CITY UNIVERSITY OF HONG KONG

An Investigation of Human Figure Drawings and the Use of Colours in Psychological Evaluation of Children with Emotional and Behavioral Disorders

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By

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Abstract

Objective. This study investigated whether psychological evaluation of children with Emotional and Behavioural Disorders (EBD) could be conducted through Human Figure Drawings and the use of color.

Methods. A total of 74 participants from a youth center, local primary or secondary schools were invited, and 57 of them (25 students with EBD, 32 students without EBD) who had not received art education beyond schools were chosen to study. To measure their Human Figure Drawings, 30 Emotional Indicators (EIs) and 30 Developmental Items (DIs) (Koppitz, 1968) were employed to assess the participants' emotional state. Besides, their use of colour including the number of colours used, the utilization of disfavoured colours and the number of misplaced colours were examined.

Results. Results showed that children with EBD tended to draw more EIs (Koppitz, 1968), depict a figure with an unhappy face, and use misplaced colours, compared to those without EBD. Remarkably, a relationship between the number of misplaced Colours and EIs was also found among the EBD children. However, regarding the number of colours used and the utilization of disfavoured colours in HFDs, no

significant difference was observed between these 2 groups of participants.

Conclusions. The results demonstrated that there was significant difference in HFDs and the use of misplaced colours between children who suffered from EBD and those who did not. Implications of HFDs with the use of colour in schools and clinical settings were discussed.

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List of Abbreviations

DAP	Draw-A-Person
DIs	Developmental Items
EBD	Emotional and Behavioral Disorders
EIs	Emotional Indicators
HFDs	Human Figure Drawings
NMHSEC	National Mental Health and Special Education Coalition
WISC	Wechsler Intelligence Scale for Children

Chapter 1: Introduction and Literature Review

1.1. Introduction

There has been psychological interest in children's drawings since the late 19th century. Early investigators stated that a child's drawing was a copy of the child's mind. Drawing, therefore, could provide a "window" into his or her thoughts and feelings (Harris, 1972, cited in Cox, 1993; Thomas & Silk, 1990). In this sense, communication through art may be a valuable way to understand feelings and needs of children, especially for those with emotional and behavioural disorders (EBD). In fact, children with EBD tend to have difficulties in verbalizing their problems and express their feelings (Reid, Epstein, Pastor, & Ryser, 2000). In 2002, Benner, Nelson and Epstein reported that "*approximately three out of four elementary-age students with EBD (71%) had expressive, receptive, and/or pragmatic language deficits*" (p.43). Besides, it was noted that "*about one out of two (57%) children with diagnosed language deficits was identified with EBD*" (Benner, Nelson, & Epstein, 2002, p.43). EBD children also typically suffer from social skill deficit that can induce problems in interacting with others and difficulties in communicating their physical or emotional need appropriately (Quinn, Kavale, Mathur, Rutherford, & Forness, 1999; Walker, Colvin, & Ramsey, 1995). With communication problems, the

EBD children often conceal their emotions such as sadness, rejection, anger, and fear (King & Schwabenlender, 1994). Since their negative feelings can interfere with their successful functioning at home, in school, or in the community, it is important to explore ways to uncover their feelings, understand their needs, and provide supports with them accordingly. Drawing is thus seen as an appropriate activity in which their feelings can be released on paper and no verbalization is demanded.

The remained question is how to understanding their inner experience through the medium of the art. Human Figure Drawings (HFDs, Koppitz, 1968) is one of the most widely used techniques to evaluate children's emotional state (e.g. Cates, 1991; Catte & Cox, 1999; Fuller, Preuss, & Hawkins, 1970; Hibbard, & Hartman, 1990; Norford & Barakat, 1990). HFDs are frequently employed as it can capitalize on most children's tendency to draw human beings (Pikunas & Carberry, 1961, as cited in Koppitz, 1968). Based on Harry Stack Sullivan's Interpersonal Relationship Theory, Koppitz (1968) suggested that HFDs could reveal children's emotional conflict about themselves and the people in their lives. Koppitz (1968) assumed a drawn human figure was a reflection of the child's self-representation (p.4). It was maintained that "*nonspecific instruction to draw 'a whole person' could lead the children to look into themselves and into their inner feelings since who they knew best were themselves*" (Koppitz, 1968, p.5). In that way, they would *"consciously or unconsciously portrait*

their inner self, projecting their minds, concerns as well as attitudes towards life stresses onto the paper" (Koppitz, 1968, pp.3-4). Koppitz also adapted the work of Machover (1949, 1953) and Hammar (1958) to develop a list of thirty Emotional Indicators (EIs) on HFDs for measuring the children's emotional difficulties and conflicts. "*Presence of 2 or more indicators on HFDs was considered as emotional disturbance or unsatisfactory interpersonal relationships*" (Koppitz, 1968, p.42).

However, Koppitz's (1968) work has been highly controversial among researchers. First of all, it was argued that it neglected other variables such as the children's artistic ability and training, their mental functioning and examiner biases (William, Wiener, & MacMillan, 2005). Thus, its validity was remained uncertain. Besides, it was argued that drawings made by children may display different significant features at different time. Therefore, the reliability of Koppitz's (1968) EIs was debatable (Swenson, 1968). In this sense, further extended study is needed.

Most importantly, Koppitz's (1968) study limited to only pencil drawings of human figures. Another important aspect, the use of colours in HFDs, is remained unexplored by her. Indeed, coloured drawings may reveal even more about one's inner psychological condition than pencil drawings (Hammer, 1997). It maintained that utilization of colours can provide addition information regarding their emotional state. As early as 1942, Rorschach proposed a relationship between colours and

emotion. Rorschach (1951) considered colours as a channel for people to reveal their emotions. It was assumed that colours could reflect the unconscious layers of an individual's psychological state (Atkinson, 1986). In Rorschach (1984)'s study, it found that people with depressed mood tended to give few colour responses, while those with elated moods inclined to give numerous colour answers. Based on these findings, Rorschach deduced that the number of colours responses may represent human's capacity of emotional adaption. In other words, the number of colour responses could measure one's affective liability. From this perspective, a constricted and emotionally unstable child may tend to avoid use of colours, whereas an impulsive child would use colours uncontrollably. Although research finding of this area were inconsistent (e.g. Gulbro-Leavitt & Schimmel, 1991; Malchiodi, 1990), it provided a direction for researchers to investigate.

Another aspect that helps reveal a child's feeling in drawings is his or her choice of colours. Generally, there are 2 approaches among investigators. The first one is colour symbolism. It is an association between colour and emotional symbolism. It was suggested that colours could symbolize certain feelings and mood (Alschuler & Hsttwick, 1947; Hammer, 1953). For example, Furth (1988) noted that "black might symbolize the unknown; if used for shading; it was generally viewed as negative thoughts, a threat, or fear" (p. 97). However, this perceptive was criticized since

emotional meanings of specific colours are subjective and personal (Golomb, 1992). Besides, it was commented that colour symbolism just reveal one's sensitivity to metaphorical associations of colour, rather than his or her self-expression (Burkitt, Barrett, & Davis, 2003). Hence, colour symbolism may not be an objective and appropriate means to understand children's emotions and thoughts.

Instead of colour symbolism, another approach, colour preference, was proposed. It was documented that children would systematically select colour to depict their feelings according their own colour preference and the drawn topic (Burkitt, Barrett, & Davis, 2003). For instance, children would intentionally use their favorite colours for the figure they like, disfavored colours for the figures they dislike. This finding implied that children's feelings and attitudes could be revealed by analyzing their colour preference and their colours used in drawings.

Additionally, children may deliberately demonstrate the misplacement of colours for self-expression, Furth (1988) implied that "*colour out of place such as a purple person or a black sun might carry a significant psychological meaning for children"* (p. 99). In this sense, the misplacement of colours (i.e. unrealistic use of colour) was considered as one of the focal points worth noticing. Taken together, by examining children's use of colour in drawings, it may help disclose their psychological states.

The present study aimed to investigate whether HFDs and the use of colours

could be used to reveal children's psychological condition. To achieve it, HFDs drawn by children suffered from EBD and those did not would be compared by using Koppitz's (1968) EIs. Besides, its reliability would be examined, and the use of colours of children with EBD would be explored.

The following chapter serves as the background in the development of hypothesis for the current study. It will start with the literature on the underlying relationship between emotional disturbance and expression on drawings. Further, the link between emotional expression and the use of colours will be explained. Then an overview of the concept of EBD will be presented, and finally, the statement of the hypotheses of the present study will be presented.

1.2. Literature Review

1.2.1. A Relation between Emotional Problem and Expression on Drawings

A relation between feelings and art product has been well established. Researchers tended to view art as a natural ways for the children to express themselves (e.g. Di Leo, 1983; King & Schwabenlender, 1994; Wolff, 1946). Drawings, therefore, are regarded as "a mirror of the child's inner life, a reflection of his or her self-image, conflicts, fear and desires" (Golomb, 2004, p. 297).

1.2.1.1 A Historical Perspective on Children's Drawings

Historically, drawings have been considered as unique personal statements

represent both conscious and unconscious meaning of children's inner would (Malchiodi, 1998). For example, in the view of Lowenfeld (1939, 1947), children's art could reflect one's conscious experience. It was explained that in drawings or paintings, "*children would express their subjective values, intentions or emotional evaluations of objects and events through exaggerating their proportions or sizes*" (as cited in Golomb, 2004, p.158). They would also "*express only what were important to them and what they knew intimately from their bodily sensation*" (Lowenfeld, 1939, 1947, as cited in Golomb, 2004, p.158). Therefore, their subjective experience may become the vehicle for their artistic expression and the source of their creative behaviour. It may make them change commonly used drawing schema and produce a unique art work. From this perspective, drawings can be used as revealing children's conscious experience.

On the other hand, Freud (1900, 1958) proposed a link between one's unconsciousness and art. Freud believed that human conflicts and neuroses could motivate an individual to artistic creation. It was noted that symbols expressed in art might represent "*anxiety-laden content*" from the unconscious (Freud, 1900, 1958, as cited in Oster & Gould, 1987). According to Freud, to guard the individual from experiencing anxiety, unconscious material originating in the psyche would be disguised as the symbol and reveal through art expressions. For this reason, art

expression was viewed as a route to understanding the inner world of the human psyche.

To understand the latent meaning of the symbol, Jung (1985) focused on studying the psychological content of art expressions. Jung placed more emphasis on universal meanings of the symbol and proposed a principle of constancy, theory of opposites and theory of compensation for picture interpretation. It provided a basis on developing the following projective drawing test: Human Figure Drawings (HFDs).

1.2.1.2. Human Figure Drawings (HFDs)

Machover's (1949) Draw-A-Person (DAP) test was one of the pioneering works on the HFDs. Machover (1949) adopted Schilder's (1935) concept of the "body image" and formulated a series of psychodynamic hypotheses for her interpretations of the drawn human figure. She noted that:

> The human figure drawn by an individual who is directed to 'draw a person' relates intimately to the impulses, anxieties, conflicts, and compensation characteristic of that individual. In some sense, the figure drawn is the person, and the paper corresponds to the environment. (Machover, 1949, p. 35)

On the basis of this premise, she proposed a list of body parts and a key to their symbolic interpretation. Taking a psychoanalytically oriented stance towards the

symbolic meaning of diverse body parts, Machover interpreted structural characteristic such as the size and placement of the figure, completion or omission of features, shading of body, and erasures as the indicative of affects related to one's self-image (as cited in Golomb, 2004). However, Machover's work was criticized for no scoring system and lack of empirical support (Swensen, 1968; Roback, 1968). Its validity, thus, was still uncertain.

Unlike Machover (1949), Koppitz (1968) did not based on psychoanalytic theory to build the framework of HFDs. Instead, Koppitz used Sullivan's theory of interpersonal relationship*, " a philosophy that emphasized ego psychology and conscious processes"* in the present (as cited in Malchiodi, 1998, p.7). Based on this approach, Koppitz focused on examining children's current status and feelings along with developmental, interpersonal, emotional and scientific aspect.

Furthermore, Koppitz (1968) assumed that a human figure a children drawn is a reflection of the child's inner representation of self. It was explained that to draw a person and to capture the essence of a person, "*children might look into themselves and their feelings as the person the children known best were themselves*" (Koppitz, p. 5). Thus, their HFDs might project their inner "self" and their attitudes. In this sense, HFDs could reveal children's views of themselves. Besides, the drawing could depicted their attitudes toward life's stresses, problem and conflicts, disclosing fears

and anxieties they concerns, consciously or unconsciously, at that moment (Koppitz, pp. 3-4). In short, HFDs were regarded as a portrait of the inner child of the moment. Koppitz (1968) also suggested the three principles in interpretation of human figure drawings in children aged between five and twelve. According to Koppitz (1968), they were:

(1) "*Regardless of who is drawn, the drawing is a self-portrait and therefore indicative of self-concept*," (p. 75)

(2) "*The person who is drawn is the person of greatest importance in the child's life at that time.*" (p. 75)

(3) "*Interpretation of the drawing may be twofold, for it may represent actual attitudes and conflicts or wishes.*" (p.77)

Besides, Koppitz (1968) examined traits in children's HFDs that were indications of emotional problems. A list of thirty Emotional Indicators (EIs) which was claimed to be suggestive emotional conflicts was proposed. According to Koppitz, these indicators could reflect a child's anxiety, concern and attitude. Besides, the EIs could be categorized into three types of items: the quality sign, the special features and omission. Each item could meet the following three criteria: " (1) *it could reach clinical validity and it could differentiate HFDs between children with and without emotional problems"*; (2) *"it occurred less than 16% of the HFDs of children without*

emotional disturbance"; and (3) *"its frequency of occurrence on HFDs was not related to age and maturation"* (Koppitz, 1968, p.35), Based on this concept, it was proposed that "*presence of two or more indicators might imply emotional or behavioural problems and unsatisfactory interpersonal relationship*" (Koppitz, 1968, p.42).

Further, Koppitz (1968) adopted a Holistic approach while using EIs to interpret HFDs. It was noted there was no one-to-one relationship between any emotional indicator and a definite emotional state of the children (Roback, 1968; Swensen, 1957, 1968). The reason was that anxiety, conflicts or attitudes could be expressed on HFDs in various ways by different children at different time. As a result, it could not make an evaluation of a child's specific emotional difficulty based on any single item. Instead, degree of emotional disturbance should be assessed according to a child's total number of EIs in the drawing (p.55).

However, empirical support for the validity of HFDs as measures of emotional or behavioural functioning has been mixed (Bruening, Wagner, & Johnson, 1997). In fact, children's art product may be also affected by their mental functioning.

To control this factor, Koppitz's (1968) thirty Developmental Items (DIs) on HFDs may provide a means to assess their mental ability to draw. DIs was defined as "*an item that occurs only on few HFDs of children of a younger age level and then*

increases in frequency of occurrence as the age of the children increases, until it gets to be a regular feature of most HFDs at a given age level" (Koppitz, p.9). It was hypothesized that presence of DI on HFDs was related to the child's age and maturation.

According to Koppitz (1968), DIs included 2 types: "*Expected Items"* and "*Exceptional Items"* (pp. 11-13). Expected items were present on the HFDs of many children (the frequency of occurrence was 86-100%). Omission of these items might indicate either mental retardation or regression due to emotional problems. As for exceptional items, they were only found on HFDs of children with above-average mental maturity (the frequency of occurrence was less than 15%). Koppitz (1967) also developed a scoring system to assess the children's general level of mental functioning. The scores obtained from HFDs were claimed to correlate with the Wechsler Intelligence Scale for Children (WISC) Full Scale IQ scores and the Stanford-Binet IQ scores. Since DIs could reflect one's mental maturity, it may be a possible tool to estimate children's mental ability to draw.

Besides mental functioning, other factors should be controlled. First of all, since pictorial interpretation may involve subjective judgment and the validity may be difficult to establish, inter-rater reliability would be measured in the current study. Also, to alleviate the effect of art training on the quality of HFDs, this study would

focus on those children who had not received any additional art education outside school. Finally, to ensure that HFDs is reliable on assessing children's emotional states, the reliability would be measured.

1.2.2. A Relation between Emotional Expression and the Use of Colour

Apart from drawings, the use of colour may be also related to expression of affect (Burkitt, Barrett, & Davis, 2003). Indeed, colour was regarded as the language of feelings (e.g. Alschuler & Hattwick, 1947; Hammer, 1953; as cited in Burkitt, *et al.* 2003). It was maintained that one's feelings, conflicts, and difficulties could be expressed by a process of colouring. Although research on the use of colour was rare, there was some evidence to show that colour might be an indication of a nature of one's emotional life.

1.2.2.1. A Link between the Number of Colour and Affective Liability

The relationship between the number of colour response and affective liability was first proposed by Rorschach (1942, 1951). In his work, it showed that depressed patients tended to avoid colours response whereas impulsive patients inclined to respond colours uncontrollably. Based on this finding, Rorschach (1984) suggested that "*the avoidance of colour may imply one's conscious control of emotional reaction or neurotic suppression of emotion*" (p.98). In contrast, excessive colours respond might represent '*the tendency to one's impulsive emotional discharge*" (Rorschach,

1984, p.33). From this perspective, it indicated that the number of colour response was a possible measure of one's emotional stabilization. Although it was criticized that Rorschach offered no theoretical explanation for the relationship he posited, it provided a direction for explore the role of colour in drawings (Arnheim, 1974).

Since Rorschach's (1942, 1951) work had been published, there was an interest in investigating whether the number of colour used in drawings would reflect one's emotional state. However, no consistent findings were found. For example, in line with Rorschach (1951), Hammer (1997) stated that one's psychological condition could be revealed by his or her number of colour employed in drawings. It indicated that "*most 'emotional-shy' people tended to use crayon as if it were a pencil, using no colour in drawings*" (as cited in Veltman & Browne, 2003, p.5). In contrast, "*those displayed inability to control over their emotional impulse inclined to exhibit a more expansive use of colours than the normative middle range*" (Hammer, 1997, as cited in Veltman & Browne, 2003). Another study by Gulbro-Leavitt and Schimmerl (1991), however, obtained an inconsistent result. It was reported that depressed children used more colours in their art work than non-depressed children. It contradicted the view that those with depressed mood used a few colours or monochromatic colour schemes. As no consistent research findings have been found yet, it is worthy to re-examine the relationship between the number of colours used and Intensity of Affection.

1.2.2.2. Least Preferred Colour in HFDs and Low Self-esteem

Besides, children's negative self-image may be depicted by using their least preferred colour. According to Burkitt and his colleagues' study, children's colour choices were affected by their feelings towards the topic drawn (Burkitt, Barrett, & Davis, 2003; Burkitt, Barrett, & Davis, 2004, Burkitt, Barrett, & Davis, 2005; Burkitt, Tala, & Low, 2007). Their research showed that children would use their least preferred colours for depicting the figures they disliked, preferred colours for the figure they like (Burkitt, *et al*., 2003; Burkitt, *et al* 2004, Burkitt, *et al*, 2005; Burkitt, *et al*, 2007). It implied that selecting the colour for depiction might be a way for children to express themselves. From this perspective, children with EBD may selectively use their least preferred colour for their HFDs (represented their self-portraits) due to their low self-esteem. In fact, it is well recognized that children with EBD tended to have negative self-image (e.g. Cooper 1993; Jones, 1985; Maras & Hall, 1996) and negative sense of self-worth (Evans, Brody, & Noain, 1995). Thus, it may be possible that their negative self-image may be depicted through use of their least preferred colour on their HFDs.

1.2.2.3. The Misplacement of Colours and Turbulent Emotions

Furthermore, a link between the misplacement of colours and Emotions disturbance was documented (Furth, 1988; Lev-Wiesel, & Daphna-Tekoha, 2000).

Generally, *"children in middle childhood begin to depict each object with its 'true-life' hue"* (i.e. the original color of the object) (Gardner, 1980; as cited in Veltman & Browne, 2003, p.5). For instance, Golomb and Farmer (1983) reported that paintings made by children aged around six-to-eight-year-olds showed a more realistic use of colour. This can be explained by theory of artistic development. According to Luquet (1913), children of eight years and older (about 12 years) reached a stage termed "Visual Realism". In this stage, the children view aim of painting as beings to represent something. Therefore, the degree of realism is a primary criterion for them judging its quality and beauty (Parson, 1987, p.22). This principle of realism not only guides one's drawing style, but also the use of colours. Therefore, well-known features of the object often dictate certain colour choices. For instance, red lips and white, brown or black hair in human figure drawing would be appear frequently (Golomb, 2004). However, those children without ability to manage their emotional impulses would often show the unconventional use of colours such as a purple person (Hammer, 1997). Thus, it was suggested that the displacement of colours may imply children's turbulent emotion (Veltman & Browne, 2003).

1.2.3 An Overview of the Concept of EBD

Based on the previous studies, drawings by EBD children may be different from their peers. In fact, children with EBD tend to struggle with many problems such as

academic learning (Hinshaw, 1992), social communication and emotional control (Reid et al., 2000). This negative experience and difficulties may drive them to artistic expression, producing the unique art work. To enhance understanding of their inner worlds; the following session serves to provide an overview of the concept of EBD.

1.2.3.1 A Definition of EBD

The term EBD is an umbrella term encompassing a wide range of emotional or behavioral difficulties, or problems which have both emotional and behavioural dimensions (Maras & Redmayne, 1997). These difficulties would interferes with a child's own learning or the learning of their peers; signs of emotional turbulence; and difficulties in forming and maintaining relationships.

Indeed, the definition of EBD is contested. Thus, it has not been reached an agreement among mental health professionals and educators yet (Merrell & Walker, 2004; Webber & Plotts, 2008). By far, the most popular definition is the one proposed by the National Mental Health and Special Education Coalition (NMHSEC; Forness & Knitzer, 1992). Its definition is as follows:

1. "*The term Emotional or Behavioral Disorder (EBD) means a disability characterized by behavioral or emotional responses in school so different from appropriate, age, cultural, or ethnic norms that they adversely affect educational performance. Educational performance*

includes academic, social, vocational, and personal skills. Such a disability

(a) is more than a temporary, expected response to stressful events in the environment;

(b) is consistently exhibited in two different settings, at least one of which is school related; and

(c) is unresponsive to direct intervention in general education or the child's condition is such that general interventions would be insufficient.

2. *Emotional and behavioral disorders can co-exist with other disabilities.*
3. *This category may include children or youth with schizophrenic disorders, affective disorders, anxiety disorders, or other sustained disturbances of conduct or adjustment when they adversely affect educational performance in accordance with section 1.*

Moreover, Children with EBD are a diverse group whose difficulties exist along continua of intensity, duration and frequency of occurrence".

(as cited in Forness & Knitzer, 1992, p. 13.)

Though such definition for EBD (Forness & Knitzer, 1992) has not been authorized, many states use definitions for EBD similar to this proposed one. They require (1) the presence of an emotional or behavioural disability; (2) adverse effect on academic,

social, or related skills; and (3) exhibition of the effect in at least 2 different settings, at least 1 of which is school-related (Gonzales, 1991).

1.2.3.2 Externalizing and Internalizing Broadband Dichotomy

EBD can be dichotomously classified as being externalizing behaviors and internalizing behaviors (Achenbach, 1991; Kauffman, 2005; Walker, Ramsey, & Gresham., 2004). According to the researchers, externalizing problems include "*under-controlled or outer-directed behavioural characteristics such as antisocial and aggressive behaviour, conduct problems and delinquency, destructive and harmful behavior*" (Achenbach, 1991; Kauffman, 2005; Walker, *et al.*, 2004). In contrast, internalizing problems involve "*over-controlled or inner-directed behavioural and emotional characteristics, which display problems of an introverted nature, that is, problems with self that include worries and fears* (Achenbach & Edelbrock, 1978). Examples of internalizing disorders are depression, anxiety, and social withdrawal (Merrell & Walker, 2004). Achenbach and Edelbrock (1983) noted that externalizing and internalizing problems are not necessarily mutually exclusive although their behavioural patterns are contrast. In some case, instead, a child's behavioural characteristics can be "mixed".

Besides, it be should noted that there is a gender difference in internalizing versus externalizing problems. A cross-cultural study reported that boys tended to

have externalizing kinds of problems, especially at ages six to eleven. In contrast, girls inclined to suffer from Internalizing kinds of problems, especially at ages twelve to sixteen. (Rescorla, Achenbach, Ivanova, Dumenci, Almqvist, Bilenberg, 2007). Thus, it indicated that boys are more vulnerable to be externalizers, whereas girls are more at risk of being internalizers (Achenbach & Edelbrock, 1983).

1.2.3.3 Prevalence of EBD

Research generally indicated that about one fifth of children suffered from EBD. For example, in China, the overall prevalence rate of EBD was 15.5%, with 95%confidence interval from 14.2% to 16.8% (Liu, Kurita, Guo, Tachimori, Ze, & Okawa, 2000). The prevalence is similar comparable to those, ranging from 14% to 20%, found in America and Europe (Brandenburg, Friedman, & Silver, 1990; Costello, 1989; Puura, Almqvist, Tamminen, Piha, Rasanen, Kumpulainen, Moilanen, & Koivisto, 1998). However, the rate of EBD be should substantially higher because of the under-identification problem (see Kauffman, 2001, for a thorough overview of the under-identification problem). Thus, it assumed that only those children with the most unmanageable or intolerable problems were identified with EBD.

Furthermore, there were gender differences in the rate of EBD. Generally, children with EBD are predominantly male (Cullinan, 2007). For instance, in China, a large-scale epidemiological study reported that the prevalence rate of EBD was higher

in boys (20.6%) than girls (10.3%), with a boy-to-girl ratio of 2:1 (Liu et al., 2000). It was consistent with the western studies, which estimated that that boy was more vulnerable to EBD, with a boy-to-girl ratio of 3:1 (U.S. Department of Health and Human Services, 1999).

Importantly, it should be aware that the prevalence rate of EBD has been increasing (Epanchin & Paul, 1987; Liu et al., 2000). However, research on EBD in Hong Kong remains scarce. Especially, study of artistic expression of EBD children is rare. Thus, the present study aims to enhance understanding of children with EBD through a means of art.

1.2.4 Research Hypotheses

Taken together, art may be a valuable way to reveal the children's innermost feelings. Based on the previous studies, both drawing and colouring processes may be channels for their self-expression. Thus, children's drawings and their use of colours may carry emotional content that may uncover their emotions. From this perspective, there are four research hypotheses generated in the current study:

(1) Children with EBD may draw more EIs on HFDs than those without EBD (i.e. control group).

   a. Specially, based on Koppitz's (1968) study, it was hypothesized that children with EBD may draw two or more EIs whereas those without EBD

may only draw one or less EI.

(2) There may be a significantly difference in the number of colours used on HFDs between children suffered from EBD and those did not.

(3) A higher number of children with EBD would use their least preferred colour in their HFDs than control group.

   a. In particular, it was hypothesized that for children with EBD, the least preferred colour would be used in their HFDs rather than other type of drawing (i.e. a pre-drawn figure).

(4) Finally, HFDs by children with EBD may show more misplaced colours than control group.

Chapter 2: Methodology

2.1 Participants

A total of seventy-four participants from a youth center, local primary or secondary schools were invited to take part in the study. To eliminate an effect of additional art training on their pictures, only fifty-seven participants (77%) who had not received any art education beyond schools were selected to study. Among them, twenty-five participants with EBD (mean age = 10.76 years, SD = 1.48, 22 male, 3 female) were from two special schools, while the remaining thirty-two participants without EBD were from two mainstream schools and the youth center (mean age = 10.38 years, SD = 1.72, 26 male, 6 female). All of them were Hong Kong Chinese. The students ranged in age between eight and fourteen years (for detail, see Table 3).

Table 1
Number of Participants in Each Age Group

School Type	Gender	Age							Total (n)
		8	9	10	11	12	13	14	
Special School	M	2	3	6	5	6	0	0	22
	F	0	0	0	0	0	3	0	3
Mainstream School	M	5	6	7	5	3	0	0	26
	F	0	0	0	0	3	1	2	6
	Total	7	9	13	10	12	4	2	

This age range was chosen because children of eight years and older were proposed to reach the stage of "visual realism" (Luquet, 1913, see Thomas & Silk, 1990) and thus tended to use colours under the principle of realism (Golomb, 2004). Besides, since the students involved were under eighteen years of age, informed consent for their participation was obtained either from their parents or schools. Each child also agreed to participate in it.

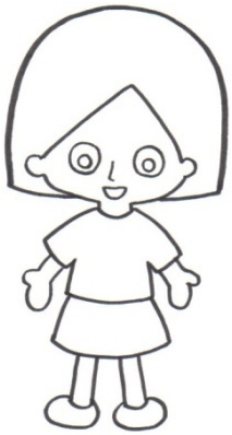
2.2 Materials

Two HB pencils, a pencil sharper, a rubber and two A4 size papers (8.3 × 11.7 inches) were provided in the drawing task (session 1). Besides, two kinds of pre-drawn human figure drawings were used during the coloring task (session 2). The drawings included one male figure (see Figure 1a) and 1 female figure (see Figure 1b) centered on two separate A4 size papers. Gender of the pre-drawn figure given was consistent with gender of the first figure drawn by the participants.

Figure 1. Pre-drawn Human Figures Used in Colouring Task

a. A Male Figure (On the Left).

b. A Female Figure (On the Right)



Also, twelve colour pens (including red, orange, yellow, green, blue, purple, pink, brown, black, medium flesh, yellow green and light blue) were provided in the coloring task since these colours were usually used in local art education and most children were familiar with.

2.3 Procedure

The study was conducted in February and March in 2008. There were three sessions. For both sessions, the participants were interviewed individually in a quiet room.

2.3.1 Session 1. Human Figure Drawing

Each participant was asked to draw a person. The Chinese instruction was: "請在這張紙上畫一個完整的人。你可以畫任何你想畫的人物，但你要確定他/她是完整的人，並且不是‘火柴枝人’或卡通人物。" ("*On this piece of paper, I would like you to draw a WHOLE person. It can be any kind of a person you want to draw, just make sure that it is a whole person and not a stick figure or a cartoon figure*", Koppitz, 1968, p.6). No time limit was set for the task. However, the amount of time taken was recorded. During the task, the participants' behaviour, attitude as well as spontaneous comments were observed and written down. Besides, those dissatisfied with their drawings were allowed to start over again on an additional sheet. After making the drawing, they were invited to describe this figure. The following opened

questions (translated in Chinese) were asked: “請你介紹這個人。例如你可以介紹他/她是什麼人? 他/她正在做什麼？” (“Please introduce this person. For example, you can talk about what kind of a person this is or what he/ she is doing.”) This sharing session was lasted for about 1 minute. The participants were free to introduce this figure and their descriptions were recorded in the questionnaire (see Appendix A) by examiners.

2.3.2 Session 2. Colouring Task

The participants finished the following 3 tasks:

Part I. Colouring the Human Figure

Each participant was required to colour his or her human figure drawn in the previous session. The instruction in Cantonese was: ““請用這些顏色筆把你所畫的人物填上顏色。” (“I would like you to colour the human figure you have drawn by using these colored pens”). There was no time limit in this task, but the time taken was recorded. Their behaviors and their attitude toward the task were observed. During this task, the participants might leave any part of the figure blank either because of a refusal of colouring the figure or a purpose of representation of a white colour. To consider intentions behind, a description of their coloured figure and a reason of their use of colour were asked in the end of this part. This sharing session was lasted for about 1 minute. The participants were free to introduce this figure and their descriptions were

recorded in the questionnaire (see Appendix A)

Part II. Colouring the Pre-drawn Human Figure

Based on the gender of the drawn figure in session 1, a same-sex pre-drawn outline drawing of human figure (either a male or female) was provided. Each participant was then given the Chinese instruction: “請用這些顏色筆把這個預先畫好的人物填上顏色。” (“I would like you to colour this pre-drawn human figure by using these colored pens”). No time limit was set for this task. However, the time needed was recorded. In this part, any part of the figure might remain uncoloured. To examine the reason behind, their description of the coloured figure (such as its personality) and their color use were asked.

Part III. Colour Preference Task

Twelve colour pens used in the previous parts (including red, orange, yellow, green, blue, purple, pink, brown, black, medium flesh, yellow green and light blue) were spread out in a random arrangement in front of the participants. They were required to remove the colour (s) they disliked. The Cantonese instruction was: “請從這些顏色筆中取出你不喜歡的顏色。你可以選取一種或多於一種的顏色。” (“Here are some colour pens with one colour on each. I would like you to sort the colour which you dislike. You can choose more than one colours”). The removed colour pen(s) was (were) then recorded. As white colour pen are uncommon and unavailable in local

setting, their preference of white colour was verbally asked and noted down in the end of this task.

In the end of session 2, to ensure that their art products and their use of colours were not directly copy from the clothing of the examiner or themselves, their clothing and those colours were recorded (see Appendix A).

2.3.3 Session 3. Drawing an Opposite Sex Human Figure

The participants were asked to draw a person whose sex was opposite to the first figure. The instruction in Cantonese was: “請在這張紙上畫一個完整的人，而他／她的性別是與你剛才所畫的人物不同的。你可以畫任何你想畫的人物，但你要確定他/她是完整的人，並且不是‘火柴枝人’或卡通人物。” (“On this piece of paper, I would like you to draw a WHOLE person whose gender is opposite to the first figure you have drawn. It can be any kind of a person you want to draw, just make sure that it is a whole, opposite-sex person and not a stick figure or a cartoon figure.”) If younger children did not understand the meaning of “opposite-sex person”, the examiner would have based on the gender of their first figure and directly ask: “你可以畫一個男性？” (“You may draw a male)” if the children had drawn a women or a girl before, or “你可以畫一個女性？” (“You may draw a female”) if the children had drawn a man or a boy before). There was no time limit set for this part.

2.4 Measurement

To investigate whether there was a difference in HFDs between participants suffered from EBD and those did not, the drawings obtained were analyzed according to two criteria: features of HFDs and the use of colour.

2.4.1 Features of HFDs

To start with, in order to ensure their art products did not affect by their mental ability to draw, their mental functioning would be assessed by Koppitz's (1968) DIs on the first-drawn human figure. The DIs score would be calculated according to Koppitz's DIs scoring system.

Further, the features of HFDs made in session 1 and 3 were measured according to Koppitz's (1968) thirty EIs scoring system. Each drawing was scored for the presence or absence of each indicator. The total score of these indicators was then calculated. The minimum possible score was zero and the maximum was thirty. Since the first-drawn HFDs was proposed to be superior to the later one, only the first drawn figure was used to analyze their emotional states (Richey, 1965, as cited in Koppitz, 1968). As for the opposite-sex figure, it was used to assess test-retest reliability through comparing the first drawn figure. Besides, in order to avoid the examiner's bias, the backgrounds of the participants were blinded at the time of drawing interpretation.

2.4.2 The Use of Colour

The coloured HFDs in session 2 were scored in three ways: the total number of colour use, the use of disfavoured color and the number of misplacement of colour.

(1) The Total Number of Colour(s) Used

The total number of colour(s) used in first drawing (Session 2 part A) was recorded. Each colour in the picture was scored one mark and the minimum possible score was zero and the maximum was thirty, including those twelve colours in colour pens and the original white colour in the drawing paper. However, if the participants reported that they had leaved the figure blank because of their refusal of colouring instead of a representation of a white colour, the white colour would have not been counted.

(2) The Use of Disfavoured Colour

Based on the result obtained in the Colour Preference Task (Session 2 Part III), the colours used in the first HFD (Session2 Part I) and the pre-drawn HFD (Session 2 Part II) were first checked whether they were disliked by the participants or not. The presence of their disliked colour (s) in the drawings was scored one mark (regardless the number of the disfavoured colour used). Nonetheless, if they had used their disfavored colour (s) (e.g. black color) only for depicting the realistic feature of the person (e.g. the Chinese with black hair),

this colour would have not been scored. The reason was that they may use their least preferred color for reflecting the reality, not for expressing their negative feeling towards themselves. Finally, their used of the disfavoured color in the first HFD and the pre-drawn were compared.

(3) The Number of Misplacement of Colour(s)

Its criterion was the number of misplacement. The definition in there was the colours used in an unrealistic manner (e.g. green skin or a yellow mouth). The picture was scored one mark each when the colour was misplaced. The scoring items included the figure's mouth, ears, limbs, teeth, eyes and pupils. However, hair with blown or other colours was not counted (except for those with highly unrealistic or uncommon colour). The reason was that it might imply a trend of dyed hair in society and it may not attribute to one's emotional disturbance. Besides, the skin would have not been scored if it had just revealed the nationality (e.g. the white or black people) or the personal characteristic of the figure (e.g. a sporty person with brown skin) described by the participants.

2.5 Data Analyses

The data obtained would be analyzed through the following procedures:

To start with, the independent *t*-test was employed to assess a significant difference in the total EIs scores (Koppitz, 1968) on the first-drawn HFDs between

the EBD children and the control group (hypothesis 1). Specifically, to explore whether there was any significantly individual features associated with EBD, the chi-square test for goodness of fit was used. Additionally, to estimate a significant difference in the total number of colours used between the two groups, the independent *t*-test was performed (hypothesis 2), Besides, to testify whether there was a higher number of the EBD children would use their disfavored colours in HFDs than the control group (hypothesis 3), the chi-square test for goodness of fit was computed. In order to further investigate whether the EBD children's disfavored colour would be present on HFDs more frequent than a pre-drawn outline figure (hypothesis 3a), the paired *t*-test was employed. As for the children without EBD, the paired *t*-test was also performed to confirm no difference in their disfavored colour used between the figures. Lastly, the independent *t*-test was used to estimate the difference in the number of misplaced colour in HFDs between the two groups (hypothesis 4).

To ensure results obtained from the two groups did not affected by their differential mental maturity, the data would be further analyzed by the following steps. First of all, in order to testify the participants' mental ability to draw, their mental functioning would be examined through the calculation of their DIs scores (Koppitz, 1968). The DIs scores obtained from the EBD children would be then compared with the control group (i.e. the children without EBD) by performing the independent

t-test.

In addition, inter-rater reliability would be assessed. The HFDs were estimated independently by two undergraduate students. The inter-rater reliability was then calculated through the correlation of the agreement on the presence of each EI in the HFDs. Besides, if disagreement had existed, they would have discussed the drawing together and reached consensus. The agreement on the total number of indicators present in the HFDs was also computed.

Finally, test-retest reliability would be examined. To calculate it, the total number of EIs presented in the first-drawn figure and the opposite-sex figure were compared by the paired *t*-test.

Chapter 3: Results

3.1 EIs Score and Emotional Difficulties

To test hypothesis 1 (children with EBD may draw more EIs on HFDs than control group), the independent *t*-test was done to compare the mean of EI scores between the two groups. As expected, results indicated that there was a highly significant difference in the EIs score between the two groups, t (36.46) = 3.74, p =.001.The children with EBD drew more EIs on HFDs (M= 2.64, SD = 2.06) than the control groups (M=0.91, SD = 1.20). This result, thus, supported hypothesis 1. Besides, according to the data obtained, the EBD children tended to draw 2 or more EIs (M=2.64) whereas those without EBD inclined to draw only 1or less item (M=0.91). Therefore, hypothesis 1a was accepted.

Specifically, in order to explore any individual features associated with EBD, the chi-square test for goodness of fit was used. Resulted showed that the indicators of short arms (χ^2=7.02, *d.f.* = 1, p<.01), hands cut off (χ^2=7.02, *d.f.* = 1, p<.01), and monster or grotesque figure (χ^2=8.58, *d.f.*= 1, p<.01) were drawn highly significantly more frequent by the children with EBD in comparison with the control group. Also, the indicators of crossed eyes (χ^2=4.05, *d.f.*= 1, p<.05), long arms (χ^2=5.51, *d.f.*= 1, p<.05) and no neck (χ^2=4.30, *d.f.*= 1, p<.05) were depicted significantly more frequent by the EBD children, compared with the control group (for illustration, see

Figure 2a,b,c,d, e).

Figure 2. An Illustration of Six EIs Frequently Displayed by the EBD Children, in Comparison with the Control Group

a. *A Human Figure by an Eleven-Year-Old Boy with EBD.*

Note: The human figure was a monster or grotesque figure with short arms, but without hands and neck.

b. *A Human Figure by an Eleven-Year-Old Boy with EBD.*

Note: The human figure was a monster or grotesque figure without neck.

c. A *Human Figure by a Ten-Year-Old Boy with EBD.*

Note: The human figure was a monster or grotesque figure with crossed eyes and short arms, but without hands and neck.

d. *A Human Figure by a Nine-Year-Old Boy with EBD.*

Note: Long arms were depicted in the human figure.

d. *A Human Figure by a Ten-Year-Old Boy without EBD*

3.2 The Number of Misplacement of Colours

To investigate whether HFDs by the children with EBD would display more number of misplaced colours than the control group (hypothesis 4), the independent *t*-test was used. Result showed a statistically significant difference in the number of misplacement of colours between the two groups, t (36.85) =2.03, p =.05. The children with EBD used more misplaced colours (M= 1.24, SD = 1.48) than those without EBD (M=0.56, SD = 0.88) (for illustration, see Figure 3a, b, c, & d). Therefore, hypothesis 4 was supported.

Figure 3. An Illustration of HFDs with Misplaced Colours by the Children with EBD, in Comparison with the Control Group

a. A Human Figure with Misplaced Colours by a 12-Year-Old Boy with EBD.

Note: The colours of the face and the hands of the human figure were misplaced. Also, the colours of the sun, clouds and rain were depicted in an unrealistic manner.

b. *A Human Figure with Misplaced Colours by a 12-Year-Old Boy with EBD*

c. *A Human Figure with Misplaced Colours by a 10-Year-Old Boy with EBD*

Note: The colours of the face and the ears of the human figure were misplaced.

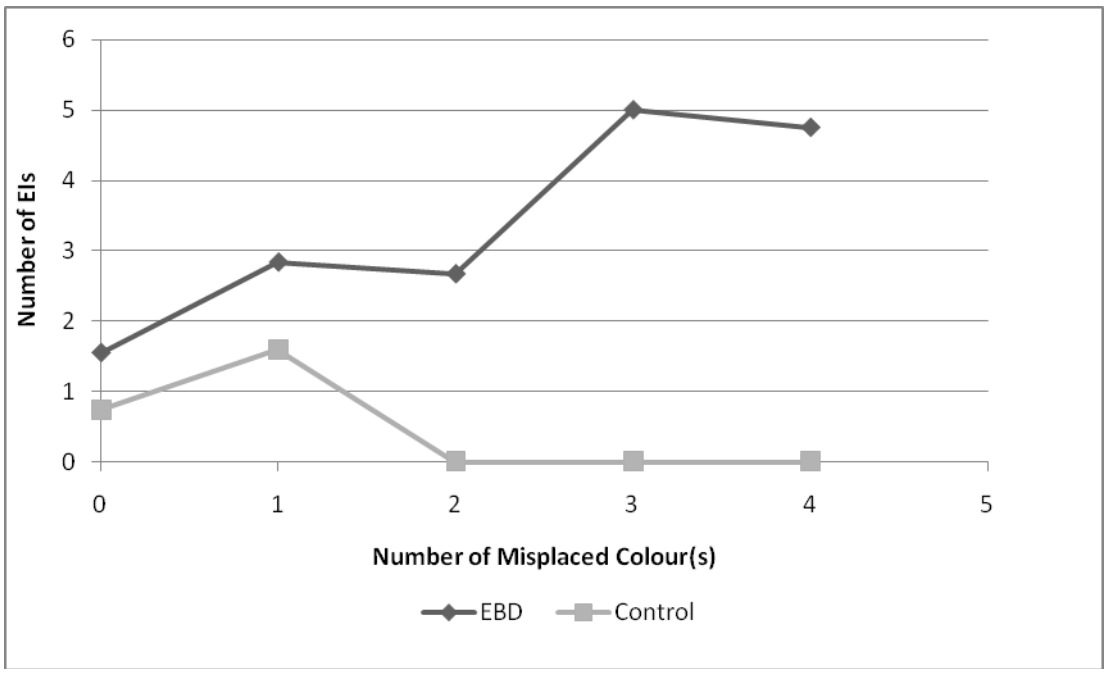
d. *A Human Figure by an 11-Year-Old Boy without EBD*

Note: No misplaced colour was demonstrated.

3.3 The Correlation between the Numbers of EIs and the Misplaced Colours

Noteworthily, the Pearson correlation indicated that there was a significantly moderate and positive relationship between the number of misplaced color and the number of EIs in HFDs, r = +.4.63, N =57, p <.001, two tails. Importantly, this correlation only occurred in HFDs by the EBD children, r = +.58, n =25, p <.01, two tails. Regarding the HFDs by the control group, no significant correlation was found, r = -.03, n =25, p >.05 (see Figure 4). Therefore, it implied that one's emotional disturbance was related to use of misplaced color on HFDs.

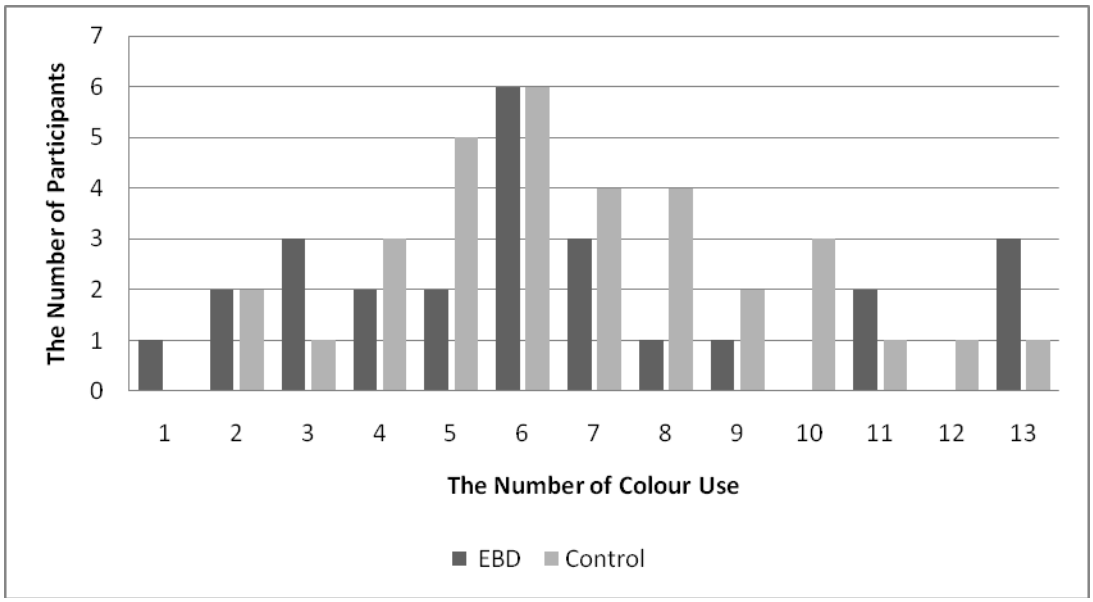
Figure 4. The Relationship between the Numbers of Misplaced Colour and EIs Score in HFDs by the Children with EBD and the Control Group



3.4 The Total Number of Colours Used

The independent *t*-test was conducted to test hypothesis 2 (there may be a significantly difference in the number of colours used on HFDs between the EBD children and the control group). The result was illustrated in Figure 5. It demonstrated that both the EBD children (M=6.6, SD=3.43) and the control group (M=6.94, SD=2.60) tended to use 6 colors in their HFDs. Therefore, no statistically significant difference in the number of colours used was found, t (55) = -.423, p>.05. From this statistic results, hypothesis 2 was rejected.

Figure 5. The Number of Colour(s) Used of the EBD Children and the Control Group



3.5 The Use of Disfavored Colour

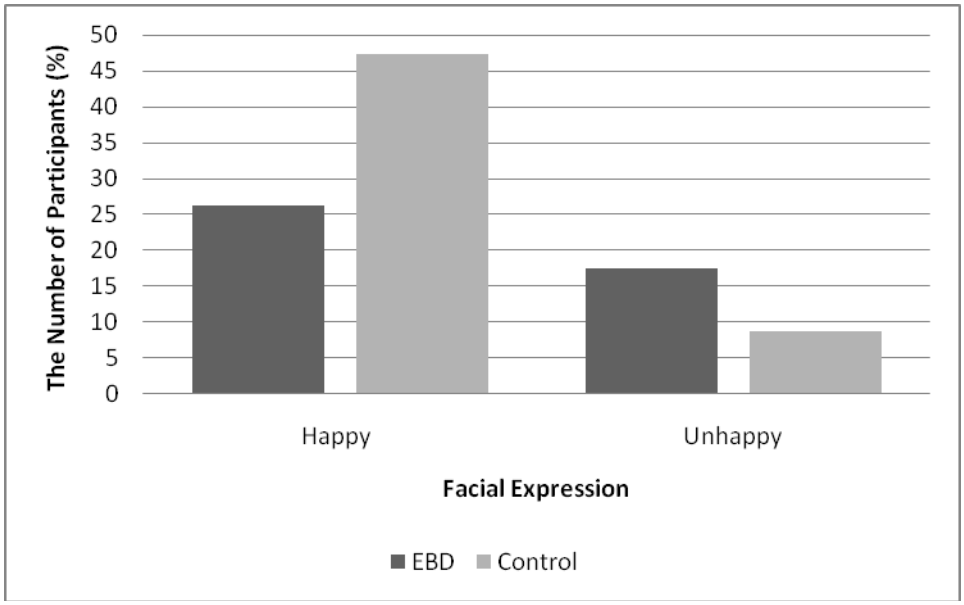
To test hypothesis 3 (a higher number of the children with EBD would use their least preferred colour in their HFDs than the control group), the chi-square test for goodness of fit was conducted. The results demonstrated that 27.5 % of the EBD children and 37.3% of the control group used their disfavored colour in HFDs. However, there was no statistically significant difference obtained (χ^2=0.02, *d.f.*= 1, p<.05). Hence, hypothesis 3 was not accepted.

For the EBD children, to investigate whether there was a significant difference in use of their least preferred colour between HFDs and pre-drawn figures (hypothesis 3a), the paired *t*-test was employed was performed. However, no significant difference was found, t (21) =1.37, p>.05. It revealed that they did not alter their choice of disfavored colour on the first-drawn figure (M=.64, SD=.49) and the pre-drawn outline figure (M=.50, SD=.51). Regarding the children without EBD, the same result was found. Result demonstrated that there was no significant difference in their use of the disfavored colour between the first-drawn figure (M=.66, SD=.48) and the pre-drawn outline figure (M=.59, SD=.50), t (28) =.70, p>.05. Hence, hypothesis 3a was rejected.

3.6 An Unexpected Result - A Difference in Facial Expression of HFDs

Unexpectedly, through performing the chi-square test for goodness of fit, a statistically significant difference in facial expression depicted in HFDs was found between the groups, (χ^2=4.3, *d.f.* = 1, p<.05, see figure 6). As illustrated in Figure 3, a higher number of the children with EBD (17.5%) drew a figure with an unhappy face, in comparison with the control group (just 8.8%). On the other hand, a lower number of the children with EBD (26.3%) drew a figure with a happy face, compared with those without EBD (47.4%). Thus, it implied that the children with EBD inclined to draw the unhappy face, compared with the control group. Besides, it was not universal for the EBD children to depict the happy face.

Figure 6. A Significant Difference in Facial Expression Depicted in HFDs by the Children with EBD and the Control Group



3.7 DIs Scores and Mental Functioning

To ensure the findings did not affected by the differential mental maturity between the groups, their DIs scores were calculated. Results indicated that there was no statistically significant difference in mental functioning between the children suffered from EDB and those did not, t (55) = -1.24, p>.05. Although the EBD children (M=3.92, SD=1.61) seemed to achieve lower DIs score than the other group (M=4.38, SD=1.16), such difference was not significant. Besides, according to Koppitz's (1968) interpretation of DIs score, both of their intelligence quotients (IQ) ranged from 80-110. It implied that both of them have a certain degree of mental ability to draw. Thus, their differences in HFDs and the use of colours could not be explained from their differential mental functioning.

3.8 Inter-Rater Reliability

Furthermore, the inter-rater reliability was assessed through the correlation of the agreement on the presence of each EI in the HFDs between the raters. Results showed that the percentage of agreement on the indicators ranged from 56.7% to 100% with a mean of 93.23%. Excepted for the indicators of gross asymmetry of limb (56.7%) and no arms (70%), a majority of the indicators had a high Inter-rater reliability, ranging from 81% to 100%. Besides, the raters achieved a high agreement (93.8%) on the total number of indicators present in the HFDs.

3.9 Test-Retest Reliability

Finally, the paired *t*-test was used to estimate the test-retest on HFDs. The total number of EIs presented in the first-drawn figure and the opposite-sex figure were compared by the paired *t*-test. Table 2 presented that test-retest Reliability in the study. It showed that for the EBD children, there was no significant difference in the total number of EIs presented in the first-drawn figure (Mean= 2.64, SD=2.06) and the opposite-sex figure (Mean= 2.36, SD=2.06), t (24) = .71, p >.05.

Table 2

Test-Retest Reliability: Total Numbers of EIs in First-Drawn Human Figure and Opposite-Sex Human Figure

		First-Drawn Figure	**Opposite-Sex Figure (Re-Test)**
EBD	Mean	2.64	2.36
(n=25)	SD	2.06	2.06
Control	Mean	0.94	0.91
(n=32)	SD	1.19	0.97
All Participants	Mean	1.68	1.58
(N=57)	SD	1.82	1.68

As for those without EBD, there was also no significant difference in number of EIs between the first-drawn (Mean= 0.94, SD=1.19) and the opposite-sex figure

(Mean= 0.91, SD=.97), t (31) = -.19, p >.05. It indicated that the EIs scores of the participants were stable over a certain time period (see Table 3).

Table 3

Time (Minutes) Taken in the Tasks

		First-Drawn Figure	**Opposite-Sex Figure (Re-Test)**	**Total Time Taken**
EBD Children (n=25)	Mean	4.84	6.24	17
	SD	3.56	3.89	7.83
Control Group (n=32)	Mean	6.16	6.63	18.19
	SD	5.34	8.14	13.88
All Participants (N=57)	Mean	5.58	6.46	17.67
	SD	4.65	6.71	11.47

Chapter 4: Discussion and Conclusions

4.1. Discussion

The objective of the present study was to investigate whether psychological evaluation of children with EBD could be conducted through HFDs and use of color. To achieve this, the EBD children's HFDs and their use of colors were compared with the control group. The results demonstrated that the EBD children tended to draw more EIs (Koppitz, 1968) and use misplaced colours. Remarkably, a relationship between the number of EIs and misplaced colours was discovered among the EBD children. The study also found that the children with EBD were inclined to draw a human figure with an unhappy face, compared to the control group. However, regarding the number of colour used and the utilization of the disfavoured colours in HFDs, no significant difference was observed between these two groups. In this chapter, interpretations of the results of the present study will be presented. Possible implication will also be suggested. Finally, limitations of this study and suggestions for further research will be discussed.

4.1.1. Interpretations of the Results

4.1.1 .1. The Relation between Emotional Difficulties and EIs on HFDs

The results of the study showed that the children with EBD tended to depict more EIs on HFDs than the control group. It was consistent with the early research

studies reported (e.g. Eno, Elliot, & Woehlke, 1981; Fuller, Preuss, & Hawkins, 1970; Handler & McIntosh, 1971; Johnson, 1989). Particularly, it revealed that the EBD children were inclined to draw two or more EIs (M = 2.64) whereas the control group tended to draw only one or less item (M =0.91). This finding not only replicated Jones's (1985) work, in which reported that HFDs by emotionally disturbed students contained an average of two EIs (M=2.61), but also supported Koppitz's (1968) proposition: presence of two or more indicators might imply emotional or behavioural problems. Thus, in line with previous studies (e.g. Arkell, 1976; Goldman & Warren, 1976; Handler & McIntosh, 1971), this study provided an evidence to support that Koppitz's (1968) thirty EIs could be used to identify children with EBD.

More specifically, the results of this study demonstrated six EIs which were significantly frequently displayed by the EBD children. It included: no neck (17.5%), monster or grotesque figure (10.5%), hands cut off (8.8%), short arms (8.8%), long arms (8.8%), and crossed eyes (5.3%). According to Koppitz (1968), these indicators suggested impulsivity, poor self-concept, feeling of inadequacy or guilt over failure to art correctly, withdrawal, an aggressive reaching out into the environment, rebellion and anger respectively. Although these EIs seemed to represent a contradictive sign of emotional state, it may reflect a bipolar dimension of EBD: externalizing and internalizing in reality. As mentioned before, the externalizing profile represents

extrovertive and under-controlled behaviors such as aggression and impulsivity/ hyperactivity. In contrast, the internalizing profile of EBD refers to problems of an introverted or over-controlled nature (i.e. problems with self) that includes worries, fears, and social withdrawal (Achenbach & Edelbrock, 1978). In this sense, the differential kinds of emotional difficulties represented by EIs may just reveal the bipolar nature of EBD. Thus, the finding of this study was not contradictive.

According to Lowenfeld (1939, 1947), children with EBD tended to depict more special features (e.g. long arms and hands cut off) and omit a certain item of body (i.e. neck) may stem from their emotional disturbance. With reference to Lowenfeld (1939, 1947)'s work, it suggested that children's emotional distress could drive them to change their drawing schemas, and consequently, lead them to produce peculiar drawings. For instance, those with "feeling of intense inadequacy and poor self-concept" may depict a human figure as a monster or grotesque figure (Koppitz, 1968, p.64). Besides, those who have "difficulty in reaching out into the world and toward others may draw short arms for a figure" (Koppitz, 1968, p.62). In this sense, EBD children tended to depict HFDs in a different manner which may result from their inner negative feelings towards themselves, others or their environment. Thus, in accordance with (Koppitz, 1968), this study demonstrated that HFDs could reveal children's anxiety, concern and attitude.

4.1.1.2 The Misplacement of Colours Used and Emotion Expression

Additionally, the data indicated that the children with EBD significantly used more misplaced colours (M= 1.24) than the control group (M=0.56). This result was in line with earlier studies which noted that displacement of colours may imply children's turbulent emotions (Hammer, 1997; Veltman & Browne, 2003).

Indeed, this research finding was contradicted to theory of artistic development (e.g Golomb, 2004; Hargreaves, 1989; Luquet, 1913; Parsons, 1987). According to Luquet (1913), children in their middle childhood (around 8 years old) often reach a stage of visual realism. In this stage, they become aware of the rule of colours and begin to "*portray every object with its 'true-life' hue*" (Gardner, 1980; as cited in Veltman & Browne, 2003, p.5). In short, they inclined to use colours under the realism principle (Persons, 1987). However, from the data of this study, this theory failed to apply to the EBD children. As the EBD children in this study aged between eight and fourteen, they were theoretically assumed to have reached a stage of visual realism and use colours under the realistic rule (e.g. a red month and black hair). Nevertheless, the result demonstrated that the EBD children tended to not follow this rule and displayed more misplaced colours on HFDs.

The possible explanation for this result is that for the EBD children, their use of colours may not be mainly guided by realism principle, but their inner need for

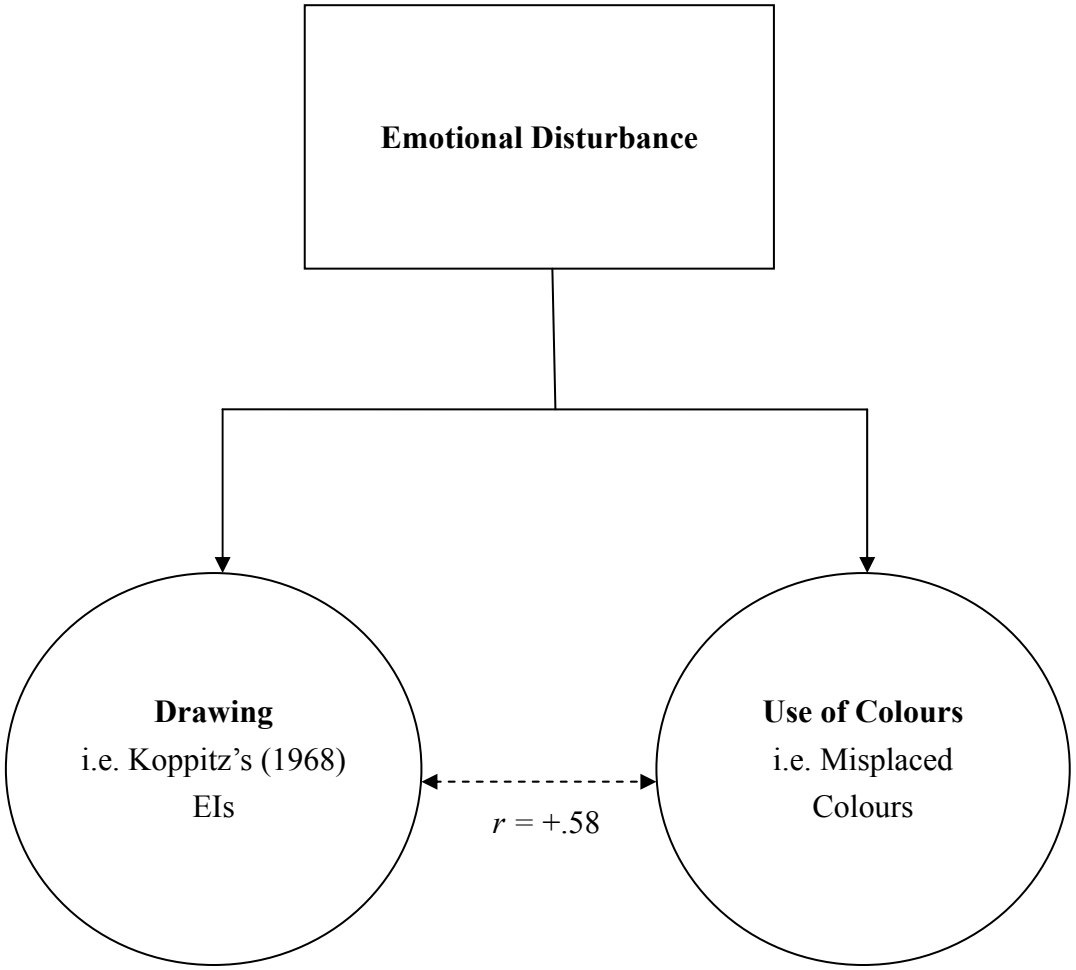
emotional expression. As described by Betensky (1995), "*when a person was burdened with complex emotional experiences, colour was a chief vehicle for self-expression*" (pp.74-75). Betensky further maintained that in other "*to soothe one's negative feeling, he or she may use colours in a particular way*" (pp.74). Misplacement of colours may be one way for those with turbulent emotions to release their distress. In other words, in line with the work of Veltman and Browne (2003), misplacement of color can be one of the reliable indicators of emotional state of the EBD children.

4.1.1.3. The Relationship between the Numbers of Misplaced Color and EIs

Besides, the study discovered that there was a significant and positive correlation between the number of misplaced colours and EIs on HFDs by the EBD children (r = +.58) (see Figure 7). This meant that the more EIs they drew, the more number of misplaced colours they used. This relationship may imply that both drawing and colouring may have a related expressive quality for the EBD children to release their emotional distress. As discussed before, emotional disturbance can affect both children's drawings and the use of color. For instance, children with emotional distress change their drawing schemas and produce unique art products to express their emotional experiences (Lowenfeld, 1939, 1947). On the other hand, they may also use colour in a peculiar way to soothe their inner negative feelings at the same

time (Betensky, 1995). Thus, it may be possible that the more emotional disturbance the EBD children suffered, the more EIs and misplaced colours would be displayed.

Figure 7. A Diagram of the Relationship between the Drawing and the Use of Colours



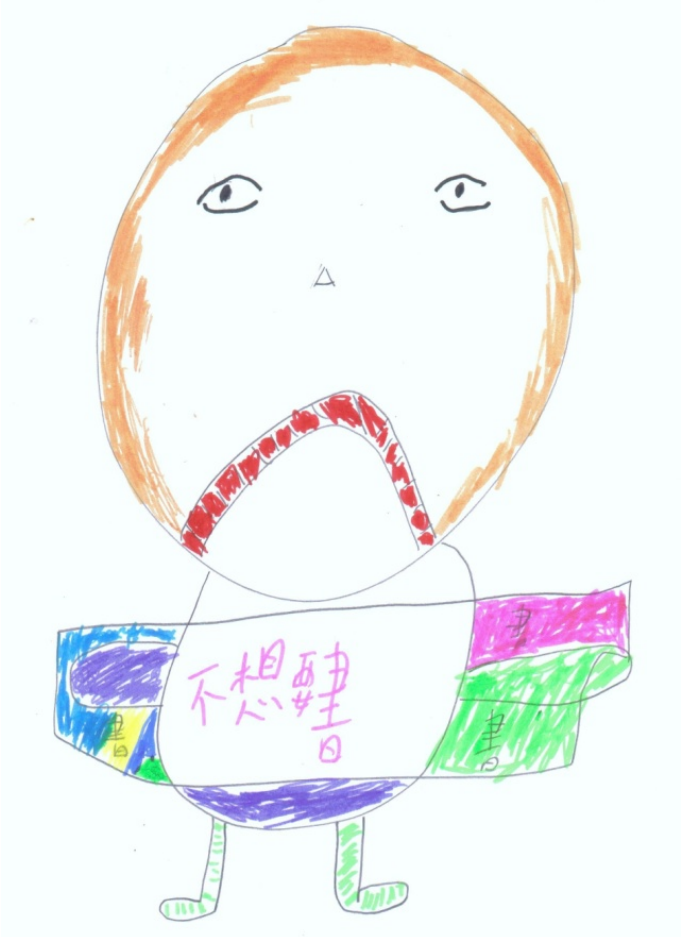
4.1.1.4 The *Unhappy Facial Expression and Negative Emotion*

This study also displayed that there was a significant difference in portraying facial expression on HFDs between the EBD children and the control group. For example, the EBD children tended to draw an unhappy face (17.5%), compared with just 8.8% of the control group. On the other hand, nearly half of the control group (47.4%) portrayed a happy face. However, it was not universal for the EBD children (only 26.3%). Therefore it can be concluded that facial expression of HFDs may be a potential signs of children's psychological states.

Although this finding has rarely been relativity mentioned in previous research studies, some researchers agreed that facial expression drawn could represent one's inner experience (e.g. DiLeo, 1983; Sadowski & Loesch, 1993). For instance, Sadowski and Loesch (1993) documented that tears and frowns were indicators of sadness or depression, whereas smiles might be indicators of happiness. In this sense, the EBD children drawing unhappy faces may be a reflection of their negative feelings such as sorrow, hostility and fear. Indeed, previous studies generally documented that children with EBD typically struggle with many problems such as academic failure (Barry, Lyman, & Klinger, 2002) and emotional turbulence (Kauffman, 2005). These problems may make them feel distressed, leading them to deliberately convey their feelings on HFDs. For example, Figure 8 drawn by

eleven-year-old boy with EBD presented a sad face. The boy referred to the figure drawn as “himself,” and said, “he hates studying and he want to throw all his books away”.

Figure 8. A Human Figure with a Sad Face by an Eleven-Year-Old Boy with EBD.



Note: The figure was marked “不想要書” (‘I don’t like Book’).

Similarly, a twelve-year-old boy with EBD also portrayed an unhappy face in his figure (see Figure 9), and described, “It was ‘me’ and both of us (i.e. the human figure and the child) don’t like going to school”. Through these illustrations and descriptions,

it may possibly show that the sad face depicted in HFDs may represent one's negative emotion state.

Figure 9. A Human Figure with an Unhappy Facial Expression by a Twelve-Year-Old Boy with EBD.

Note: The figure wore a school uniform, as described by the Child.

4.1.1.5. The Number of Colours Used and the Drawing Topic

Additionally, the results showed that there was no significant difference in the number of colours used between the EBD children (M=6.6) and the control group (M=6.94). Both of them tended to use six colours to depict their figures. This result was contrary to the finding of the early studies which indicated that a person with emotional distress would use a different number of colours, compared with those without such problem (e.g. Gulbro-Leavitt & Schimmerl, 1991; Hammer, 1997; Rorschach 1942, 1951; Oster & Gould, 1987).

Such difference could not be observed between the two groups can be possibly

due to the drawing topic: HFDs employed in this study. In the present study, the children were invited to draw a person and six parts of the figure were commonly portrayed. They include hair, head (include eyes and mouth), two to three pieces of clothes (e.g. T-shirt, trouser or skirt, and shoes) and limbs (for illustration, see Figure 10). Considering the number of body parts, to a certain extent, may confine the children's creative expression and the number of colours used. Therefore, no significant difference in the number of colour used between the two groups was found.

Figure 10. An Illustration of a Trend of Children Using around Six Colours in HFDs

a. A Human Figure by a 10-Year-Old Boy with EBD

b. A Human Figure by a 9-Year-Old Boy without EBD

4.1.1.6. The Use of Disfavored Colours by the EBD Children

Furthermore, the results showed that the EBD did not tend to use their least preferred colours to express themselves. It represented that they did not systemically alter their colour choice to reveal their frame of mind. This finding was contrary to the earlier research studies reported (Burkitt et al., 2003, 2004, 2005; Burkitt, Tala, & Low, 2007). One of the explanations was that the use of disfavored colours may not be the most effective ways for the EBD children to self-express. In the previous research (e.g. Burkitt et al., 2003; Burkitt et al., 2007), it controlled the children's ways of expression (only colour choice was allowed). Thus, to express their certain feelings towards differential affective drawing topic, they could only systematically alter their colour choice. On the contrary, the present study did not restrict ways of expressions. Thus, the EBD children could be relatively free to express their emotion through various means (e.g. using misplaced colour or drawing special features in HFDs). Since there were differential choices for self-expression, they may prefer other means to convey their feelings. In other words, the use of disfavored colour may not be regarded as the most effective way for them to expression themselves. Hence, the use of disfavored colours may not be an important sign for revealing their emotional states.

4.1. 2. Implication of the Present Study

Taken together, this study confirmed that both HFDs and the use of colours can reveal the children's emotional state. The results showed that the children with EBD tended to draw more Koppitz (1968)'s EIs, depict figures with unhappy faces and use more misplaced colours. Remarkably, the relationship of the number of EIs and the number of misplaced colours used was discovered among the EBD children. It implied that not only the drawing features (i.e. EIs and an unhappy facial expression), but also the use of colours (i.e. the misplaced colours) used can be employed as reliable indicators of emotional difficulties. However, the previous studies (e.g. Di Leo, 1983; Eno, Elliot, & Woehlke, 1981; Koppitz, 1968) mainly focused on drawings and neglected the fact that the use of colours can be one of the reliable indicators. Thus, this finding helped explore the EBD children' inner world by their art work in a new direction.

The major implication of this study is that along with interviews and rating scales, HFDs and the use of colours may contribute to provide further information for identifying students with EBD in schools or clinical settings. In addition to identification, it can provide more information for planning interventions and monitoring the outcome of EBD students. Hence, it is recommended that educators, school psychologists, and other mental health professionals should consider using

coloured HFDs to conduct more comprehensive assessments, along with other assessment tools. As a result, multiple sources of data could be obtained and more accurate assessments for their psychological conditions could be made.

4.1.3. Limitations of the Present Study and Suggestions for Future Research

To enhance the understanding of children by their art work and improve the study in the field of psychology of art, three main limitations were reviewed in this research. Suggestions were also made for the future investigation of the topic.

4.1.3.1. Lack of Representative Sample Size

A major limitation of this study was a lack of reprehensive sample size. Owing to limited resources, only twenty-five children with EBD who had not received additional art education beyond schools could be approached. Among them, just three of them were female. Although it reported that children with EBD are predominantly male (Cullinan, 2007), a small number of female participants may limit the interpretation of the results. Hence, it is proposed that the future research should include a larger number of female participants with EBD. Also, due to the limited number of female participants, this study failed to investigate whether there is a gender difference in HFDs among EBD children. In fact, it indicated that boys tended to have externalizing kinds of problems whereas girls inclined to suffer from internalizing ones (Achenbach & Edelbrock, 1983). This bipolar dimension of EBD

may represent a gender difference in artistic expression such as the number of colours used. Therefore, this possibility should be explored further.

4.1.3.2. Issue of Reliability of HFDs

Besides, the issue of test-retest reliability remained to be solved. Although, the present study attempted to estimate the test-retest reliability and demonstrated that the EIs scores were stable over a certain period of time, it was questionable whether such limited period of time (about 20 minutes) could sufficiently estimate the reliability. Hence, it is suggested that further study should consider extending a test-retest period.

4.1.3.3. Lack of Test for Colour Blindness

Lastly, in the present study, it did not examine the participants' colour-vision condition. In fact, it should not be neglected that the possibility that the defect of one's color vision could affect his or her use of colour. However, owing to limited resources, colour blindness test was not attainable in the study. Thus, the findings of this study (e.g. children with EBD frequently used misplaced colours) did not exclude this confounding variable. To control this factor, a test for colour blindness should be employed to testify participants' normal color-vision functioning by future researchers.

4.2. Conclusions

To conclude, the present study aimed at investigating whether the EBD children's psychological condition could be revealed through HFDs and the use of colours. To achieve this, Koppitz's (1968) EIs, the number of colours used, the use of disfavored colours and the misplacement of colours were used as the indicators to measure the drawings. In line with previous research studies (e.g. Eno et al., 1981; Fuller et al., 1970; Handler & McIntosh, 1971; Johnson, 1989), the results showed that HFDs by the EBD children were inclined to contain more EIs, compared to the control group. Significantly, this difference did not result from their differential mental ability. Further, this study found that HFDs by the EBD children included an average of two EIs. It was consistent with Koppitz (1968)'s work, which proposed that two or more EIs may represent emotional problems and unsatisfactory interpersonal relationships. Besides Koppitz's (1968) EIs, this study found that unhappy facial expression depicted and the misplacement of colours may be reliable indicators for measuring their emotional distress. Noteworthily, the positive relationship between the misplaced colours used and the EIs depicted was discovered. It demonstrated that both of them have expressive quality for the EBD to convey their internal psychological state. However, not all the indicators of the use of colour could be reliable signs of affect. In the present study, the number of colours used and the

utilization of disfavoured colours could not detect the children with EBD. To improve the further study in the field of psychology of art, three limitations of this research were proposed. Hopefully, the professional and the parent can enhance the understanding of the children's inner world by their artistic expression: HFDs and the use of colours in the future.

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Appendix A

Questionnaire for Examiners

Participant No:
Date:
Time:
Place:

Please put a tick "√" in the appropriate block

Session 1. Human Figure Drawing (Only for the First Human Figure)

I. The amount of time needed: _____ (Begin:_____
End:_____)

II. Amount of paper used:_____ Reason:_____

III. Based on the observation, did the child pay any effort on completing this drawing task?

□Yes □No

IV. Any special things observed during the drawing task (e.g. refuse to draw or slips of the pencil)

V. The child's description (or spontaneous comment) of the human figure (e.g, "What kind of a person is this? and "What is he/ she doing")

VI. What are the reasons for him/her drawing the figure in this way (can be more than one)?

□ Based on his/her imagination

□ Copied from comic books or TV programs

□ Learned from others: (Please specific*: Teacher/ Parent/ Others:_____)

□ Based on his/her knowledge, thinking and/or feeling at this moment

□ No ideas

□ Other (Please specific:_____)

*Please delete the inappropriate

Session 2. Coloring Task

Part I. Coloring the Human Figure (Only for the Drawn Figure)

I. The amount of time needed: _____ (Begin: _____End: _____)

II. Based on the observation, did the child pay any effort on completing this colouring task?

□Yes □No

III. Any special things observed during the colour task?

_____

_____

_____

IV. The child's description (or spontaneous comment) of the coloured human figure:

_____

_____

_____

V. What are the reasons for him/her colouring the figure in this way? (can be more than one)

□ His/her own drawing style

□ Colouring skills taught by others: (Please specific*: Teacher/ Parent/ Others:_____)

□ Copy by drawing books and others

□ No ideas

□ Others (Please specific):_____

VI. If the pre-drawn figure uncoloured, what is the reason?

A representation of white color

Refusal to color the figure

No idea

Others: (Please specific):_____

*Please delete the inappropriate

Part II. Coloring the Pre-drawn Human Figure (Only for the Pre-drawn Figure)

I. The amount of time needed: _____ (Begin: _____End:

_____)

II. Based on the observation, did the child pay any effort on completing this colouring task?
□Yes □No

III. Any special things observed during the colour task?

IV. The child's description (or spontaneous comment) of the coloured human figure:

V.. What are the reasons for him/her colouring the figure in this way (can be more than one)?
□ His/her own drawing style
□ Colouring skills taught by others: (Please specific*: Teacher/ Parent/ Others:_____)
□ Copy by drawing books and others
□ No ideas
□ Others (Please specific):_____

VI. If the pre-drawn figure uncoloured, what is the reason?
□ A representation of white color
□ Refusal to color the figure
□ No idea
□ Others: (Please specific):_____

*Please delete the inappropriate

Part III. Colour Preference Task

1. Please put a "X" for the colour participants disliked

□	Red	□	Pink
□	Orange	□	Medium Flesh
□	Yellow	□	Yellow green
□	Green	□	Blue
□	Light blue	□	Purple
□	Brown	□	Black
□	White	□	

Note: Please put a tick to indicate and the dressings of the participant and the examiner (the color of his/her clothing should be also noted down)

	The child (Color)	**The examiner (Color)**
Dressing		
T-shirt		
Sports wear		
Jacket		
Coat		
Sweater		
Dress		
Jeans		
Trousers		
Shorts		
Skirt		
Blouse		
Shoes		
Other (Please specific)		

Personal Information of the Participant

1. Sex: □ Male □ Female
2. Age: _____
3. Ethnicity: _____
4. Religion:_____
5. Have the participant even attended drawing tutorial outside school?

□Yes: _____year(s)/ month(s)/ week(s)/ day(s) (Please delete the inappropriate)

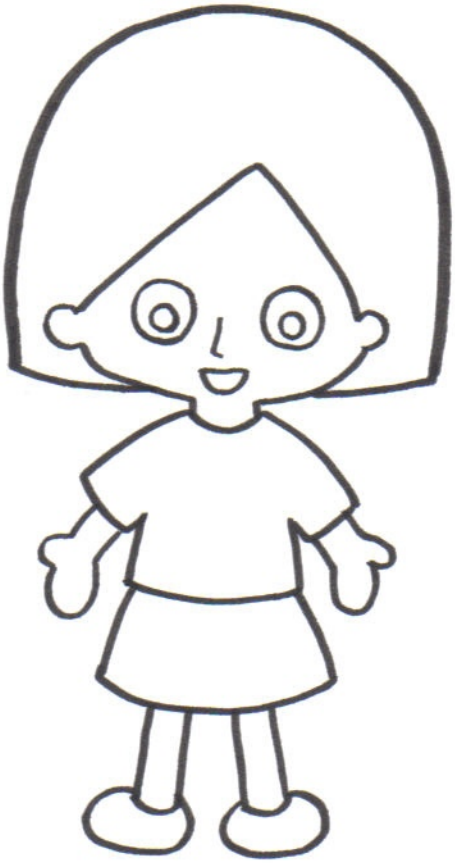
□No

Appendix B

A Pre-Drawn Human Figure (Male)

Appendix C

A Pre-Drawn Human Figure (Female)



Appendix D

Attachment for School

1. The possible contributions resulted from the proposed study

It can fulfill special needs for the teenager, such as

- Providing research findings and empirical methods for helping teachers and parents analyze their children's drawings and enhance understanding of their inner worlds.
- Providing a report about children's emotional development to the teachers and parents.

2. Requests for schools

I. Participants needed

Participants Needed				
Research	***No. of Participants***	***Age of Participants***	***Duration of study***	***Task***
Leung, 2007 Human Figure Drawing	8 female students	Age: 13 (F.1)	20-30 minutes for each participants 2 mins for briefing session	Human figures Drawing & Colouring

II. A separate room is requested

III. Four research assistants is asked for admission

3. Available time slot for the study

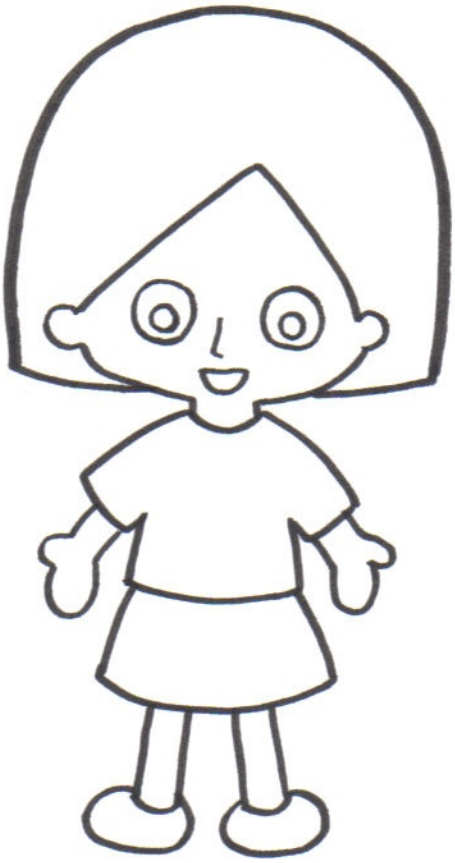
1. 28/2 (Thu.), from 1:30pm to 5:30pm
2. 29/2 (Tue.), from 8:30am to5:30pm
3. 1/3 (Fri.), from 8:30am to5:30pm
4. 3/3 (Mon.), from 8:30am to5:30pm

4. Sample questions

An instruction:

1. "On this piece of paper, I would like you to draw a WHOLE person. It can be any kind of a person you want to draw, just make sure that it is a whole person and not a stick figure or a cartoon figure" (Koppitiz, 1968, p.6).

2. “I would like you to colour this human figure using these colored pens”



Appendix E

Consent Form for Parents of Participants

〈繪畫與心理發展研究〉

邀請書

敬啓者：

這是一項關於繪畫與心理發展的研究，旨在探索如何從圖畫中了解兒童及青少年的內心世界，由香港城市大學應用社會科學系三年級同學梁艷婷負責，並由林少峰博士監督。參加者需要繪畫，並回答簡單問題，約需時二十至三十分鐘。

基於本人對於家長及參加者個人權益的尊重，此研究對您有以下的承諾：

1. 參與研究純屬自願性質，家長及參加者有權隨時退出活動；
2. 參加者所有資料只供學術用途及將絕對保密。研究完成後，除了必須附諸出版的數據外，其他資料全部銷毀。
3. 參加者有權在本研究結束後知道研究結果。

如有任何疑問，歡迎致電 聯絡梁小姐，或 聯絡林少峰博士。非常感謝您對研究的支持及參與。

此致

貴　家長

香港城市大學社會科學系

心理學三年級

梁艷婷

二零零八年二月二十六日

致：梁艷婷

家長同意書

本人已了解有關繪畫與心理發展研究的目的及內容，並清楚與此研究純屬自願性質，本人及子女有權隨時退出活動。本人得悉是次活動所得的全部資料及研究將會保密，並將於研究完成後全部銷毀 (除必須附諸出版的數據外)。

本人現同意/ 不同意* 兒子/女兒 _____(姓名) 參與此項研究。

家長簽署：_____

家長姓名：_____

日　　期：_____

* 請刪去不適用者

Appendix H

Consent Form for of Participants

〈繪畫與心理發展研究〉

邀請書

各位同學：

這是一項關於繪畫與心理發展的研究，旨在探索如何從的圖畫中了解兒童及青少年的內心世界，由香港城市大學應用社會科學系三年級同學梁艷婷負責，並由林少峰博士監督。參加者需要繪畫，並回答簡單問題，約需時二十至三十分鐘。

基於本人對參加者個人權益的尊重，此研究對您有以下的承諾：

4. 參與研究純屬自願性質，參加者有權隨時退出活動；
5. 參加者所有資料只供學術用途及將絕對保密。研究完成後，除了必須附諸出版的數據外，其他資料全部銷毀。
6. 參加者有權在本研究結束後知道研究結果。

如有任何疑問，歡迎致電 聯絡梁小姐，或 聯絡林少峰博士。非常感謝您對研究的支持及參與。

香港城市大學社會科學系
心理學三年級

梁艷婷
二零零八年二月二十六日

致：梁艷婷

家長同意書

本人已了解有關繪畫與心理發展研究的目的及內容，並清楚與此研究純屬自願性質，本人有權隨時退出活動。本人得悉是次活動所得的全部資料及研究將會保密，並將於研究完成後全部銷毀 (除必須附諸出版的數據外)。

本人現同意/ 不同意* 參與此項研究。

簽署：_____

姓名：_____

日期：_____

* 請刪去不適用者