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A STUDY OF THE HUMAN FIGURE DRAWINGS OF CHILDREN WITH LANGUAGE DISORDERS

by

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CHAPTER I

THE PROBLEM

Human figure drawings have been one of the most widely used diagnostic techniques in the evaluation of intellectual, emotional, and neurological functions for about half a century. In the evaluation of children with language disorders, however, this technique has been used only to a very limited extent. At the present time no objective criteria have been reported for identifying human figure drawings by young emotionally disturbed children with language disorders or by young neurologically impaired children with language disorders, or for distinguishing such drawings from those by children without such impairments. This study attempts to establish criteria for the assessment of human figure drawings by language impaired children. The present chapter states the problem to be investigated, examines the need for the study, delimits the problem, and defines the terms of the problem.

Statement of the Problem

Increased attention has been focused during the past twenty years on the study of children's language in both its

typical and its deviant states. The knowledge gained from the disciplines of psychology, neurology, biology, physics, speech and hearing science, and linguistics has contributed to the understanding of the complex phenomenon of human language development. This knowledge has also highlighted the importance of the early detection, diagnosis, and treatment of those children who fail to develop language or who show a marked deviation in its development. Our present state of knowledge also seems to indicate that there is often considerable overlapping of the conditions causing language disorders in children, particularly in cases of neurological impairment and emotional disturbance. As one writer has pointed out, "There is probably a continuum from the exclusively organic to the exclusively psychogenic, with a range of mixtures in between" (Kahn, 1969, p. 39).

The identification of the probable etiological factors in a child's language disorder usually contributes to the accuracy of the prognosis and the effectiveness of the rehabilitation. Nevertheless, the complexity of the problems of diagnosis may make it necessary for the therapist to embark on a more or less extended program of "diagnostic teaching" (Berry, 1969, p. 189), undertaking a treatment of the symptoms without a knowledge of their etiology. The advocates of Skinner's behavior theory principles claim that the etiology of the disorder is irrelevant, since the manipulation of learned behavior does not depend upon a knowledge of its causes (Sloane and MacAulay, 1968, p. 100).

Because of the difficulty often encountered in differentiating between emotionally disturbed and neurologically impaired children with language disorders, the present study explores the contribution which can be made by human figure drawings to the diagnostic language evaluation of these children. This investigation is designed to identify the characteristics which distinguish the drawings of such children, and to examine the accuracy with which these characteristics can be recognized. It is hypothesized that drawings by emotionally disturbed children with language disorders and neurologically impaired children with language disorders can be distinguished from each other and from those by children without evidence of any impairment.

The following questions will be considered:

1. What characteristics distinguish the human figure drawings by emotionally disturbed children with language disorders from those by neurologically impaired children with language disorders?
2. What characteristics distinguish the human figure drawings by children without language disorders or any other evident impairment from those by a) emotionally disturbed children with language disorders and b) neurologically impaired children with language disorders?
3. What concurrence is there among "expert" and "naive" judges in their evaluation of these drawings?

4. How do the evaluations of three groups of drawings differ:
   a) when a continuous scale, modeled on the semantic differential, is used in rating the drawings;
   b) when a discrete scale is used to identify the drawings according to the three categories of "Normal," "Emotionally disturbed," and "Neurologically impaired"; and
   c) when a ranking scale is used in arranging the drawings along a continuum from "Best" to "Worst"?

Need for the Study

The human figure drawing has been recognized as a useful instrument in the evaluation of intellectual, emotional, and neurological functions. Since the introduction of Goodenough's Draw-a-Man Test in 1926, children's human figure drawings, scored quantitatively according to a detailed protocol, have been widely used to obtain children's I.Q. scores (Harris, 1963). Human figure drawings, used particularly since 1940 as a projective technique, rank high among both the clinical and research approaches to emotional disturbances. A 1961 survey of 185 hospitals and agencies indicated that this technique was surpassed only by the Rorschach in frequency of use (Sundberg, 1961). From 1947 to 1965, studies of human figure drawings ranked third in frequency of occurrence in eleven leading scholarly journals,

with the Rorschach and Thematic Apperception Test ranking first and second, respectively, according to Mills (1965) and Crenshaw, Bohn, Hoffman, Matheus, and Offenbach (1968). In the 18 year period surveyed in these two reports, a total of 158 articles on human figure drawings appeared in four leading psychological journals. Human figure drawings have also held a prominent place for the past 30 years in the assessment of neurological functions. Beginning with Bender (1940), who reported that considerable disruption of the body image was seen in human figure drawings by children with cerebral damage, many investigators, such as Silver (1950), Bell (1952), Cohn (1960), and Koppitz (1968), have studied human figure drawings as indicators of neurological pathologies.

In contrast there have been only occasional references to the use of human figure drawings in reports of the clinical and research activities of language and speech pathologists. In describing the evaluation of children with language delay, Bangs made only this statement regarding human figure drawings: "The following tests appear to include both modalities of learning, memory and visual-motor perception: Paper folding and Draw-a-Man" (1961, p. 11). A similarly brief remark was included in Berry's discussion of testing the abilities associated with language learning. She stated that the value of the Goodenough-Harris Drawing Test "lies in the discovery of such specific aspects of visuo-motor and spatial retardation as form, directional orientation, and body image" (1969, p. 282). Wyatt merely included the Goodenough Draw-a-Man Test in a list of testing procedures

and noted that it provides information about "general intellectual ability, fine motor coordination, self-image" (1969, p. 209).

A more thorough consideration of the use of human figure drawings by the speech pathologist has been provided by Kastein. In a detailed case history of a language impaired child, she presented a series of human figure drawings reflecting this child's development over a period of seven years (1966). She also included several series of drawings in her diagnostic study of a group of young children with language disorders (1964). Stressing the importance of the body concept as a source of information in the diagnosis of language impaired children, Kastein wrote:

> To gain further information and to complete the picture of the total developmental levels attained by the child, psychomotor functions, that is body concept, spatial orientation, figure-ground discrimination and visuo-motor functions must be explored. These are the areas which appear to be most sensitive to disturbances of the central nervous system and resultant language disorders, and thus a source of indispensable diagnostic information (1966, p. 10).

As part of the diagnostic language evaluation, she tests "the awareness of the child of himself as an organism separate from the mother and the physical world around him, his awareness of the boundaries and position of parts of his body, as well as his ability to indicate or project this awareness." She has pointed out that a child of three years or older "is expected to project his body concept through the 'Drawing of a Man'" (1964, p. 149).

The most explicit statement regarding the use of human figure drawings as a diagnostic technique with language impaired children is Di Leo's. He stated that in communication disorders "resulting from hearing loss, cerebral dysfunction, or emotional disorder, drawings are often valuable aids in supporting or in formulating a diagnostic impression" (1970, p. 290). On the basis of extensive clinical observation, Di Leo pointed out that human figure drawings "may be validly used as criteria in differentiating peripheral from central disorders. Where the brain is intact, the drawings will fail to show the distortions and deficiencies typically present in the drawings of children with known cerebral involvement" (1970, p. 291). He added that a child with a peripheral hearing loss will not show the discrepancy between his mental age and his human figure drawing which children with a central language disorder typically do. When a communication disorder "is a manifestation of pathology involving the personality as a whole," Di Leo stated, "human figure drawings are bizarre, often unrecognizable, poorly integrated and scattered with no connection between parts of the body." He presented many series of drawings to illustrate his point that "in some children who are progressing favorably, the body parts come together in subsequent drawings made when, in response to therapy, the personality has become better organized" (1970, p. 332).

These statements of Kastein and Di Leo provide illuminating clinical insights which serve as the basis for

the present study of human figure drawings by children with language disorders. These authors have also presented graphic documentation of the changes that have taken place over time in the human figure drawings of emotionally disturbed and of neurologically impaired children with language disorders. Two additional points, also expressed by these authors, must be recognized: 1) the effect of a language disorder on the young child, and 2) the significance of a child's human figure drawing. Kastein has pointed out that "language impairment may interfere with the child's ability to understand his environment and to develop a sense of self" (1966, p. 7). She emphasized "the devastating consequences of language disorders for the integrity of the development of personality, thinking processes and intelligence of the child" (1966, p. 9). It is through his drawing of a person, rather than through words, that the child tells us about himself, according to Di Leo, "talking to us in a language more primal than the spoken word, more natural than the written" (1970, p. 140). Di Leo also stated that the child's drawings are "less susceptible than speech to the influence of defenses. More than words can tell, they are valuable aids to understanding the child and his problems. They tell us more than we can decipher" (1970, p. 379).

While perceptive clinical observations like those of Kastein and Di Leo are indispensable to the full understanding and rehabilitation of language impaired children, the support of empirical evidence is lacking. In the relatively

few instances where human figure drawings are routinely used in children's language evaluations, no objective criteria have been reported for distinguishing the drawings of emotionally disturbed and neurologically impaired children with language disorders.

Delimitations of the Problem

This investigation was limited in the following ways:

1. Children with impairments of hearing or vision were excluded from the study.
2. Mentally retarded children were excluded from the study.
3. Children with physical anomalies, such as cleft palates, deformed limbs, and facial stigmata, were excluded from the study.
4. Children with serious motor impairments were excluded from the study.

Definitions of Terms

In this study the terms "language disorder," "emotionally disturbed," and "neurologically impaired" are used within the frame of reference of the pediatricians, neurologists, psychiatrists, speech pathologists, audiologists, and psychologists at Columbia-Presbyterian Medical Center who evaluated the children studied in the present investigation.

The children with language disorders were described as failing to follow the typical pattern in the mastery of

the phonemic, morphemic, semantic, and/or syntactic dimensions of language. This failure was manifested by the child's inability to understand and/or to produce spoken language, resulting in a total lack of communication or in various degrees of delay in the development of language.

The term "emotionally disturbed" is used in this study to designate children who were described as manifesting continued and excessive anxiety, dependence, fear, withdrawal, insecurity, depression, guilt, hostility, or passivity. These conditions interfered markedly with the children's functioning in home, school, and/or play situations, but did not warrant hospitalization of the children for treatment.

The term "neurologically impaired," as it is used in this study, designates the children whose neurological examinations revealed aberrations, or who manifested disturbances in communication, behavior, and/or learning.

The term "human figure drawing" designates the drawing produced by the child in response to the request made, according to the child's sex, to "draw a boy" or "draw a girl."

CHAPTER II

RELATED LITERATURE

Educators, psychologists, psychiatrists, and neurologists have contributed a vast body of literature which explored children's human figure drawings as manifestations of their intellectual, emotional, and neurological functioning. The most outstanding of the earlier publications, Goodenough's Measurement of Intelligence by Drawings (1926), was one basis for later studies of drawings by emotionally disturbed and neurologically impaired children. These later investigations were also based on the extensive literature dealing with the concept of the body image formulated by neurologists and psychiatrists. The present chapter surveys the historical background of the studies of children's human figure drawings, summarizes the literature on the concept of the body image, and reviews the studies of children's human figure drawings as indicators of emotional and neurological problems. Reports of factor analyses and studies of the validity and reliability of these drawings are also discussed.

Historical Background

Children's drawings have been the subject of

extensive and systematic investigation since at least 1885, when Ebenezer Cooke published an article directing attention to this area of study. Eight years later Barnes (1893), one of the most outstanding of the early students of children's drawings, published an analysis of the drawings of almost 6,400 children, 6 to 16 years old. He proposed that for the young child, drawing is a language, a means of expressing ideas. He noted that there is little difference between the drawings of boys and girls, and that children are interested in drawing heads of persons and begin to draw profiles after about nine years of age.

Interest in drawing the human figure was reported in two other studies of this period. Maitland (1895) found that up to 10 years of age, children's drawings were mainly attempts to draw a person, and Lukens (1896) reported that 75 per cent of the drawings of children 2 to 16 years of age were human figures. Some years later, McCarty's (1924) study of more than 31,000 drawings of children, ages 4 to 12 years, supported the previous finding that both boys and girls showed a strong preference for drawing the human form. She noted, however, that this preference declined with increasing age. Similar observations were offered by more recent investigators, such as Pikunas and Carberry (1961) who studied 3,200 drawings by 350 children, ages 5 to 15 years. They reported that the human figure is most frequently chosen as the subject of drawings, and that this frequency gradually decreases with increasing age.

According to the findings of Bieliauskas (1960), who studied 1,000 human figure drawings by children from 4 to 14 years of age, children of both sexes at all ages prefer to draw a person of their own sex. This conclusion was confirmed by McHugh's report (1966), based on the responses of 320 girls and 306 boys, aged 7 through 11 years. She found that children of both sexes usually choose to draw a human figure of their own sex when asked to draw a person. These studies indicated the strong preference of young children for drawing human figures, usually of their own sex.

An important contribution of the early research was the emphasis on developmental aspects of children's drawings and the identification of progressive stages. Among those who described the developmental stages in the drawings of normal children were Cooke (1885) in England, Partridge (1902) in the United States, Rouma (1913) in France, and Burt (1921) in England. The publications of Rouma and Burt were of particular interest because of their detailed analyses of the development of children's human figure drawings. Rouma (1913) described six states in the evolution of the drawing of the human figure: 1) first attempts at representation, 2) the "tadpole" stage, 3) transitional stage, 4) complete representation of the human figure as seen in full face, 5) transitional stage between full face and profile, 6) profile. Burt (1921) distinguished the stages of scribbling, drawing lines, descriptive symbolism, realism, visual realism, repression, and artistic revival. These

analyses had a significant influence on Goodenough's work, Measurement of Intelligence by Drawings, published in 1926.

The "Draw-a-Man Test," resulting from Goodenough's painstaking investigation of the extent to which young children's drawings are conditioned by their intellectual development, correlated well with standardized intelligence tests and with teachers' judgments of children's ability in the first three grades. Goodenough concluded that the test, rated on a carefully devised scale of 51 highly specific points, "throws considerable light on the development of conceptual thinking in young children" (1926, p. 82). For almost half a century this test has been widely used in the evaluation of children's intelligence and has been studied from many viewpoints.

Harris (1963) revised and extended Goodenough's rating scale for the Draw-a-Man Test, presenting a comprehensive review of the literature on children's drawings and reporting the impressive body of research on human figure drawings as measures of intellectual maturity. He stressed the correlation of the Draw-a-Man Test with "tests of so-called general intelligence," but stated that children's human figure drawings "do not appear to be valuable as measures of interest, temperament, affective or personality factors" (1963, p. 225).

Goodenough's work is of interest in the present investigation since it served as the basis for later research in the areas of emotional disturbance and of

neurological impairment in children. Some of these later studies will be reviewed after a discussion of the concept of the body image.

The Concept of the Body Image

While the forerunners of Goodenough were studying children's drawings, the concept of the "body image" was being explored by neurologists and psychiatrists. However, their ideas seem to have had no influence on Goodenough's work, probably because of her lack of clinical orientation, her unawareness of the concept of the body image, or her lack of interest in it. In her early writings there is no reference to the body image or to any of the publications on this subject. This failure to consider the concept of the body image is an obvious limitation of the Goodenough-Harris approach to children's human figure drawings.

Neurological Aspects of the Body Image

Among the first to formally and explicitly recognize the importance of studying the body image was Bonnier (1905), the French neurologist, who documented his careful observations of his patients with clinical data and offered some suggestions about their significance. In England, Head and Holmes (1911) published a detailed theory of the body image which greatly influenced the thinking of many other neurologists, stimulating the study of many neurological syndromes in body image terms. Introducing the term "body scheme" to signify the concept which a person

develops of his own body and which is one of the fundamental standards in any individual's judgmental system, they wrote: "For this combined standard, against which all subsequent changes of posture are measured before they enter consciousness, we propose the word 'schema'. By means of perceptual alterations in position, we are always building up a postural model of ourselves which constantly changes" (1911, p. 187). However, Head and Holmes gave no specific delineation of how a body schema is organized or how it actually influences judgments.

A refinement of these early formulations was offered when the German neurologist, Pick (1922), attempting to interpret some of the diverse symptoms found among his patients, explained his clinical observations in terms of a central body image mechanism or process. He suggested that in the course of development, the individual evolves a "spatial image of the body"--an inner representation of one's own body as it appears to him consciously from information supplied by the senses.

Developmental Aspects of the Body Image

One of the most significant contributions to the study of the concept of the body image was Schilder's The Image and Appearance of the Human Body (1950), first published in London in 1935. This work provided a detailed consideration of body image phenomena, and extended the investigation of the body image to the area of normal behavior as well as to the area of psychopathology. The

"development of the body schema," according to Schilder, parallels the child's "sensory motor development" (1950, p. 105). He believed that, since children are completely satisfied with their drawings, "the way in which children draw human figures really reflects their knowledge and sensory experience of the body-image. They express at least the mental picture they have of the human body, and the body-image is mental picture as well as perception" (1950, p. 106).

Schilder pointed out that we do not know in detail how the development of the body image evolves, but he believed that there is a maturation of "inner factors, which are given in the organism and comparatively independent of experiences which determine this development." He urged, however, that the influence of individual experiences should not be neglected, since "we always see that the process of maturation gets its final shape through individual experience" (1950, pp. 195-196). He held that the body image is to a considerable degree shaped by one's interactions with other persons, and to the extent that these interpersonal relations are faulty, the body image will be inadequately developed.

Schilder's ideas were supported by Lhermitte's (1939) view that the infant's body image develops very gradually by the interaction of many factors, including painful stimuli, visual impressions, play entailing repetition of kinesthetic activities, and libidinous factors. Similarly, Critchley (1950) suggested that under normal

conditions, there are many contributing factors in the formation of the body image, chiefly visual factors, tactile impulses, and proprioceptive stimuli.

The formation of the body image through the interaction of internal and external factors, as described by Schilder and others, was seen in Freudian terms by Mahler:

> The ego is molded under the impact of reality on the one hand, and of the instinctual drives, on the other. The body ego contains two kinds of self representations: there is an inner core of the body image, with a boundary that is turned toward the inside of the body and divides it from the ego; and an outer layer of sensori-perceptive engrams, which contributes to the boundaries of the "body self" (1968, p. 11).

She stated that the perception of inner processes (linked with feeding, contact reception, etc.) complemented later by distance perception, "form the basis of the mental representations of the body as body image" which constitutes the core of the idea of I. This is the "center around which memory traces, feelings and ideas about the self become crystallized, structured, and organized" (Mahler, 1968, p. 37).

The concept of the body image as fundamental to ego development is one of the cornerstones of Freud's theoretical system. He succinctly stated: "The ego is first and foremost a body ego; it is not merely a surface entity but it is itself the projection of a surface" (1949, p. 31). The earliest ego development, according to Freud, depends on the child's integration of sensations from his body surface and his use of these sensations to discriminate between the outer world and his own body. Freud's views on

this point were clearly summarized by Fenichel:

> In the development of reality, the conception of one's body plays a very special role. At first, there is only the perception of tension, that is, of an "inside something". Later, with the awareness that an object exists to quiet this tension, we have an "outside something". One's own body becomes something apart from the rest of the world and thus the discerning of self from nonself is made possible. The sum of the mental representations of the body and its organs, the so-called body image, constitutes the idea of I and is of basic importance for the further formation of the ego (1945, pp. 35-36).

This crucial importance of the body image in the individual's relationship to the environment has been repeatedly emphasized by other writers. Strauss and Kephart pointed out that the development of the body image and the organization of the space world go on simultaneously, stating: "As the reference point (the body) becomes more definite, the space world of the individual becomes likewise more solid and more highly organized. We use our bodies to locate ourselves in space . . . but likewise we use our visual perceptions of space to preserve our body posture" (1955, p. 74). Commenting on cerebral organization and behavior, Lashley wrote: "Mind is a complex organization, held together by interaction of processes and by the time scales of memory, centered about the body image. It has no distinguishing features other than its organization" (1958, p. 12). This central position of the body image in human functioning was further described by Brain: ". . . it is to be expected that any serious disturbance of the physiological mechanisms underlying awareness of the body and its relations with external space must seriously undermine

the foundations of the personality, apart from any other effects upon mental functioning which may be independently produced by the lesion" (1965, pp. 188-189).

In view of this vital role of the body image in human functioning, the development of the body image must be taken into account in any study of normal child development, as well as in the study of deviations from the norm. There is a significant link between Goodenough's observation that the order of development in children's drawing of the human figure is "remarkably constant, even among children from very different social antecedents" (1926, p. 12) and Freud's view of the body image as the explanation of the development of an organizational structure in the initially undifferentiated organism. Fisher and Cleveland stressed this connection between the body image and the individual's organizational structure when they stated: "Body image is a term which refers to the body as a psychological experience, and focuses on the individual's feelings and attitudes toward his own body. It is concerned with the individual's subjective experiences with his body and the manner in which he has organized these experiences" (1958, p. x). On the other hand, Simmel pointed out the need for cognitive organization as a basis for the development of the body image, a stable cognitive structure built up from past sensory experience. She stated that this sensory experience depends both on sensory input and "some minimal stability of cognitive organization" (1966, p. 83). In agreement with this point

of view is the statement of Gouin-Décarie: "The body image is not an innate reality-adapted perception of one's own body; it is a gradual acquisition based on extremely complicated neurological, physiological, perceptual cognitive and emotional processes" (1966, p. 43).

Defining the Term "Body Image"

The diversified views on the development of the body image indicate the complexity of the concept of the body image and the difficulty of clearly defining it. An additional problem in defining "body image" lies in the fact that it is studied from the widely divergent viewpoints of neurology, psychiatry, and psychology, using the medical, clinical, or experimental techniques of those disciplines, influenced by the particular biases of each investigator. As a result, the neurologist may describe the body image as "that which makes it possible for appropriate bodily movements to be performed in relation to afferent stimuli" (Russell, 1958, p. 7), with no consideration of the psychological aspects of the "vast imagery of one's experience with oneself and with the world about one" (Machover, 1953, p. 85).

Evidence of the problem of defining the term "body image" is seen in the distinctions proposed by Smythies, a British neurologist, who stressed the necessity of precision in the use of terms pertaining to "the human body as this appears from various viewpoints--to the body itself and to the small model of itself which it carries within it" (1953, p. 144). He called attention to the tendency for writers in

"neurology and allied disciplines" to use several terms rather loosely and sometimes interchangeably, and proposed as a clarification the following distinctions:

> Perceived body--the three-dimensional object "directly experienced inside central consciousness" (p. 144).
>
> Body image--"a visual, mental, or memory image of a human body, one's own or someone else's" (p. 140).
>
> Body schema--(in the sense in which the term was used by Head and Holmes) "The constant visual imagery relating to the body and parts of the body associated with movement and sensation is integrated largely by the subconscious system of servo-mechanisms into the unitary function of the human organism" (p. 144). Since the body schema is a function of the subconscious mechanism outside central consciousness, its presence is inferred, not witnessed or experienced.
>
> Body concept--"the constellation of memories and beliefs we each possess concerning our own physical bodies" (p. 140). Since these facts, learned from past experience, "can be affected by wishes and pride" (p. 144), they are not always accurate.

These suggestions seem to have had little discernable effect on the subsequent literature on the body image, but it is interesting to note that at an Oxford symposium on child neurology held eleven years after the publication of Smythies' article, Abercrombie reviewed these definitions and urged their adoption (1964, p. 644).

The Body Image in Children's Human Figure Drawings

Just as the body image has been studied and defined from various viewpoints, children's human figure drawings as manifestations of the body image have also been investigated through a variety of approaches as the studies discussed below indicate. Some of the conflicting results of these investigations can be attributed to the diversities

among the techniques used and among the experimental subjects and sometimes to very small numbers of subjects. However, a more pervasive influence seems to be the confusion about what is being assessed through the child's drawing. Those who have attempted to study the child's "body image" through his human figure drawing have used the term in widely divergent senses, meaning "what is perceived," "what is remembered," "what is imagined," "what is experienced," "what is desired, needed, or rejected," "what is unconscious," "what is known," etc. Occasionally a highly inconsistent viewpoint has been presented like that of Koppitz, who questioned the validity of the "body image hypothesis" (which she did not define) while at the same time maintaining that since the person a child knows best is himself, "his picture of a person becomes . . . a portrait of his inner self, of his attitudes" (1968, p. 5). She further stated that the child's drawings may reveal his attitudes toward life's stresses and strains, the "strong fears and anxieties which may concern the child, consciously or unconsciously, at that given moment," but she added immediately that she did not consider the human figure drawing to be "a portrait of the child's basic and enduring personality traits nor an image of the child's actual appearance" (Koppitz, 1968, pp. 3-4). The lack of a precise definition of the term "body image" seems to be the main obstacle to the integration of the findings of the innumerable studies of children's human figure drawings.

The design of the present study relied heavily on the concept of the body image. If, as Goodenough maintained (1926, p. 12), concept development is shown in drawing, which is primarily a form of expression for the child, we may expect to see the child's body image, his concept of himself, reflected in his human figure drawing. As Bender stated: "When the child draws the human form, it is essentially a projection of his body image and its problems; it is a self-portrait" (1952, p. 89). She also pointed out that "the Goodenough drawing of a man is not the man visually perceived, but a projection of one's own body image acquired by lifelong integration of all perceptual experiences" (Bender, 1952, p. 62). Similarly, Machover wrote that in studying the drawings of children at various ages, "we find that stress is put on the aspects of the drawing which refer most intimately to the emotional needs, meaningful experiences, and problems of the maturing child" (1949, p. 102). The drawing reveals the way the child experiences himself and his relationship to the world outside him. Therefore, the drawing of a normal, well-functioning child would be different from that of a child with a poorly developed or distorted body image resulting from abnormal organic and/or emotional influences. These differences, however, may not be identified by the use of Goodenough's quantitative rating scale, focusing on specific details of content. A qualitative evaluation of such drawings has been found more effective in identifying these differences, as the

studies discussed below indicate.

Human Figure Drawings and the Study of Children's Personality

With a concept of the body image as a basis, psychiatrists and psychologists have made increasing use of human figure drawings as part of their diagnostic procedures since about 1940. Their qualitative approach to the drawings, while diametrically opposed to Goodenough's quantitative scoring method, can be discerned in germinal form in her early study. She reported that "in a small proportion of drawings, qualitative differences may be observed of a type which cannot readily be accounted for" (1926, pp. 62-63). Pointing out that the subtlety of the differences made them difficult to describe, she classified the drawings as: 1) "verbalist" type, 2) "individual response" type, 3) drawings showing evidence of the flight of ideas, and 4) drawings showing uneven mental development, indicated by unusual combinations of primitive and mature characteristics. She suggested that "a method of scoring might be derived which would throw new light upon eccentricities of mental functioning during childhood" (Goodenough, 1926, p. 66). She acknowledged that her work

> which has dealt chiefly with the intellectual side, has by no means exhausted the possibilities which these drawings possess for the study of child development. On the contrary, it is the writer's opinion that, if properly understood, they would contribute much to our knowledge of child interests and personality traits. It is hoped that the experiment which has been described will point the way to further research into this very fundamental type of childish expression (1926, p. 80).

Human Figure Drawings as a Projective Technique

Goodenough's hope that her study would lead to further research has been abundantly fulfilled, particularly through the work of Machover (1949) and Buck (1948). These two investigators, working independently with children's drawings as a means of assessing intelligence, developed the earliest projective drawing techniques. Machover's Figure-Drawing and Buck's House-Tree-Person Drawing are still the most widely used techniques among a variety of later modifications, and have stimulated by far the most research in the vast body of literature on projective drawings. Machover described a "discovery" made in the course of administering I.Q. tests according to Goodenough's technique, reporting that "careful study of the individual drawings often yielded rich clinical material not related to the intellectual level of the subject. Children securing the same mental age rating would frequently do strikingly different and individualized drawings" (1949, p. 20). As a result of this discovery of the clinical value of children's drawings, "drawings of the human figure were soon incorporated in routine clinical procedures and extended to adults of all ages" (Machover, 1949, p. 21).

Machover (1953) has also specifically called attention to the discrepancies she has observed between I.Q. scores obtained by Goodenough's test and those obtained on standard intelligence tests. In reporting her study of the human figure drawings of 1,000 children, ages 5 to 11 years,

she wrote that

> many children of similar intelligence (as measured by other tests) gave grossly different I.Q. levels of drawings. This offered compelling evidence that the measurement of intelligence on such a vital unit as the body image was only secondary to understanding the complexity of body projection in a dynamic sense. The drawing of a person, calling as it does upon the vast imagery of one's experience with oneself and with the world about one, should, by its very linkage with the self, have the potentiality for rich self-projection (1953, p. 85).

The discrepancies Machover described have also been reported by other investigators. Hanvik, who studied children 5 to 12 years old, concluded that "emotionally disturbed children do not draw the human figure in a fashion commensurate with their intelligence as measured by a standardized I.Q. scale" (1953, p. 72), and Ochs (1950) reported a tendency for children's Goodenough I.Q. scores to decrease significantly with continued maladjustment. Similarly, a study by DesLauriers and Halpern (1947) showed that over 100 emotionally disturbed children, ages 4 to 11 years, had lower I.Q. scores by the Draw-a-Man technique than they attained on standardized I.Q. scales. These authors attributed this difference to the children's "body image disturbance," and concluded that the Draw-a-Man test is rarely an accurate indicator of intelligence in disturbed children, but that it is a good projective technique. They stated: "The way he structures the human form, what is emphasized and what subordinated, reveals the way the child experiences himself and what he feels his relationship is to the outside world. In this sense, the test

becomes a projective technique, revealing the patient's body image" (DesLauriers and Halpern, 1947, pp. 59-60). The identification of discrepancies between children's standardized I.Q. scores and their Goodenough test performance has had far-reaching effects leading to the use of human figure drawings as a projective technique.

Indicators of Emotional Conflict in Children's Human Figure Drawings

On the basis of her clinical observations over a period of fifteen years, Machover (1949) described the characteristics of human figure drawings which may indicate emotional conflict. These include such items as erasures, reinforcements, shadings, fragmented lines, marked disturbances in symmetry, and incompletions. Sharing Machover's point of view, Hammer stated: "The subject, by the size, placement, line pressure, content of the drawing, and the like, conveys what he feels in addition to what he sees" (1958, p. 28). Along the same lines, Halpern wrote that the child's drawings

> do definitely reveal his problems, because for him, as for the artist, drawing is one of the channels through which he can express his fears, hopes and fantasies. In fact, except for those children who are fearful of any form of manipulative activity and any situation which calls for free, spontaneous self-expression, the drawing is likely to be the way in which the child communicates much that is important to him and much that troubles him (1958, p. 119).

Working on this assumption that the child's drawing reflects his feelings, many investigators have studied the characteristics of children's human figure drawings to determine the relative importance and the significance of

various aspects of the drawings. The results of Berrien's (1935) early study of children having a "psychopathic personality" agreed with Goodenough's tentative suggestion that certain characteristics in children's drawings, particularly the combination of mature and primitive characteristics in the same drawing, are possible indicators of emotional instability. However, Springer concluded that the Goodenough quantitative scale failed "to differentiate adjusted children from maladjusted ones" (1941, p. 137). While he found that 15 of the 51 items on the scale were significantly different in the drawings of the two groups of 6 to 12-year-old children, there was a great deal of overlapping between the groups. Nevertheless, the drawings of the maladjusted children included more details and showed poorer proportions and poorer motor coordination than the well-adjusted children's drawings. Springer's findings seem to indicate the inadequacy of Goodenough's quantitative scoring method in studying the drawings of emotionally deviant children, and the necessity of a qualitative evaluation of such drawings.

A number of other investigators have emphasized the importance of evaluating the form of the child's human figure drawing as a whole, rather than analyzing the specific details of content. Waehner (1946) proposed the use of "scoring elements," such as detail, shading, etc. Witkin (1962) and his associates used three characteristics in studying "Sophistication of Body Concept": 1) form level (shape, size, proportion, organization of parts), 2) identity

and sex differentiation, and 3) level of detailing. Witkin concluded that these characteristics showed "stability of body concept" in 14 boys whose human figure drawings, done at the ages of 10 years and 17 years, were studied from this viewpoint.

Using a similar qualitative approach, Toler and Toler (1955) found that to a statistically significant degree five clinical psychologists were able to differentiate between "more popular" and "less popular" 11-year-old children on the basis of their human figure drawings. The qualities most frequently looked for by the raters were:

Size, position, and proportioning of drawings
Degree of integration and detailing
Type of line quality, shading
Type of movement depicted
Type of facial expression
Types of omissions and distortions
Sex drawn first, type of attire included

A number of studies, although using a qualitative approach, have focused on particular indicators of emotional maladjustment. Handler and Reyher (1965) reviewed 51 studies of children's and adults' human figure drawings with regard to 21 "anxiety indexes." They reported that consistently significant indicators of anxiety were omission, distortion, detail loss, increased line pressure, heavy lines, increase or decrease in size, head simplification, and trunk simplification. Anxiety in children was studied by Fox and her associates (1958), using the human figure drawings of 32 pairs of subjects matched for school grade, sex, and I.Q. score. One member of each pair was in

the top quartile on two anxiety scales for children, and the other member was in the bottom quartile. The drawings were scored on six characteristics. The drawings of the "high anxiety" children showed significantly more mutilation and rigidity, and those of the "low anxiety" children showed significantly more smiles, down arm positions, and playfulness-humor. There was significantly more shading in the drawings of the "low anxiety" girls and the "high anxiety" boys. The authors believed that the tendency for mutilation and rigidity to be present in the drawings of the "high anxiety" children supported the hypothesis that the body image of these children reflected some concern with and questioning of body integrity and adequacy. The "high anxiety" children's drawings lacked indications of positive affective associations and instead contained features reflecting negative attitudes. McHugh (1966) reported that 27 neurotic children, with a mean age of 10 years, 9 months, were significantly different from a matched group of children with "conduct disturbances" in their tendency to draw small, slight figures.

In another study of "emotional indicators," Koppitz (1966) compared the human figure drawings of 76 child guidance clinic patients and 76 well-adjusted children, ages 5 to 12 years, and found that these indicators occurred significantly more often in the drawings of the clinic patients. The individual drawings of the clinic patients also showed a higher incidence of emotional indicators than

those of the well-adjusted children. Of the 30 items studied, 8 occurred significantly more frequently in the drawings of the emotionally disturbed children: poor integration of parts, shading of body and/or limbs, slanting of figure, very small figure, very large figure, short arms, hands cut off, neck omitted. A highly significant finding was that 16 items occurred only in the disturbed children's drawings: poor integration of parts; shading of face, shading of hands and/or neck; gross asymmetry of limbs; figure slanting; very small figure; very large figure; tiny head; hands as large as head; genitals; three or more figures spontaneously drawn; omission of eyes, mouth, body, arms, or neck. Koppitz concluded that the presence of two or more of the indicators in a drawing was highly suggestive of emotional problems in the child.

Some of Koppitz' findings were supported by Vane and Eisen's (1962) study of 662 kindergarten children. They reported that four items on the human figure drawings which accurately predicted poor adjustment at the end of kindergarten were the omission of mouth, of body, or of arms, and the drawing of a "grotesque figure." Only children whose drawings included these items had significantly lower scores on the Goodenough Draw-a-Man Test than on the Stanford-Binet Test. It is noteworthy that this discrepancy, found in a presumably "normal" school population, is similar to that reported for clinical populations (Des Lauriers and Halpern, 1947 and Hanvik, 1953). In studying the total group of

children when they had reached the third grade in school, Vane and Kessler (1964) found that 42 per cent of those whose kindergarten drawings had shown any of these predictive signs were rated "poor" by the third grade teacher on a behavior adjustment scale, and 71 per cent were achieving below their grade level. On the other hand, only 10 per cent of those whose drawings had shown no predictive signs were rated "poor" in behavior adjustment, and only 32 per cent were underachieving. The authors' failure to state the statistical significance of the percentage values is a weakness of this study. Nevertheless, the combined results of these two extensive and well-designed studies offer convincing evidence of the predictive value of certain features of children's human figure drawings.

The results of a quarter-century of clinical observation were presented in Di Leo's (1970) study of human figure drawings by young children, both "the usual and normative" and "the unusual and deviant." He pointed out that "the child draws his mental impression of the object and not his visual observation of it; that the product is a representation and not a reproduction; and that the representation is imbued with emotional and imaginative elements" (1970, p. 40). Di Leo thus modified the universally accepted concept that the child draws what he knows and not what he sees by stressing the role of the child's feelings in coloring the graphic expression of his thought. Di Leo considered the child's drawings to be "significant as expressions of

personality" (1970, p. 40) and identified a number of characteristics associated with emotional disturbance, describing the drawings of psychologically withdrawn children as "bizarre, often unrecognizable, poorly integrated and scattered" (1970, p. 332). The drawings by insecure children, he found, are characterized by a lack of symmetry, the use of light, wavering strokes, and restriction to a small part of the available space on the paper; they are "inhibited" and "indeterminate" (1970, p. 346). He called attention to the additional features of large size and accentuated arms and fingers as indicators of aggression, small feet as an indication of instability, tiny head as characteristic of disturbance and depression, and shading as an expression of anxiety.

Since the subjects in the studies reviewed in this section are children ranging in age from 4 to 12 years, any generalizations regarding the reported findings may be somewhat inaccurate with respect to a particular age level. It is evident, however, that certain items are found to indicate emotional disturbance among both the youngest and the oldest of the children studied. Omissions of the mouth, body or arms were reported by Koppitz (1968) and by Vane and Eisen (1962). Additional omissions reported by Koppitz include eyes, hands, and neck, while Toler and Toler (1955) mention omissions in general. Various types of disproportions were mentioned by Springer (1941), Toler and Toler, and Koppitz, including "small head," "short arms,"

etc. Koppitz, Toler and Toler, and Di Leo (1970) referred to lack of "integration" in the drawings in general terms. Toler and Toler also reported "distortions" in general, but specific distortions were identified by others, for example, "bizarre" (Di Leo), "grotesque" (Vane and Eisen), "mutilation" (Fox, 1958), "asymmetry" (Di Leo, Koppitz). "Degree of detailing," "shading," and "size" were identified as indicators of maladjustment by three investigators. Di Leo used the terms "inhibited" and "indeterminate," and identified "disunity," "fragmentation," "disorientation," and "disorganization" in the drawings. Koppitz included "slanting" and the spontaneous drawing of three or more figures among the "emotional indicators." While there is no unanimity among these investigators regarding particular signs of emotional disturbance or the terminology for describing these signs, it can be concluded that emotional disturbance may be manifested in children's human figure drawings by a lack of integration and by various omissions, disproportions, distortions, and restrictions.

Two additional studies, because of the techniques used, are of particular interest in connection with the present investigation, even though the subjects studied were adults. Albee and Hamlin (1950) constructed a criterion scale in the form of drawings along a continuum from "best" to "worst." Four judges were asked to arrange the drawings of 21 schizophrenics, 21 neurotics, and 30 normal subjects, all veterans, in the appropriate place on the continuum.

The judges showed a significantly high agreement ($p < .01$) in their judgments of where the drawings belonged on the scale. The authors concluded that the "use of a criterion scale, while not denying the importance of individual factors would lend some objectivity to global interpretations" (Albee and Hamlin, 1950, p. 364). Kamano's (1960) study of adult schizophrenic women is of interest because of the use of the semantic differential, a combination of controlled association and scaling procedures designed "to subject meaning to quantitative measurement" (Osgood, Suci, and Tannenbaum, 1957, p. 1). Four concepts were rated by 45 young institutionalized schizophrenic women: the subject's actual human figure drawing, My Ideal Self, My Actual Self, My Least-Liked Self. The same 15 bipolar scales were used for each of the four concepts: attracting-repelling, complete-incomplete, important-unimportant, healthy-sick, high-low, sociable-unsociable, large-small, hard-soft, strong-weak, deep-shallow, masculine-feminine, active-passive, hot-cold, tense-relaxed, aggressive-defensive. The correlation between the ratings of the drawings and the "actual self" concept was significant at the .01 level of confidence. Modifications of the "best" to "worst" continuum technique and of the semantic differential, as they are used in the present investigation, are described in Chapter III.

Projection of the Self-Concept in Children's Human Figure Drawings

Since the appearance of Machover's (1949) first publication, an abundance of both clinical and experimental support has been offered for the basic premise that a person projects his own body image into his drawings. Several investigations have been reported which studied the child's "self-concept" or "self-image" as shown in his human figure drawings. Bodwin and Bruck (1960), attempting to construct a quantified self-concept scale, studied nine drawing characteristics considered to reveal one's self-concept: reinforcement of lines, erasures, sketchy lines, transparency, distortion, incompleteness, opposite sex identification, primitiveness, immaturity. The human figure drawings of 60 children, ages 10 to 17 years, were rated on the nine "revealing" characteristics to obtain "self-concept scores" which were found to have a positive and statistically significant correlation ($p < .01$) with ratings obtained through psychiatric interviews.

Machover's hypothesis that one's human figure drawing is a drawing of oneself was also supported by the findings of Craddick (1963), who compared the Draw-a-Person Test performance with the self-portrait drawing of 23 fifth grade school children. With regard to size, frequency of the same sex, and position on the page, the two drawings were similar. In addition Richey (1965) reported that the human figure drawings of 100 ten-year-old children showed that

their same-sex drawings tended to be superior in quality to their opposite-sex drawings, and concluded that the figure with which the subject identified more closely received more of his attention and effort. Bennett, stressing the necessity of "using a combination rather than just one characteristic of a drawing to make an inference about the drawer's self concept" (1966, p. 196), reported the results of her study of 213 sixth grade school children. She offered the tentative conclusion that a child in this age group may have feelings of inadequacy if his human figure drawing shows abnormal page placement, disproportionately large head, omission of ears (in drawings of a male), omission of buttons, and inclusion of heels.

Contrary to the findings of these studies on self-concept, Harris insisted that: "The self-drawing, so labeled, is the child's attempt to portray his own image as he is acquainted with it via direct inspection, mirror image, and the comments of others" (1963, p. 151). Although he maintained that the use of human figure drawings in studying personality was a trend which "has greatly outstripped the research evidence" (1963, p. 25), Harris proposed, very tentatively, that "the Drawing of the Self may, possibly, be more useful in studying non-intellectual psychological factors" (1963, p. 226). His "Guide for Analysis" of these drawings abandoned to some degree the Goodenough scale, in which each characteristic was defined as objectively as possible in order to eliminate the

subjective elements in judgments. Although Harris asks the evaluator to check the presence of a number of specific items (freckles, glasses, cap, skirt, etc.), he also asks the evaluator to compare the child's drawings of a man, a woman, and self in terms of general style. The evaluator is asked to "specify his general judgment by making specific assessments of certain qualitative components which presumably led to his general judgment" (Harris, 1963, p. 319). This eliciting of "qualitative, global impressions" is a distinct departure from the traditional Goodenough-Harris rating scale. The "Guide for Analysis" included thirteen qualitative components, based on both the clinical literature and Harris' own empirical work:

Complete and detailed
Incomplete
Active, dynamic
Stiff, wooden
Realistic
"Glamorized"
Bizarre, odd
Skillfully drawn
Crude
Erased or smudged
Neatly drawn
Large
Small

Harris' "Guide for Analysis" encompassed the two highly divergent viewpoints which characterize the literature on the use of children's human figure drawings in the assessment of personality. On the one hand, Harris emphasized the quantitative evaluation of the content of the drawing, with attention to particular parts; on the other, he stressed the qualitative aspects of the form of the drawing viewed as a

whole. However, this inclusion of qualitative aspects in the evaluation of the drawing should not be interpreted as Harris' acceptance of the projective analysis of human figure drawings. He clearly stated that "the projective hypothesis as it applies to human figure drawings has never been adequately or consistently formulated, and systems for the evaluation of such drawings have, for the most part, been exceedingly loose" (1963, p. 67).

A similar criticism had been sounded some years earlier in Goodenough's (1949) address to the American Psychological Association, upon her retirement as president of the Division on Childhood and Adolescence. Discussing the phenomenal growth of interest in projective methods since 1940, she pointed out that the interpretations of children's art products are usually made on an extremely superficial level, using the symbolism of the adult rather than that of the child. She emphatically warned: "Projection is a tool that cuts both ways. If it is true that the person under observation projects his own inner feelings and attitudes upon the situation to which he responds, it is equally true that the person who observes him does the same" (Goodenough, 1949, p. 128). She believed that those who might be willing to accept in principle the idea of the projective approach, were skeptical of it because its advocates had disregarded accepted rules of scientific verification.

Undoubtedly the use of the projective drawing approach, while it may be deceptively simple and direct,

presupposes great skill and wide experience on the part of the clinician. Discussing some of the problems and limitations of this clinical tool, Hammer pointed out that a knowledge of personality dynamics and clinical syndromes is indispensable: "The integration of the findings, yielded by the projective drawing approach, into some sort of meaningful dynamic picture of the subject depends largely upon the clinician's basic understanding of human personality" (1958, pp. 646-647). In a similar vein, Vernier stated that "the current absence of any standardized scoring system, of an integrated set of validated principles of interpretation makes the use of the test hazardous except as one part of a total test battery in the hands of an experienced clinician" (1952; p. 1).

Human Figure Drawings and Neurological Impairment in Children

Somewhat less controversial and considerably more objective than the projective use of human figure drawings is their use in the diagnosis of neurological impairment. The work of Bender, based on Schilder's concept of the body image, has been outstanding in this area. One of her earliest observations was that the Goodenough Test might suggest the presence of organic brain disturbance, and that it would be a useful additional diagnostic measure in doubtful cases of organic brain disorders in children (Bender, 1940). Bender's observation that children suffering from chronic encephalitis were not able to draw the human figure at the

level which would be expected of them according to their Stanford-Binet scores was similar to that of Machover and others cited above in their studies of emotionally disturbed children. The same point was emphasized by Francis-Williams, a British neurologist, in a recent statement: "Long before Schilder's concept of the body-image became so fashionable in this country, it was recognized that a wide discrepancy between an assessment of intellectual functioning on a standardized intelligence test and the so-called 'mental age' as assessed on the Goodenough scale was telling us something about the child that warranted further thought and exploration" (1966, p. 224).

Bender also pointed out that the inability to draw a person is "an imperception of the body image or an inability to integrate all the perceptual experiences of the body" (1952, p. 138). She considered this a specific disability, since the child can draw other subjects adequately. "It is probable that the capacity to draw the human form is not related to a simple visual gestalt but a more complicated gestalt which is based upon sensory impressions of all types coming from the surface as well as from the inside of the body" (Bender, 1952, pp. 144-145). She stressed the importance of developing an adequate body image in the neurologically impaired child, stating: "The underlying physical disability may often be unrecognized but is nevertheless very real. . . . It is by recognizing the disability and understanding the relationship to the body image problems and their significance

in the developing child and by helping him correct them, compensate for them or accept them, that the prognosis of the brain-damaged child is improved" (1956, p. 113).

Other investigators have also supported the view that the child's body image, as shown in his human figure drawing, is adversely affected when organic damage to the brain causes a disturbance in perception and motility. Burgemeister, in her discussion of human figure drawings, stated: "Disturbances in perception and disorders of affect, as well as distortions related to body image, are particularly discriminating of neuropsychological difficulty" (1962, p. 33). Bell pointed out that through the child's drawing, we may assess his perceptual development and "we may suggest the time and strength of disturbances of his integrated functioning as an adaptive organism" (1952, p. 393). He noted that the more severe the stress of the "intra and extraorganic forces" operating at all levels of development, the more gross will be the disruption within the organism. He also took into account the time relationship involved, stating: "The earlier the stress, the more disruptive its effects upon the total functioning" (Bell, 1952, p. 393). Taterka and Katz (1955) reported that in their study of 195 children, ages five and one-half to twelve and one-half years, the more abnormal the child's encephalogram, the greater were the abnormalities of perception, perceptual-motor functions, and the body image as shown in the child's human figure drawing.

A number of attempts have been made to identify particular aspects of the human figure drawings of neurologically impaired children. Among the earliest of these is the work of Bender (1952, pp. 139-143), who pointed out the following characteristics: omission of facial features, poor detail, shading, immaturity, disorientation in space, and poor motor execution. She noted that the children she studied frequently expressed their uncertainty and dissatisfaction as they made the drawings, and sometimes drew two or more figures, presumably because they were trying to improve their performance.

Another study by Blau and Schaffer (1960) yielded a statistically significant correlation ($p < .01$) between abnormal electroencephalograms in children and the single variable of "tipping" in their human figure drawings. This study of 420 children, ages 5 to 16 years, showed that a figure which was drawn slanting on an angle of at least 15 degrees from the upright position correctly predicted abnormal EEG records in 77 per cent of the cases.

One of the most extensive investigations reported was Cohn's (1960) study of the human figure drawings obtained as part of the clinical neurological examinations of over 8,000 patients, ranging in age from three and one-half to ninety-one years. Excluding about 20 per cent of these patients because of their primary psychiatric problems, Cohn established as criteria for the determination of abnormal picture drawings four "obvious, clearly defined malformations"

(1960, p. 20): distortion, asymmetry of symbols of body structures, perseveration, and simplification.

On the basis of her clinical observations, Francis-Williams (1966) stated that inconsistencies and indefiniteness in execution rather than in content are indicative of central nervous system deficit. She mentioned in particular "vagueness" and "uncertainty" in the human figure drawings of neurologically impaired children, and linked these qualities to "perceptual and visuomotor disorders" in the children (Francis-Williams, 1966, p. 225). Silver's (1950) clinical observations of children led him to conclude that "in organic states, depending of course upon the extent and location of the disease, there may be seen a disorganized figure, one with pulls from uneven muscle tone, emphasis upon perceptual structures, attempts at control of impulses" (p. 142). Silver believed the child's human figure drawing to be really "a mirror of the patient's concept of himself" (1950, p. 142) which tends to reflect his physical and emotional problems. Further clinical observations were included in Kastein's (1964) report of the diagnostic language evaluation of 28 children between the ages of 21 months and 7 years, 4 months. The human figure drawings of the children with "central nervous system deficits" showed "disorganization," "displacement of body parts and omissions," and "distorted or bizarre shapes" (1964, p. 149). She noted the interesting case of a child whose drawings "showed a marked difference between the drawings of a 'boy' (himself)

and a 'girl' (the examiner). The drawing of himself . . . was poorer, the relationship and bizarreness and displacement obvious, while the drawing of the other person, the examiner, did not show these deviations" (Kastein, 1964, p. 150).

Another report of extensive clinical observations of children with "minimal cerebral dysfunction" was provided by Di Leo, who called attention to the "discrepancy between the immature human figure drawing and the intellectual level as determined by standard I.Q. tests" (1970, p. 308), referring frequently to the "immature concept of body image." He also identified the characteristics of "impulsivity," "lack of inhibition," "disorganized manner" of drawing, and "unrecognizable" figures.

Koppitz reported several of her studies designed "to explore objectively the relationship between HFDs [human figure drawings] and brain injury in children, age six to twelve" (1968, p. 160). A serious limitation of these studies is that "all of the BI subjects were psychiatric patients with behavior and learning problems" (Koppitz, 1968, p. 162). It is therefore impossible to attribute any characteristics observed in the human figure drawings to the children's "brain injury" alone, and the findings must be interpreted in the light of this fact. The human figure drawings of 282 brain injured boys with I.Q. scores above 75 were compared with 803 normal boys. It was found that the "Developmental Items" occurring significantly more often in the drawings of the brain injured children at one or more

age levels were: omission of the body, of the pupils, of the neck, of the hands; arms drawn in one dimension, drawn raised up or in a horizontal position, incorrectly attached at the shoulder; legs drawn in one dimension; incorrect number of fingers; and fewer pieces of clothing. In addition, the following "Emotional Indicators" occurred significantly more often in the drawings of the brain injured children at one or more age levels: poor integration of parts of the figure, gross asymmetry of limbs, figure slanting by 15 degrees or more, transparencies, omission of body or neck, figure less than two inches in height, and hands cut off. According to Koppitz, the last two items "seem to reflect above all the BI child's poor self-concept and his feelings of inadequacy and helplessness" (1968, p. 176). The other "Emotional Indicators reflect immaturity, poor integrative capacity, impulsivity, and instability, all of which are so characteristic for many of the BI children" (1968, p. 176). These observations are consistent with Koppitz' expressed purpose of presenting "a systematic investigation of HFDs of children age 5 to 12, as a developmental test and as a projective test" (1968, p. 3). Her studies identify some of the significant characteristics of the human figure drawings of "brain injured" children who are also "psychiatric patients." However, these conclusions cannot be applied to the drawings of children whose only serious problem is their neurological impairment.

It is evident from the literature reviewed above

that the characteristics identified in the human figure drawings of neurologically impaired children are frequently described in the same terms as those which describe the drawings of emotionally disturbed children, for example, "distortion," "bizarreness," "asymmetry," "shading," "disorganization," "omission of facial features," "disorientation," "slanting," and spontaneously drawing more than one figure. However, terms used only with reference to drawings of the neurologically impaired children include "vagueness," "uncertainty," "immaturity," "inconsistencies," "impulsivity," "perseveration," and "displacement of body parts." In contrast to the excessive use of detail noted in the drawings of emotionally disturbed children, "poor detail" and "simplification" are reported as characteristic of the drawings of neurologically impaired children.

It is noteworthy that both types of children are found to show marked discrepancies between their standard I.Q. scores and the level of their human figure drawings.

The various descriptive terms used in studies of children's human figure drawings are listed below:

Drawing Characteristics	Type of Impairment	Investigator
Drawing on lower level than I.Q. score	E	Des Lauriers and Halpern (1947)
	E	Hanvik (1953)
	E	Vane and Eisen (1962)
	N	Bender (1940)
	N	Francis-Williams (1966)
	N	Di Leo (1970)
Distortions	E	Toler and Toler (1955)
	E	Handler and Reyher (1965)

Drawing Characteristics	Type of Impairment	Investigator
Distortions (cont.)	N	Cohn (1960)
	N	Kastein (1964)
	N	Di Leo (1970)
Bizarre, grotesque	E	Vane and Eisen (1962)
	E	Di Leo (1970)
	N	Kastein (1964)
Lack of integration	E	Toler and Toler (1955)
	E	Koppitz (1966)
	E	Di Leo (1970)
Disorganization	E	Di Leo (1970)
	N	Silver (1950)
	N	Kastein (1964)
	N	Di Leo (1970)
Disorientation	E	Di Leo (1970)
	N	Bender (1952)
Disconnected, fractured	E	Machover (1949)
	E	Di Leo (1970)
Poor proportion	E	Springer (1941)
Asymmetry	E	Machover (1949)
	E	Koppitz (1966)
	E	Di Leo (1970)
	N	Cohn (1960)
Slanting	E	Koppitz (1966)
	N	Blau and Schaffer (1960)
Poor placement on page	E	Bennett (1966)
	E	Di Leo (1970)
Drawing more than one figure	E	Koppitz (1966)
	N	Bender (1952)
Very large or very small figure	E	Handler and Reyher (1965)
	E	Koppitz (1966)
	E	McHugh (1966)
	E	Di Leo (1970)
Small head	E	Koppitz (1966)
	E	Di Leo (1970)
Large head	E	Bennett (1966)
Small feet	E	Di Leo (1970)
Hands as large as head	E	Koppitz (1966)

Drawing Characteristics	Type of Impairment	Investigator
Omissions in general	E	Toler and Toler (1955)
	E	Handler and Reyher (1965)
	N	Bender (1952)
	N	Kastein (1964)
Omission of: body	E	Vane and Eisen (1962)
	E	Koppitz (1966)
arms	E	Vane and Eisen (1962)
	E	Koppitz (1966)
mouth	E	Vane and Eisen (1962)
	E	Koppitz (1966)
eyes	E	Koppitz (1966)
ears	E	Bennett (1966)
neck	E	Koppitz (1966)
buttons	E	Bennett (1966)
Inconsistency	E	Berrien (1936)
	N	Francis-Williams (1966)
Immaturity	N	Bender (1952)
	N	Di Leo (1970)
Simplification	E	Handler and Reyher (1965)
	N	Cohn (1960)
Loss of details	E	Machover (1959)
	E	Handler and Reyher (1965)
Added details	E	Springer (1941)
Showing poor motor coordination	E	Springer (1941)
	N	Bender (1952)
Uninhibited, impulsive	N	Di Leo (1970)
Inhibited	E	Di Leo (1970)
Rigidity	E	Fox, et al. (1958)
Vague, uncertain, indeterminate	E	Di Leo (1970)
	N	Francis-Williams (1966)
Shading	E	Machover (1949)
	E	Fox, et al. (1958)
	E	Koppitz (1966)
	E	Di Leo (1970)
	N	Bender (1952)
Heavy lines	E	Handler and Reyher (1965)

Drawing Characteristics	Type of Impairment	Investigator
Reinforcements	E	Machover (1949)
Perseveration	N	Cohn (1960)
Erasures	E	Machover (1949)
Mutilation	E	Fox, et al. (1958)
Hands cut off	E	Koppitz (1966)
Accentuated arms	E	Di Leo (1970)
Short arms	E	Koppitz (1966)
Accentuated fingers	E	Di Leo (1970)
Inclusion of genitals	E	Koppitz (1966)
Inclusion of heels	E	Bennett (1966)

Factor Analyses of Children's Drawings

Several investigators have sought, by means of factor analyses, to identify the component qualities of children's drawings. In one of the most extensive of these studies, Martin and Damrin (1951) had 13 university art majors rate the drawings of 31 children in kindergarten through second grade, using the following five-point rating scales:

A. Symmetry of the drawing as a whole
B. Determination of strokes
C. Continuity of strokes
D. Pressure of strokes
E. Expansiveness of the drawing as a whole
F. Degree to which graphic elements are centered in the drawing as a whole
G. Symmetry of the individual figures in the drawing
H. Sharpness and distinctness of features of individual figures in the drawing
I. Clarity of position of natural features of individual figures in the drawing
J. Expansiveness of individual figures in the drawing
K. Activity of individual figures in the drawing

The investigators reported that the ratings on these variables can be made with high reliability, and that the profile on a given drawing as derived from the rating scales is highly stable from one rater to another. The three factors identified in this study are "Maturity" (measured by scales I and H), which may represent the psychological component studied by Goodenough, and the two formal elements of "Balance" (measured by scales E, J, A, F, K) and "Quality of Stroke" (measured by scales B, D, and C). The main limitation of this study, as the authors acknowledged, was that the number of subjects studied and the method of selecting them prevented the generalization of the findings to any larger population. They concluded, however, that: "Samples of graphic expression of children can be studied objectively without contamination from any hypotheses . . . held by the individual experimenter" (1951, p. 143).

Stewart (1955) conducted a similar study of the self-portrait drawings of adolescents, obtaining ratings by 3 judges on 7-point scales for 31 characteristics such as symmetry, firmness of line, realism, movement, complexity, integration, and vividness of style. Treating the data separately for boys and girls, Stewart found that the two factor analyses yielded similar clusters. The factors extracted were:

A) Angularity, identified by the scales measuring lack of curves, angularity, and emphasis on clothing;

B) Symmetry, identified by the scales measuring symmetry of portrait and symmetry of placement;

C) Width and variability of line identified by the two scales measuring these characteristics;

D) Movement (found only in the girls' drawings), identified by the scale measuring movement;

E) Realism, identified by the scales measuring naturalism, third dimension, symbolism, and shading; and

F) Skill-Quality, identified by the scales measuring technical skill, esthetic quality, rhythm, integration, and vividness of style.

The author appropriately pointed out that since these results were based only on drawings by adolescents, generalizations to other age groups would be unwarranted without further research.

A factor analysis of about 1,000 drawings by children aged 6 to 15 years was reported by Lark-Horowitz and Norton (1960). Seven of the ten characteristics studied contributed significantly to a "Developmental" (or "Age") factor. These were: 1) realism; 2) use of shape in an artistic manner; 3) suggestion of a specific style in painting; 4) diversity of means of indicating motion; 5) effective use of the crayon medium; 6) bold, blended, or graded treatment of area; 7) bold, subtle, or delicate use of line. The other factors were designated as "Style," characterized by the "use of color" and "intentionally indefinite shapes," and "Motion,"

characterized by "grouping" and "intentional asymmetry."

These factor analyses have identified a few general dimensions which organize the numerous specific details of children's drawings. One of these dimensions is a developmental or maturity factor, while the other dimensions deal with such aspects of the form of the drawings as style, motion, balance, quality of stroke, esthetic quality, and angularity.

Studies of the Validity of Children's Human Figure Drawings

The validity of children's human figure drawings in the assessment of intellectual maturity has been established by numerous investigators who have studied the correlation between Goodenough scores and scores on standardized intelligence tests, such as the Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scale for Children. These studies were reviewed by Harris, who concluded that "the child's drawing reflects his concepts which grow with his mental level, experience, and knowledge. Consequently, the Goodenough-Harris Drawing Test is best used as a measure of intellectual maturity and should not be used for other purposes" (1963, p. 247).

While it is unlikely that the Goodenough-Harris scoring method could be effectively used "for other purposes," human figure drawings viewed in a different light are widely used for other purposes, as the present review of the literature shows. However, the validity of these drawings

as instruments for assessing emotional disturbance or neurological impairment has not been as extensively studied as has the validation of the Goodenough Test as a measure of intelligence.

One of the more thorough validation studies was conducted by Stone (1952), who investigated the correlation between the human figure drawings of 492 sixth-grade school children and their scores on three personality and behavior measures (the California Test of Personality, a modified Haggerty-Olsen-Wickman Scale, and a test devised by the author). The drawings were rated on a "typicality" scale according to their typical or atypical features. These ratings correlated to a statistically significant degree (from .38 to .45) with the ratings of personality and behavior. Only negligible correlations, all close to zero, were found between the ratings on the human figure drawings and mental age, chronological age, and school achievement. While the negative findings must be interpreted with caution, this study suggests that atypical features in children's human figure drawings may be more closely related to personality than to age or school achievement.

Several of the studies already reviewed also indicate the validity of children's human figure drawings in the assessment of personality. Statistically significant correlations were reported between certain characteristics in these drawings and "popularity" (Toler and Toler, 1955), "anxiety" (Fox, Davidson, Lighthall, Waite, and Sarason, 1958),

and "emotional disturbance" (Koppitz, 1966). Vane and Kessler (1964) reported the validity of four predictive signs of behavior adjustment, based on a thorough, long-term study. In addition, a statistically significant correlation has been found between particular qualities in children's human figure drawings and ratings obtained through psychiatric interviews (Bodwin and Bruck, 1960).

The validity of human figure drawings as indicators of neurological impairment was demonstrated by Cohn's (1960) extensive study of both children and adults. He presented 13 detailed case histories of neurologically impaired children together with their human figure drawings, showing the effects of the clinically demonstrated pathology. He also showed the correlation of certain characteristics in the drawings of adult neurological patients with their electroencephalograms and post mortem findings, concluding that "these autopsy studies demonstrate . . . that disordered picture drawings occur in brains that are disturbed in function secondarily to generalized dysmetabolic processes from various etiologies" (Cohn, 1960, p. 185).

It is evident from the studies and reports cited, that convincing empirical and clinical evidence indicates the validity of human figure drawings as indicators of emotional disturbance and neurological impairment.

Studies of the Reliability of Children's Human Figure Drawings

The question of the reliability of children's human figure drawings involves two aspects: the consistency with which judges or raters evaluate the drawings, and the consistency in the children's repeated drawing performances.

The consistency with which even minimally trained scorers can use the Goodenough scale has been well established by the studies of Harris and other investigators (1963, p. 90). A number of studies using other criteria for evaluating drawings have also shown statistically significant interjudge reliability. Witkin (1964) reported correlations of .83 to .92 among the ratings of three pairs of judges, who used a five-point rating scale to evaluate "form level," "role and sex differentiation," and "level of detailing" in the human figure drawings by ten-year-old boys. Similarly, Koppitz (1968, p. 10) reported agreement on 95 per cent of the items scored by two "qualified psychologists" who rated 25 children's human figure drawings for the presence of "30 Developmental Items" and "30 Emotional Indicators." Cohn (1960) reported the same level of agreement among three out of four judges evaluating 236 drawings as "normal" or "abnormal," using the criteria of distortion, asymmetry, perseveration, and simplification. Although these three studies showed statistically significant interjudge reliability, in each case the results were based on the ratings of only two or three judges.

More convincing evidence of interjudge reliability is offered by Martin and Damrin's (1951) study, cited above, of the drawings of 31 children in kindergarten through second grade. In a preliminary study these investigators found that the coefficients of equivalence among the ratings of 24 judges were uniformly high, ranging from .90 to .99. Concluding that such a large number of judges was unnecessary, they reduced the number to 13. This group of judges also showed a "great amount of agreement" in their ratings on all the scales, with coefficients of equivalence ranging from .82 to .96. On the basis of these findings, Martin and Damrin concluded that "a comparable set of judges would give virtually equivalent ratings to these drawings" (1951, p. 137).

Several additional studies of the reliability of judges' evaluations of adults' human figure drawings are of interest in the present investigation, since there is a strong possibility that the conclusions may be applied to judgments of children's human figure drawings. Lehner and Gunderson found that "a high degree of objectivity may be achieved for certain indices commonly used less objectively" (1952, p. 128). The drawings of 91 college and university students were rated for 21 graphic traits, such as shading, reinforcement, erasures, detail, transparency, position on page, and symmetry. Each trait was rated by the use of a set of mutually exclusive categories, usually ten in number. The ratings and reratings of the drawings by the two investigators showed an agreement of 90.5 per cent. The

agreement of the ratings of these investigators with those of three other judges was: 87.3 per cent, 84.3 per cent, and 79.7 per cent. The investigators also rated two sets of drawings, done four months apart, and found an agreement of 64.1 per cent between the test and retest ratings. Lehner and Gunderson concluded that the study showed a "relatively high per cent of agreement" (1952, p. 127), but they failed to report the significance level of the percentage values. This study also showed the need for a simplification of the complex system of categories and for a reduction in the number of graphic traits rated. The authors, having provided this "objective exploratory analysis of the constancy of graphic indices," emphasized the need for the "study of the validity and reliability of the interpretations based on these indices" (Lehner and Gunderson, 1952, p. 128).

The rating of the human figure drawings of college students was also studied by Korner and Westwood (1955). The Rorschach protocols and the human figure drawings of 96 students were sorted by 3 clinical psychologists according to the categories of "good adjustment," "average adjustment," and "poor adjustment." The agreement among the judges on the rating of the drawings was significant beyond .01 ($r = .59, .68$, and $.68$). A lower level of agreement was found on the Rorschach, with only two of the judges showing a statistically significant agreement ($r = .44, .41$, and $.09$). These findings are of particular interest in view of the fact that the three judges used their own concept of "adjustment"

and their own criteria for judgment. The results suggest that the interjudge reliability may be higher for ratings of human figure drawings than for ratings of the Rorschach.

Further evidence of interrater reliability is found in Handler's (1967) survey of four studies of anxiety indexes. He reported interrater correlations of .73 or higher on 13 indexes, such as erasure, omission, lack of detail, distortion, shading, and simplification.

It is noteworthy that the reliability of judges' ratings has been demonstrated not only when Goodenough's specific, quantitative scale is used to rate the content of human figure drawings, but also when more global, qualitative ratings are made of the formal aspects of the drawings.

The consistency of children's performance in human figure drawing has been extensively studied by Harris (1963), who administered the Draw-a-Man Test to four classes of kindergarten children on each of ten consecutive days. He reported that "the portion of the total variance accounted for by variation within the sequence of ten drawings was quite insignificant" (1963, p. 91). In another study, using 104 first-grade school children as subjects, Harris (1950) found that the children adopted and maintained a characteristic size and characteristic proportions for their human figure drawings. He concluded that children adopt particular styles of drawing which tend to be consistent over a period of time. However, Hammer and Kaplan (1964) reported that 1,316 children in the fourth, fifth, and sixth grades showed

poor test-retest reliability in the size of their human figure drawings over an interval of one week. In another study (1966) they found that a similar population showed reliability in omission of fingers, heads-without-bodies, placement on page, shading, erasures, and type of mouth. These studies seem to indicate that younger children, such as Harris' population, show greater test-retest reliability than do children between ten and twelve years of age. It should be noted, however, that the time interval of one week in Hammer and Kaplan's studies may have been a factor in decreasing the reliability of the children's performances.

Three studies of the reliability of college and university students' human figure drawings provide additional information of interest in the present investigation. In Graham's (1956) study, 23 graduate students made human figure drawings without having any knowledge about the interpretation of these drawings. They then listened to a two-hour lecture which represented human figure drawings "as an infinitely revealing device which appeared to expose the worst aspects of any individual's personality" (Graham, 1956, p. 385). Following the lecture, they made another human figure drawing, which was found to closely resemble the first drawing. The correlation of paired comparisons was statistically significant beyond the .01 level of confidence, leading Graham to conclude that the second drawings "continued to reflect a consistent picture of the self-image, despite attempts on the part of the subjects to disguise or

conceal what they knew or imagined to be significant details relative to weaknesses in their own personalities" (1956, p. 386). It is likely that children would be even less able to consciously "disguise or conceal" aspects of the self-image reflected in their human figure drawings.

In Starr and Marcuse's (1959) study of human figure drawings by 193 college students, the items which proved to be reliable were: perspective, position on page, incompletions, height of the figure, and ratio of head size to height of the figure. A change of examiners, a difference in the time interval between test and retest, or a change in set on the part of the subjects had no significant effect on the drawings. Further support for the reliability of college students' human figure drawings was offered by Guinan and Hurley (1965). Two sets of 20 drawings, done 5 weeks apart, were presented to 3 college freshmen, 3 graduate students, and 3 holders of the Ph.D. degree. These 9 judges were able to match the pairs of drawings beyond the .001 level of confidence, judging the drawing as a whole without reference to specific aspects. The conclusion of the authors is particularly relevant to the present investigation. They stated: "It is, therefore, suggested that a method which employs a global or 'intuitive' impression of the clinician as the basis of judgment is more appropriate than the atomistic methods which use more carefully defined but perhaps useless and irrelevant indices" (Guinan and Hurley, 1965, p. 303). This observation

seems to be as applicable to children's human figure drawings as it is to those of college students.

Summary

The present investigation explores some of the controversial points in the highly diversified studies which have been reported, while using as a basis those points upon which agreement has been established. There is unanimous agreement among the investigators that young children show a marked interest in drawing human figures, and engage in this activity with enjoyment and spontaneity. It is also generally agreed that among emotionally and/or neurologically impaired children the level of the human figure drawing is markedly below the level of achievement on a standard intelligence test.

Another significant point of agreement is that human figure drawings are not to be used alone in the study of the child, but only as one part of the total evaluation procedure. This viewpoint recurs frequently in the literature and is stressed by representatives of all schools of thought, for example, Harris (1963), Vernier (1952), Kastein (1964), Koppitz (1968), Burgemeister (1962), Machover (1949), Bender (1956), Wyatt (1969), and Di Leo (1970). Harris points out that the Draw-a-Man Test should not be the only intelligence test administered to children, even though there is general agreement that the analytic scoring of the details of children's human figure drawings has been

established as a valid and reliable means of assessing intellectual maturity. Even Machover, perhaps the most notable of the "clinical enthusiasts" who "work deductively (or intuitively) from drawings" to Harris' dismay (1963, p. 65), does not advocate using the drawing alone as a diagnostic, selective, or predictive device.

There is also agreement that, besides the details of content which can be analyzed and scored quantitatively, there are certain qualitative elements which can be identified in children's human figure drawings. The controversy arises, however, over the interpretation of these qualitative aspects. Contrasting points of view and conflicting evidence characterize the reports of clinical observations and experimental studies. This lack of agreement on the interpretation of children's human figure drawings may be partly due to the variety of experimental techniques used, the wide age ranges, the use of small samples, and the lack of clearly defined populations. However, two factors which seem to exert a stronger influence are: 1) the way in which the drawing is viewed, and 2) the terminology used to describe what is identified in the drawing.

Children's human figure drawings are viewed in two very different ways. Some investigators, following Goodenough (1926) and Harris (1963), while admitting that qualitative differences do appear in the drawings, advocate only a rigidly objective quantitative analysis of the details of the drawings, claiming that the validity and

reliability of other methods have not been established. The concept of the body image and its representation in the human figure drawing is excluded from this type of analysis. On the other hand, Machover's (1949) use of the drawings as a projective technique has gained wide acceptance and has generated extensive research. The interpretation of the qualitative aspects of the drawing as a whole, as well as of combinations of specific details, has been found useful in the diagnosis and treatment of emotional disorders and neurological impairments.

The present investigation experiments with a combination of these two approaches by a quantitative and objective analysis of global, qualitative, and subjective evaluations of children's human figure drawings. A basic assumption in this experiment is that these drawings reflect the self-concept resulting from the lifelong conscious and unconscious integration of all past and on-going sensations, perceptions, and affects, shaped by emotional and social experiences. It is also assumed, on the basis of the literature reviewed, that human figure drawings do not reflect the child's intelligence level in the case of emotionally disturbed or neurologically impaired children.

The second main area of disagreement concerns the terminology used to describe the characteristics identified in human figure drawings by emotionally disturbed or neurologically impaired children. It is often difficult to know what difference in the drawing is represented by very

slightly different terms, for example, "bizarre" and "grotesque"; "disunity," "disorganization," and "fragmentation"; "vague," "uncertain," and "indeterminate"; "poor detail," "simplification," and "immaturity." A further problem lies in the use of the same terms by different investigators to describe the drawings of both emotionally disturbed and neurologically impaired children, despite the fact that these two groups of drawings seem to manifest different characteristics. Some of the terms used with reference to both groups are "distortion," "disorganization," "bizarreness," "omissions," and "asymmetry." In the present investigation an attempt is made to identify the terms which most clearly distinguish between these two groups of drawings, and which best differentiate them from drawings by unimpaired children.

An objective analysis of the subjective evaluation of children's human figure drawings and the identification of the most distinctive descriptive terms for the characteristics of the drawings should contribute to the present body of knowledge on this subject and improve the usefulness of human figure drawings in the clinical setting.

CHAPTER III

PROCEDURE

The subjects of this investigation were emotionally disturbed children with language disorders, neurologically impaired children with language disorders, and a control group of children without any evident impairment. The human figure drawings of these children were rated by a group of "expert" and a group of "naive" judges, using a rating scale modeled on the semantic differential. These judges were also asked to identify each drawing as that of an emotionally disturbed, a neurologically impaired, or a normal child. The judges then arranged the drawings along a continuum from "Best" to "Worst." The selection of the subjects, the rating scale used in this study, and the procedure followed in judging the drawings are described in the present chapter.

Selection of Subjects

The Experimental Group

Twenty children, ranging in age from 4 years, 2 months to 6 years, 1 month were selected for study. They were chosen after a survey of the records of almost 5,000 children referred to the Speech and Hearing Clinic of

Columbia-Presbyterian Medical Center because of speech and/or language problems. Through this survey, approximately 175 children were chosen as potentially acceptable for the present investigation. A thorough study of the hospital charts of these children resulted in the selection of 20 children with language disorders in which either emotional disturbance (10 subjects) or neurological impairment (10 subjects) was considered to be the major causative factor. The problems involved in the diagnosis of children with language disorders, and particularly in differentiating between emotional and organic factors, made it necessary to study many case histories in order to identify subjects suitable for the present investigation. In 18 of the 20 cases selected, the hospital records indicated that at least four members of the professional teams--pediatricians, neurologists, psychiatrists, speech pathologists, audiologists, and psychologists--who saw the children agreed on the diagnosis. In the two remaining cases, one in the emotionally disturbed group and one in the neurologically impaired group, there was concurrence on the child's major problem in three diagnoses, with no contradictory opinions recorded. In five cases, school reports had also been recorded; all of these reports agreed with the medical diagnosis. Four of the children in the emotionally disturbed group were also studied by an interdisciplinary team in the National Institutes of Health Collaborative Study at Columbia University College of Physicians and Surgeons. All

of the subjects included in the experimental group also met the criteria of normal hearing and vision, at least average intelligence, and the absence of physical anomalies and serious motor impairments.

The difficulty of differentiating the neurological from the psychological factors in evaluating the disordered functioning of a child has been the subject of much discussion (for example, Birch, 1964; de Hirsch, 1967; Kahn, 1969; Berry, 1969). This difficulty was evident in many of the case histories and diagnoses of the language impaired children who were studied for possible inclusion in the present investigation. However, the major causative factor of the language disorder had been identified in the 20 subjects selected for this study. The diagnosis in these instances was accepted because of the agreement among the presumably competent diagnosticians at Columbia-Presbyterian Medical Center who evaluated the children.

After the children had been chosen for inclusion in the emotionally disturbed or neurologically impaired group on the basis of their hospital charts, their human figure drawings were obtained from the hospital files for use in this study. These drawings had been made by the children during their evaluation at the Speech and Hearing Clinic. The children had been requested, according to their sex to "Draw a boy" or to "Draw a girl," without a time limit.

The Control Group

Ten children without language disorders or any other evident impairment were chosen to constitute a control group. These children were selected from two kindergarten classes and a nursery school class. Although these three classes were conducted under private auspices (the Academy of Mount Saint Ursula and the College of New Rochelle), the children were from lower as well as middle socio-economic levels. Throughout the selection process an effort was made to exclude both children who were judged to be in the top quartile of their group and those in the bottom quartile, in order that the control group might consist of children of "low-average" to "high-average" ability and achievement.

The process of selecting the control group consisted of the following procedures:

1. An assessment of the child's speech and language functions through his responses on the Peabody Picture Vocabulary Test, Form A (Dunn, 1959) and informal conversation with the examiner. Children with exceptionally high or exceptionally low Peabody scores or with any speech or language deficiency were not accepted for the control group.
2. An evaluation of the child's general performance in the kindergarten or nursery school by his teacher, after she had taught him for at least seven months. The teacher was asked to rate her entire class on a

five-point scale, shown in Appendix II, for "general achievement and behavior," without knowing which children were being considered for inclusion in this study. Only children rated in the three middle categories were selected for the control group. Six of these children were rated "Average," three were rated "Above average," and one was rated "Below average." Children rated "Superior" or "Inferior" were excluded from the control group.

3. A review of the child's health history through his mother's replies to a simple questionnaire shown in Appendix III. The questions inquired about the health of the mother during the pregnancy, the condition of the child at birth, post-natal illnesses, surgery, and accidents, and the attainment of developmental milestones. None of the children selected for the control group had any history of pre-natal or post-natal abnormalities, serious injuries, or convulsions. The only surgery reported was tonsillectomy performed on three of the children. Five of the children were reported to have had chicken pox, German measles, mumps, and upper respiratory infections. One child had had pneumonia at five years of age.
4. An estimate of the child's intellectual functioning through the use of the Stanford-Binet Intelligence Scale (Form L-M, 1960 Revision). These tests were

administered by three experienced psychologists. One held a Ph.D. degree, and the others were candidates for this degree. Children with scores above 126 were excluded from the study; no retarded children were found among those tested.

A human figure drawing to be used in this study was obtained for each child in the control group, according to the procedure used with the experimental group.

A summary of information about the 30 children whose drawings were used in this study is presented in Table 3.1. These children represent a broad range of socio-economic levels within the geographical area of Greater New York. The children in the control group (C) were 6 boys and 4 girls who ranged in age from 4 years, 2 months to 5 years, 11 months, with a mean age of 5 years, 3 months; those in the emotionally disturbed group (E) were 4 boys and 6 girls who ranged in age from 4 years, 2 months to 5 years, 10 months, with a mean age of 5 years; those in the neurologically impaired group (N) were 9 boys and 1 girl who ranged in age from 4 years, 3 months to 6 years, 1 month, with a mean age of 5 years, 1 month.

The psychologists' estimates of the intelligence of the 30 children ranged from low-average to high average. In all but four cases, these estimates were reported as I.Q. scores earned on the Stanford-Binet (16 cases), the WISC (1 case), or the Merrill-Palmer (9 cases) tests of intelligence.

TABLE 3.1.--Sex, Chronological Age, and Estimates of Intelligence of Children in Control Group, Emotionally Disturbed Group, and Neurologically Impaired Group

SEX			Chronological Age			Estimate of Intelligence			Teacher's Rating for Control Group
C	E	N	C	E	N	C	E	N	
M	M	M	5:11	5:10	6:1	S-B 114	Low average	WISC 100	Below average
M	M	M	5:9	5:6	6:0	S-B 113	Above average	M-P 103	Above average
M	F	M	5:8	5:5	5:9	S-B 106	M-P 98	M-P 117	Above average
F	M	M	5:8	5:0	5:8	S-B 95	M-P 97	S-B 100	Above average
M	F	M	5:6	4:11	5:0	S-B 110	S-B 98	S-B 92	Average
F	F	M	5:2	4:11	5:0	S-B 112	S-B 97	M-P 92	Average
F	F	M	5:2	4:10	4:8	S-B 109	S-B 96	M-P 91	Average
F	M	F	4:10	4:9	4:5	S-B 103	S-B 97	M-P 93	Average
M	M	M	4:5	4:5	4:4	S-B 126	M-P 96	Above average	Average
M	M	M	4:2	4:2	4:3	S-B 119	Average	M-P 119	Average
6M 4F	6M 4F	9M 1F	Mean 5:3	Mean 5:0	Mean 5:1	Mean I.Q. 110.7			

In the four cases in which quantitative scores were not reported, the psychologist's estimate of the child's intelligence was reported in descriptive terms. The I.Q. scores ranged from 95 to 126 in the control group, from 90 to 98 in the emotionally disturbed group, and from 91 to 119 in the neurologically impaired group. Despite the effects of their language disorders and their emotional or neurological deficits, the children in the two impaired groups attained scores within the normal range. In addition, all of those who evaluated the impaired children considered them to have at least low-average intelligence.

The Rating Scale

A rating scale modeled on the semantic differential (Osgood, Suci, and Tannenbaum, 1957) was constructed, consisting of a series of seven-point bipolar scales. On the basis of the literature reviewed in Chapter II, the following 15 scales were selected for study:

Well-proportioned--Disproportioned
Undistorted--Distorted
Precise--Vague
Complete--Incomplete
Sophisticated--Naive
Strong--Weak
Non-perseverative--Perseverative
Unfractured--Fractured
Rounded--Angular
Pleasant--Unpleasant
Organized--Disorganized
Expansive--Constricted
Well-defined--Poorly defined
Uninhibited--Inhibited
Complex--Simple

Since one of the purposes of this investigation is to identify the terms which best discriminate among the three

groups of drawings, some scales with similar meanings were included, for example: "Precise--Vague" and "Well-defined--Poorly defined"; "Sophisticated--Naive" and "Complex--Simple"; "Expansive--Constricted" and "Uninhibited--Inhibited." The scales were arranged in random order so that half of the positive and half of the negative qualities were on the right. A sample of the rating scale as it was presented to the judges is in Figure 3.1.

Procedure in Judging the Drawings

The 30 human figure drawings done by the children described above are shown in Appendix I, arranged in random order. Each drawing bore only the child's age and a code number assigned by the experimenter. These drawings were presented to each of ten judges, who were designated "expert" or "naive" according to the extent of their acquaintance with young children's human figure drawings through study and experience. The five expert judges, four speech pathologists and one specialist in early childhood education, had dealt with such drawings for six to ten years in their professional work in clinical or educational settings. One of these judges held a Ph.D., while the others held Master's degrees. The five naive judges were beginning speech therapists who had been acquainted with children's human figure drawings as part of their training and clinical work for about three years. All held B.A. degrees, except one who held the Master's degree. This judge was considered "naive" despite an advanced degree, because of a limited

Figure 3.1.--Rating Sheet Used by the Judges

Evaluation of Children's Drawings

Rated by _____ Drawn by _____

On each line, mark the space which best indicates the degree to which the drawing manifests the characteristics listed. The middle space represents: "Average for this child's age group."

Well-proportioned	____:____:____:____:____:____:____	Disproportioned
Distorted	____:____:____:____:____:____:____	Undistorted
Precise	____:____:____:____:____:____:____	Vague
Complete	____:____:____:____:____:____:____	Incomplete
Sophisticated	____:____:____:____:____:____:____	Naive
Strong	____:____:____:____:____:____:____	Weak
Perseverative	____:____:____:____:____:____:____	Non-perseverative
Unfractured	____:____:____:____:____:____:____	Fractured
Rounded	____:____:____:____:____:____:____	Angular
Unpleasant	____:____:____:____:____:____:____	Pleasant
Disorganized	____:____:____:____:____:____:____	Organized
Expansive	____:____:____:____:____:____:____	Constricted
Well-defined	____:____:____:____:____:____:____	Poorly defined
Uninhibited	____:____:____:____:____:____:____	Inhibited
Simple	____:____:____:____:____:____:____	Complex

acquaintance with young children's human figure drawings.

The ten judges worked independently in their evaluation of the drawings, and were encouraged to work at their own rate without regard to a time limit. Written instructions were presented to each judge, explaining that the purpose of the study was to determine his impressions of the children's drawings and asking him to keep in mind the ages of the children as he rated the drawings on the scales presented. Specific directions were given for marking the scales, with examples to illustrate each point. (See "Instructions to Judges for Use of Rating Scale" in Appendix IV.)

When the judge had completed the rating of the 30 drawings, the rating sheets were collected and a second set of written instructions was presented to the judge. These explained that some of the drawings had been made by emotionally disturbed children, some by neurologically impaired children, and some by normal children. It was also pointed out that all of the children were rated at least "average" on intelligence tests. The judge was asked to sort the drawings into the three groups mentioned, keeping in mind the ages of the children.

When the sorting task had been completed, the experimenter recorded the code numbers of the drawings in each of the three groups, and presented the final instruction to the judge. This was a request to arrange the drawings along a continuum from "Best" to "Worst," keeping in mind the ages

of the children. The instructions to the judges for the sorting and ranking tasks are presented in Appendix IV.

Summary

On the basis of their hospital records at Columbia-Presbyterian Medical Center, 20 experimental subjects between the ages of 4 years, 2 months and 6 years, 1 month were chosen. These children had been diagnosed as having language disorders, with emotional disturbance (10 cases) or neurological impairment (10 cases) as the major causative factor. All of these children had normal hearing and vision, at least average intelligence, and no physical anomalies or serious motor impairments. The control group consisted of 10 children without language disorders or any other known impairment.

A rating scale was constructed, modeled on the semantic differential. It consisted of 15 seven-point bipolar scales for the rating of specific qualities in the drawings. This scale was used by 5 "expert" and 5 "naive" judges to rate the 30 human figure drawings. The only information given to the judges was the ages of the children.

Following the ratings of the drawings, the judges were asked to sort the drawings into three categories: those drawn by emotionally disturbed children, those by neurologically impaired children, and those by normal children. The judges' final task was to arrange the drawings along a continuum from "Best" to "Worst."

CHAPTER IV

PROCEDURES IN TREATING THE DATA

Several statistical procedures were followed in analyzing the data obtained from the judges' rating, sorting, and ranking of 30 human figure drawings. Through an analysis of variance the differences in the judges' ratings of the drawings by the children in the control group (C), the emotionally disturbed group (E), and the neurologically impaired group (N) were studied. A factor analysis showed the correlations among the 15 items on the rating scale, and the factors underlying these characteristics. The judges' ability to identify the drawings as done by a child in the control group, the emotionally disturbed group, or the neurologically impaired group was studied. By means of the Kendall Coefficient of Concordance, the agreement among the judges in their ranking of the drawings from "Best" to "Worst" was determined. This ranking was compared with the ranks of the drawings on the basis of the rating scale, using the Spearman rank correlation coefficient. Each of these procedures will be discussed in detail.

The Analysis of Variance

The judges' ratings on the 15 scales were translated into numerical form by assigning values of "1" through "7" to the intervals on the scales, with the positive quality receiving the highest value. For example, on the "Complete--Incomplete" scale, a judge's mark in the space closest to the positive pole ("Complete") was counted as "7," a mark in the middle or "Average" space was counted as "4," and a mark in the space closest to the negative pole ("Incomplete") was counted as "1," with the appropriate values assigned to the other spaces. Composite scores were calculated for each of the three groups of drawings (C, E, N) on each of the 15 scales on the Judges' Rating Sheet (Figure 3.1). These composite scores, the raw data for the statistical analysis of the ratings, are shown in Appendix V, and are graphically depicted in the profiles shown in Figure 4.1. Inspection of these data indicates that the greatest differences in the ratings on most of the scales are between the C and N groups, with the smallest differences between the E and N groups. A 2x3 analysis of variance of these data was performed with the aid of an IBM 1130 computer, and yielded the information presented in Table 4.1.

Differences Among the Three Groups of Drawings

The first question to be considered was: What characteristics distinguish the human figure drawings by children without language disorders or any other evident impairment from those by emotionally disturbed children with

Figure 4.1.--Profiles of the Composite Scores of the Drawings by the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group on the Fifteen Rating Scales

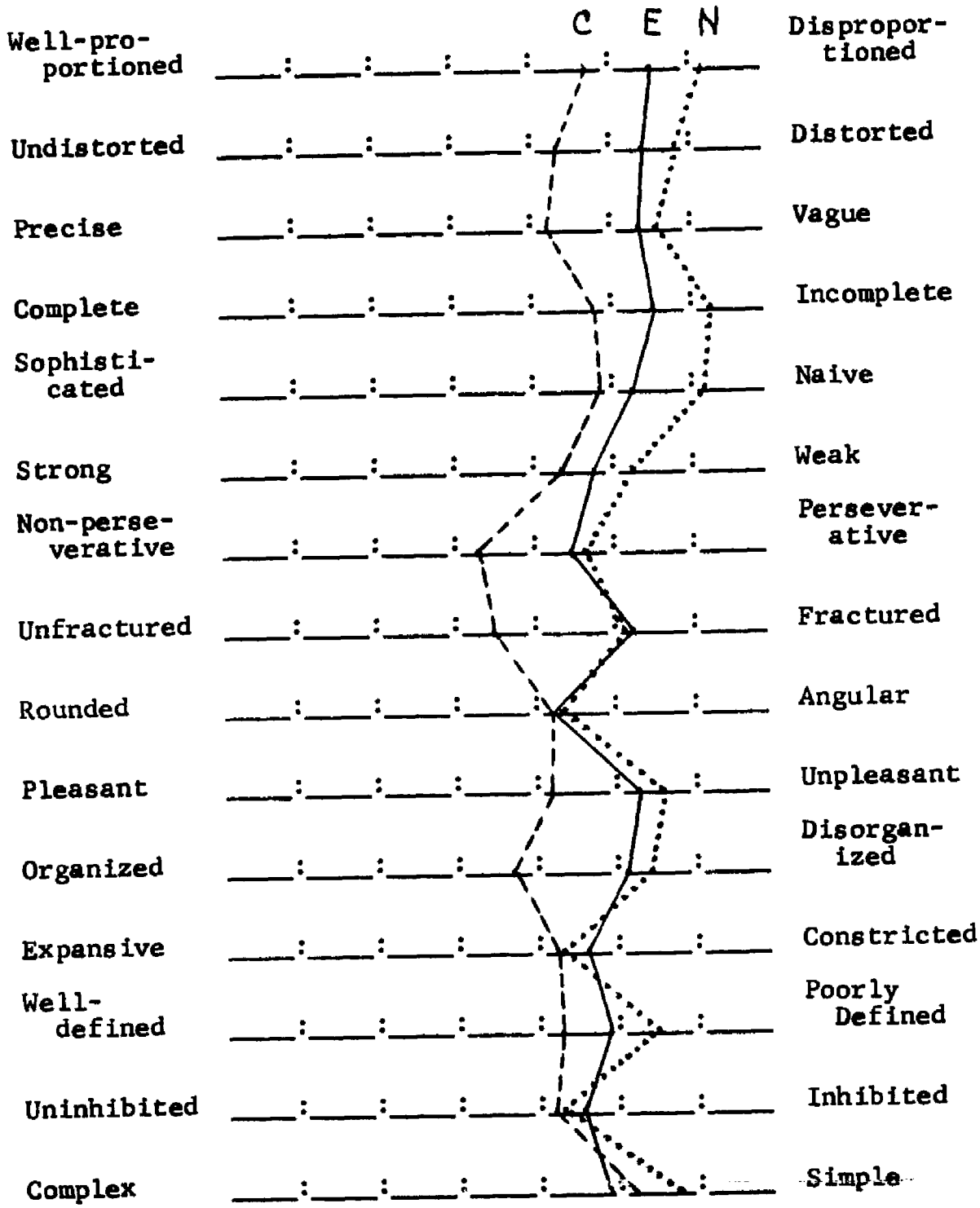


Table 4.1.--Summary of the Analysis of Variance Performed on Ratings of the Drawings of the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group by the "Expert" and "Naive" Judges

Scale	Source of Variation	Sum of Squares	df	Mean Square	F	p
Well-proportioned--Disproportioned	Between Groups					
	Groups: C-E-N	530.03	2	265.01	8.05	$<.01$
	Error	888.45	27	32.90		
	Within Groups					
	Judges: I-II	58.01	1	58.01	12.26	$<.01$
	Interaction	20.83	2	10.41	2.20	NS
	Error	127.66	27	4.73		
	Total	1624.98	59			
Undistorted--Distorted	Between Groups					
	Groups: C-E-N	588.63	2	294.31	5.11	$<.025$
	Error	1556.05	27	57.63		
	Within Groups					
	Judges: I-II	43.35	1	43.35	11.44	$<.01$
	Interaction	1.90	2	.95	.25	NS
	Error	102.25	27	3.79		
	Total	2292.18	59			
Precise--Vague	Between Groups					
	Groups: C-E-N	548.40	2	274.20	4.51	$<.025$
	Error	1642.75	27	60.84		
	Within Groups					
	Judges: I-II	40.01	1	40.01	7.59	$<.025$
	Interaction	4.13	2	2.06	.80	NS
	Error	142.35	27	5.27		
	Total	2377.64	59			

Complete--Incomplete	Between Groups					
	Groups: C-E-N	537.70	2	268.85	5.66	<.01
	Error	1282.30	27	47.49		
	Within Groups					
	Judges: I-II	81.66	1	81.66	27.77	<.001
	Interaction	22.03	2	11.01	3.74	<.05
	Error	79.30	27	2.94		
	Total	2002.99	59			
Sophisticated--Naive	Between Groups					
	Groups: C-E-N	360.63	2	180.31	3.88	<.05
	Error	1253.85	27	46.44		
	Within Groups					
	Judges: I-II	54.15	1	54.15	17.14	<.001
	Interaction	3.10	2	1.55	.49	NS
	Error	85.25	27	3.16		
	Total	1756.98	59			
Strong--Weak	Between Groups					
	Groups: C-E-N	156.13	2	78.06	1.78	NS
	Error	1178.60	27	43.65		
	Within Groups					
	Judges: I-II	32.26	1	32.26	7.74	<.01
	Interaction	12.13	2	6.06	1.45	NS
	Error	112.61	27	4.17		
	Total	1491.73	59			
Non-perseverative--Perseverative	Between Groups					
	Groups: C-E-N	660.43	2	330.21	7.78	<.01
	Error	1145.25	27	42.42		
	Within Groups					
	Judges: I-II	46.81	1	46.81	4.73	<.05
	Interaction	12.43	2	6.21	.62	NS
	Error	267.26	27	9.90		
	Total	2132.18	59			

Scale	Source of Variation	Sum of Squares	df	Mean Square	F	p
Unfractured--Fractured	Between Groups					
	Groups: C-E-N	913.63	2	456.81	8.85	<.01
	Error	1394.04	27	51.63		
	Within Groups					
	Judges: I-II	7.35	1	7.35	1.02	NS
	Interaction	66.10	2	33.05	4.34	<.025
	Error	193.05	27	7.15		
	Total	2574.18	59			
Rounded--Angular	Between Groups					
	Groups: C-E-N	4.03	2	2.01	.03	NS
	Error	1563.05	27	57.89		
	Within Groups					
	Judges: I-II	7.35	1	7.35	1.62	NS
	Interaction	11.70	2	5.85	1.21	NS
	Error	122.45	27	4.53		
	Total	1708.58	59			
Pleasant--Unpleasant	Between Groups					
	Groups: C-E-N	645.10	2	322.55	9.34	<.001
	Error	932.05	27	34.52		
	Within Groups					
	Judges: I-II	16.01	1	16.01	3.44	NS
	Interaction	31.03	2	15.51	3.35	<.05
	Error	125.45	27	4.65		
	Total	1749.64	59			
Organized--Disorganized	Between Groups					
	Groups: C-E-N	862.30	2	431.15	7.56	<.01
	Error	1539.30	27	57.01		
	Within Groups					
	Judges: I-II	1.06	1	1.06	.14	NS
	Interaction	1.03	2	.51	.06	NS
	Error	200.90	27	7.44		
	Total	2604.59	59			

Expansive--Constricted	Between Groups					
	Groups: C-E-N	80.43	2	40.21	.45	NS
	Error	2375.50	27	87.98		
	Within Groups					
	Judges: I-II	129.06	1	129.06	11.38	<.01
	Interaction	25.63	2	12.81	1.12	NS
	Error	306.31	27	11.34		
	Total	2916.93	59			
Well-defined--Poorly defined	Between Groups					
	Groups: C-E-N	453.70	2	226.85	3.11	NS
	Error	1969.30	27	72.94		
	Within Groups					
	Judges: I-II	72.60	1	72.60	18.76	<.001
	Interaction	16.90	2	8.45	2.18	NS
	Error	104.49	27	3.87		
	Total	2616.99	59			
Uninhibited--Inhibited	Between Groups					
	Groups: C-E-N	56.63	2	28.31	.37	NS
	Error	2013.30	27	74.57		
	Within Groups					
	Judges: I-II	21.60	1	21.60	4.36	<.05
	Interaction	9.70	2	4.85	.97	NS
	Error	133.70	27	4.95		
	Total	2234.93	59			
Complex--Simple	Between Groups					
	Groups: C-E-N	219.03	2	109.51	2.28	NS
	Error	1294.05	27	27.93		
	Within Groups					
	Judges: I-II	3.75	1	3.75	.68	NS
	Interaction	.30	2	.15	.02	NS
	Error	147.45	27	5.46		
	Total	1664.58	59			

language disorders and neurologically impaired children with language disorders? The analysis of variance showed significant F ratios ($p < .05$) among the three groups of drawings (C, E, N) on the following nine rating scales:

Well-proportioned--Disproportioned
Undistorted--Distorted
Precise--Vague
Complete--Incomplete
Sophisticated--Naive
Non-perseverative--Perseverative
Unfractured--Fractured
Pleasant--Unpleasant
Organized--Disorganized

The remaining six scales, which did not significantly differentiate the C, E, and N groups, were:

Strong--Weak
Rounded--Angular
Expansive--Constricted
Well-defined--Poorly defined
Uninhibited--Inhibited
Complex--Simple

The Scheffé test (Spence, Underwood, Duncan, and Cotton, 1968, pp. 168-173) was used to further analyze the significant differences found on the nine scales listed above. This highly conservative test (Kerlinger, 1965, p. 199 n.) is preferable to the "dubious practice of calculating many confidence intervals from the same data, all using the upper $\alpha/2$ point of the t-distribution" (Scheffé, 1959, p. 71). In introducing his method, Scheffé pointed out: "those accustomed in applied statistics to making repeated t-tests at the 5% significance level might consider choosing $\alpha = 10\%$ rather than 5% with the new method. The user of the repeated 5% tests is working at some 'overall' significance level that is unknown but greater than 5%; perhaps he would

be glad to settle for a guaranteed 10%" (1953, p. 94). In a later discussion of this test, Scheffé stated unequivocally: "A guaranteed 90 per cent confidence coefficient is preferable to a nominal 95 per cent one, if, as usually, we have no idea how far the true value falls below 95 per cent" (1959, p. 71). In the present study, therefore, confidence coefficients of .10 or less obtained through the Scheffé analysis are accepted as statistically significant.

Table 4.2 shows the results of the Scheffé analysis of the significant differences in the ratings of the three groups of drawings on nine of the scales. The ratings of the C group were significantly more positive ($p < .005$) than those of the N group on all nine scales. The ratings of the C group were also significantly more positive than the E group ($p < .05$) on eight of these nine scales. The exception was the "Sophisticated-Naive" scale, on which there was no significant difference between the C and E groups. On this scale, however, the E group was rated significantly more positively than the N group ($p < .05$). The only other significant difference between the E and N groups was on the "Well-proportioned--Disproportioned" scale, on which the E group was rated significantly more positively than the N group ($p < .10$).

These results of the analysis of variance and the Scheffé test indicate that the drawings of the C group were rated significantly more positively than each of the other groups ($p < .05$) on the scales evaluating proportion,

TABLE 4.2.--Summary of Scheffé Analysis of Significant Differences in the Ratings of the Drawings of the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group by the "Expert" and "Naive" Judges

Scale	C vs. E		C vs. N		E vs. N	
	F	p	F	p	F	p
Well-proportioned-Disproportioned	10.72	<.025	31.95	<.001	5.67	<.10
Undistorted-Distorted	9.20	<.025	19.52	<.001	1.91	NS
Precise-Vague	11.44	<.025	17.04	<.005	.55	NS
Complete-Incomplete	7.60	<.05	22.44	<.001	3.91	NS
Sophisticated-Naive	1.31	NS	14.74	<.005	7.24	<.05
Non-perseverative-Perseverative	18.12	<.001	27.59	<.001	.99	NS
Unfractured-Fractured	27.33	<.001	25.73	<.001	.02	NS
Pleasant-Unpleasant	21.21	<.001	33.46	<.001	1.39	NS
Organized-Disorganized	15.98	<.005	26.25	<.001	1.26	NS

distortion, precision, completeness, perseveration, fracturing, pleasantness, and organization. The C group was also rated significantly more positively than the N group on sophistication. The E group was rated significantly more positively than the N group on the scales evaluating sophistication and proportion.

It is noteworthy that on the scale "Sophisticated--Naive" statistically significant differences were found between the C and N groups, and between the E and N groups, while on the "Complex--Simple" scale, using terms closely

related in meaning, no significant differences were found. Similarly, on the "Precise--Vague" scale there was a significant difference between the C group and each of the other groups, but no significant differences were found on the "Well-defined--Poorly defined" scale. This may indicate that "Sophisticated--Naive" and "Precise--Vague" provide more useful terminology for designating certain qualitative differences in these three groups of drawings than do "Complex--Simple" and "Well-defined--Poorly defined."

Differences between the Ratings by the "Expert" and "Naive" Judges

The second basic question to be answered was: What concurrence is there among "expert" and "naive" judges in their evaluation of the three groups of drawings? The analysis of variance showed that the ratings of the "expert" and "naive" judges were not significantly different on five of the scales:

Unfractured--Fractured
Pleasant--Unpleasant
Rounded--Angular
Organized--Disorganized
Complex--Simple

This fact is of particular importance in reference to the scales evaluating fracturing, pleasantness, and organization, since these scales also showed significant differences among the three groups of drawings. Although the judges agreed in their evaluations on the scales measuring angularity and complexity, these two scales did not differentiate among the three groups of drawings.

Significant differences ($p < .05$) were found in the analysis of variance between the ratings given by the two groups of judges on the following scales:

Well-proportioned--Disproportioned
Undistorted--Distorted
Precise--Vague
Complete--Incomplete
Sophisticated--Naive
Strong--Weak
Non-perseverative--Perseverative
Expansive--Constricted
Well-defined--Poorly defined
Uninhibited--Inhibited

As Table 4.3 shows, all of the ratings of the "expert" judges were significantly more positive ($p < .025$) than those of the "naive" judges on all of these scales except those measuring constriction, inhibition, and strength. Since these three scales showed no significant differences among the C, E, and N groups, the differences in the ratings by the two groups of judges are not of great importance. However, it is of interest to note that the "naive" judges rated all three groups of drawings more expansive and less inhibited than the "expert" judges did. The "naive" judges also gave slightly more positive (not statistically significant) ratings to the N group on the "Strong--Weak" scale, while the "expert" judges rated the C and E groups significantly more positively on this scale.

For the interpretation of these findings, the interaction effect in the analysis of variance must be taken into account. A statistically significant interaction effect was found on only the following three scales:

TABLE 4.3.--Significant Differences in the Ratings of the Drawings of the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group by the "Expert" and "Naive" Judges

Scale	Higher Rating		p
	Expert Judges	Naive Judges	
Well-proportioned-Disproportioned	C E N		$<.01$
Undistorted-Distorted	C E N		$<.01$
Precise-Vague	C E N		$<.025$
Complete-Incomplete	C E N		$<.001$
Sophisticated-Naive	C E N		$<.001$
Strong-Weak	C E	N	$<.01$
Non-perseverative-Perseverative	C E N		$<.05$
Expansive-Constricted		C E N	$<.01$
Well-defined-Poorly defined	C E N		$<.001$
Uninhibited-Inhibited		C E N	$<.05$

Complete--Incomplete
Unfractured--Fractured
Pleasant--Unpleasant

A further analysis of the interaction effect by means of the Scheffé test showed that all the judges rated the C group significantly more positively ($p<.01$) than the E and N groups on these three scales. In addition, on the "Complete--Incomplete" scale, the "expert" judges rated the C and E groups significantly more positively than the "naive" judges did ($p<.05$), and also rated the E group significantly more positively ($p<.001$) than the N group. These findings,

summarized in Table 4.4, show that on scales evaluating completeness, fracturing, and pleasantness the C group was consistently rated significantly more positively ($p < .01$) than the E and N groups by both groups of judges. This consistency is of particular importance since these three scales significantly differentiated the C group from the other two groups of drawings ($p < .05$). In addition, the ratings on the scales evaluating fracturing and pleasantness showed no significant differences between the two groups of judges.

TABLE 4.4.--Summary of Analysis of Significant Interaction Effects in Analysis of Variance Performed on Ratings of the Drawings of the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group by the "Expert" and "Naive" Judges

Scale	Expert Judges		Naive Judges	
	Rating	p	Rating	p
Complete-Incomplete	C higher than E	$<.001$	C higher than E	$<.001$
	C higher than N	$<.001$	C higher than N	$<.001$
	Higher for C	$<.05$	Lower for C	$<.05$
	Higher for E	$<.01$	Lower for E	$<.01$
	E higher than N	$<.001$		
Unfractured-Fractured	C higher than E	$<.001$	C higher than E	$<.001$
	C higher than N	$<.001$	C higher than N	$<.01$
Pleasant-Unpleasant	C higher than E	$<.01$	C higher than E	$<.001$
	C higher than N	$<.001$	C higher than N	$<.001$

On the basis of the analysis of variance several of the rating scales can be identified as particularly effective in differentiating among the three groups of

drawings, and as showing agreement among the judges and consistency in their ratings. The scales which showed significant differences between the C group and the other two groups but no significant differences in the ratings by the two groups of judges are:

Unfractured--Fractured
Pleasant--Unpleasant
Organized--Disorganized

In addition, significant differences between the E and N groups were found on the "Sophisticated--Naive" and the "Well-proportioned--Disproportioned" scales, with the "expert" judges consistently giving significantly more positive ratings than those of the "naive" judges. On four other scales, measuring distortion, precision, completeness, and perseveration, the C group was given significantly more positive ratings than the other two groups.

The statistically significant findings yielded by the analysis of variance are summarized in Table 4.5.

Factor Analysis

The differences found in the ratings of the three groups of drawings lead to the question: Which of the rating scales are measuring something in common? To identify these underlying variables, a factor analysis was performed on the IBM 1130 computer, using the raw data shown in Appendix V, derived from the judges' ratings. The matrix of correlation coefficients among the 15 scales is shown in Table 4.6. Highly significant correlations, beyond .46 ($p < .01$, d.f.=28), were found among all of the scales except

TABLE 4.5.--Summary of Significant Findings in Analysis of Variance Performed on Ratings of the Drawings of the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group by the "Expert" and "Naive" Judges

Scale	Differences among Groups of Drawings			Differences between Groups of Judges				Interaction Effect			
	C > E	C > N	E > N	Higher Rating							
	p	p	p	Expert	p	Naive	p	Expert	p	Naive	p
Well-proportioned--Disproportioned	<.025	<.001	<.10	C E N	<.01						
Undistorted--Distorted	<.025	<.001		C E N	<.01						
Precise--Vague	<.025	<.005		C E N	<.01						
Complete--Incomplete	<.05	<.001		C E N	<.01			C higher	<.05	C lower	<.05
								C > E	<.001	C > E	<.001
								C > N	<.001	C > N	<.001
								E > N	<.001		
								E higher	<.01	E lower	<.01
Sophisticated--Naive		<.005	<.05	C E N	<.01						
Strong--Weak				C E	<.01						
Non-perseverative--Perseverative	<.001	<.001		C E N	<.05						
Unfractured--Fractured	<.001	<.001						C > E	<.001	C > E	<.001
								C > N	<.001	C > N	<.001
Pleasant--Unpleasant	<.001	<.001						C > E	<.01	C > E	<.001
								C > N	<.001	C > N	<.001
Organized--Disorganized	<.005	<.001									
Expansive--Constricted						C E N	<.01				
Well-defined--Poorly defined				C E N	<.001						
Uninhibited--Inhibited						C E N	<.05				

TABLE 4.6.--Matrix of Correlation Coefficients Among Fifteen Rating Scales

Scales	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A. Well-proportioned-Disproportioned	.92	.82	.76	.77	.64	.79	.80	.26	.84	.89	.12	.78	.17	.52
B. Undistorted-Distorted		.91	.88	.84	.75	.83	.86	.36	.92	.93	.12	.88	.18	.60
C. Precise-Vague			.91	.90	.83	.82	.90	.25	.87	.91	.08	.97	.14	.73
D. Complete-Incomplete				.91	.81	.83	.81	.19	.85	.88	.14	.93	.21	.76
E. Sophisticated-Naive					.77	.75	.72	.10	.75	.79	.07	.91	.13	.89
F. Strong-Weak						.63	.74	.09	.70	.75	.21	.83	.31	.67
G. Non-perseverative-Perseverative							.78	.21	.84	.86	.30	.82	.32	.52
H. Unfractured-Fractured								.39	.90	.92	.10	.85	.12	.51
I. Rounded-Angular									.42	.41	.01	.28	.04	.00
J. Pleasant-Unpleasant										.94	.30	.82	.34	.47
K. Organized-Disorganized											.16	.89	.22	.55
L. Expansive-Constricted												.06	.95	-.11
M. Well-defined-Poorly defined													.14	.80
N. Uninhibited-Inhibited														-.02
O. Complex-Simple														

"Rounded--Angular," "Expansive--Constricted," and "Uninhibited--Inhibited." The scale evaluating angularity correlated beyond the .05 level with the following scales: "Undistorted--Distorted," "Unfractured--Fractured," "Pleasant--Unpleasant," "Organized--Disorganized," and "Complex--Simple." The scales evaluating expansiveness and inhibition were correlated beyond the .01 level, but showed no significant correlations with any other scales.

The highly significant correlations ($p < .01$) among the scales evaluating proportion, distortion, precision, completeness, sophistication, strength, perseveration, fracturing, pleasantness, organization, definiteness, and complexity suggested the existence of a single, all-pervasive factor among these scales. Significant differences among the three groups of drawings had been found in the analysis of variance on all of these scales except those evaluating strength, definiteness, and complexity. The three scales measuring angularity, constriction, and inhibition, which did not show the same consistent correlation as the twelve mentioned above, also failed to differentiate among the three groups of drawings in the analysis of variance.

Correlations of at least .85 were found in the following groups of scales:

Group A

Undistorted--Distorted
Precise--Vague
Complete--Incomplete
Unfractured--Fractured
Pleasant--Unpleasant
Organized--Disorganized
Well-defined--Poorly defined

Group B

Precise--Vague
Complete--Incomplete
Sophisticated--Naive
Well-defined--Poorly defined
Complex--Simple

Group C

Well-proportioned--Disproportioned
Undistorted--Distorted
Organized--Disorganized

Several scales showed a correlation of at least .85 with only one other scale. The "Complex--Simple" scale had a correlation of .89 with the "Sophisticated--Naive" scale, and correlations of .80 or lower with the other scales. Similarly, the "Non-perseverative--Perseverative" scale showed a correlation of .86 with the "Organized--Disorganized" scale, but also had correlations between .82 and .84 with several other scales. The "Expansive--Constricted" and "Uninhibited--Inhibited" scales had a correlation of .94 with each other, and no correlation above .34 with any other scale.

The highest correlation of the "Strong--Weak" scale was .83 with the "Precise--Vague" and the "Well-defined--Poorly defined" scales. The highest correlation of the "Rounded--Angular" scale was .42 with the "Pleasant--Unpleasant" scale.

In the factor analysis, five factors were extracted. The correlation among them is shown in Table 4.7. There is a relatively high positive correlation (.61) between Factor I and Factor V. Factor IV has a relatively high negative

correlation with Factor I (-.65) and Factor V (-.56), and a lower negative correlation (-.35) with Factor III. Factor II shows only low correlations with the other factors.

TABLE 4.7.--Correlation Among Oblique Primary Factors in Drawings by Control, Emotionally Disturbed, and Neurologically Impaired Groups

Factor	I	II	III	IV	V
I	1.00				
II	.03	1.00			
III	-.03	.02	1.00		
IV	-.65	.23	-.35	1.00	
V	.61	-.11	.17	-.56	1.00

Table 4.8, giving the oblique primary factor matrix, shows the correlation of the 15 scales with each of the 5 factors. On the basis of these loadings, the factors were labeled as follows:

I <u>Primitiveness</u>, identified by the scales:

Complex--Simple
Sophisticated--Naive
Well-defined--Poorly defined
Complete--Incomplete
Precise--Vague

II <u>Expansiveness</u>, identified by the scales:

Expansive--Constricted
Uninhibited--Inhibited

III <u>Angularity</u>, identified by the scale:

Rounded--Angular

TABLE 4.8.--Oblique Primary Factor Matrix for Drawings by Control, Emotionally Disturbed, and Neurologically Impaired Groups

	Factors				
	I	II	III	IV	V
Well-proportioned--Disproportioned	-.59	.15	-.25	.92	-.46
Undistorted--Distorted	-.68	.16	-.38	.97	-.59
Precise--Vague	-.80	.12	-.25	.93	-.69
Complete--Incomplete	-.81	.19	-.17	.89	-.63
Sophisticated--Naive	-.94	.11	-.07	.83	-.59
Strong--Weak	-.72	.26	-.09	.75	-.83
Non-perseverative--Perseverative	-.58	.33	-.17	.88	-.38
Unfractured--Fractured	-.57	.12	-.43	.91	-.62
Rounded--Angular	-.01	.02	-.80	.34	-.11
Pleasant--Unpleasant	-.54	.34	-.45	.96	-.52
Organized--Disorganized	-.61	.20	-.43	.97	-.59
Expansive--Constricted	.07	.97	.03	.19	-.06
Well-defined--Poorly defined	-.85	.11	-.28	.89	-.69
Uninhibited--Inhibited	-.01	.97	-.01	.24	-.18
Complex--Simple	-.96	-.06	.03	.57	-.57

IV Wholesomeness, identified by the scales:

Organized--Disorganized
Undistorted--Distorted
Pleasant--Unpleasant
Precise--Vague
Well-proportioned--Disproportioned
Unfractured--Fractured
Complete--Incomplete
Well-defined--Poorly defined
Non-perseverative--Perseverative

V Vagueness, identified by the scales:

Strong--Weak
Precise--Vague
Well-defined--Poorly defined

The factors of Expansiveness and Angularity, which are identified by scales which did not significantly differentiate the three groups of drawings in the analysis of variance, may be considered of less importance than the factors of Primitiveness, Wholesomeness, and Vagueness. The factor of Wholesomeness is of particular interest, since nine of the scales loaded very heavily upon it (at least .88). This factor seems to be an all-pervasive, positive quality recognized in a global view of the aspects of the form of the drawing, as contrasted with the content of the drawing. It shows a high negative correlation with the factors of Primitiveness (-.65) and Vagueness (-.56), which have a high positive correlation (.61) with each other. It is noteworthy that two of the rating scales are measures of all three factors: "Well-defined--Poorly defined" and "Precise--Vague." In the analysis of variance, however, the "Precise--Vague" scale differentiated among the three groups of drawings, while the "Well-defined--Poorly defined"

scale did not. This scale measuring "definiteness" is the only one of the nine scales heavily loaded on the factor of Wholesomeness which did not significantly differentiate among the three groups of drawings in the analysis of variance.

The exceptionally heavy loadings of nine of the scales on the factor of Wholesomeness, ranging from .97 to .88, seems to indicate the superfluity of this large number of scales and the advisability of using only those scales which most clearly differentiate among the drawings without any significant difference between the ratings of the two groups of judges. Such scales are "Well-proportioned--Disproportioned," "Pleasant--Unpleasant," "Organized--Disorganized," and "Unfractured--Fractured." Similarly, the single scale "Sophisticated--Naive," which significantly differentiated between the E and N groups in the analysis of variance, seems to be the most accurate indicator of the factor of Primitiveness, while the "Precise--Vague" scale seems most effective for identifying the factor of Vagueness.

Ability of the Judges to Correctly Identify the Drawings

After each judge completed his rating of the 30 drawings on the 15 scales discussed above, he was told that some of the drawings had been made by emotionally disturbed children, some by neurologically impaired children, and some by normal children. The judge was asked to sort the drawings according to these categories, keeping in mind the

ages of the children.

Table 4.9 shows the number of drawings identified as belonging in each of the three categories by each of the ten judges. The mean number of correct identifications made by the "expert" judges was 11.8, while the mean for the "naive" judges was 16.2, giving an overall mean of 15 correct identifications, which is significant beyond the .05 level. By the binomial test (Siegel, 1956, pp. 36-42) $p < .03$. The difference in the proportion of correct identifications made by the two groups of judges is not statistically significant ($p = .37$).

TABLE 4.9.--Number of Drawings Correctly Identified by the Ten Judges

Judges	Number of Drawings Correctly Identified			Total
	C	E	N	
Expert--Group I				
A	6	4	4	
B	7	2	5	
C	5	2	6	
D	7	2	2	
E	7	5	5	
Total I	32	15	22	69
				Mean= 11.8
Naive--Group II				
F	7	7	6	
G	4	5	6	
H	7	3	1	
I	6	6	8	
J	3	6	6	
Total II	27	27	27	81
				Mean= 16.2
Total I and II	59	42	49	150
				Mean= 15

Table 4.10 shows the number of times each drawing was correctly identified by the judges. The number of correct judgments ranges from seven or more in eight of the drawings, to three or fewer in nine of the drawings. This wide range suggests that some of the drawings are more difficult than others to identify. An analysis of these data by means of the Cochran Q test (Siegel, 1956, pp. 161-166) reveals highly significant ($p < .001$) differences in difficulty in identifying the 30 drawings.

Ranking of the Drawings from "Best" to "Worst"

The final task of the 10 judges was to rank the 30 drawings along a continuum from "Best" to "Worst," keeping in mind the ages of the children. Table 4.11 shows the ranks of the drawings on the basis of the composite ranking scores of the 10 judges, with the rank of "1" designating the "best" drawing. These composite ranking scores were derived from the raw-data shown in Appendix VI. Only 1 drawing in the C group ranked below the median, while 7 drawings in each of the other groups ranked below the median. Of the 6 highest ranks, 5 were assigned to drawings in the C group; of the 7 lowest ranks, 6 were assigned to drawings in the N group.

Among the 10 highest ranking drawings, 6 are in the C group, 3 in the E group, and 1 in the N group. Among the next 10 drawings there are 4 in the C group, 3 in the E group, and 3 in the N group. Among the 10 lowest ranking

TABLE 4.10.--Number of Judges Who Correctly Identified Each Drawing

Code Number of Drawing	Category of Drawing			Number of Judges Identifying Drawing
	C	E	N	
5	X			10
29	X			10
10	X			9
20			X	8
21			X	8
9	X			7
15		X		7
17			X	7
12		X		6
14	X			6
25			X	6
26	X			6
2			X	5
3	X			5
13		X		5
16		X		5
27		X		5
1			X	4
11			X	4
18		X		4
22		X		4
7	X			3
24			X	3
6		X		2
8		X		2
19	X			2
23			X	2
28			X	2
30		X		2
4	X			1

TABLE 4.11.--Ranks of the Drawings from "Best" to "Worst" on the Basis of the Composite Ranking Scores of the Ten Judges

Drawing Number	Drawing Category			Composite Ranking Scores			Rank of Drawing
	C	E	N	Expert Judges	Naive Judges	Total	
5	X			6	6	12	1
29	X			13	18	31	2
10	X			24	15	39	3
9	X			42	28	70	4
30		X		28	51	79	5
3	X			36	47	83	6
18		X		48	40	88	7
1			X	46	47	93	8
7	X			55	40	95	9
15		X		61	52	113	10
19	X			73	43	116	11
26	X			53	79	132	12
24			X	63	71	134	13
4	X			86	55	141	14
25			X	67	75	142	15
28			X	52	102	154	16
22		X		84	78	162	17
14	X			61	102	163	18
16		X		105	65	170	19
27		X		81	93	174	20
13		X		113	83	196	21
6		X		87	116	203	22
8		X		102	103	205	23
11			X	128	115	243	24
23			X	130	114	244	25
21			X	134	123	257	26
2			X	133	137	270	27
20			X	136	140	276	28
12		X		133	147	280	29
17			X	145	140	285	30

drawings there are 4 in the E group and 6 in the N group. This distribution is summarized in Table 4.12.

TABLE 4.12.--Ranks of the Drawings in the Control, Emotionally Disturbed, and Neurologically Impaired Groups

Rank of Drawing	Number of Drawings in Each Category		
	C	E	N
1-10	6	3	1
11-20	4	3	3
21-30	0	4	6

To determine the association among the 10 sets of judges' rankings, the Kendall coefficient of concordance (Siegel, 1956, pp. 229-239) was applied to the raw data shown in Appendix VI. The coefficient of concordance for each of the two groups of judges was .84, yielding a highly significant χ^2 value of 121.80 (d.f.=29, $p < .001$). The coefficient of concordance for the entire group of 10 judges was .79, also yielding a highly significant χ^2 value of 229.10 (d.f.=29, $p < .001$). These findings indicate that the 10 judges probably applied essentially the same criteria in ranking the 30 drawings studied.

A comparison was made between these ranks of the drawings and the ranks of the drawings according to the composite scores based on the 15 rating scales. For this purpose the Spearman rank correlation coefficient was used (Siegel, 1956, pp. 202-213), and yielded a correlation of

.94 ($p < .001$) between the two ranks. This highly significant value indicates a close association between the two rankings, which are shown in Table 4.13.

The relationship between the judges' ranking of the drawings on a continuum from "Best" to "Worst" and the chronological ages of the children was also investigated through the calculation of the Spearman rank correlation coefficient. A value of .23 was obtained, which was not statistically significant. Finally, the Spearman rank correlation coefficient was used to examine the relationship between the judges' ranking of the drawings and the children's I.Q. scores. The correlation of the ranks of the drawings with the ranks of the Stanford-Binet scores ($r = .03$) and with the ranks of the Merrill-Palmer scores ($r = .48$) was not significant. Table 4.14 summarizes these data.

A very important finding is the high correlation (.94) between the ranks of the drawings according to their scores on the 15 rating scales and their places on a continuum from "Best" to "Worst." It shows that almost identical evaluations were made of the drawings through the use of the vastly different methods of 1) rating specific qualities of each drawing, and 2) making a global qualitative judgment of each drawing. There is a basic similarity in the two methods, however. In both types of evaluation the judges were examining the total drawing, rather than specific parts of the drawing. The highly significant agreement among the judges may indicate their use of similar

TABLE 4.13.--Ranks of the Drawings on a Continuum from "Best" to "Worst" versus the Ranks Based on the Rating Scales

Number of Drawing	Category of Drawing			Rank of Drawing	
	C	E	N	Continuum	Rating Scales
5	X			1	1
29	X			2	2
10	X			3	4
9	X			4	7
30		X		5	8
3	X			6	5
18		X		7	9
1			X	8	3
7	X			9	12
15		X		10	6
19	X			11	19
26	X			12	13
24			X	13	15
4	X			14	17
25			X	15	11
28			X	16	10
22		X		17	16
14	X			18	14
16		X		19	20
27		X		20	21
13		X		21	23
6		X		22	18
8		X		23	22
11			X	24	27
23			X	25	28
21			X	26	26
2			X	27	24
20			X	28	25
12		X		29	30
17			X	30	29

TABLE 4.14.--Judges' Ranking of Drawings Compared with the Ranks of the Children's Ages and I.Q. Scores

Number of Drawing	Category of Drawing			Rank of Drawing	Age of Child	Rank by Age	Rank by I.Q. Score	
	C	E	N				S-B	M-P
5	X			1	5:11	3	3	
29	X			2	4:10	20.5	9	
10	X			3	5:8	8	15	
9	X			4	5:8	8	8	
30		X		5	4:10	20.5	14	
3	X			6	5:6	10.5	6	
18		X		7	4:11	18.5	11	
1			X	8	6:1	1		
7	X			9	5:2	13.5	5	
15		X		10	4:9	22	13	
19	X			11	5:2	13.5	7	
26	X			12	4:5	25	1	
24			X	13	5:9	5.5		2
4	X			14	5:9	5.5	4	
25			X	15	4:5	25		7
28			X	16	4:3	28		1
22		X		17	5:0	16		5
14	X			18	4:2	29	2	
16		X		19	5:6	10.5		
27		X		20	5:10	4		
13		X		21	4:5	25		6
6		X		22	4:11	18.5	12	
8		X		23	4:2	30		
11			X	24	6:0	2		3
23			X	25	5:8	8	10	
21			X	26	4:8	23		9
2			X	27	4:4	27		
20			X	28	5:0	16	16	
12		X		29	5:5	12		4
17			X	30	5:0	16		8

criteria in ranking the drawings.

A study of the ranks of the drawings also shows that the highest ranks are assigned to the C group and the lowest to the N group, with the E group distributed in between. The absence of any statistically significant correlation between the ranks of the drawings and the ages and I.Q. scores of the children suggests that these factors may not significantly affect those aspects of the drawings on which the judges based their evaluation.

Summary of Specific Findings

Differences Among the Three Groups of Drawings

1. The drawings in the C group were rated significantly more positively than the other two groups (E and N) on the rating scales measuring proportion, precision, completeness, pleasantness, organization, and freedom from distortion, perseveration and fracturing.

2. The drawings by the E group were rated significantly more positively than the N group on the scales measuring proportion and sophistication. On the latter scale, the C group was also rated significantly more positively than the N group.

3. By means of a factor analysis of the scores on the rating scales, five factors were extracted, which were labeled Primitiveness, Expansiveness, Angularity, Wholesomeness, and Vagueness. Nine of the characteristics measured by the rating scales loaded very heavily upon the

factor of Wholesomeness, which had a high negative correlation with the factors of Primitiveness and Vagueness.

4. The judges were able to identify correctly the category to which the drawings belonged (C, E, or N) to a statistically significant degree. Highly significant differences in the difficulty of correctly identifying the drawings were found.

5. A very high correlation was found between the ranking of the drawings along a continuum from "Best" to "Worst" and the ranking according to the scores on the rating scales. On the continuum most of the C group received the highest ranks, and most of the N group received the lowest ranks, with the E group distributed in between.

6. No significant correlation was found between the ranks of the drawings and the chronological ages or the I.Q. scores of the children.

Differences Between the Two Groups of Judges

1. There were no significant differences between the ratings of the "expert" and "naive" judges on the rating scales measuring fracturing, pleasantness, angularity, organization, and complexity.

2. The ratings of the three groups of drawings by the "expert" judges were significantly more positive than those given by the "naive" judges on the scales measuring proportion, precision, completeness, sophistication, definiteness, and freedom from distortion and perseveration.

3. The "expert" judges rated the drawings of the C and E groups significantly more positively than the "naive" judges did on the scale measuring strength.

4. The "naive" judges rated the three groups of drawings significantly more positively than the "expert" judges did on the scales measuring expansiveness and freedom from inhibition.

5. The "expert" judges rated the drawings of the C and E groups significantly more positively than the "naive" judges did on the scale measuring completeness.

6. No significant difference was found between the two groups of judges in the number of correct identifications of the drawings as belonging to the C, E, or N group.

7. A highly significant correlation was found between the two groups of judges in their ranking of the drawings along a continuum from "Best" to "Worst."

CHAPTER V

CONCLUSIONS AND DISCUSSION

The results of this investigation suggest a number of conclusions regarding the human figure drawings studied, as well as the possible clinical use of a rating scale for the evaluation of drawings by children with language disorders. The specific conclusions of this study will be summarized and discussed, and some recommendations for future research will be offered.

Summary of Specific Conclusions

On the basis of the statistically significant findings presented in Chapter IV, it may be concluded that the human figure drawings by the emotionally disturbed children with language disorders and the neurologically impaired children with language disorders can be distinguished from each other and from those by the control group when the three groups of drawings are judged together. Of the 15 qualities studied, proportion and sophistication of the drawings seem to be the most distinctive features differentiating the human figure drawings by the two impaired groups, with the drawings by the emotionally disturbed children showing better proportion and greater sophistication than

those by the neurologically impaired children. It is noteworthy that the drawings by the emotionally disturbed group are almost as sophisticated as those by the unimpaired children.

A number of other qualities, while they do not differentiate between the drawings done by the two impaired groups, clearly distinguish these drawings from those done by the control group. The drawings by the children with emotional disturbances or neurological impairments and language disorders show greater disproportion, vagueness, incompleteness, unpleasantness, disorganization, distortion, perseveration, and fracturing. In addition, the drawings by the neurologically impaired children show far less sophistication than those by the unimpaired children.

These distinctive features of the children's human figure drawings can be reduced by factor analysis to the factors of Wholesomeness, Primitiveness, and Vagueness. The factor of Wholesomeness characterizes the drawings by the control group, with an absence of the factors of Primitiveness and Vagueness. The drawings by the emotionally disturbed children are characterized by the factor of Vagueness, with an absence of the factors of Wholesomeness and Primitiveness. The drawings by the neurologically impaired children are characterized by the factors of Primitiveness and Vagueness, with an absence of the factor of Wholesomeness. Although the factors of Expansiveness and Angularity are also present, they do not significantly differentiate the three groups of drawings.

The results of this study indicate that the three groups of drawings can also be distinguished on the basis of a global view of each drawing. Although some of the drawings are more difficult to identify as belonging in the control group, the emotionally disturbed group, or the neurologically impaired group, the drawings can be correctly identified to a statistically significant degree without the use of any specific evaluating technique.

The validity of a global, qualitative evaluation of the drawings is further demonstrated by the exceptionally high correlation between the ranks of the drawings on a continuum from "Best" to "Worst" and their ranks on the basis of a quantitative scoring using 15 rating scales. In general, the drawings by the control group are most positively evaluated, those by the neurologically impaired group are most negatively evaluated, and those by the emotionally disturbed group lie between these extremes but closer to the negative pole.

No significant correlations were found between the ranks of the drawings and the chronological ages or the I.Q. scores of the children. This finding must be interpreted in the light of the limitations of the present study, particularly the limited sensitivity of the instruments and statistical procedures employed. The lack of correlation may indicate, however, that the factors of chronological age and I.Q. score do not significantly affect those aspects of the drawings which are the basis for the judges' evaluations.

Consistent agreement is evident in the evaluations of the drawings by "expert" and "naive" judges, and indicates that, in general, additional experience in dealing with children's human figure drawings does not seem to affect the evaluation. The two groups of judges do not differ significantly in the number of drawings correctly identified as belonging in the control group, the emotionally disturbed group, or the neurologically impaired group. In addition, the high correlation between the two groups of judges in their ranking of the drawings on a continuum from "Best" to "Worst" suggests that all the judges are using essentially the same criteria as a basis for their judgments.

On a number of the rating scales there are significant differences in the ratings by the two groups of judges, but the ratings by the "expert" judges are usually more positive than those by the "naive" judges. The only inconsistencies occur on the scales measuring expansiveness and freedom from inhibition, where the ratings by the "naive" judges are more positive than those by the "expert" judges. However, since these two scales do not differentiate the three groups of drawings, the inconsistencies are not of great importance in the present study.

The results of this investigation suggest that the characteristics which distinguish the human figure drawings by young language impaired children with emotional disturbance or neurological impairment as the major causative factor can be recognized equally well by "expert" and "naive"

observers. The findings also indicate that a global, qualitative judgment results in an accurate identification of the drawing as that of an unimpaired child, an emotionally disturbed child, or a neurologically impaired child. Evaluations of the drawings based on such a global view are almost identical with those based on ratings of particular qualities of the drawings.

Discussion

The conclusions of this study suggest that a rating scale for the evaluation of children's human figure drawings might be a useful clinical tool, providing objective criteria for identifying the drawings of language impaired children with emotional disturbances or neurological impairments. Six of the rating scales studied in the present investigation are selected as suitable for such a clinical tool. These are:

Sophisticated--Naive
Well-proportioned--Disproportioned
Organized--Disorganized
Pleasant--Unpleasant
Precise--Vague
Unfractured--Fractured

The six scales selected meet one or more of the following criteria:

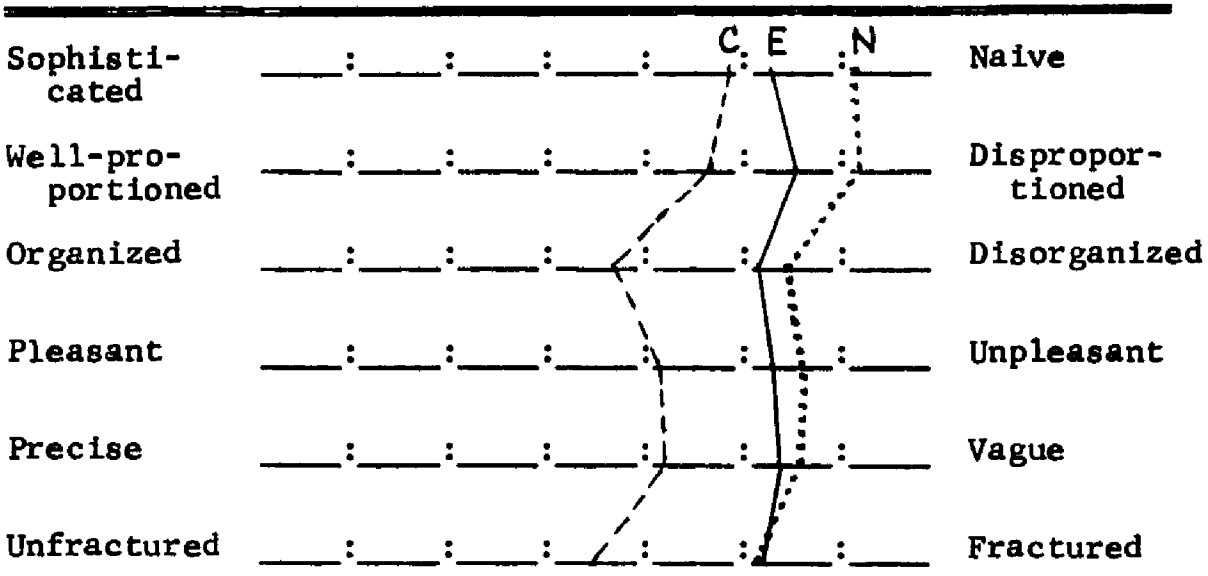
1) Significant differentiation between the drawings by the emotionally disturbed group and the neurologically impaired group. ("Sophisticated--Naive" and "Well-proportioned--Disproportioned")

2) Inclusion of scales identifying the factors of Wholesomeness, Primitiveness, and Vagueness which differentiate the three groups of drawings. (All of the scales)

3) Agreement between the two groups of judges. ("Organized--Disorganized," "Pleasant--Unpleasant," and "Fractured--Unfractured")

Figure 5.1 shows the profiles based on the composite scores of each of the three groups of drawings on the selected scales. These profiles graphically depict the

Figure 5.1.--Profiles of the Composite Scores of the Drawings by the Control Group, the Emotionally Disturbed Group, and the Neurologically Impaired Group on Selected Rating Scales



consistently significant differences between the scores of the control group and those of the neurologically impaired group. The profile of the emotionally disturbed group moves from a point close to the control group on the "Sophisticated--

Naive" scale to a point slightly below the neurologically impaired group on the "Unfractured--Fractured" scale.

The proposed rating scale, providing for the identification of the characteristic qualities of the three groups of drawings, seems to bridge the wide gap between the two viewpoints discussed in Chapter II. At one extreme, the rigidity of the Goodenough-Harris method of scoring specific details of content seems to omit the significant qualitative differences in the drawings, while at the other extreme, the projective interpretation of the drawings seems to be highly subjective, requiring specialized training and broad experience on the part of the examiner. In the present study, objective evidence has been provided to support some of the clinical observations reported by other investigators. Throughout this study, the children's human figure drawings were evaluated from a global and qualitative point of view. Even in using the rating scales, the judges were examining particular qualities of the drawing as a whole, rather than estimating quantitatively the specific details included in the drawing. However, these qualitative judgments were quantified through the use of the rating scales in order that the data might be statistically treated. The six-item rating scale based on these data is proposed as a guide for identifying the qualities which seem to characterize the human figure drawings by young language impaired children who have emotional disturbances or neurological impairments as the major causative factor.

Of the 15 rating scales used in this study, only two scales, those measuring proportion and sophistication, significantly differentiate the drawings by the emotionally disturbed children from those by the neurologically impaired children. It is possible that some of the other scales would also have shown significant differences if the children in the two groups had been more severely impaired.

The presence of a single, all-pervasive quality as the basis for the judges' evaluations of the drawings is strongly suggested by the results of this study. In the factor analysis, nine of the variables measured by the rating scales loaded heavily upon the factor labeled Wholesomeness. The other two factors which significantly differentiated the three groups of drawings (Primitiveness and Vagueness) show highly significant negative correlations with the factor of Wholesomeness. Therefore the drawings may be evaluated solely on the basis of the presence or absence of the factor of Wholesomeness. The very high correlation between the judges' ranking of the drawings on a continuum from "Best" to 'Worst" and the ranks of the drawings based on the rating scale scores indicates the close relationship between the single global judgment made in ranking the drawings and the more specific qualitative judgments made in rating the drawings on the 15 scales. It seems likely that the two types of evaluation are based on the same criterion, which may be the presence or absence

of the factor of Wholesomeness. In addition, the very high correlation among the judges' ranking of the drawings on a continuum suggests that all of the judges are using the same criterion in evaluating the drawings. It seems probable that this criterion may be represented by the factor of Wholesomeness.

The only significant difference found between the evaluations by the "expert" and the "naive" judges was that the "expert" judges gave more positive ratings on some of the rating scales. This may indicate that the "expert" judges were more realistic in their expectations as a result of a more extensive acquaintance with children's human figure drawings. The consistent agreement between the two groups of judges may indicate that the two groups were really homogeneous, and that the criteria used in selecting them did not differentiate the "expert" judges from the "naive" judges. However, the consistent tendency of the "expert" judges to rate the drawings more positively than the "naive" judges did, suggests that the two groups are distinctive, but that the differences between the two groups do not affect the global evaluations involved in the sorting and ranking tasks.

On the basis of the objective evidence that certain qualitative differences in children's human figure drawings can be identified, it is proposed that these drawings be more extensively used as one part of the evaluation of children with language disorders. The results of the present

study are particularly relevant to the observations of Di Leo (1970) and Kastein (1964, 1966) summarized in Chapter I. With the help of the proposed six-item rating scale, the examiner should be able to identify the distinguishing characteristics of the child's drawing and thereby recognize the message which the child is communicating about himself through the drawing. In addition, following the opinions of both Di Leo and Kastein that the child's drawings reflect the changes effected by therapy, human figure drawings may be periodically elicited and rated as one means of assessing a child's progress. The findings of the present investigation and the proposed rating scale provide the basis for a more extensive use of human figure drawings in the diagnostic evaluation and the treatment of young language impaired children.

Recommendations for Future Research

The proposed six-item rating scale for the evaluation of children's human figure drawings should be further studied and evaluated as a clinical tool. In particular, the validity and reliability of the scale should be established, using drawings by children of various ages and with various types and degrees of impairment. Comparisons might also be made between judges' ratings using the six-item scale and the fifteen-item scale for evaluating children's human figure drawings. A further comparison of such ratings with the ratings of the drawings on the Goodenough-Harris scale,

and with the ratings of the same children's Bender-Gestalt figures might provide useful information.

The clinical observation that children's human figure drawings improve in the course of therapy and the relationship between this improvement and the observed changes in language warrant further study to obtain the support of empirical evidence. The proposed six-item rating scale might provide an effective means of more objectively evaluating series of drawings in such investigations.

This rating scale might also be used to study the differences between the drawing of the head and the drawing of the rest of the body in children's human figure drawings. Clinical observation suggests that the emotionally disturbed child's drawing may combine a very distorted body with a relatively well-drawn head, or vice versa, whereas the neurologically impaired child's drawing may not show this inconsistency.

The results of this study suggest possibilities for the further investigation of the judges' ratings of the drawings under different conditions. In the present study, the judges ranked the drawings on a continuum from "Best" to "Worst" after they had rated the drawings on 15 scales. There might be a difference in the ranking if the judges performed this task without first directing their attention to particular characteristics of the drawings.

It might also be of interest to study the judges' evaluation of the drawings on the basis of the one quality

of "wholesomeness" described in terms of the characteristics comprising it: proportion, organization, pleasantness, precision, and the absence of perseveration, distortion, and fracturing. This type of evaluation might also be compared with the judges' ratings on the proposed six-item scale.

In the present study the judges were asked to identify each drawing as that of an emotionally disturbed, a neurologically impaired, or a normal child. It might be helpful to investigate the judges' ability to correctly identify the drawings after a preliminary explanation of the characteristics found in the present study to be typical of each group.

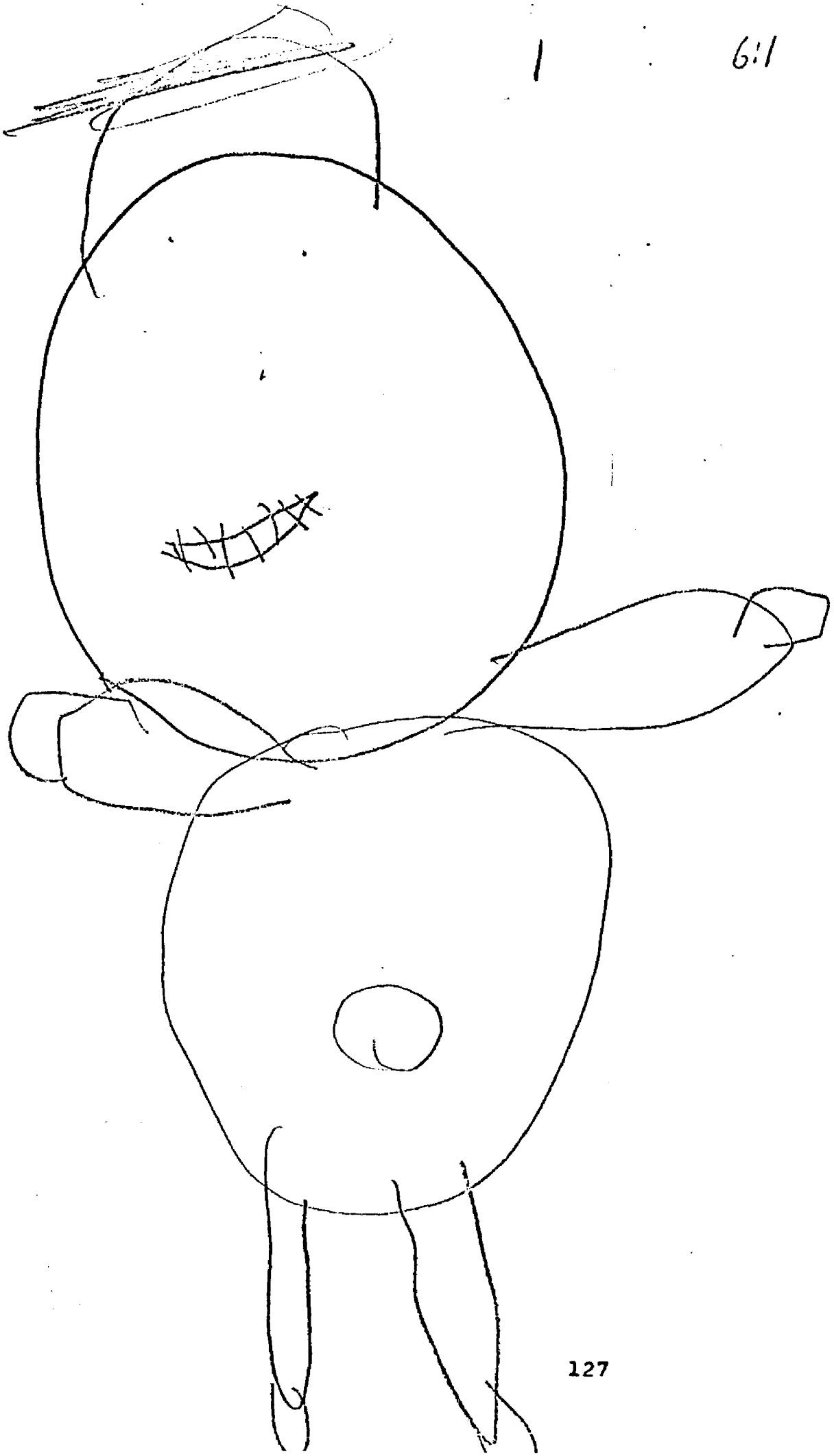
In addition to such further investigation of the judges' ratings of children's human figure drawings under different conditions, studies of the drawings of different populations might be undertaken, using the proposed rating scale. The drawings of emotionally disturbed or neurologically impaired children who have no language disorders might be compared with those of language impaired children who have emotional disturbances or neurological impairments as the major causative factor.

It is hoped that the results of the present investigation may not only stimulate further research on the human figure drawings of language impaired children, but also contribute to the usefulness of the human figure drawing as

an additional source of information in the diagnostic evaluation of such children, as well as in the assessment of their progress.

APPENDIX I

THIRTY HUMAN FIGURE DRAWINGS USED IN THIS STUDY



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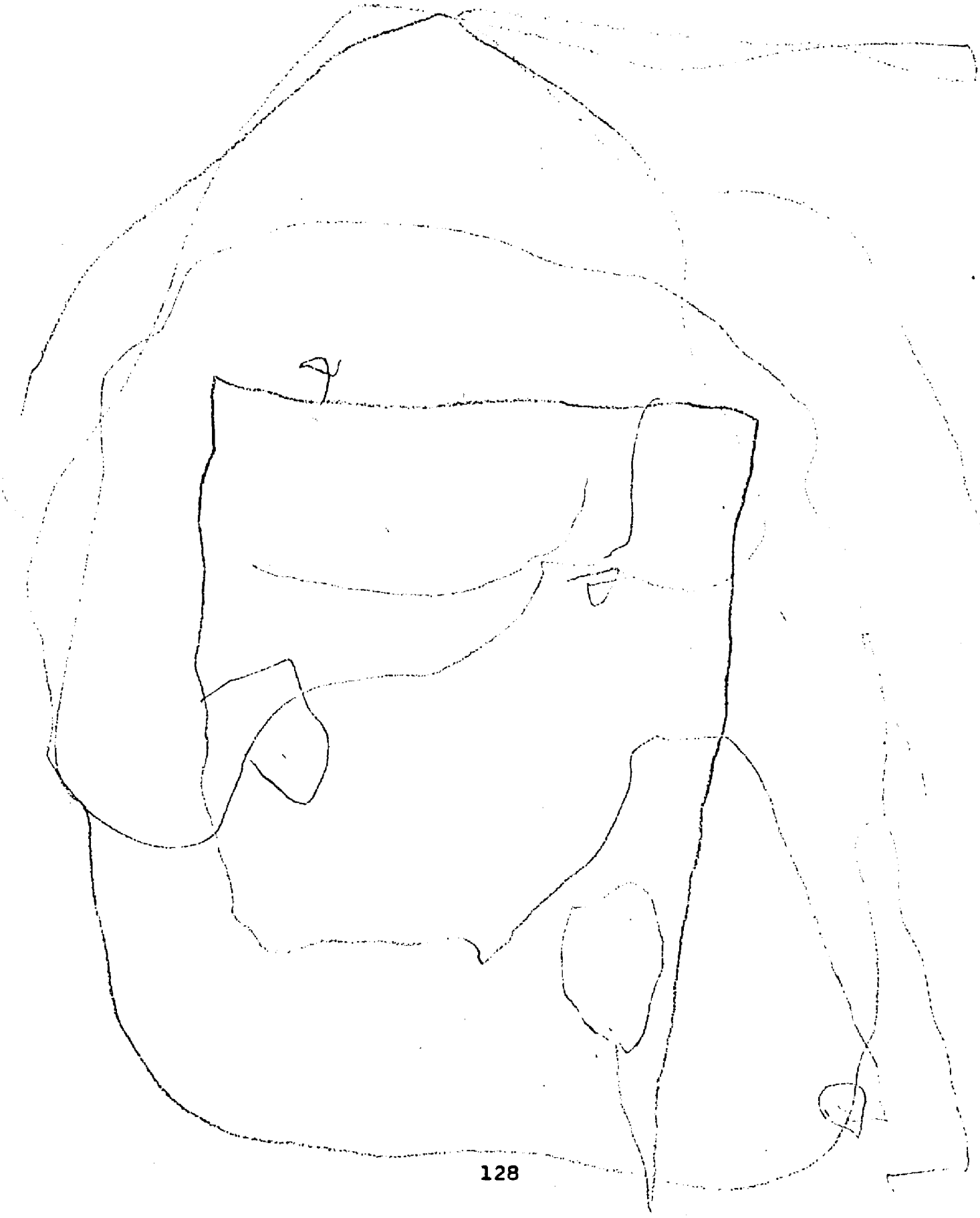

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5

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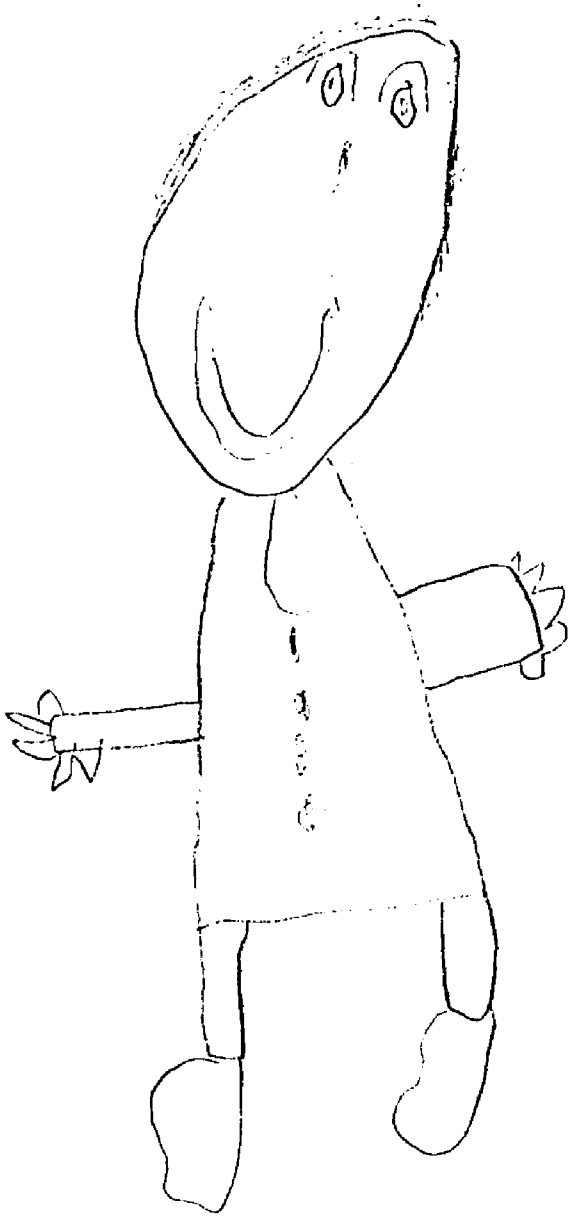

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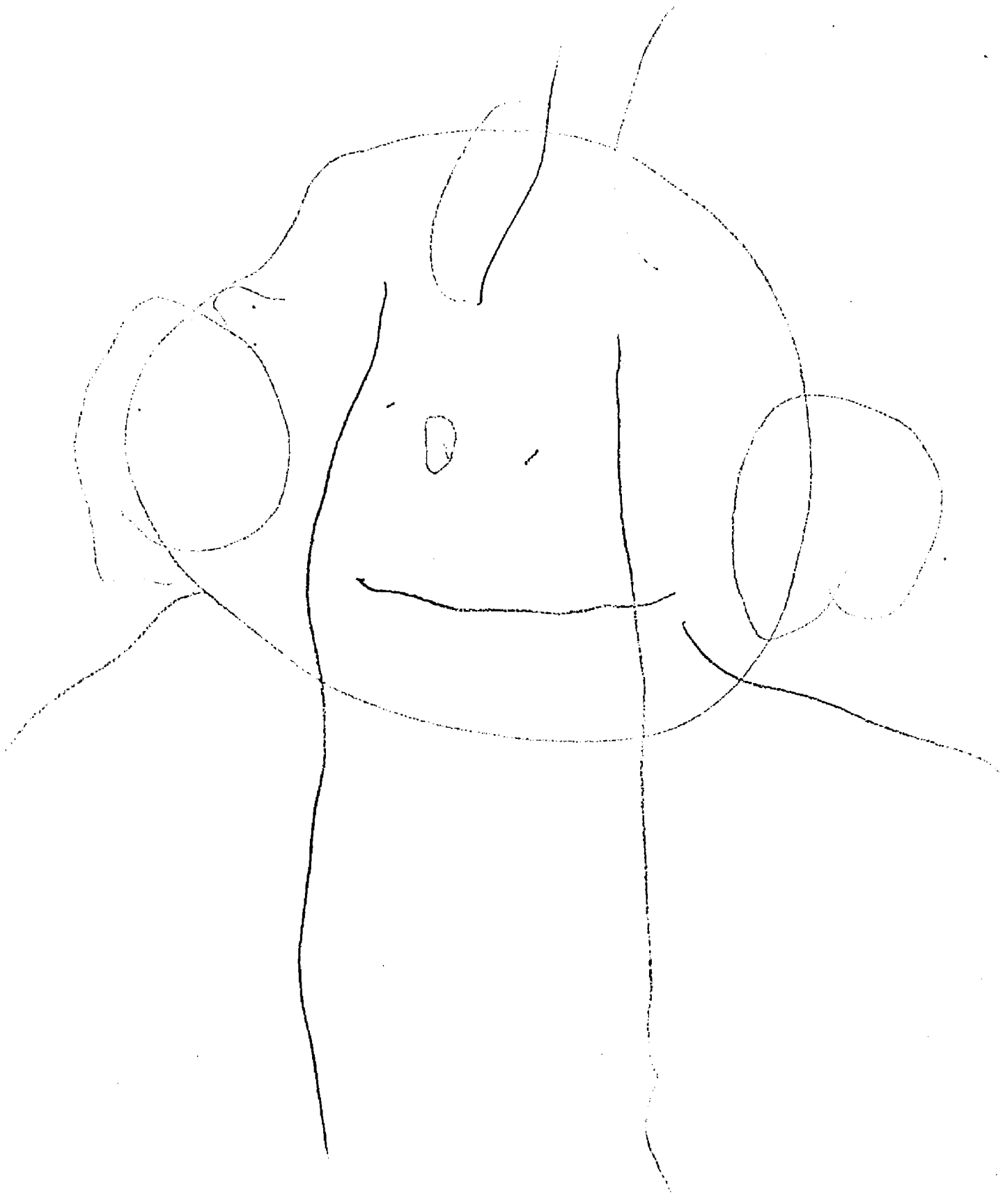

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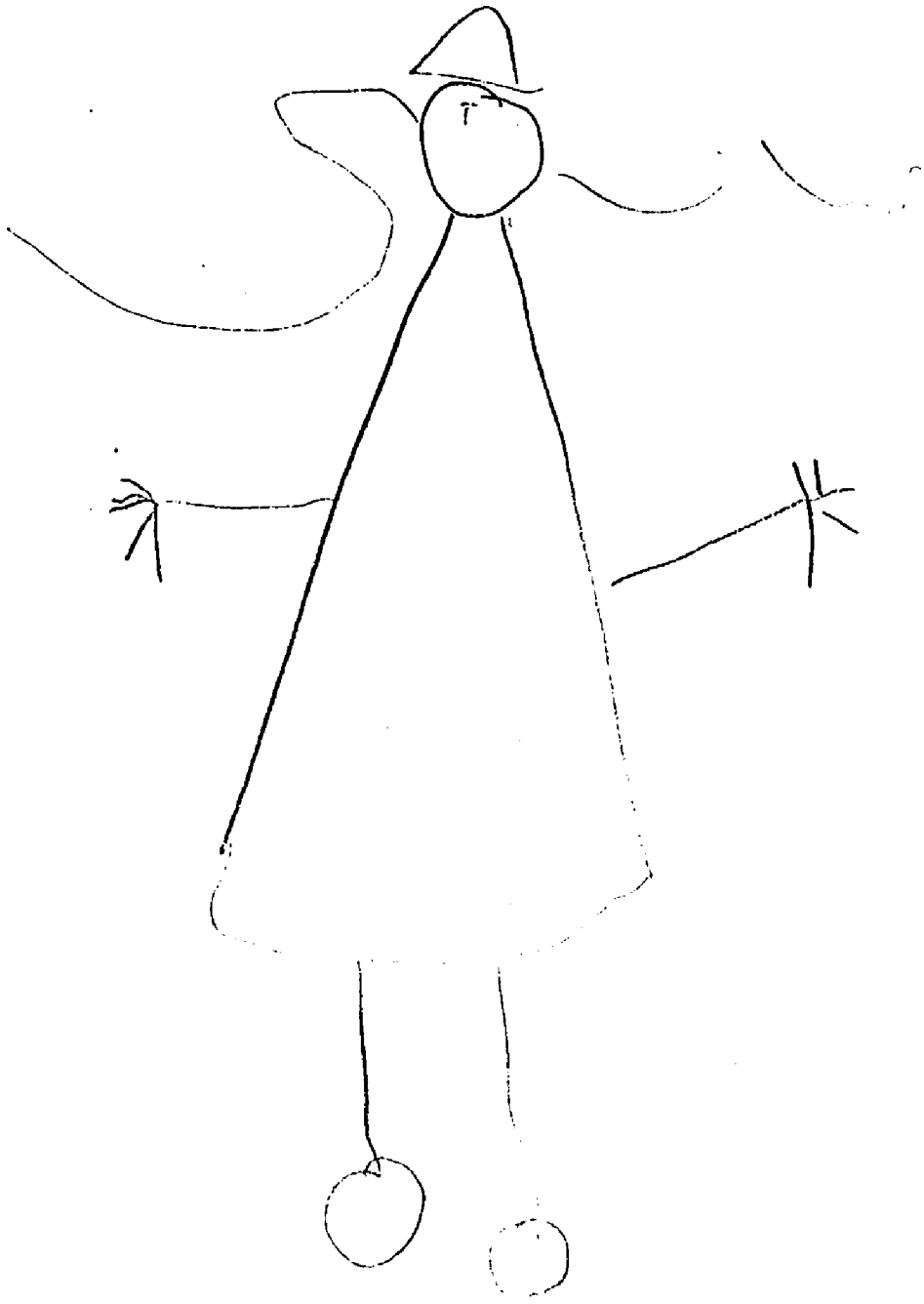

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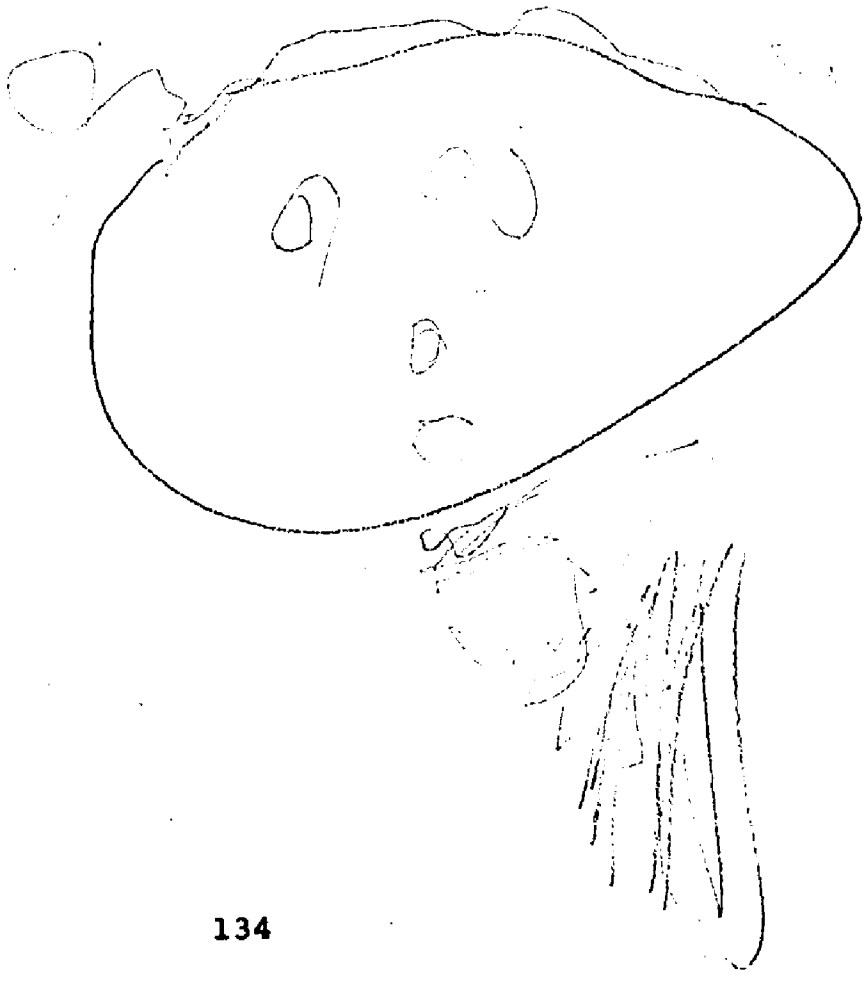

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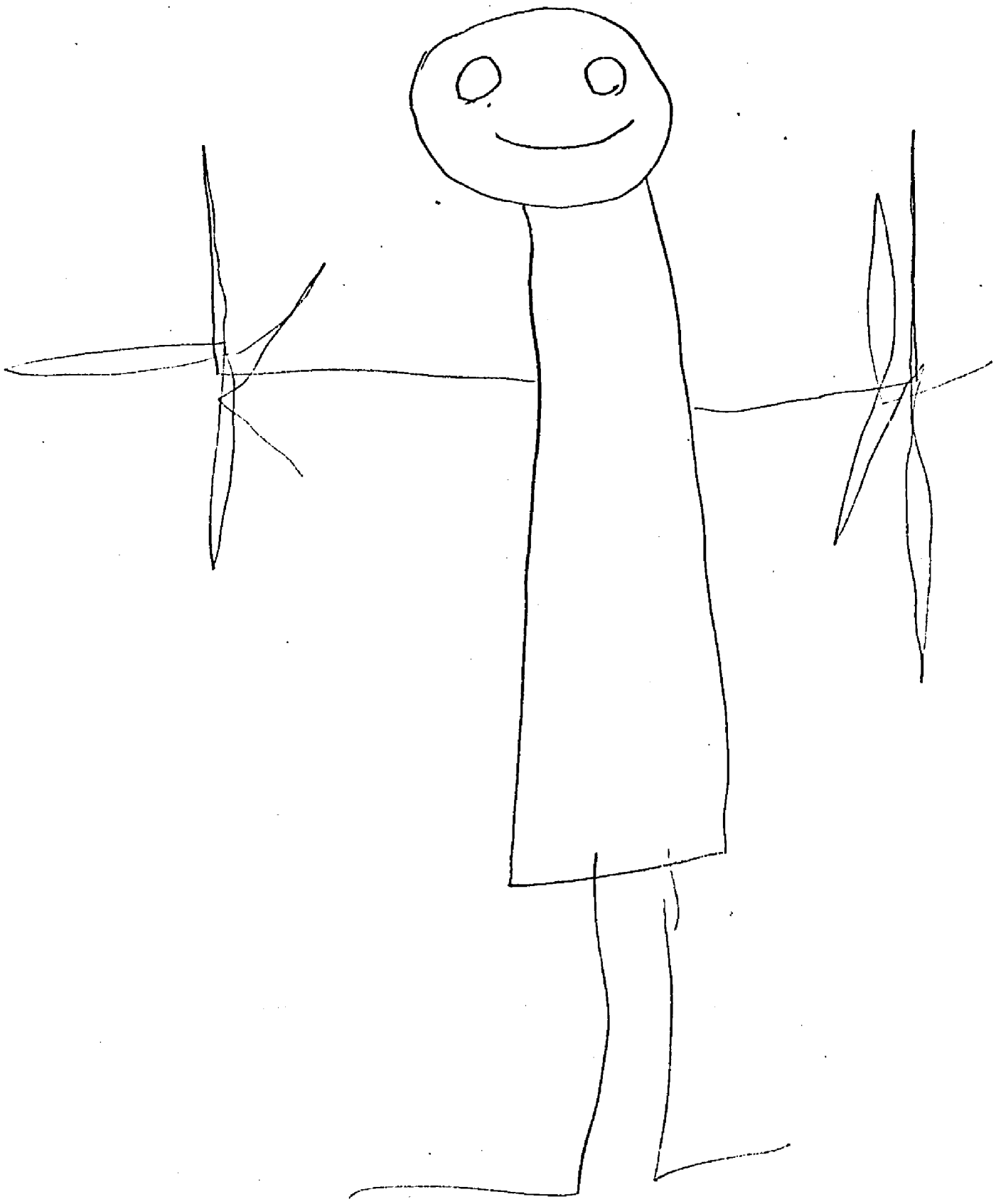

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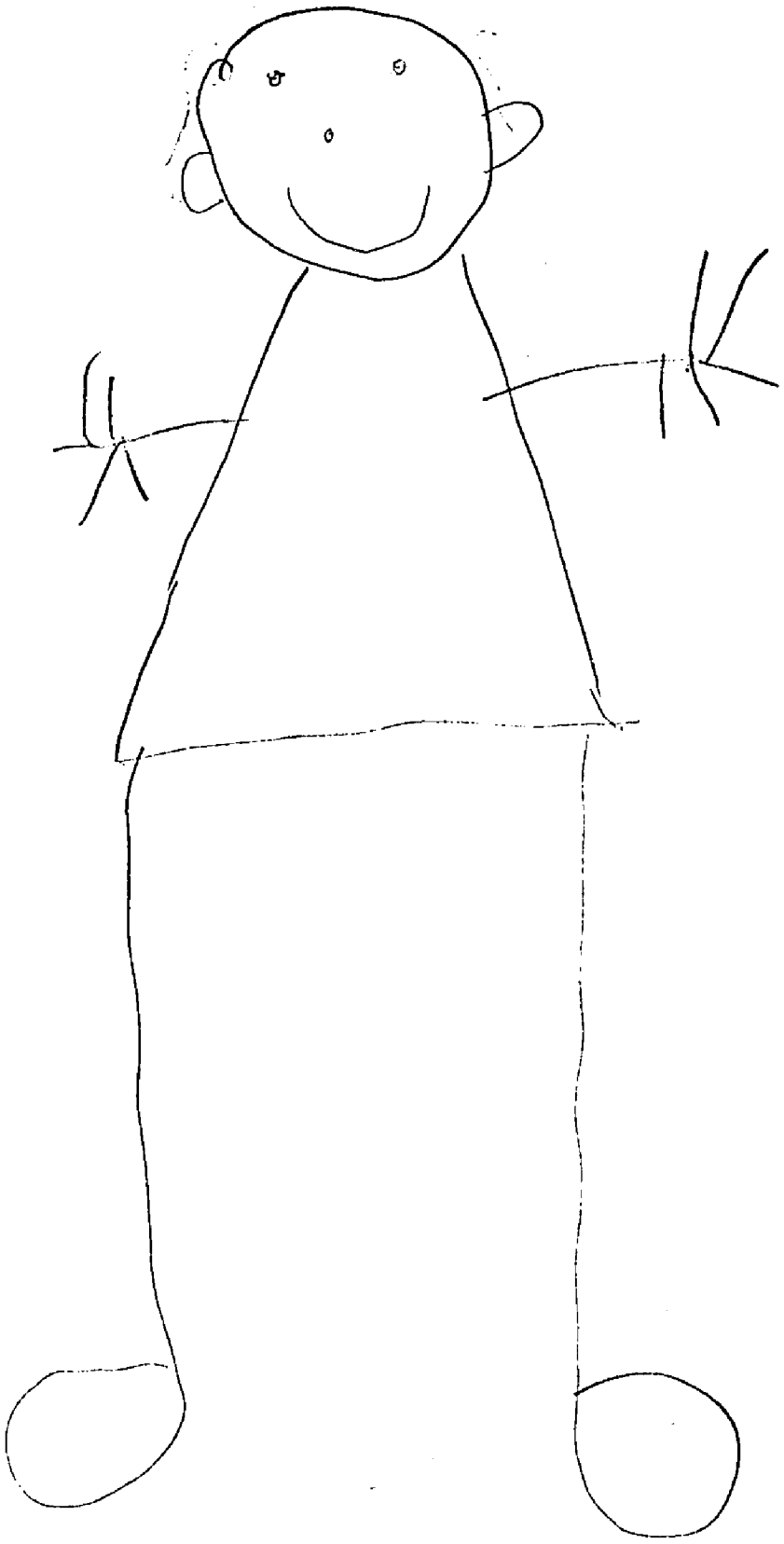

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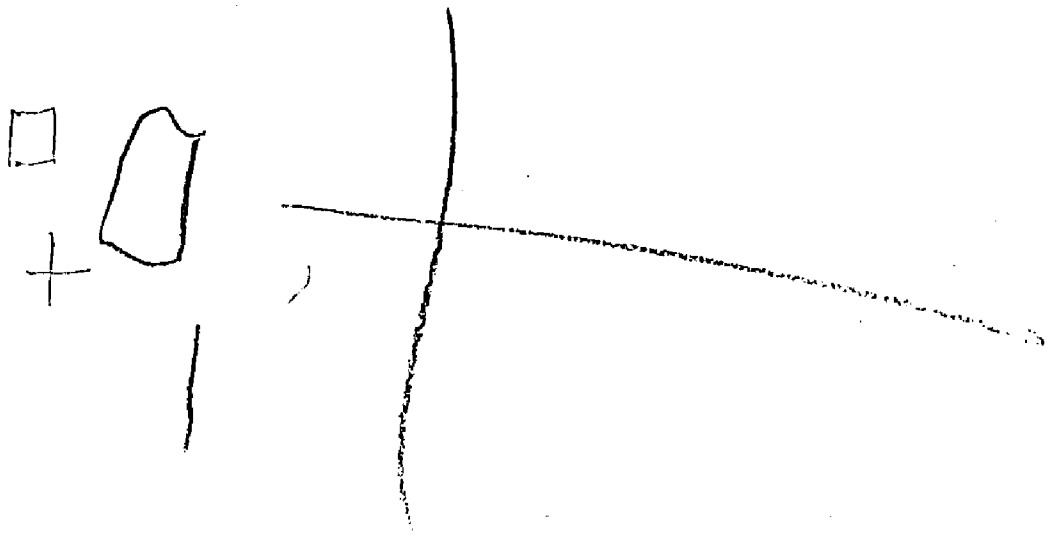

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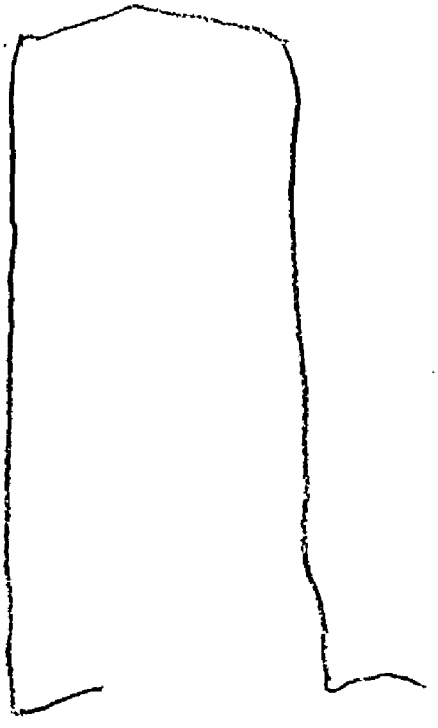

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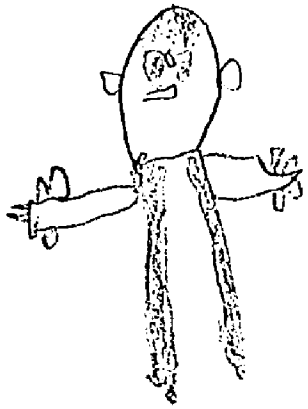

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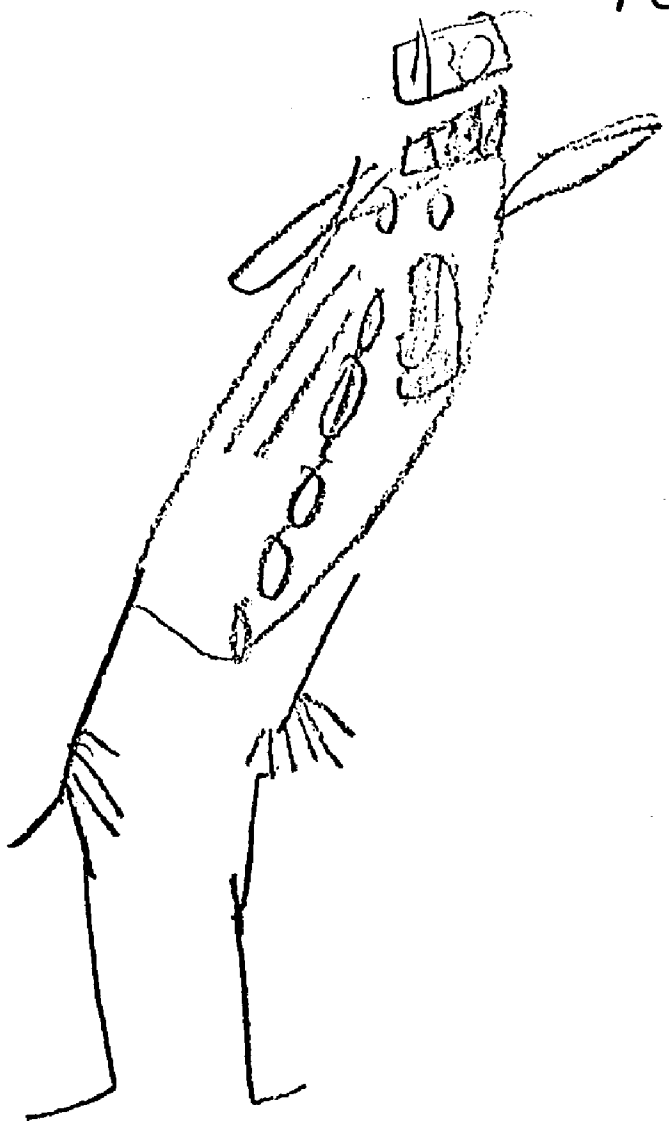

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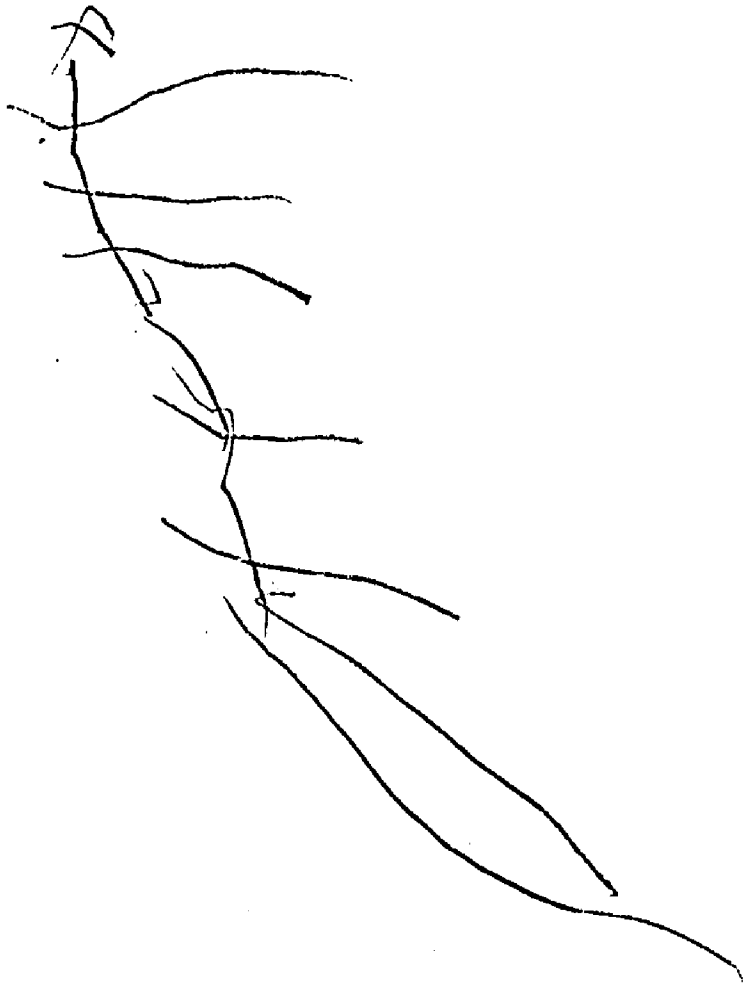

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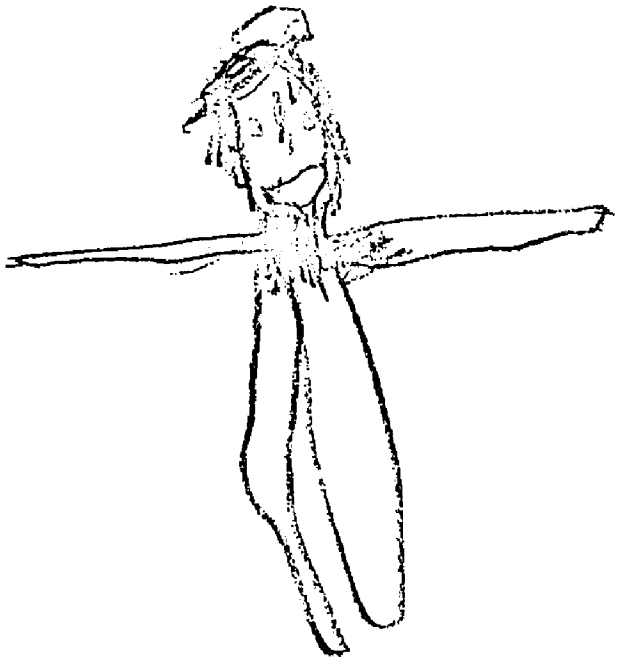

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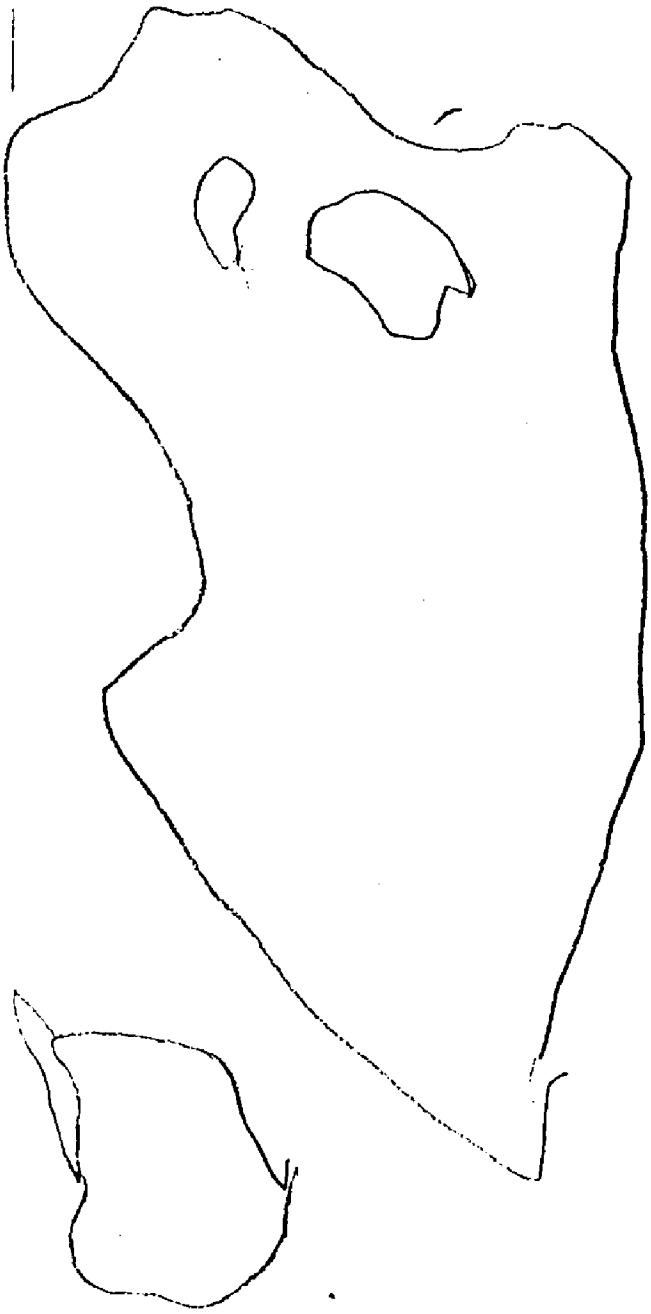

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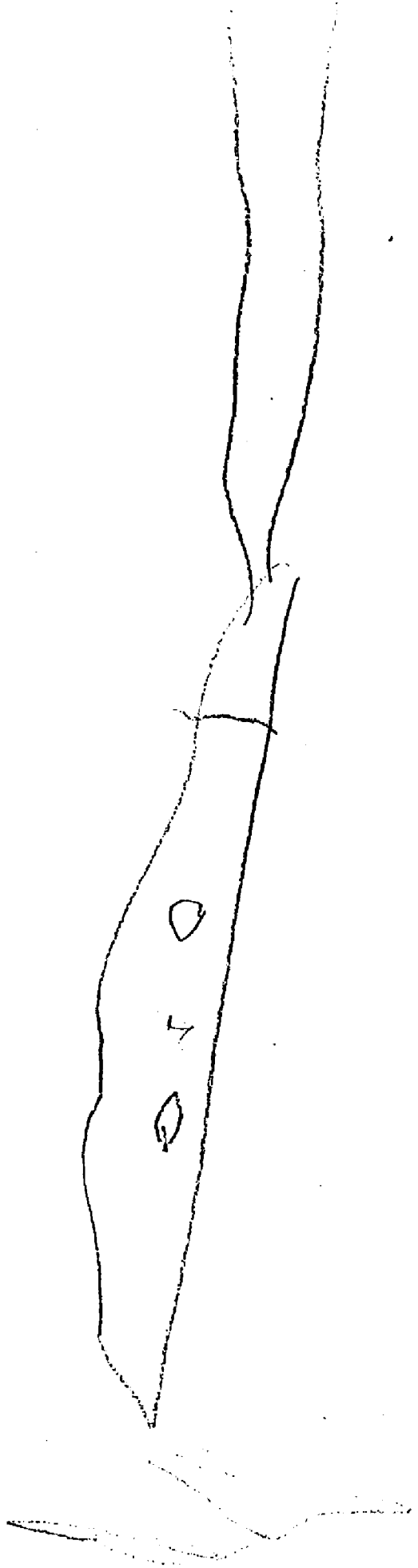

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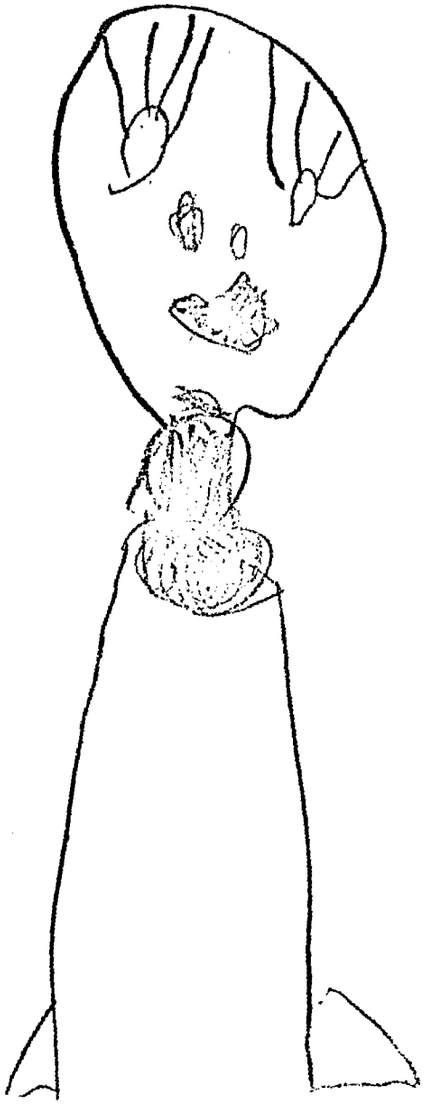

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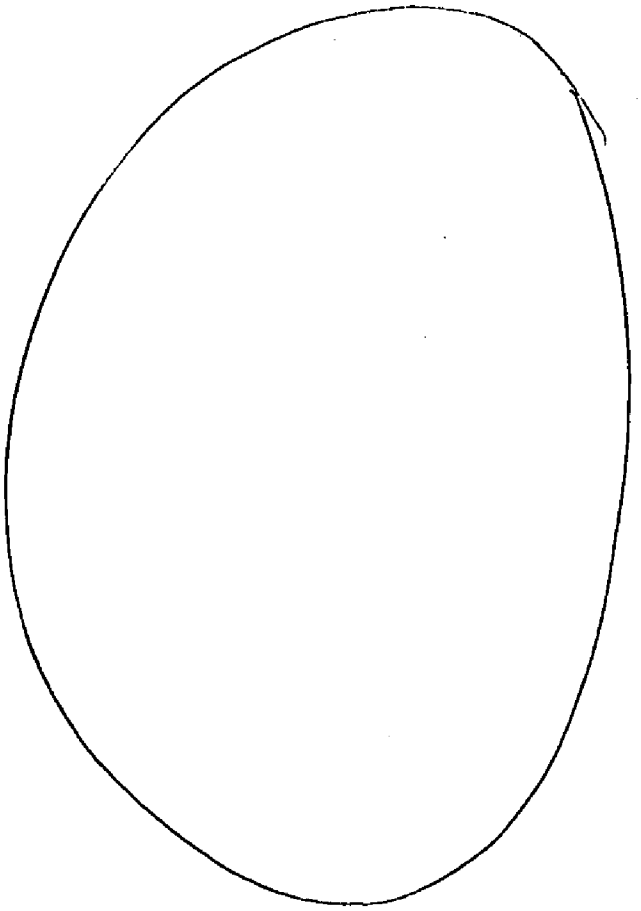

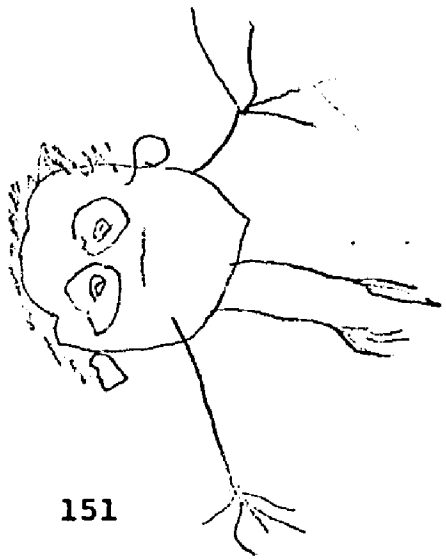

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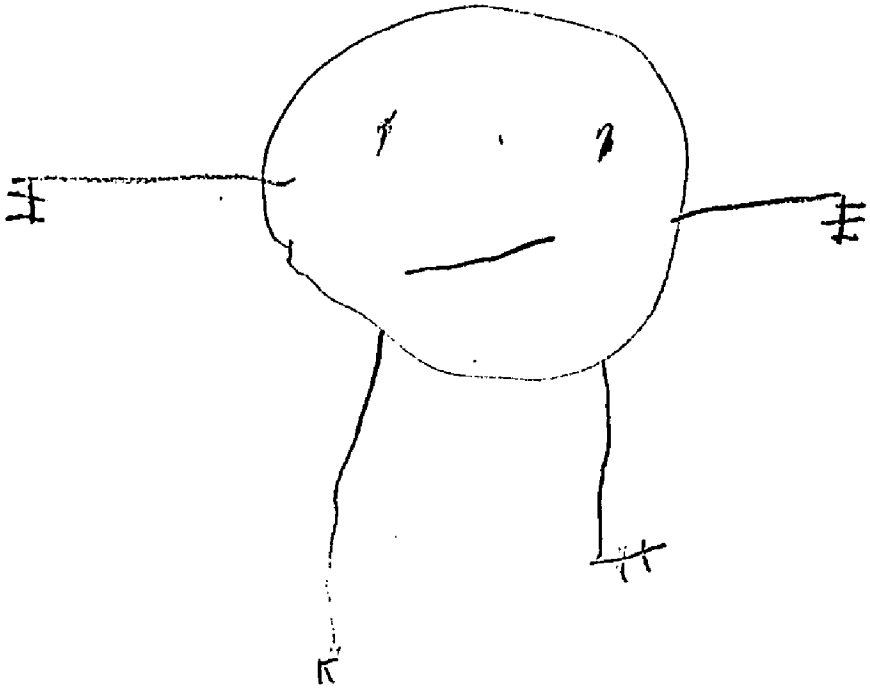

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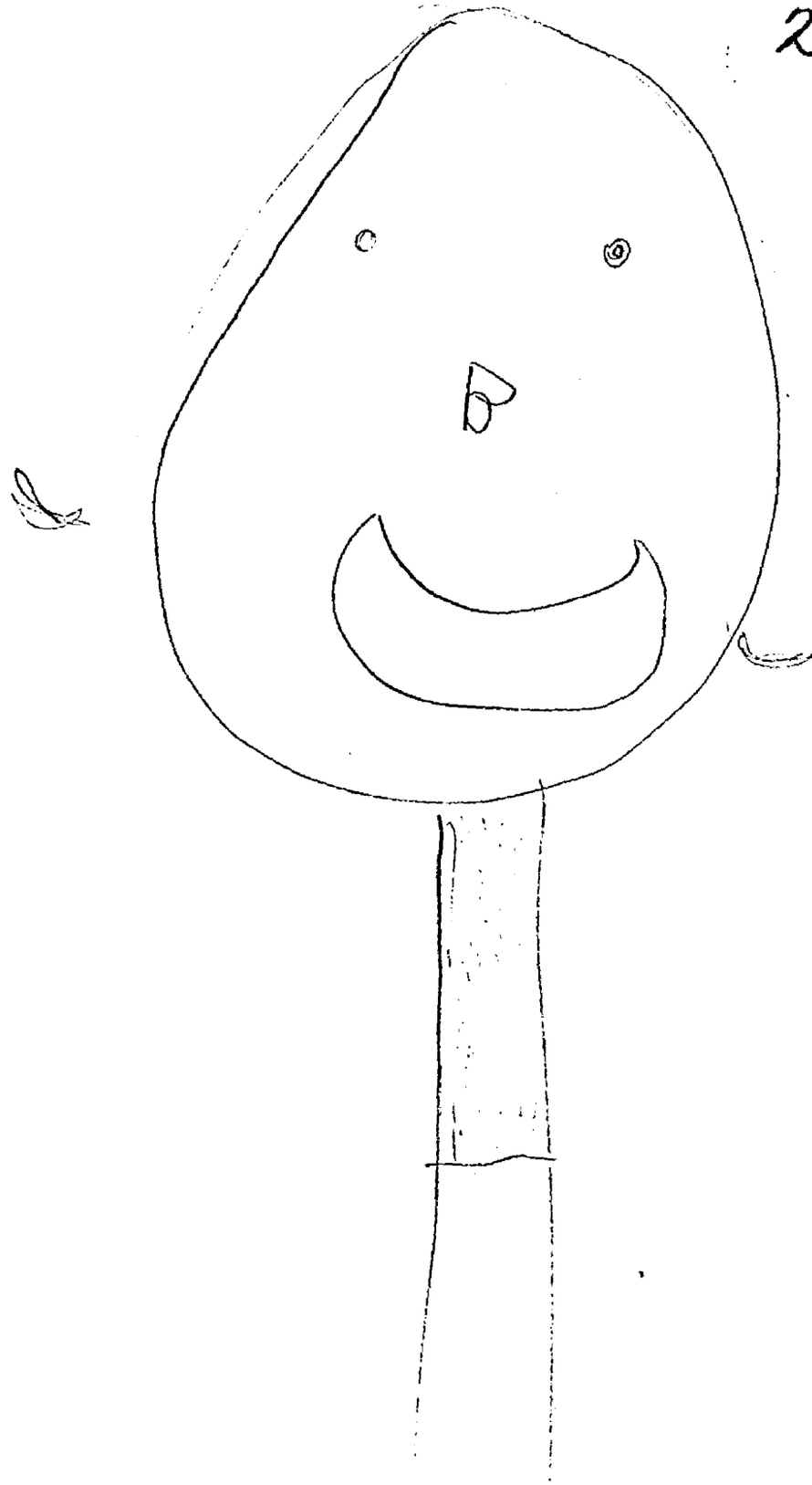

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APPENDIX II

EVALUATION FORM USED BY TEACHER

Please rate each child's general achievement and behavior. Check one estimate for each child.

Children	General Estimate				
	Superior	Above Average	Average	Below Average	Inferior

APPENDIX III

HEALTH QUESTIONNAIRE

Child's name_____ Date of birth_____

1. Did you have any illnesses, surgery, or injuries during this pregnancy?

	Approximate dates	Treatment received
_____	_____	_____
_____	_____	_____

2. How much did your child weigh at birth? _____

3. Was there any complication during or after the birth of this child? _____

4. At what age did your child begin to walk alone? _____

5. When did your child begin to say single words? _____
   Two word phrases? _____

6. What illnesses has your child had?

	Approximate age of child
_____	_____
_____	_____
_____	_____

7. Has your child had any surgery?

Type of operation	Approximate age of child
_____	_____
_____	_____

8. Did your child ever have a convulsion? _____
   At what age? _____

9. Has your child had any serious injuries?

Type of injury	Approximate age of child
_____	_____
_____	_____

10. Has your child ever been hospitalized?

Reason for hospitalization	Length of time	Age of child
_____	_____	_____

Mother's Signature:_____

APPENDIX IV

INSTRUCTIONS TO JUDGES

Instructions to Judges for Use of Rating Scale

The purpose of this study is to determine your impressions of a collection of human figure drawings made by children aged 4 years, 2 months to 6 years, 1 month. As you look at each drawing, please rate it on each of the scales presented, keeping in mind the age of the child who made the drawing.

The middle space on the scale represents an "average" or "neutral" position; the other spaces represent the various degrees to which the particular quality is evident to you in the drawing.

For example: If you feel that the drawing is of average size for the child's age, mark the scale in the middle space:

Large ____:____:____:__X__:____:____:____ Small

If you feel that the characteristic listed is extremely manifested in the drawing, mark the scale as follows:

Large __X__:____:____:____:____:____:____ Small

or

Large ____:____:____:____:____:____:__X__ Small

If you feel that the characteristic is quite evident in the drawing, mark the scale as follows:

Large ____:__X__:____:____:____:____:____ Small

or

Large ____:____:____:____:____:__X__:____ Small

If you feel that the characteristic is manifested in the drawing slightly more than average, mark the scale as follows:

Large ____:____:__X__:____:____:____:____ Small

or

Large ____:____:____:____:__X__:____:____ Small

Please mark in the middle of the space, not on the boundaries. Mark the scales in order, omitting none and putting only one mark on each scale. Please try to make each rating an independent judgment.

Instructions to Judges for the Sorting Task

This collection of drawings consists of three groups:

1) those made by children diagnosed as emotionally disturbed;
2) those made by children diagnosed as neurologically impaired; and
3) those made by normal children.

All of the children in this study were rated at least "average" on intelligence tests.

Please sort the drawings into the three groups listed above, keeping in mind the ages of the children.

Instructions to Judges for the Ranking Task

Please arrange the drawings along a continuum from "Best" to "Worst," keeping in mind the ages of the children.

Composite Scores of Drawings Derived from Judges' Ratings of Fifteen Characteristics

Scales	Control			Emotionally Disturbed			Neurologically Impaired		
	Expert Judges	Naive Judges	Total	Expert Judges	Naive Judges	Total	Expert Judges	Naive Judges	Total
Well-proportioned-Disproportioned	182	154	336	140	112	252	97	94	191
Undistorted-Distorted	191	171	362	139	120	259	112	100	212
Precise-Vague	202	183	385	136	131	267	125	116	241
Complete-Incomplete	177	150	327	139	103	242	94	87	181
Sophisticated-Naive	168	143	311	147	129	276	104	90	194
Strong-Weak	195	173	368	169	149	318	136	144	280
Non-perseverative-Perseverative	253	227	480	189	167	356	166	161	327
Unfractured-Fractured	246	210	456	143	145	288	140	153	293
Rounded-Angular	201	191	392	204	188	392	188	193	381
Pleasant-Unpleasant	192	202	394	147	126	273	131	111	242
Organized-Disorganized	218	214	432	156	141	297	129	130	259
Expansive-Constricted	188	201	389	154	184	338	170	215	385
Well-defined-Poorly defined	209	172	381	158	144	302	131	116	247
Uninhibited-Inhibited	194	198	392	161	184	345	183	192	375
Complex-Simple	145	148	293	149	155	304	106	112	218

APPENDIX VI

Ranking of the Thirty Drawings by the Ten Judges Along a Continuum from "Best" to "Worst"

Judges	Code Numbers of Drawings														
Expert	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	8	27	9	20	1	23	2	24	18	5	26	22	21	11	12
B	2	28	12	19	1	14	13	22	7	5	21	29	24	10	15
C	10	24	8	14	1	21	17	15	4	3	30	28	22	7	9
D	18	26	5	15	2	9	14	19	7	4	28	27	22	12	6
E	8	28	2	18	1	20	9	22	6	7	23	27	24	21	19
Naive															
F	3	30	9	13	1	23	10	24	11	2	25	28	17	22	14
G	5	27	6	14	1	23	8	22	4	2	16	30	12	24	9
H	20	25	4	9	1	23	13	18	3	2	21	30	12	22	5
I	13	30	10	15	1	21	4	22	3	6	24	29	23	19	12
J	6	25	18	4	2	26	5	17	7	3	29	30	19	15	12
Expert	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A	19	28	10	15	29	30	16	25	17	7	6	14	13	4	3
B	23	30	11	20	26	25	18	27	4	17	9	16	8	3	6
C	23	27	11	16	26	25	19	29	18	12	13	20	6	2	5
D	23	30	3	17	29	25	20	24	8	16	11	21	13	1	10
E	17	30	13	5	26	29	11	25	16	15	14	10	12	3	4
Naive															
F	16	27	6	5	29	26	7	15	12	19	21	18	20	4	8
G	7	29	11	10	28	26	17	25	13	18	20	19	21	3	15
H	6	29	7	14	28	26	15	27	19	11	16	24	17	8	10
I	14	28	8	5	27	25	16	26	17	11	9	18	20	2	7
J	22	27	8	9	28	20	23	21	10	16	13	14	24	1	11

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