and normal participant subsets of these groups. In addition, the analysis was run with individuals 7-11 and 12- 18 years of age.

For the regression curve estimation analysis, there were two significant findings that emerged. There was a significant result for the unusual variable in the 7-11 clinical subgroup F (2, 23) = 5.52, p =. 011, with individuals at the younger and older extremes of the group including more unusual characteristics than individuals in the middle of the age range. There was also a significant result for the unusual variable in the normal control group (comprised of all individuals with no diagnosis), F (2, 57) = 4.61, p =

.014, with individuals at younger and older ages including more unusual characteristics than individuals in the middle of the age range.

For the analysis of normal control participants, 60 cases were available, 29 females and 31 males. Participants ranged in age from 7.0 to 57.5 years (*M* = 25.69, *SD* = 15.03). The correlation between age and number of unusual characteristics included in HFDs was not significant ($r = -.231$, $p = .058$), although the correlation approached significance in the hypothesized direction. *R* for regression was not significantly different from zero, $F(2, 57) = 1.56$, $p = .22$. Detail accounted for 1.0 % of the variance in age, and unusual characteristics accounted for 3.4 % of the variance in age. Altogether, 5.2% of the shared variability of age was accounted for by detail and unusual characteristics ($R = .228$, $R^2 = .052$, Adj. $R^2 = .019$, $p = .22$).

For the analysis of TS, ADHD, and OCD (i.e., clinical) participants, 100 cases were available, 35 females and 65 males. Participants ranged in age from 7.0 to 58.5 years (*M* = 21.91, *SD* = 13.99). The correlation between age and number of unusual characteristics included in HFDs was significant ($r = -.22$, $p = .013$), yet *R* for regression was not significantly different from zero, $F(2, 97) = 2.96$, $p = .056$. Detail accounted for 0.7 % of the variance in age, and unusual characteristics accounted for 5.3 % of the variance in age. Altogether, 5.8% of the shared variability of age was accounted for by detail and unusual characteristics ($R = .240$, $R^2 = .058$, Adj. $R^2 = .038$, $p = .056$) in the HFDs of the clinical group participants.

For the analysis of the TS group, 21 cases were available (7 females, 14 males). Participants ranged in age from 8.5-53.5 (*M* = 23.12, *SD* = 14.98). *R* for regression was not significantly different from zero, F (2, 18) = .363, p = .701. Detail accounted for 0.52 % of the variance in age, and unusual characteristics accounted for 2.5 % of the variance in age. Altogether, in the TS group, 3.9% of the shared variability of age was accounted for by detail and unusual characteristics (R = .197, R^2 = .039, Adj. R^2 = -.068, p = .701). Unusual characteristics and detail did not account for a significant portion of the variability in age for individuals in the TS group.

For the analysis of the OCD group, 27 cases were available, 13 females and 14 males. Participants ranged in age from 7.5 to 54.5 years (M = 26.24, SD = 13.20). R for regression was not significantly different from zero, F (2, 24) = 3.10, p = .063. Detail accounted for 17.9 % of the variance in age, and unusual characteristics accounted for 4.9 % of the variance in age. Altogether, 20.6% of the shared variability of age was accounted for by detail and unusual characteristics (R = .454, R^2 = .206, Adj. R^2 = .140, p = .063), indicating that as age increased, unusual characteristics and detail decreased, although this relationship did not reach significance.

For the analysis of the TS/OCD group, 13 cases were available, 6 females and 7 males. Participants ranged in age from 9.5 to 45.5 years (M = 20.00, SD = 12.54). R for regression was not significantly different from zero, F (2, 11) = .041, p = .960. Detail accounted for 0.03% of the variance in age, and unusual characteristics accounted for 0.74 % of the variance in age. Altogether, only 0.7% of the shared variability of age was accounted for by detail and unusual characteristics (R = .086, R^2 = .007, Adj. R^2 = -.173, p = .960), indicating that in the TS/OCD group, the amount of detail and unusual characteristics included in HFDs were not related to age of participant.

Secondary analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the subsequent regression analyses with both clinical and normal participant subsets of these groups. These analyses were conducted to explore the data for the possibility of developmental trends in the smaller groups. There were several significant findings that emerged.

For the analysis of the 7-11 years of age clinical group there was a significant result. Twenty-six cases were available, 7 females and 19 males. Participants ranged in age from 7.37 to 11.99 years (*M* = 10.24, *SD* = 1.09). *R* for regression was significantly different from zero, F (2, 23) = 6.96, p = .004. Detail accounted for 32.2% of the variance in age, and unusual characteristics accounted for 9.5 % of the variance in age. Altogether, 37.7% of the shared variability of age was accounted for by detail and unusual characteristics (R =.614, R^2 =.377, Adj. R^2 = .323, p = .004), indicating that detail and unusual characteristics were related to age of participant in individuals older in the 7-11 year age group.

For the analysis of the 7-11 years of age normal group there was also a significant result. Twelve cases were available, 6 females and 6 males. Participants ranged in age from 7.04 to 11.93 years (*M* = 9.81, *SD* = 1.71). *R* for regression was significantly different from zero, F (2, 9) = 4.45, p = .045. Detail accounted for 26.11% of the variance in age, and unusual characteristics accounted for 29.16 % of the variance in age. Altogether, 49.7% of the shared variability of age was accounted for by detail and unusual characteristics (R = .705, R^2 =.497, Adj. R^2 = .385, p = .045), indicating that detail and unusual characteristics were related to age of participant in the 7-11 normal subset.

For the analysis of the 12-17 group, *R* for regression was not significantly different from zero. The 12-17 group was then divided into two groups, normal control and clinical. Neither of these groups revealed significant results.

For the analysis of the 18 and older group, 78 cases were available, 42 females and 36 males. Participants ranged in age from 18.03 to 58.92 years ($M = 36.63$, $SD = 11.85$). *R* for regression was not significantly different from zero, $F(2, 75) = .179$, $p = .842$. Detail accounted for 0.01% of the variance in age, and unusual characteristics accounted for 0.46 % of the variance in age. Altogether, only 0.5% of the shared variability of age was accounted for by detail and unusual characteristics ($R = .068$, $R^2 = .005$, Adj. $R^2 = -.022$, $p = .842$), indicating that detail and unusual characteristics were not related to age of participant in individuals older than 18 years of age. The regression analyses were run with the clinical and normal subsets of the 18 and older group. Neither of these findings were significant.

The regression analysis was then conducted with all individuals with multiple diagnoses. The analysis included individuals diagnosed with TS/OCD, TS/ADHD, and TS/OCD/ADHD. Thirty-one cases (11 females, 20 males) were available. Participants ranged in age from 8.5 to 58.5 years ($M = 21.10$, $SD = 13.26$). *R* for regression was not significantly different from zero, $F(2, 28) = .922$, $p = .409$. Detail accounted for 4.5% of the variance in age, and unusual characteristics accounted for 2.3% of the variance in age. Altogether, 6.2% of the shared variability in age was accounted for by detail and unusual characteristics (R =.249, R^2 =.062, Adj. R^2 = -.005, p = .409), indicating that age was not related to the inclusion of detail and unusual characteristics in HFDs in the multiple diagnosis sample.

Sex Differences

To investigate the hypothesis that males' and females' drawings would differ significantly regarding the amount of detail included in the drawings, a one-way ANOVA was performed. Analyses were first performed with the entire (N =161) sample, followed by analyses of the clinical and normal control groups separately.

A total of 161 cases (65 females, 96 males) were available for analyses involving sex differences. Participants ranged in age from 7.0 to 58.5 years (M = 23.75, SD = 14.32). Table 5 displays the results of the ANOVA. A significant difference was not found between males and females, F (1, 59) = .382, p = .537, n^2= .002, indicating that sex of participant was not related to amount of detail included in HFDs.

The analysis was then run with the inclusion of IQ as a covariate. IQ was measured using the Wechsler Abbreviated Scale of Intelligence (WASI: Wechsler, 1999). The WASI is available in two and four subtest forms. The four subtests are Vocabulary, Similarities, Block Design, and Matrix Reasoning. The four-subtest form provides full scale, verbal, and performance IQ scores. The two-subtest form includes Vocabulary and Matrix Reasoning and provides only the FSIQ score. Both forms have been used to gain a measure of general intellectual ability in individuals aged 6-89 years. The inclusion of IQ as a covariate did not influence the results, indicating that participants' IQ scores did not have an impact on amount of detail included in the HFDs of the sample.

Table 5. *One-Way Analysis of Variance for Detail*

Source	*df*	*SS*	*MS*	*F*	*p*	n^2
Between Groups	1	.778	.778	.382	.54	.002
Within Groups	159	323.433	2.034			
Total	160	342.248				

Note. *N* = 160

A total of 61 cases (30 females, 31 males) were available for analyses involving sex differences among normal control participants. Participants ranged in age from 7.0 to 57.5 years (*M* = 25.69, *SD* = 15.03). A significant difference was not found between males and females, F (1, 59) = 1.60, p = .210, n^2 = .026, indicating that sex of participant was not related to amount of detail included in HFDs in the normal control group. The analysis was then run with the inclusion of IQ as a covariate. The inclusion of IQ as a covariate did not influence the results.

A total of 100 cases (35 females, 65 males) were available for analyses involving sex differences and detail among clinical participants. Participants ranged in age from 7.0 to 58.5 years (*M* = 23.75, *SD* = 14.32). A significant difference was not found between males and females, F (1, 98) = .310, p = .579, n^2 = .003, indicating that sex of participant was not related to amount of detail included in HFDs for the clinical group. The analysis was then run with the inclusion of IQ as a covariate. The inclusion of IQ as a covariate did not influence the results.

Secondary analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the ANOVA analyses with both clinical and normal participant subsets of these group. These analyses were conducted to examine sex differences in the smaller groups. One significant finding emerged. For the below 18 years of age group, normal control participants, females included more detail than their male counterparts, F (1, 23) = 5.41, p = .029.

To investigate the hypothesis that males would include more anxiety indicators than females, a one-way ANOVA was performed using the entire (*N* = 161) sample. Participants ranged in age from 7.0 to 58.5 years (*M* = 23.75, *SD* = 14.32). As shown in Table 6, a significant difference emerged between males and females, F (1,159) = 8.156, p = .005, n^2 = .049. Males included more anxiety indicators in HFDs than did females, providing support for this hypothesis. The analysis was then run with the inclusion of IQ as a covariate, which did not influence the results.

A total of 61 cases (30 females, 31 males) were available for analyses involving sex differences and anxiety indicators with normal control participants. Participants ranged in age from 7.0 to 57.5 years (*M* = 25.69, *SD* = 15.03). A significant difference was not found between males and females, $F\ (1,59) = 3.12$, $p = .083$, $n^2 = .050$, indicating that sex of participant was not related to amount of anxiety indicators included in the HFDs of normal control participants. The analysis was then run with the inclusion of IQ as a covariate. The inclusion of IQ as a covariate did influence results, $F\ (2, 57) = 4.24$, $p = .04$, $n^2 = .069$, indicating that when taking into account IQ, sex of participant was related to inclusion of anxiety indicators, with females in the normal control group including fewer anxiety indicators than their male counterparts.

Table 6. *One-Way Analysis of Variance for Anxiety Indicators*

Source	*df*	*SS*	*MS*	*F*	*p*	n^2
Between Groups	1	16.700	16.700	8.156	.05	.049
Within Groups	159	325.549	2.047			
Total	160	342.248				

Note. *N* = 160

A total of 100 cases (35 females, 65 males) were available for analyses involving sex differences and anxiety indicators of the clinical participants. Participants ranged in age from 7.0 to 58.5 years (M = 23.75, SD = 14.32). As shown in Table 7, a significant difference was found between males and females, F (1, 98) = 4.35, p = .040, n^2 = .042, indicating that sex of participant was related to amount of anxiety included the HFDs of the clinical group. The analysis was then run with the inclusion of IQ as a covariate. The inclusion of IQ as a covariate did not influence the results.

Table 7. *One-Way Analysis of Variance for Anxiety Indicators in Clinical Group*

Source	*df*	*SS*	*MS*	*F*	*p*	n^2
Between Groups	1	10.766	10.766	4.349	.04	.042
Within Groups	98	242.624	2.476			
Total	99	253.390				

Note. N = 100

Secondary analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the ANOVA analyses with both clinical and normal participant subsets of these group. These analyses were conducted to examine anxiety indicators in the smaller groups. Several significant findings emerged.

For the group of individuals below 18 years of age, males were more likely to include anxiety indicators in their HFDs than their female counterparts $F\ (1, 63) = 6.81$, $p = .011$. This finding held true for the clinical subgroup, as well, $F\ (1, 37) = 5.35$, $p = .026$. For the analysis of individuals over 18 years of age, the only significant finding to emerge was in the entire group. Males included more anxiety indicators than females $F\ (1, 74) = 5.35$, $p = .024$.

Chi-square analyses were conducted to investigate the hypothesis that gender would be significantly related to sex of first drawn figure. For the chi-square analysis of sex of subject and sex of first drawn figure, 161 cases were available. As shown in Table 8, males were significantly more likely to draw a same sex figure first than were females, $\chi^2\ (2, N = 161) = 75.70$, $p < .0001$, supporting the hypothesis that males would be more likely to draw a same sex figure than females.

Secondary analyses were conducted by dividing the sample into groups comprised of individuals below 18 and above 18 years of age, then running the ANOVA analyses with both clinical and normal participant subsets of these group. These analyses were conducted to examine sex differences in the smaller groups. Several significant findings emerged.

For the analysis of individuals younger than 18 years, males were more likely to draw a same sex figure than females were. For the clinical subgroup, a chi-square analysis was conducted, and results demonstrated that males were significantly more likely to draw a same sex figure first than were females, χ^2 (2, N = 39) = 28.54, $p <$ .0001. This finding held true for the normal subgroup also, χ^2 (2, N = 25) = 8.97, p =.011.

For the analysis of individuals older than 18 years, males were again more likely to draw same sex figure than females were. For the clinical subgroup chi-square analysis demonstrated that males were significantly more likely to draw a same sex figure first than were females, χ^2 (2, N = 40) = 17.92, $p <$ .0001. This finding held true for the normal subgroup also, χ^2 (2, N = 36) = 17.12, $p <$ .0001.

Table 8. *Sex of Figure Drawn for Male and Female Participants*

Sex of HFD	Men (n = 96)	Women (n = 65)	χ^2 (2)	p
Male	80.2%	20%	75.70	.001
Female	6.3%	70.8%		
Ambiguous	13.5%	9.2%		

SUMMARY AND CONCLUSIONS

The present study sought to determine whether or not previous HFD findings would be replicated with individuals with no psychiatric diagnosis and individuals diagnosed with ADHD, OCD, and TS.

The experimental hypothesis that symptom severity would influence HFD characteristics was not supported, as symptom severity was not related to amount of detail or number of emotional indicators included in HFDs. This result differs from research that has suggested a correlation between psychiatric diagnosis and presence of detail and unusual characteristics. This finding warrants some attention, and further exploration, as the scoring systems of both Machover (1960) Koppitz (1968) suggest that these variables are useful differentiating between well-adjusted and abnormal (i.e., anxious, aggressive, organically impaired) individuals. It would seem reasonable that individuals who are battling symptoms of OCD, TS, or ADHD may exhibit more of these indicators. Because research has not been conducted with these groups before, it is possible that the detail and emotional indicator variables do not tap the same constructs in this population compared to normal individuals.

The experimental hypothesis that unusual characteristics and detail would be related to age was partially supported. The results of the multiple regression analysis indicated that unusual characteristics in HFDs were less for older individuals, a finding in the hypothesized direction. However, the findings indicated no relationship between age and amount of detail included in HFDs. This finding is in direct opposition to previous research, which has shown a developmental trend that older individuals include more detail in their HFDs (Groves and Fried, 1991).

The bulk of previous HFD research has included individuals up to age 21 only. It is possible that the inclusion of adults through age 58.9, while an asset, may have had a role in the different pattern of results in this analysis. Although possible that a curvilinear relationship between age and detail may exist, such was not the case in this sample.

Although analyses supported the sex differences hypotheses of sex of figure drawn and anxiety indicators, the detail hypothesis was not supported because sex of participant was not related to the amount of detail included in HFDs. Previous research has found that males include more anxiety indicators in HFDs than females (Saarni & Azara, 1971; Rierdan et al., 1982). This finding was replicated with the current sample. As Rierdan et al. (1982) suggested, males may be more concerned about anxiety than females, while at the same time lack the ability to express this anxiety in a manner that will be construed as socially acceptable.

The experimental hypothesis that sex of participant would be correlated with sex of first drawn figure (i.e., males drawing a same sex figure significantly more often than females) was supported. This finding is in concert with previous research findings. Sex of first drawn figure is one of the most replicated findings in the HFD research and has been observed in different cultures (e.g., Mexico, Virgin Islands and Japan). It is possible, as some authors (Cox et al., 2001; Machover, 1960) have posited, that women may be more comfortable with the "male" side of themselves than men are with the "feminine" side of themselves.

Previous research has also shown that females include more detail in their HFDs than their male counterparts, a finding that was not replicated in the present study. It is possible that females with OCD, ADHD, or TS do not approach the task of creating an HFD in the same way as females without these disorders. Another reason for this finding may be that previous studies have not included participants with OCD, ADHD, and TS.

These data can provide some potentially useful information about the general nature of the relationship between age, sex, and amount of detail in HFDs. However, sound inferences cannot be made at this point. The likelihood exists of specification error in the form of omitted relevant causes. Because the relationships between the dependent variables (i.e., detail, anxiety, emotional indicators) and the independent variables (age and sex of subject) may be affected by other omitted relevant variables, it is important to consider this possibility when drawing inferences from the data.

Strengths and Limitations

A strength of this study is that it is the first study to compare the HFDs of individuals with ADHD, TS, and OCD. The large age range of participants is also an asset, as previous studies have been largely limited to children and adolescents. The combined age range, inclusion of different disorders, and use of males and females makes this study a useful addition to the HFD research.

A strength of this study may also be a limitation because no other research has compared the HFDs of individuals with OCD, ADHD and TS. Therefore, there are no normative data for these groups. Further exploration of the HFDs of these diagnostic groups may yield more normative information for this group. Further analyses with a larger sample size would be useful to determine the replicability of these findings with OCD, ADHD, and TS populations, as well as with non-clinical populations. In addition, although several of the regression analyses of the smaller clinical groups were statistically significant, these results should be interpreted with caution due to the small number of cases used for the analysis.

Implications for Future Research

The results of the present study are similar to other findings in the are of HFD research, contradictory to previous research findings and somewhat inconclusive. The present study mimics the larger body of this research area in this respect. This may reflect the very nature of the HFD task, individual differences in the approach to the task, the unique characteristics of this data set, or some combination. While problematic and plagued by inconsistencies and uncertainties, the investigation of HFDs continues to be driven by theoretical and psychometric interest in the subject that is unlikely to wane (Shaffer et al., 1984). Future research with different diagnostic groups, as well as with males and females of varying ages, may help to illuminate the nature of the task. In addition, future research with different groups may allow investigators to explore the ways in which the HFD task is approached by different individuals, at varying ages.

In addition to continuing to use HFDs with different populations, comprehensive investigations of different scoring methods should be employed when using HFDs in order to help create clear-cut and easily quantifiable methods for use with HFDs (Riethmiller & Handler, 1997; Shaffer et al., 1984). One way to efficiently and effectively analyze different aspects of HFDs, would be to weigh the common and unusual aspects of the HFD in proportion to the statistical frequency of their occurrence in the population of interest (Shaffer et al., 1984). This would help to further define and clarify concepts such as "common" and "unusual" in the area of HFD research.

Another important task for researchers is to demonstrate the reliability of projective drawing tasks (Riethmiller & Handler, 1997). One way to do this is to evaluate inter-rater reliability in the scoring of HFDs. While some studies have shown acceptable inter-rater reliabilities for HFDs, not all studies report them. Indeed, the current data set is in the process of being analyzed for inter-rater reliabilities. The reporting of acceptable inter-rater reliabilities would allow both proponents and critics of HFDs to better analyze the quality of the research being conducted.

Factor analytic studies of HFD variables would be useful in determining if different HFD constructs (i.e., anxiety and emotional indicators) are applicable and useful with different populations. Similarly, there is a need for more empirical studies evaluating the utility if HFDs to differentiate between diagnostic groups, expected versus unusual developmental indicators, and emotional indicators. The only way to gather this information is by continuing to refine and revise current scoring methods.

The replication of Koppitz' (1968) original norming study with different diagnostic groups and ages would provide a large base of information from which future critics and proponents alike can draw in order to investigate and refine HFD hypotheses.

Although advances have been made in HFD research, substantial work is yet to be done. Indeed, as Hammer (1997) stated, the relative balance of positive and negative HFD research results has not changed since Swenson's (1968) seminal article. Continuing to work toward more advanced and elegant research designs will allow researchers to fill the gaps from previous research, and to create practical and valid guidelines regarding appropriate and useful applications of the HFD task.

REFERENCES

Aikman, K.G., Belter, R.W. & Finch, A.J. (1992). Human figure drawings: Validity in assessing intellectual level and academic achievement. *Journal of Clinical Psychology, 48*, 1, 114-120.

American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition* (DSM-IV). American Psychiatric Association: Washington, DC: Author.

Brand, N., Geene, R., Oudenhoven, M., Lindeborn, B., van der Ree, A., Cohen-Kettenis, P., & Buitelaar, J.K. (2002). Brief report: Cognitive functioning in children with Tourette syndrome with and without comorbid ADHD. *Journal of Pediatric Psychology, 27*, 2, 203-208.

Brown, E.V. (1990). Developmental characteristics of figure drawings made by boys and girls ages five through eleven. *Perceptual and Motor Skills, 70*, 279-288.

Catte, M., & Cox, M.V. (1999). Emotional indicators in children's human figure drawings. *European Child and Adolescent Psychiatry, 8*, 86-91.

Cox, M.V. & Catte, M. (2000). Severely disturbed children's human figure drawings: Are they unusual or just poor drawings? *European Child and Adolescent Psychiatry, 9*, 301-306.

Cox, M.V., Koyasu, M., Hiranuma, H. & Perara, J. (2001). Children's human figure drawings in the UK and Japan: The effects of age, sex, and culture. *British Journal of Developmental Psychology*, *19*, 275-292.

De La Serna, M., Helwig, L. & Richmond, B.O. (1979). Cultural impact on human figure drawings. *Social Behavior and Personality*, *7*, 1, 29-32.

Feyh, J.M., & Holmes, C.B. (1994). Use of the Draw-A-Person with conduct-disordered children. *Perceptual and Motor Skills*, *78*, 3, 1353-1354.

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*, 1, 54-56.

Fuller, G.B., Vance, H.B., Awadh, A.M. (1997). Interscorers' agreement of the human figure drawings with a referred group of children. *Perceptual and Motor Skills, 84,* 3, 882.

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.

Goodman, W.K., Price, L.H., & Rasmussen, S.A. (1992). The Yale-Brown Obsessive Compulsive Scale. I. Development, use, and reliability. *Archives of General Psychiatry, 46*, 11, 1006-1011.

Groves, J.R. & Fried, P.A. (1991). Developmental items on children's human figure drawings: A replication and extension of Koppitz to younger children. *Journal of Clinical Psychology*, *47*, 1, 140-148.

Hammer, E. F. (1997). Critique of Swensen's "Empirical Evaluations of Human Figure Drawings". In E.F. Hammer (Ed.) *Advances in projective drawing interpretation,* (pp. 122-152). Springfield, IL: Charles C. Thomas.

Jankovic, J. (2003, January). Tics and tourette syndrome. In J. Jankovic (Chair), *Overview of neurology and treatment of tics and tourette syndrome. Symposium conducted at the Tourette Syndrome and Related Neurobehavioral Disorders Conference*, Houston, TX.

Joiner, T.E. & Schmidt, K.L. (1997). Drawing conclusions-or not-from drawings. *Journal of Personality Assessment*, *69*, 3, 476-481.

Kahill, S. (1984). Human figure drawing in adults: An update of the empirical evidence. *Canadian Psychology*, *25*, 269-292.

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

Koppitz, E.M. (1983). Projective drawings with children and adolescents. *School Psychology Quarterly*, *12*, 4, 421-427.

Leckman, J. F. (2002). Tourette syndrome. *The Lancet*, *360*, 1577-1586.

Leckman, J.F., Riddle, M.A., Hardin, M.T., Ort, S.I., Swartz, K.L., Stevenson, J., & Cohen, D.J. (1989). The Yale Global Tic Severity Scale: Initial testing of a clinician-rated scale of tic severity. *Journal of the American Academy of Child & Adolescent Psychiatry, 28,* 566-573.

Lev-Weisel, R. & Hershkovitz, D. (2000). Detecting violent and aggressive behavior among male prisoners using the Machover Draw-A-Person test. *The Arts in Psychotherapy*, *27*, 3, 171-177.

Lilienfeld, S.O., Wood, J.M. & Garb, H.N. (2000). The scientific status of projective techniques. *Psychological Science*, *1*, 2 ,27-66.

Machover, K.A. (1949). *Personality projection in the drawing of a human figure* (pp 1-45). Springfield, IL: Charles C. Thomas.

Machover, K.A. (1960*)*. Sex differences in the development patterns of children as seen in human figure drawings. In E.F. Hammer (Ed.), *Advances in projective drawing interpretation* (pp. 10-69). Springfield, IL: Charles C. Thomas.

McNeish, T.J. & Naglieri, J.A. (1993). Identification of individuals with serious emotional disturbance using the Draw-A-Person: Screening procedure for emotional disturbance. *The Journal of Special Education*, *27*, 1, 115-121.

Motta, R.W., Little, S.G., & Tobin, M.J. (1993). The use and abuse of human figure drawings. *School Psychology Quarterly, 8*, 3, 162-169.

O'Britto, G.N., Pereria, C.S., & Santos-Morales, T.R. (1999). Behavioral and neuropsychological correlates of hyperactivity and inattention in Brazilian school children. *Developmental Medicine and Child Neurology*, *41*, 732-739.

Rae, W. A. (1991) Analyzing drawings of children who are physically ill and hospitalized using the ipsative method. *Children's Health Care*, *20*, 4, 198-207.

Rierdan, J., Koff, E., & Heller, H. (1982). Gender, anxiety, and human figure drawings. *Journal of Personality Assessment*, *46*, 6, 594-596.

Riethmiller, R.J. & Handler, L. (1997). Problematic methods and unwarranted conclusions in DAP research: Suggestions for improved research procedures. *Journal of Personality Assessment*, *69*, 3, 459-475.

Rubin, J.A., Schachter, J. & Ragins, N. (1983). Intraindividual variability in human figure drawings: A developmental study. *American Journal of Orthopsychiatry*, *53*, 4, 654-667.

Saarni, C. & Azara, V. (1977) Developmental analysis of human figure drawings in adolescence, young adulthood, and middle age. *Journal of Personality Assessment*, *41*, 1, 31-38.

Shaffer, J.W., Duszynski, K.R., & Thomas, C.B. (1984). A comparison of three methods for scoring figure drawings. *Journal of Personality Assessment*, *48*, 3, 245-254.

Sheppard, D.M., Bradshaw, J.L., Purcell, R. & Pantelis, C. (1999). Tourette and comorbid syndromes: Obsessive compulsive and attention deficit hyperactivity disorder. A common etiology? *Clinical Psychology Review*, *19*, 5, 531-552.

Sitton, R. & Light, P. (1992). Drawing to differentiate: Flexibility in young children's human figure drawings. *British Journal of Developmental Psychology*, *10*, 25-33.

Smith, D. & Dumont, F. (1995). A cautionary study: Unwarranted interpretations of the Draw-A-Person test. *Professional Psychology: Research and Practice*, *26,* 3, 298-303.

Swensen, C.H. (1968). Empirical evaluations of human figure drawings: 1957-1966. *Psychological Bulletin*, *70*, 1, 20-44.

Tabachnik, B.G. & Fidell, B.G. (2001). *Using multivariate statistics*. Fourth Edition. Boston, MA: Allyn and Bacon.

Thomas, G.V. & Jolley, R.P. (1998). Drawing conclusions: A re-examination of empirical and conceptual bases for psychological evaluation of children from their drawings. *British Journal of Clinical Psychology*, *37*, 127-139.

Wechsler, D. (1999). *Wechsler Abbreviated Scale of Intelligence*. New York: Psychological Corporation.

Other Sources Consulted

Abell, S.C., Heiberger, A.M & Johnson, J.E. (1994). Cognitive evaluations of young adults by means of human figure drawings: An empirical investigation of two methods. *Journal of Clinical Psychology, 50* (6), 900-905.

Harris, D.B. (1963). *Children's drawings as a measure of intellectual maturity* (pp. 1-5). New York: Harcourt, Brace & World.

Keppel, G. (1991). *Design and analysis: A researcher's handbook* (pp. 59-110). Paramus, NJ: Prentice-Hall.

Pihl, R.O. & Nimrod, G. (1976). The reliability and validity of the Draw-A-Person test in IQ and personality assessment. *Journal of Clinical Psychology*, *32*, 2, 470-472.

VITA

Wendy A. Burch
Department of Psychology
4235 TAMU
College Station, TX 77843-4235

Education	M.S.	Texas A&M University	August 2004
	M.A.	State University of New York at Brockport	August 2002
	B.A.	State University of New York at Buffalo	May 1994

Grants Received

Gaulke, K. & Burch, W. (2003, September). *Female performers in the live entertainment industry: An investigation of stigmatization appraisal, coping, and health in a sample of exotic dancers.* NIOSH Research Training Program of the SWCOEH ($10,000).

Clinical Experience

September 2003- May 2004
Experience: Counselor at the Brazos County Juvenile Services Academy School
Description: Providing individual therapy services, facilitating group therapy interventions for adolescent males and females, and conducting motivational interviews with new students at the school.
Supervisor: Robert W. Heffer, Ph.D.

Summer 2002
Experience: Interim Director of the Office for Students with Disabilities. State University of New York College at Brockport, Division of Student Affairs. Brockport, New York.
Description: Responsible for the review and acceptance of documentation for students seeking accommodations due to a disability. Met with students and parents to discuss college requirements, and assisted students and parents in obtaining needed documentation.
Supervisor: Roger Weir, Ed.D.

December 2001-August 2002
Experience: Counselor. State University of New York College at Brockport Counseling Center. Brockport, New York.
Description: Responsible for individual counseling with student clients, average caseload of to 20 clients, conducted intake interviews, crisis counseling, and functioned as a mental health liaison for residential community on campus.
Supervisor: Roger Weir, Ed.D.