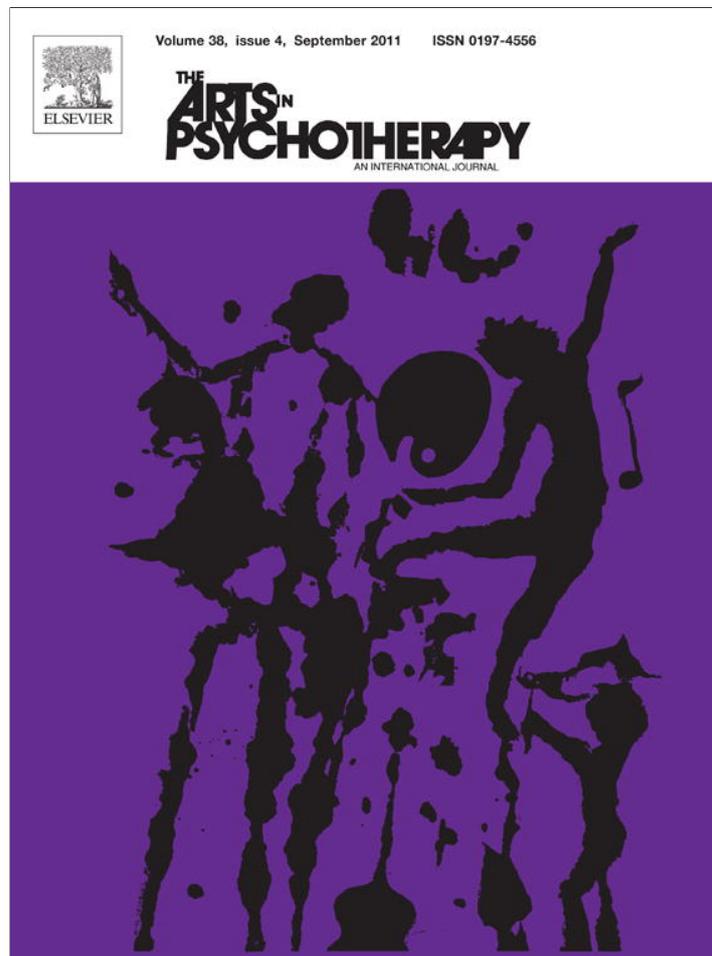


Provided for non-commercial research and education use.  
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

## The Arts in Psychotherapy



## Self-esteem and anxiety in human figure drawing of Iranian children with ADHD

Afsoon Saneei, M.A.<sup>a,\*</sup>, Hadi Bahrami, Ph.D.<sup>a</sup>, Sayyed Abbas Haghegh, Ph.D.<sup>b</sup><sup>a</sup> Department of Psychology, University of Allameh Tabatabayi, Tehran, Iran<sup>b</sup> University of Isfahan, Isfahan, Iran

## ARTICLE INFO

## Keywords:

Draw-A-Person Test

Self-esteem

Anxiety

Attention Deficit/Hyperactivity Disorder

## ABSTRACT

This study is aimed at investigating the self-esteem and anxiety of children with Attention Deficit/Hyperactivity Disorder compared with normal children by means of Draw-A-Person Test. 30 children with ADHD were selected from psychiatric clinics of Isfahan, Iran using multi-cluster sampling. 30 normal children were also selected from public schools of Isfahan by the same method. The results were analyzed using analysis of variance and Chi-square. In this research, six criteria were selected from Draw-A-Person Test. The results revealed significant differences between the performance of the children with ADHD and normal children in terms of size and line characteristic ( $P < 0.05$ ). For the other criteria no significant difference was found between these groups. Based on this finding, some aspects of drawing may be more meaningful than other aspects in drawings of children with ADHD.

© 2011 Elsevier Inc. All rights reserved.

## Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common childhood onset neuropsychiatric disorders, with prevalence rates ranging from approximately 4 to 10% of the population globally (Skounti, Philalithis, & Galanakis, 2007). Children with Attention Deficit/Hyperactivity Disorder (ADHD) suffer from symptoms of inattention, demonstrate hyperactive and impulsive behavior or suffer from a combination of these two symptom domains (APA, 1994).

ADHD is associated with numerous developmental, cognitive, emotional, social, and academic impairments (Barkley, 2006; Barkley, Murphy, & Fischer, 2008; Swanson, 2003). In the United States, over one-third of children with ADHD were reported to have high levels of emotional difficulties (Wehmeier, Schacht, & Barkley, 2010). A study in Europe clearly showed that children and adolescents with ADHD had more emotional problems as measured by the Strengths and Difficulties Questionnaire, than children and adolescents without ADHD (Coghill et al., 2006). Boys with ADHD and comorbid ODD have, in particular, been reported to suffer from impaired regulation of negative emotions (Braaten & Roseñ, 2000).

The emotional impairments of children with ADHD may include poor self-regulation of emotion, greater excessive emotional expression, especially anger and aggression, greater problems coping with frustration, reduced empathy, and decreased arousal to stimulation (Barkley, 2006). Anxiety or depression is also a common comorbid disorder of ADHD (Elia, Ambrosini, & Berrettini, 2008;

Escobar et al., 2005). Children and adults with ADHD are also more likely to develop dysthymia, major depressive disorder, and various anxiety disorders, all of which involve difficulties with emotion. The reasons for such high comorbidity with other disorders are several (Angold, Costello, & Erkanl, 1999). Experiences such as academic failure, peer rejection, family conflict, parental hostility, accidental injuries, poor occupational achievement, marital strife, or loss of driving license, can all result in emotional consequences. These emotional consequences add to the emotional problems that are already part of ADHD and or possible comorbid disorders (Barkley, 2006). The aim of this study was to investigate emotional impairment in children with ADHD. The social and emotional problems of children and adolescents with ADHD have been discussed in reviews (Harpin, 2005; Thorell & Rydell, 2008) and research papers (Buitelaar, Wilens, Zhang, Ning, & Feldman, 2009). But since children may have limited verbal skills and this may not allow them to participate in conversations or conceptualize family issues using language (Terr, 1994), the decision reached was to provide them in a way which helped to express the emotions more easily.

One of the research methods applied to children was analysis of their creations, like their drawings. Drawing is an important element of children's lives. Children's drawings can give clues about their ongoing lives. The content of a painting reflects previous experiences of a child. Children may reveal that they are heart-broken, jovial, or aggressive thought in their drawings. The structure of a child's personality can be revealed through his or her pictures (Oguz, 2010). Children can describe their happiness, unhappiness, future dreams, past life and continuing life as they wish in their drawings (Artut, 2006). Clinicians and researchers claim that analytic interpretation of the expressions in the drawing reveals weaknesses, fears (Freilich & Shechtman, 2010) and

\* Corresponding author. Tel.: +98 9132020574; fax: +98 3115724942.  
E-mail address: afsoon.2216@yahoo.com (A. Saneei).

negative traits, as well as the strengths, accomplishments and untapped potential, giving insight into who one is (Malchiodi, 1998). Unlike other assessment procedures such as psychometric tests, drawing requires the psychologist to administer little or no training to the client. For many children, drawing represents a natural activity, in which the child spontaneously and frequently participates, usually with much enjoyment. When applied to a clinical setting, it is likely to reduce the child's anxiety about the situation and the nature of the investigation. Furthermore, the drawing literature is littered with formal drawing tests which claim to assess children's intellectual ability, personality, current emotional state, or their feelings towards the important people in their life. Although research evidence has seriously questioned the reliability and validity of most of these tests, recent surveys conducted in America suggest that drawings are still frequently used as projective assessments (Camara, Nathan, & Puente, 2000; Cashel, 2002).

There are a variety of projective tests employing children's drawings. Draw-A-Person (DAP) is a type of technique carried out in art therapy diagnosis (Brooke, 2004). This test is a most frequently utilized instrument, as reported in surveys of clinical psychologists, especially when psychologists working with children are surveyed (Camara et al., 2000; Cashel, 2002). There are two main areas where human drawings are used with children. The first is the attempt to do a global prediction of the child's cognitive development (Brown, 1990; Cherney, Seiwert, Dickey, & Flichtbeil, 2006; Koppitz, 1968). The second area of utilization is to evaluate the emotional make up or the emotional state of the child (Catté & Cox, 1999; Matto, 2002; Özer, 2010). In emotional evaluations, the presence of signs that a theoretical framework (which has traditionally been an analytical framework) deemed important has been used as the foundation for clinical interpretation (Özer, 2010).

Machover (1949) and Koppitz (1968) analyzed children's drawings from an emotional perspective. Machover (1949) proposed projective drawing tests as a means for uncovering the preconscious or unconscious material that a client may not be able to access verbally. Machover's system attempts to analyze the DAP through a projective hypothesis, whereby the figure is the main subject and the paper is the environment. Numerous attempts have been made to develop valid DAP scoring systems. Nevertheless, the original projective scoring system designed by Machover (1949) remains largely recognized as a most important, and widespread DAP system (Arteche, Bandeira, & Hutz, 2010).

Koppitz (1968) uses the "Draw a Man" approach in identifying certain emotional disorders in children and proposes alternative ideas in the interpretation of special signs. Koppitz's view of seeing children's drawings from the perspective of emotional indicators has continued since the 1950s. It is a popular projective technique based on the assumption that children's drawings reflect emotions that they cannot verbally express. There are 38 emotional indicators in Koppitz's Human figure drawing method which are present in some human figure drawings reflecting children's anxiety, fears and attitudes (Willis, Joy, & Kaiser, 2010). Many of these indicators are noted by Machover (1949), including shading, figure height, absence of certain parts of body, size, detailing, etc. Cultural differences are also important in determining Emotional Indicators (Cox, 1993).

This instrument and other similar instruments are commonly utilized to detect signs of mental maturity, learning difficulties, schizophrenia, dissociative disorders, attention deficit hyperactivity disorder (ADHD), personality and emotional disorders. Such evaluations of child drawings have always cast doubt upon and fueled discussions about the validity and reliability of the method used (Dailioilu, Deniz, & Kan, 2010; Lubin, Larsen, Mattarazzo, & Seever, 1985; Watkins, Campell, Neiberding, & Hallmark, 1995).

Inter-rater reliabilities for the various scales of DAP range from weak to excellent (Maloney and Glasser, 1982). Some reliability

studies indicate that the inter-rater reliability estimates ranged from .42 to .78 (Tharinger & Stark, 1990). However, DAP is still commonly used in Iran. It is a popular test in working with children. Numerous studies have been conducted in Iran to investigate the validity of DAP as an emotional assessment technique. These studies have shown that some emotional signs common in the scoring systems of Koppitz and Machover are more reliable indicators for self-esteem and anxiety, especially size, color, line characteristic, shading, etc. (Dadsetan, 1995).

Seven indicators of DAP including size, line characteristics, chromatic drawings, detailing, shading, distortion and detailing based on previous evidences in Iran have been chosen which demonstrated the acceptable correlation between these chosen indicators, anxiety and self-esteem (Dadsetan, 1995). The aim of the current study was to investigate emotional problems of children with ADHD, using their drawings. This study hypothesized that drawings of children with ADHD could show lower self-esteem and higher level of anxiety compared with normal children.

## Method

### Participants

This study was conducted to examine the emotional problems in the drawings of 7–12-year-old children with ADHD ( $M=8.86$ ,  $SD=.66$ ) comprising normal children of the same age ( $M=8.9$ ,  $SD=.68$ ). The study group comprised of 30 children with ADHD (12 girls and 18 boys) who had referred to the psychiatric clinics of Esfahan in Iran. Also 30 normal children (14 girls and 16 boys) were selected from elementary schools. All the participants of each group were selected through the multi-cluster sampling method.

### Instrument

In this study the Draw-A-Person Test was administered to investigate the emotional problems of children with ADHD. Evidences for validity and reliability of this test are ambivalent. Swenson (1968) and Roback (1968) argue that "Draw-A-Person Test" has weak reliability and validity, and that particular aspects of a drawing cannot be related to particular types of maladjusted personality. But in contrast, a few studies have reported findings supporting the validity of the emotional indicators of DAP (Sturner, Rothbaum, Visintainer, & Wolfer, 1980). Reliability studies even indicate that the inter-rater reliability commonly exceeds 0.90 (Rae & Hyland, 2001). It should be noted that Koppitz scoring system has received more empirical support (Lilienfeld, Wood, & Garb, 2000).

We selected seven emotional indicators which were noted by both Koppitz (1968) and Machover (1949) and formerly investigated in Iran as reliable indicators for anxiety and self-esteem (Dadsetan, 1995; Pourahmadi, Abedin, Pakdaman, Shaieri, & Jalali, 2009).

Children were given crayons or pencils and asked to draw a person. They were made to sit at a distance from each other while drawing so that they would not influence each other.

### Statistical analysis

When the participants were selected, the test was administered individually to the group samples. In all the cases, children were free in drawing the style and time. The age and sex of each case were written on their drawing sheets. The collected drawings were analyzed by 3 examiners (master degree students of a clinical psychology) to whom the grading method was taught. For the presence of each indicator, 1 score was allocated to each drawing and 0 was allocated to absence of these indicators. For example, score 1 was

**Table 1**  
Mean age and standard deviation of participants.

	ADHD group (N=30)		Normal group (N=30)	
	M	SD	M	SD
Age	8.86	0.66	8.9	0.68

dedicated to sharp lines and 0 to soft lines. The sizes of human figures in the drawings were measured using a ruler.

The examiners graded the drawings independently without knowing whether they belonged to the ADHD or normal group. After grading and analyzing the integration among the three points of views, the differences were distinguished and the agreements between 2 examiners were chosen. In the end, the points of the sample group members were set into a table. Chi-square analyses were carried out to analyze six qualitative indicators comprising the frequency of these emotional indicators between two groups and the analysis of the variance for was compared to the height of the participants.

**Results**

Table 1 contains the demographic information of all the samples including children with ADHD and normal children.

Table 2 compares the results of human figures' size in two groups. The heights of human figure were measured with a ruler and then the means were compared.

The result showed that there was a significant difference between human figures' sizes in both groups ( $P < .05$ ).

Table 3 contains the Chi-square test results for five other investigated aspects in Draw-A-Person Test of children with ADHD compared with normal children in this study.

**Discussion**

Aiming to identify emotional problems of children with ADHD from their drawing, this study used six categories of Draw-A-Person Test for analysis. Children with ADHD are commonly known to have impairments that are linked to low self-esteem (Biederman, 2005).

**Table 2**  
Comparing size in 2 groups.

	Mean	Std. error	Mean difference (I - J)	df	P
Children with ADHD (Group I)	6.7	0.829	-2.85	1	.001*
Normal children (Group J)	9.55	0.829			

\*  $P < .05$ .

**Table 3**  
Frequency and Chi-squares test results of children's drawings.

Aspects of Draw-A-Person Test	Children with ADHD (N=30)		Normal children (N=30)		Pearson Phi-squares	df	P
	F	%F	F	%F			
Line characteristic							
Thick and sharp	14	46.60%	6	20%	4.8	1	.27*
Soft	16	53.40%	24	80%			
Detailing							
With detailing	6	20%	4	13.30%	0.48	1	.365*
Without detailing	24	80%	26	86.70%			
Shading							
With shading	2	6.60%	4	13.30%	0.741	1	.335*
Without shading	28	93.40%	26	86.70%			
Distortion							
With distortion	1	3.30%	0	0	1.017	1	.500*
Without distortion	29	96.70%	30	100			
Colors							
Warm	19	63.30%	22	73.30%	0.693	1	.290*
Cool	11	36.70%	8	26.70%			

\*  $P < .05$ .

Self-concept and self-esteem have been found to be impaired in these children (Demaray & Elliot, 2001; Graetz, Sawyer, & Baghurst, 2005). Analysis of their drawings in this study showed that they usually draw a significantly shorter person than normal children. Machover (1949) hypothesized that the relative size of a drawing is linked to a person's level of self-esteem and energy. She speculated that extremely small and miniaturized drawings reflect low self-concept, depression, and lack of energy. Moderately large drawings suggest higher levels of energy and self-esteem. Empirical research has produced inconsistent results but there has been moderate support for the view that size reflects varying levels of self-esteem, mood, anxiety level, and relative degree of self-inflation (Fox & Thomas, 1990, Kahill, 1984; Mitchell, Trent, & McArthur, 1993; Paine, Alves, & Tubino, 1985). DiLeo (1983) subscribed to the view that small figures drawn at or near the lower edge of the paper indicated feelings of inadequacy, insecurity, and even depression. Hibbard and Hartman (1990) reported that sexually abused children will draw tiny figures more often than non-abused children, which are credited to shyness or withdrawal.

Children with ADHD are also well-known to experience substantial peer difficulties (Hoza, Gerdes, Mrug, Hinshaw, Bukowski, & Gold, 2005). Compared to typically developing youth, children with ADHD are more peer-rejected, have fewer dyadic friendships (Blachman & Hinshaw, 2002), and are rated by parents and teachers as having lower social skills (Hoza et al., 2005). Poor peer relationships warrant concern, as they predict serious adjustment problems in adolescence and adulthood, such as anxiety and depression (Bagwell, Molina, Kashdan, Pelham, & Hoza, 2006). Anxiety disorders are one of the most studied fields of comorbid conditions with attention deficit hyperactivity disorder (ADHD). Pliszka, Carlson, and Swanson (1999) note that although 5–15% of children population will have an anxiety disorder, 15–35% of children with ADHD also manifest significant anxiety. According to Machover (1949), detailing, shading, distortion and line characteristics show anxiety in Draw-A-Person Test. Hammer (1958) and Machover (1949) have all suggested that inclusion of an excessive number of details is consistent with persons who handle anxiety by becoming more obsessive. Thus, the number of details has been used as a rough index not only of anxiety but also of the style by

which the person attempts to deal with their anxiety. In contrast, a noteworthy shortage of detail suggests withdrawal and reduction of energy. A small number of details may also be consistent with persons who are mentally deficient, hesitant, or merely bored with the task (Kahill, 1984; Mitchell et al., 1993). Machover (1949) and Hammer (1958) have hypothesized that shading represents anxiety. The specific area that is shaded is likely to suggest concern for that area. Thus a person who is self-conscious about his or her facial complexion might provide a large amount of shading on the face, or a person with concern for their breasts might similarly include more shading in this area (Burgess & Hartman, 1993; Kahill, 1984). Distortion in drawings occurs when the overall drawing or specific details are drawn in poor proportions, are disconnected, or placed in inappropriate locations on the body. Hammer (1958) hypothesized that mild distortions reflect low self-concept, anxiety, and poor adjustment, and excessive distortions are characteristic of persons who have experienced a severe emotional upheaval. This has become one of the most strongly supported hypotheses (Chantler, Pelco, & Mertin, 1993; Kahill, 1984). The drawn figure can be conceptualized as the relation between the person's environment and their body (Machover, 1949). It can thus reflect the person's degree of insulation, vulnerability, or sensitivity to outside forces. Thick, heavily reinforced lines might be attempts to protect one from anxiety-provoking forces, and faint sketchy, thin lines might conversely represent insecurity and anxiety (Kahill, 1984; Mitchell et al., 1993). In this study children with ADHD were not different from normal children in detailing, shading and distortion. But their drawings were different in line characteristic. These children use thick and sharp lines more often than normal children.

In the end, children with ADHD in this study usually used hot colors including red and yellow in their drawings like normal children. It is believed that colors might be important indicators of emotional status or personality traits. The use of colors is an important evaluation criterion in psychological assessment, especially in projective methods. This type of tests and various drawing methods are widely used as children psychological assessment tools, besides interview (information) with the child's tutors. Research shows that color preferences are important indicators of the child's emotional state and can demonstrate their feelings towards the drawing object (Boyatzis & Varghese, 1993; Burkitt & Newell, 2005). However, most claims made about the significance of emotions expressed in children's drawings are based on professional observations usually within clinical contexts (Burkitt, Barrett, & Davis, 2004). Hence there is a lack of controlled research where systematic validation of the children's feelings towards the colors used and towards the topic drawn would be taken into consideration. When talking about interpretation of child color choices, some developmental, cultural and gender issues should be discussed. Culture influence in color symbolism and gender stereotypes are also important (Kaya & Epps, 2004). Color can be described in temperature terms, such as warm or cool as they relate to dominant wavelength of the colors. Cool colors (e.g. blue, green, and purple) are generally considered to be peaceful and quiet, while warm colors (e.g. red, yellow, and orange) are seen as active and stimulating (Ballast, 2002). However some colors may be associated with several different emotions and some emotions are associated with more than one color (Kaya & Epps, 2004). Using hot colors may show anxiety in children with ADHD (considering culture or developmental stage of children). Thus other signs of emotional problems must be considered to interpret the meaning of color preference in the drawings of these children.

To conclude, the findings of this study showed that some aspects of Draw-A-Person Test such as line characteristics and size may show emotional disturbance better than other features in children with ADHD. These aspects were more reliable in the investigations of the children's emotions in this study.

## References

- Angold, A., Costello, E. J., & Erkanli, A. (1999). Comorbidity. *Journal of Child Psychology and Psychiatry*, 40, 57–87.
- APA. (1994). *Diagnostic and Statistical Manual, DSM IV, 4th Edition*. Washington, D.C.: American Psychiatric Association.
- Arteche, A., Bandeira, D., & Hutz, C. S. (2010). Draw-a-Person test: The sex of the first-drawn figure revisited. *The Arts in Psychotherapy*, 37, 65–69.
- Artut, K. (2006). *Art education theories and methods* (5th edition). Ankara: Ani Publishing.
- Bagwell, C. L., Molina, B. S., Kashdan, T. B., Pelham, W. E., & Hoza, B. (2006). Anxiety and mood disorders in adolescents with childhood attention deficit/hyperactivity disorder. *Journal of Emotional and Behavioral Disorders*, 14, 178–187.
- Ballast, D. K. (2002). *Interior reference design manual: A Guide to the Ncidq Exam*. Belmont, CA: Professional Pub. Inc.
- Barkley, R. A. (2006). *Attention-Deficit/Hyperactivity Disorder: A handbook for diagnosis and treatment* (3rd edition). New York: Guilford Press.
- Barkley, R. A., Murphy, K. R., & Fischer, M. (2008). *ADHD in adults: What the science says*. New York: Guilford Publications.
- Biederman, J. (2005). Attention deficit/hyper activity disorder: A selective overview. *Biological Psychiatry*, 57, 1215–1220.
- Blachman, D. R., & Hinshaw, S. P. (2002). Patterns of friendship among girls with and without attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, 30, 625–640.
- Boyatzis, C. J., & Varghese, R. (1993). Children's emotional associations with color. *The Journal of Genetic Psychology*, 75, 77–85.
- Braaten, E. B., & Rosein, L. A. (2000). Self-regulation of affect in attention-deficit hyperactivity disorder (ADHD) and non-ADHD boys: Differences in empathic responding. *Journal of Consulting and Clinical Psychology*, 68, 313–321.
- Brooke, S. L. (2004). *Tools of the trade: A therapist's guide to art therapy assessments*. Springfield: Charles C. Thomas Publisher.
- Brown, E. V. (1990). Developmental characteristics of figure drawings made by boys and girls aged five through eleven. *Perceptual & Motor Skills*, 70, 279–288.
- Buitelaar, J. K., Wilens, T. E., Zhang, S., Ning, Y., & Feldman, P. D. (2009). Comparison of symptomatic versus functional changes in children and adolescents with ADHD during randomized, double-blind treatment with psychostimulants, atomoxetine, or placebo. *Journal of Child Psychology and Psychiatry and Allied Discipline*, 50, 335–342.
- Burgess, A. W., & Hartman, C. R. (1993). Children's drawings. *Child Abuse & Neglect*, 17, 161–168.
- Burkitt, E., Barrett, M., & Davis, A. (2004). The effect of affective characterizations on the use of size and colour in drawings produced by children in the absence of a model. *Educational Psychology*, 24(3), 315–343.
- Burkitt, E., & Newell, T. (2005). Effects of human figure type on children's use of colour to depict sadness and happiness. *International Journal of Art Therapy*, 10, 15–22.
- Camara, W. J., Nathan, J. S., & Puente, A. E. (2000). Psychological test usage: Implications in professional psychology. *Professional Psychology: Research and Practice*, 31, 141–154.
- Cashel, M. L. (2002). Child and adolescent psychological assessment: Current clinical practices and the impact of managed care. *Professional Psychology: Research and Practice*, 33, 446–453.
- Catte, M. V., & Cox, M. (1999). Emotional indicators in children's human figure drawings. *European Child and Adolescent Psychiatry*, 8, 86–91.
- Chantler, L., Pelco, L., & Mertin, P. (1993). The psychological evaluation of child sexual abuse using the Louisville Behavior Checklist and Human Figure Drawing. *Child Abuse & Neglect*, 17, 271–279.
- Cherney, I. D., Seiwert, C. S., Dickey, T. M., & Flichtbeil, J. D. (2006). Children's drawings: A mirror to their minds. *Educational Psychology*, 26, 127–142.
- Coghill, D., Spiel, G., Baldursson, G., Döpfner, M., Lorenzo, M. J., Ralston, et al. (2006). Which factors impact on clinician-rated impairment in children with ADHD? *European Child & Adolescent Psychiatry*, 15, 30–37.
- Cox, M. V. (1993). *Children's drawings of the human figure*. Philadelphia: Psychology Press.
- Dadsetan, P. (1995). *Evaluation of children's personality on the basis of drawing tests*. Tehran: Roshd.
- Dailioili, H. E., Deniz, Ümit., & Kan, A. (2010). A study on the emotional indicators in 5–6 year-old girls' and boys' human figure drawings. *Procedia Social and Behavioral Sciences*, 2, 1503–1510.
- Demaray, M. K., & Elliot, S. N. (2001). Perceived social support by children with characteristics of attention-deficit/hyperactivity disorder. *Professional School Psychology*, 16, 68–90.
- DiLeo, J. H. (1983). *Interpreting children's drawings*. New York: Brunner/Mazel.
- Elia, J., Ambrosini, P., & Berrettini, W. (2008). ADHD characteristics: I. Concurrent comorbidity patterns in children and adolescents. *Child and Adolescent Psychiatry and Mental Health*, 2, 15–23.
- Escobar, R., Soutullo, C. A., Hervas, A., Gastaminza, X., Polavieja, P., & Gilaberte, I. (2005). Worse quality of life for children with newly diagnosed attention-deficit/hyperactivity disorder, compared with asthmatic and healthy children. *Pediatrics*, 116, e364–e369.
- Fox, T., & Thomas, G. V. (1990). Children's drawings of an anxiety eliciting topic: Effect on size of the drawing. *British Journal of Clinical Psychology*, 29, 71–81.
- Freilich, R., & Shechtman, Z. (2010). The contribution of art therapy to the social, emotional, and academic adjustment of children with learning disabilities. *The Arts in Psychotherapy*, 37, 97–105.

- Graetz, B. W., Sawyer, M. G., & Baghurst, P. (2005). Gender differences among children with DSM-IV ADHD in Australia. *Journal of the American Academy of Children & Adolescent Psychiatry*, 44, 159–168.
- Hammer, E. F. (1958). *The clinical application of projective drawings*. Springfield, Illinois: C.C. Thomas.
- Harpin, V. A. (2005). The effect of ADHD on the life of an individual, their family, and community from preschool to adult life. *Archive of Disease in Childhood*, 90, 2–7.
- Hibbard, R. A., & Hartman, G. L. (1990). Emotional indicators in human figure drawings of sexually victimized and nonabused children. *Journal of Clinical Psychology*, 46, 211–219.
- Hoza, B., Gerdes, A. C., Mrug, S., Hinshaw, S. P., Bukowski, W. M., Gold, J. A., et al. (2005). Peer-assessed outcomes in the multimodal treatment study of children with Attention Deficit Hyperactivity Disorder. *Journal of Clinical Child and Adolescent Psychology*, 34, 74–86.
- Kahill, S. (1984). Human figure drawing in adults: An update of the empirical evidence. *Canadian Psychology*, 25, 269–292.
- Kaya, N., & Epps, H. H. (2004). Relationship between color and emotion: A study of college students. *College Student Journal*, 38, 396–405.
- Koppitz, E. M. (1968). *Psychological evaluation of children's human figure drawings*. New York: Grune & Stratton.
- Lilienfeld, S. O., Wood, J. M., & Garb, H. N. (2000). The scientific status of projective techniques. *Psychological Science in the Public Interest*, 1, 27–66.
- Lubin, B., Larsen, R. M., Mattarazzo, J. D., & Seever, M. (1985). Psychological test usage patterns in five professional settings. *American Psychologist*, 39, 451–454.
- Machover, K. A. (1949). *Personality projection in the drawing of a human figure*. Springfield, Illinois: C. C. Thomas.
- Malchiodi, C. A. (1998). *Understanding children's drawings*. London: Jessica Kingsley.
- Maloney, M. P., & Glasser, A. (1982). An evaluation of the clinical utility of the Draw-A-Person Test. *Journal of Clinical Psychology*, 38, 183–190.
- Matto, H. C. (2002). Investigating the validity of the Draw-A-Person screening procedure for emotional disturbance. *Psychological Assessment*, 14, 221–225.
- Mitchell, J., Trent, R., & McArthur, R. (1993). *Human figure drawing test: An illustrated handbook for clinical interpretation and standardized assessment of cognitive impairment*. Los Angeles: Western Psychological Services.
- Oguz, V. (2010). The factors influencing children's drawings. *Procedia Social and Behavioral Sciences*, 2, 3003–3007.
- Özer, S. (2010). A comparison of clinical and nonclinical groups of children on the Bender-Gestalt and Draw a Person Tests. *Procedia Social and Behavioral Sciences*, 5, 449–454.
- Paine, P., Alves, E., & Tubino, P. (1985). Size of human figure drawing and Goodenough-Harris scores on pediatric oncology patients: A pilot study. *Perceptual and Motor Skills*, 60, 911–914.
- Pliszka, S. R., Carlson, C., & Swanson, J. M. (1999). *ADHD with comorbid disorders: Clinical assessment and management*. New York: Guilford.
- Pourahmadi, E., Abedin, A., Pakdaman, S., Shaiery, M., & Jalali, M. (2009). Comparison of "draw-a-person" test elements in oppositional defiant disorder and normal children. *Journal of Behavioral Sciences*, 3, 209–216.
- Rae, G., & Hyland, P. (2001). Generalizability and classical test theory analyses of Koppitz's Scoring System for human figure drawings. *British Journal of Educational Psychology*, 71, 369–382.
- Roback, H. B. (1968). Human figure drawings: Their utility in the clinical psychologist's armamentarium for personality assessment. *Psychological Bulletin*, 70, 1–19.
- Skounti, M., Philalithis, A., & Galanakis, E. (2007). Variations in prevalence of attention deficit hyperactivity disorder worldwide. *European Journal of Pediatrics*, 166, 117–123.
- Sturner, R. A., Rothbaum, F., Visintainer, M., & Wolfer, J. (1980). The effects of stress on children's human figure drawings. *Journal of Clinical Psychology*, 36, 324–331.
- Swanson, J. M. (2003). Role of executive function in ADHD. *Journal of clinical psychiatry*, 64, 35–39.
- Swenson, C. H. (1968). Empirical evaluation of human figure drawings: 1957–1966. *Psychological Bulletin*, 70, 20–44.
- Terr, L. (1994). *Unchained memories*. New York: Basic books.
- Tharinger, D. J., & Stark, K. D. (1990). A qualitative versus quantitative approach to evaluating the Draw-A-Person and Kinetic Family Drawing: A study of mood- and anxiety-disorder children. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 2, 365–375.
- Thorell, L. B., & Rydell, A. M. (2008). Behaviour problems and social competence deficits associated with symptoms of attention-deficit/hyperactivity disorder: Effects of age and gender. *Child: Care, Health and Development*, 34, 584–595.
- Watkins, C. E., Campell, V. L., Neiberding, R., & Hallmark, R. (1995). Contemporary practice of psychological assessment by clinical psychologists. *Professional Psychology Research and Practice*, 26, 54–60.
- Wehmeier, P. M., Schacht, A., & Barkley, R. A. (2010). Social and emotional impairment in children and adolescents with ADHD and the impact on quality of life. *Journal of Adolescent Health*, 46, 209–217.
- Willis, L. R., Joy, S. P., & Kaiser, D. H. (2010). Draw-a-Person-in-the-Rain as an assessment of stress and coping resources. *The Arts in Psychotherapy*, 37, 233–239.