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Exploring Tactile Media with Blind and Visually Impaired Women

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EXPLORING TACTILE MEDIA WITH BLIND
AND VISUALLY IMPAIRED WOMEN;
A COMPARISON STUDY OF CLAY
AND RAISED LINE PAPER

A Culminating Project
Presented to
the Faculty of the Graduate School
Lindenwood 4 College

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Art Therapy

by
Sherry Lynn Carrigan
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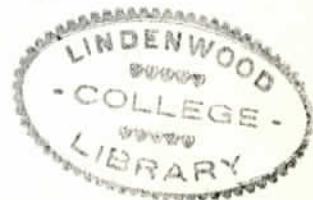


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Chapter 1

INTRODUCTION

Purpose

Enriching the lives of the blind and visually impaired has been my goal since I was hired over two and a half years ago as a leisure time specialist by a small private agency serving the blind. Upon completing forty credits towards a master's degree in art therapy I realized that I needed to expand the media which I use in my therapy groups from latch hooking, macrame, leather lacing, ceramics, and many others, to include materials which would not only foster the creative process, but which would also be suitable for use in art psychotherapeutic relationships.

The art therapy literature is replete with case studies and relevant art therapy theories and methods concerning the treatment of multitudes of problems confronting society. Many authors, (Cane, 1951; Kramer, 1971; and Ulman and Dachinger, 1975) have written concerning art activities with normal and disturbed children. Still others (Alschuler and Hattwick, 1969; Lydiatt, 1971; Naumberg, 1966; Rhyne, 1973; and Robbins and Sibley, 1976) have formulated theories concerning art relationships with normal and disturbed adults. Various media were described in detail by these authors who suggested that certain media are more appropriate for working with specific

populations. Most of the media described was of a visual nature.

Having read articles by Barr, 1970; Fukurai, 1974; Kennedy, 1980; Lisenco, 1971; Lowenfeld, 1975; Melotte and Engel, 1980; and Rubin, 1979, I identified clay and raised line paper as the tactile media which has received the most attention by professionals working with the blind. I felt that it was necessary to determine which of these two media was more appropriate when using art therapy techniques with the blind. As a means of demonstrating which media was most appropriate I presented the following hypothesis and subsequent research:

Hypothesis

When directed to model and to draw a human figure with both clay and raised line paper and pen, respectively, blind and visually impaired subjects, when using clay will produce results which have more detail and more appropriate proportion than they will when using raised line paper and pen; as judged by three art therapists using sections of the Goodenough-Harris Draw-a-Man Scale as their evaluative criteria.

Rationale for Current Procedure

The selection of the human figure as the subject matter for the art work was made primarily because it is "...by far the most popular single subject." (Harris, 1963, p. 14) Secondly, because art therapy is concerned with helping people to understand themselves I felt that the choice of the human figure was a suitable theme.

The human figures produced by the subjects were judged for details and proportion by judges who used an abbreviated Goodenough-Harris Draw-a-Man Scale. The original test has been

used primarily to evaluate the psychological development of children and adolescents, and to understand their developing concepts and ideas. It has been used in the diagnosis of behavior disorders, in determining artistic talent, in noting sex differences, in relating other tests of intelligence and in testing "sensing deviates." (Harris, 1963). In 1968 Chase and Rapaport developed an oral version of the test for use with the blind. The blind subjects describe the details which they would incorporate in a drawing of a human figure. Their descriptions are then scored on the basis of style, detail, emphasis and other characteristics. (Scholl and Schnur, 1976)

The only author mentioned by Harris to have studied the Draw-a-Man test with the blind was the art educator and psychologist, Victor Lowenfeld. (Harris, 1963) Lowenfeld found differences in methods of art expression among visually impaired children. He recognized that children produced artwork either from a visual or a haptic approach. The visually minded person learns about his environment through his eyes; the haptically oriented person relates to his world with the sense of touch, his bodily sensations and bodily feelings. In his work Lowenfeld noticed that some individuals use their sense of touch while others use their remaining vision. This observation initiated a further study of persons with no visual difficulty. Lowenfeld found that 47% of 1,128 subjects were visually oriented as opposed to 23% who classified as haptic, and 30% who were a mixture of visual and haptic. (Lowenfeld, 1975)

The blind are limited to the use of their hands in art expression, and are, therefore, haptically oriented. The visually impaired can be visual, haptic, or a combination of both visual and haptic in their artwork. For an art therapist to be most effective in working with the blind and visually impaired it is necessary to understand visual and haptic orientation in art, and also to identify goals, lessons, and materials geared to the two distinctly separate groups.

In essence, the media chosen to enhance the haptic perception must be conducive to the creative process, geared to various developmental levels and perceptual motor abilities, and to various medical problems. I speculate that an elderly, diabetic, totally blind adult will probably react differently to various media than will the young, congenitally blind, healthy adult. The variables of age, length of time blind, health, education, and so forth, complicate the media choice and the general artwork completed.

Due to the scarcity of literature relating to art therapy with blind adults it seemed that hypotheses concerning the therapeutic process would be premature without further study regarding the most appropriate media with the blind and visually impaired. I compared my quest with appropriate media when working with the blind to a carpenter's or a doctor's quest for the most appropriate tools or instruments. It is vital for a carpenter to understand how to read a blueprint and to have knowledge of his tools and his lumber. It is vital for a doctor to understand how

to read x-rays and to have knowledge of his instruments and medications. Likewise, to be an effective art therapist one must understand how to interpret artwork and to be knowledgeable concerning the appropriateness of the art media and the art process being used.

Topic Delimited

My goal in conducting this research was to become more knowledgeable concerning art media and processes. It was not within the scope of the project to interpret the products produced with the media. In no way did I attempt to provide a qualitative or quantitative method for determining adjustment to blindness through the evaluation of art work.

My major objectives were to test the two media and to research the specific hypothesis which identifies clay as a preferable medium to raised line paper. By researching the most appropriate media choice for producing a human figure I was attempting to establish the groundwork, or initial stages, whereupon a more scientific and sophisticated experimental design could be implemented.

The forty participants, who were women between the ages of twenty-one and eighty and varied in educational experience from grade three to two years of college, were either blind or visually impaired. A split-half design was utilized in the investigation. Twenty blind and twenty visually impaired subjects were asked to produce two human figures each; one by means of clay and one by means of raised line paper.

Upon completion of the experimental portion of the project three art therapists judged the results. After examining the scoring information from the Goodenough-Harris Draw-a-Man Manual the judges used an abbreviated scoring sheet to rate five sections in each clay piece and each drawing for the details shown. The raw scores for each section were totalled and the composite averages were compared.

Definition of Terms

The term "art therapists" refers to the people who have completed a master's degree program in the field of art therapy, and who are practicing art therapy skills as a part of their job description.

The term "blind" as used herein means having no useful vision.

The term "visually impaired" as used herein means having some vision, but still unable to read newsprint with corrective lenses.

"Clay" as used in the experiment is a white sculpting substance which has two properties of concern to the study: when moist, it is one of the most plastic of all substances, easily modelled and capable of registering the most detailed impressions; when dry, it is leather-hard and coherent.

"Raised line paper" as used in the experiment is a polyethylene paper which has the property of either indenting or forming a ridge when the pressure of a pen or a stylus is applied to its surface.

"To model" is the term used to describe the building up of a structure in the medium of clay by molding, shaping, adding and deleting.

"Goodenough-Harris Draw-a-Man Scale" is an IQ measurement developed by Florance Goodenough in 1926, and later expanded and revised by Dale Harris. It is also used as a measurement of details and proportions. Seventy-three items are scored for an individual's graphical depiction of the male figure and seventy-one for that of a female. The test has standardized norms of reliability which enable the evaluator to compare the subject's age with the number of items which were scored. The resultant number is converted to a standardized IQ score.

Outline of Chapters

The second chapter contains a review of the literature pertinent to the hypothesis. Literature was drawn from the fields of art therapy, art education and psychology. A great deal of information was also gleaned from literature written about blindness and visual impairment.

The third chapter describes in detail the methodology and the major characteristics of the study. The specific details concerning the subjects, the experimental process, the judging procedure, the criteria for judging, and the design of the investigation are explained.

The fourth chapter reports results of the computer analysis.

The fifth chapter includes a discussion which recapitulates the highlights, interprets the data, reports the limitations, and makes conclusions and implications.

The final section, the appendices, is comprised of figures, tables and forty photographs of the subjects' art work.

Chapter 2

REVIEW OF LITERATURE

Attitudes Towards the Blind

The popular slogan, "You've come a long way..." is a relevant statement regarding the attitude of the general public towards the blind and visually impaired. In biblical times, the sighted society did not allow the blind to earn a living wage at any trade, but rather, forced them into a position in which it was necessary to beg for food and money. Today's public, however, no longer approves of, nor does it accept the blind in the beggar role. Society states that the blind are allowed to be educated in the public schools, and has made provisions for those who are capable of furthering their education at the undergraduate, graduate, and even post graduate levels. Commerce and industry are expected to hire the blind. We are learning that pity for the blind is degrading to them. By helping the blind to help themselves we take the beggars from our society and we treat the blind with the respect and dignity which we accord others.

Monbeck (1973) discussed the attitudes and beliefs of the past by exploring quotes from historical records, mythology, folk lore, and other literature. He delineated fifteen basic attitudes prevalent in the past; "deserving of pity and sympathy, miserable, in a world of darkness,

helpless, fools, useless, beggars, able to function, compensated for their lack of sight, being punished for some past sin, to be feared, avoided and rejected, maladjusted, immoral and evil, better than sighted people, mysterious." (p. 25) According to Monbeck the agencies serving the blind must not foster any one of these attitudes but must continue to educate the public.

In a historical review of the role and status of the blind, Berthold Lowenfeld (1964), noted that the Vocational Rehabilitation Act, particularly in its 1954 admendments, has mandated that blind individuals should be provided with training and education commensurate with their aptitudes and interests. In the realm of education, Public Laws 93-380, 94-142 and section 504 of the 1973 Rehabilitation Act established guidelines for the education of handicapped children. School administrators and teachers are now required to study three elements of P.L. 94-142 for immediate implementation.

1. Education for handicapped children must be provided in the least restrictive educational program.
2. Education must be free and suitable (appropriate).
3. Education must be individualized, and the Individualized Education Program (IEP) is the instrument to achieve this.(Lowenfeld, 1980, p.3)

Thus, our governmental bodies and agencies have become aware of the needs, attitudes, interests and capabilities of the blind and visually impaired. They have started to explore the most appropriate means by which to implement quality educational programs for the blind.

Definitions of Blindness

Before exploring the specific topics concerning the sense of touch and art media with the blind, I feel it is appropriate to further define blindness and visual impairment. The definition of blindness as stated by the American Medical Association in 1934 has remained the same although some physicians, ophthalmologists, and oculists have questioned its relevancy. The 1934 definition states that a person shall be considered blind whose central visual acuity does not exceed 20/200 in the better eye with correcting lenses or whose visual acuity, if better than 20/200, has a limit to the field of vision to such a degree that its widest diameter subtends an angle of no greater than 20 degrees. (Hoover, 1964, p. 97)

The World Assembly of the World Council for the Welfare of the Blind, in 1954, "urged all Governments to accept as a minimum definition for services to the blind, total absence of sight or visual acuity not exceeding 3/60 or 10/200 (Snellen) in the better eye with correcting lenses or serious limitations in the field of vision generally to not greater than 20 degrees." (Hoover, 1964, p. 105)

If a person has no light perception and cannot distinguish forms he is called totally blind. A person born with blindness is labelled congenitally blind. If a person becomes blind later in life through some trauma or disease he is called adventitiously blind. Examining the legal definition of blindness, we realize that a person with a visual acuity

close to 20/200 may be able to function visually, in a nearly normal manner, and yet, by definition, be labelled "blind." Any person with vision greater than ten percent, or 20/200, but still unable to function as well as fully sighted people, in terms of reading small print and recognizing forms at a distance, is called "visually impaired." A standard definition for visual impairment is difficult to find. The words, "visually handicapped," "partially sighted," and "low vision" are often used interchangeably with "visually impaired."

In terms of relating with art media Lisenco (1971) has aptly described visual impairment as: "The varying conditions of individuals who, although having visual difficulties which cause severe problems in their ability to perform daily tasks, can still make use of their residual vision in an art activity." (p.10)

Exploring the Sense of Touch

Since 1749, when Denis Diderot published his "Letter on the Blind for the Use of Those Who See," there has been an interest in exploring and researching the sense of touch with the blind. Diderot noted, "A blind man studies by his touch that relationship required between the parts of a whole to enable it to be called beautiful." (Diderot, 1919, p. 25)

Perhaps the most well known blind person, and a pioneer in educating the public to the needs of the blind, and particularly the needs of the deaf-blind, is Hellen Keller. Commenting on the relevancy of the sense of touch to the

blind, she stated: "My hand is to me what your hearing and sight are to you. In large measure we travel the same road, read the same books, speak the same language, yet our experiences are different." (Eaton, 1959, p.16)

The sense of touch, or the tactile sense, is not to be construed as replacing vision, nor is it to be regarded as a super human sense with which the blind are endowed. Carroll (1961) stated that, "In actual use, the external or cutaneous touch senses blend and work together with the internal or kinesthetic touch sense (and, in many cases, with the labyrinthine sense also)." (p. 113) Basically, Carroll is stating that the touching of an object is felt with the skin (cutaneous), is mediated by the bodily movements of the muscles, tendons, and joints (kinesthetic), and is perceived in terms of direction and balance (labyrinthine). In addition to these three aspects of tactile sense he adds one, formally termed "stereognosis," or knowledge of three-dimensional forms. A more informal term, or a term which has a greater acceptance among the blind is, "to braille," which means, "to handle, to feel, to explore tactually, to gain all the information that can be obtained about something by touch." (p. 116)

Geza Revesz, (1950) a professor and psychologist, projected a concept of haptics, another term used for the sense of touch, which established a theoretical foundation for all future studies of the tactile and kinematic sense. The term, "kinematic," as used by Revesz, denotes one's

sense of bodily movement. Revesz defines two types of haptics: haptics of an essentially optical nature, and pure or autonomous haptics. The study of persons blind from birth can yield data about pure haptics. The haptics of space, of objects, and of form are perceived by the blind through their hands. Resting touch and moving touch experiences with the hands help the blind to form impressions of the world around them.

Revesz (1950) explored the sculptural and aesthetic experiences of the blind in the second part of his book. He maintained a negative viewpoint regarding the ability of the blind to perceive and to create art work, as evidenced by the following statement:

"The judgement of the haptically perceiving subject is not determined by the rules of pictorial art and the norms of aesthetic apprehension, but by structural elements of a simple realism. The blind are unable to derive aesthetic principles from the haptic reality, nor are they able to realize such ideals in images born from their fancy," (p. 204)

In contrast, Cutsforth (1951) viewed the aesthetic experience of the blind as always conforming to the expectations of the sighted. He blamed the sighted workers for the blind, including teachers, psychologists, and administrators for labelling the blind. He felt that the blind place little subjective value on their aesthetic experiences. As a result, the artistic endeavors of the blind generally are not individually expressive because they merely parrot the expectations of the sighted world, never reaching within themselves to produce that which is of themselves.

Cutsforth (1951) valued the sense of touch as being the only true and real experience for the blind. He stated, "Sensory organization and tactual perception roughly delineate the boundaries within which the blind have access to objective sources for aesthetic stimulation." (p. 167) He did agree with Revesz that the sighted are mistaken to think that the blind child or adult is perceiving the same form with his fingers that the sighted see with their eyes.

A more recent study, concerning touch, was completed in 1976. The five year project tested the differences between the sighted and the blind performing search strategies and exploratory scanning procedures. Philip Davidson, (1976) who conducted the study, concluded that although sighted persons, while using their vision, can discriminate between the various parts of a given object more quickly than the blind, when blindfolded they perceived less accurately than did their blind counterparts. Videotaping the blind in action revealed that they gripped an object as their strategy for identification. The sighted rarely used gripping, but instead, used pinching and top sweeping as their method of hand movement. Davidson found that,

"Exploratory activity seems to become more proficient and economical with experience, suggesting that the more accurate haptic perception of shape by blinded individuals might be linked to perceptual learning of better ways to explore the stimulus." (p. 198)

In conducting studies regarding the concept of tactile it was determined by Vallbot and Johansson (Gordon, 1978) that active touch and movement are essential to recognition.

Active touch is always linked to the function of the hand.

Art Media With the Blind

In considering the various implications for art therapy of the above mentioned studies on the sense of touch and the blind, it follows logically that the more actively the blind handle or manipulate a medium the more useful that medium is to their perception of beauty and realness. Dr. Judith Rubin, (1976) an art therapist, investigated whether blind children could perceive beauty through touch differently from that of their sighted and visually impaired peers. Her research consisted of presenting a group of scrap wood sculptures which had been created by blind, partially sighted and sighted children to a group of children who were, themselves, blind, partially sighted and sighted. These children judged the articles. The results of her study indicate that blind students have a different judgment of beauty than do their sighted peers. The implication for sighted teachers and therapists is for a change in attitude and perception.

Macdonald (1978) conducted a research study of schools for the blind to determine if art teachers and art therapists were developing curricula which incorporated concepts that help in the development of the self image. Macdonald states that most of the schools he visited had not selected appropriate art media, nor were they using effective instructional techniques in art classes and were, therefore failing to assist their student in the development of personal imagery.

Various authors in the art therapy literature have developed exercises which utilize art materials to enhance personal imagery. Some of the materials listed as being suitable for use with the sighted can be used with the blind if a tactual component is present. Plasticine, clay, papier mache, plaster of paris, fiber art, finger paints with sand, are just some of the materials which have been listed as having tactile qualities, and which can be shaped, modelled or moved into forms to express the individual's self image. Erickson, 1979; Kramer, 1971; Naumburg, 1966; Rhyne, 1973; Robins and Sibley, 1976; Ulman and Dachinger, 1975; Williams and Wood, 1977.

Using these tactile media, and others, Dr. Rubin has worked with blind children in an art program at the Western Pennsylvania School for the Blind. She found that feelings, fantasies, and tactile aesthetic judgements emerged and were expressed by the children when they could relate well with the chosen media. It was apparent from Rubin's case studies (1975) that appropriate choice of media as being tactile and enjoyable was important to a therapeutic relationship with the blind.

Lisenco, (1971) working with adventitiously blind and visually impaired adults found that media must meet two important criteria to be considered for inclusion in his program: "...the amount of personal satisfaction received from the creative activity and the possibility of continued satisfaction after the completion of the work." (p. 59)

He also discussed the relevancy of three dimensional media. Commenting on his drawing technique with the blind he mentioned that he has used ballpoint pens, marking wheels, mimeograph styli, leather modelling tools and fingernails on surfaces such as bristol board, braille paper, and plastic sheets.

The Medium of Raised Line Paper

In relating the experiences of other countries utilizing three dimensional raised line paper, Lisenco (1971) cited the Soviet Union for developing a raised plastic outline for representing various views of the same object. Some soviet blind persons have been taught to draw from prepared plates using plastic sheets.

A relief drawing method has been used in this country for at least fifteen years. The earliest relief drawing method in the U.S. consisted of drawing on paper which had been positioned over a sheet of wire gauze. The difficulty with this method was that the relief was felt on the reverse side of the paper, and the finished product was the mirror image of what was intended. An additional and significant drawback was that the artist could not feel any portion of what was drawn until the project was completed. Another method was devised in which the drawing on cellophane became raised because a rubber layer was placed under the cellophane prior to drawing. (Mélotte and Engel, 1980)

Ruth Barr, (1970) an occupational therapist at Barnes Hospital in St. Louis, developed a polyethylene paper with

the property of being heavier than the previously used cellophane, and which forms a ridge when the pressure of a pen or stylus is applied to the surface. It is this polyethelene paper developed by Ruth Barr which I decided to use in my research with the blind and visually impaired.

John Kennedy, (1980) a psychologist who has tested raised line drawings for nine years reported on a program of research in which he is investigating the practical and important supposition that pictorial representation may be useful to the blind. Although he is still compiling research data he presented the initial phases of his investigation to the American Psychological Association in 1978. Kennedy claimed that the blind can depict, that their picturing is perceptual, not just visual, and that the blind have an intuitive sense of perspective. These claims are based on successes achieved by some blind subjects in performing drawing tasks as established in an eight step process. Examples of pictures drawn by the blind on raised line paper depicting a hand, a glass, a table, a wheel, and a human figure, were shown in the article. By showing these drawings it appeared that Kennedy was attempting to convey the message that the world of visual art is not impossible for blind persons and that the use of raised line paper opens another means of communication for the blind.

The Medium of Clay

Although Kennedy's study in raised line paper has been started and speaks well for the use of this medium with the blind, no such scientific study has ever been attempted

with the medium of clay as the focal point. Lisenco (1971) and Fukurai (1974) are two art educators who have stated that they recognize that three-dimensional art is excellent for allowing an expression of creativity. Neither author claimed to have researched any specific medium. Both recognized that when they observed blind and visually impaired individuals working with a three-dimensional medium, specifically clay, they noticed that response to the medium was very favorable. Fukurai emphasized that the clay products done by his blind children are opening a new tactile dimension in artistic beauty "which includes a sense of power and movement in its simplicity." (p. 52)

Fukurai, (1974) an art educator in a school for the blind in Japan, is the first person to note the creativity of clay modelling and also the therapeutic value which is derived from working with this medium. Mumma, (1975) another art educator in Japan working with the aged blind, has stated that she has found clay modelling to be excellent in establishing group interaction. The blind were able to be assistants to one another because of the nature of the medium.

Tactile Art Exhibits

Because clay sculpturing touched the hearts of Fukurai's art students he decided to enter their works in a national art exhibit to see if the art pieces would touch the hearts of the public. To his surprise and to the amazement of the blind students, the clay sculptures were highly praised as opening a new frontier in the world of art. Every

year since 1953 Fukurai's students have successfully competed in some type of art exhibit.

Recognizing the need for tactile exhibits for the blind has prompted the government officials of South Africa to employ Rowland Williams. Rowland (1974) has advised the South African National Gallery concerning the tactile values in art, and the opportunities for creative self-expression, as well as having established a sculpture exhibition and a touch gallery.

In the United States the Vocational Rehabilitation Administration gave a grant to Allen Eaton (1959) so that he could establish the first National Exhibit for the Blind. He collected around forty articles made by professional artists and craftsmen. Several clay objects were among those chosen for the special display which was transported to various cities around the United States. In Eaton's book written about the travelling exhibit, 1959, he stated that material, function, and form are essential to the comprehension and the enjoyment by the blind of the objects of beauty. These elements are mainly perceivable to blind persons through their sense of touch. Eaton found that the elements which are perceived by touch are: order, proportion, motion, temperature, rhythm, flow of line, and especially texture.

The first National Exhibit by the Blind was organized in 1976 as an event for the 200th anniversary of our country. Fine arts and crafts, including many clay sculptures were featured in hopes of educating the public as

to the quality and ability displayed in the art work of the blind.(Viddy, 1977) Michael Coyle, the organizer of this exhibit was quoted as saying, "Art by the blind has too long been regarded solely as a therapeutic medium. In fact, the blind artist is creating work which is in every way comparable as fine art to the work produced by the sighted artist."(National Exhibit of Art by the Blind, p.344) In support of this statement, I cite the case of Louis Vidal, who, despite his total blindness, became a famous sculptor. Vidal received more medals than any other exhibitor in the Paris art exhibitions of 1855-1875.(Ravin and Drachler, 1977, p. 180)

Not only are exhibitions and museums displaying articles made by the blind but also professional artists have designed special tactile exhibits specifically for the blind. Two galleries have become known on a national level as having touch displays. The Mary Duke Biddle Gallery in North Carolina and the Atheneum in Connecticut are frequently visited by blind persons.(Toll, 1975; Viddy, 1977; Hunt, 1979; and Switzer, 1967)

Painting as a Medium

Some exhibits in museums and galleries for the blind have shown paintings which have been executed by either visually impaired artists or by adventitiously blind artists. Merrill Maynard (1965) who is one of these adventitiously blind artists, proclaimed that she loves to paint despite her handicap. She stated that Gorden Stent of England, and Mary Drake Cole of Nantucket also continued to paint after

they lost their sight. The author did not suggest that all blind persons can paint, but she postulated that if individuals desire to paint, then they should be encouraged to do so despite any visual limitation. Interestingly, even in Maynard's process of painting she employed the use of a tactile line. She suggested using perforating wheels, pouncing wheels, orange sticks and inkless pens for the purpose of sketching. Using these orientation boundaries she proceeded to add the paint in gradual application stages.

A retired, 81 year old man in Duluth, Minn. wants to manufacture painting kits so that other blind people can learn to paint using his method. Upon losing his vision three years ago Erick Frisk discovered that he could mark his canvas with straight pins to delineate the horizon or objects. Applying thick texture paint he can feel the images with his fingers. (Battin, 1980)

In contrast, Charlette Haupt, (1966) who is a teacher at elementary, secondary and college levels, as well as being a consultant to teachers of blind children, stated, "An adult who turns to painting may do so to win praise for such an unusual accomplishment. The approval may be more important to him than searching for new meaning in life. If a blind person finds joy in painting pictures, it is his right, but it is unrealistic." (p. 46) Haupt contended that blind persons should be directed toward areas that they can comprehend and that help to fulfill their creative urge.

Art Education and Art Therapy with the Blind

In order to establish objectives and goals for art education or for art therapy when working with the blind and visually impaired one should evaluate case studies and experiences of other professionals. Bauman (1976) has compiled an extensive bibliography relating to many areas of concern when working with the blind. One section concerns the arts and the blind. Anderson (1956), Dauterman (1959), Freund (1969), Hadary (1979), Halpin and Torrance (1973), Kewell and Hollingsworth (1955), Rose (1976), Slatoff (1962), Sykes, Watson, and Manze (1974), and Tillinghast (1977) are just a few of the professionals who have written about their art experiences with the blind. Generally all these authors agreed that art is regarded as being a dynamic experience when the blind relate tactually with the materials.

Some art educators and art therapists, other than those who specialize in art with the blind, might be discouraged by the blind person's inability to see the art product and therefore might not be willing to become involved educationally or therapeutically with blind persons in art activities. Several of my clients have been involved in previous art classes. Some have expressed to me their feeling that the sighted instructors seemed unwilling to allow them in their classes. The art instructors relate through their actions and comments the general attitude that lack of vision indicates to them a total lack of artistic ability.

In contrast, Slatoff (1962) and Freund (1969) stated that art experiences should not be denied the child or adult who is blind or visually impaired. Case studies have been written which indicate that blind children and adults develop a greater sense of confidence and mutual accomplishment when they are integrated with the sighted and are learning the same skills such as drawing, painting, and sculpting. (Freund, 1969) By carefully planning objectives to meet the needs of the blind, the art educator and the art therapist should not only remember to provide integrating experiences but also to provide experiences which are adaptable to the child's or adult's current developmental level, are therapeutic, and are readily accepted by the child or adult. (Tillinghast, 1977)

The area in which art educators and art therapists differ the greatest is in their stated objectives. Packard and Anderson (1976) have stated that the art educator is usually the determiner of the art activities because of a state-prescribed art curriculum or because of a concern for the artistic growth of the child. The art therapist, on the other hand, usually determines the art goals and activities together with the child, or client, because the focus is on the child's or client's psychological, emotional, and mental health. Barlow, Shupe and Niswander (1977) contend that when people have control of their media they basically have control of themselves and their environment.

Another art therapist, Arden Rose (1976) stated that she wants her choice of media to vary with the different clients. She asserted that using different media can help clients to express themselves in a variety of ways. According to Florance Cane (1951) the basic aim of the therapist is to develop the pupil's body, soul and mind through the art experience. Cane has striven to help individuals find a more compatible relationship between their inner and outer worlds.

I believe that in order for individuals to develop it is necessary that the media be conducive to the creative process. In the creative process the important aspect is to relate with the object. For the blind relating with an object is a tactual experience. If a blind person is to ascend the five steps toward a creative experience described by Rollo May (1976) and espoused by educators and therapists alike, then the art media should become a suitable, comfortable and appropriate means. The five steps delineated by Rollo May are: 1. the encounter with the object, 2. the engagement with the object, 3. the intensity of the encounter, 4. the encounter as it relates with the world, and 5. ecstasy of the experience. For the blind to reach the height of creativity which would be ecstasy then the blind must use a media which is tactual.

I also feel that it is important that blind and visually impaired children be integrated with the sighted in the public sector of education. Likewise, I feel that visually handicapped adults should be integrated with the sighted.

To accomplish this aim it will be necessary for the general public to become familiar with the public laws numbers 93-380 and 94-142 and section 504 of the 1973 rehabilitation act. These laws are affecting various institutions.

It is important for art therapists to be aware of these national and state laws regarding mainstreaming handicapped children into the "normal" classroom environment. The handicapped have to be understood in terms of their limitations, abilities and needs. With a background in psychological theories the art therapist should have little difficulty understanding the goal behind mainstreaming. Because art educators recognize that art therapists have studied various theories of psychology they are frequently turning to art therapists for guidance in establishing programs to meet the needs of the handicapped child. The recent legislative developments have inspired this mutual cooperation. (Packard, 1976)

In an effort to become more knowledgeable regarding art with handicapped children, art educators and therapists can turn to the several sources already listed. Another excellent source is Victor Lowenfeld (1957) who has expressed his belief that schools should educate the whole child. Educators and therapists have been influenced by his haptic/visual explanation of perceptual behavior and his delineation of age related art stages. Both areas can be interpreted for use with the visually impaired, but I have been able to find no study relating to the haptic perception or the art stages with blind children.

The age-related art stages devised by Lowenfeld (1957) are: scribbling, two-four years; pre-schematic, four-seven years; schematic, seven-nine years; gang, nine-twelve years; and pseudo-naturalistic, twelve-fourteen years. He offers stage related guidance for educators which is equally applicable to art therapists. He has stated that "There is an increasing awareness today of the need for developing sensitivities to the needs and feelings of others. Art may be the only field within the framework of our system where the development of feelings and emotions is given proper recognition." (Lowenfeld, 1957 pp. 224-225) It is my opinion that feelings and emotions can be expressed with facility through art media. The correct interpretation of these expressions is the key to an effective dialogue between clients and therapists.

With the aforementioned mainstreaming of visually impaired and blind students, art therapists, psychologists and school counselors are being asked to evaluate personality traits and other relevant psychological factors of these individuals. These professionals are making use of projective techniques used with the blind would include: auditory projective tests, three dimensional apperception tests, musical stimulae tests, sentence completion tests, sound tests and tactile projective tests. (Scholl and Schnur, 1976)

It is not my intent to defend the use of projective techniques with the blind by art therapists, but rather, to delineate the most suitable medium when such projective techniques are used. I have intended to lay the groundwork

for a more sophisticated experimental design wherein the most appropriate tactile medium can be used in projective tests. It was my objective to delimit the medium choice and to draw some conclusions regarding the participating blind population. It was hoped that some general conclusions could be drawn, and that these conclusions would be relevant to the work of therapists involved with the blind. I believe that this research covers a neglected area of concern.

Chapter 3

METHODOLOGY AND STUDY DESIGN

Subjects

The forty subjects chosen for this research project were blind and visually impaired women living in the St. Louis area. Each of the forty subjects attends one of six two hour classes which are sponsored on a monthly basis by the St. Louis Society for the blind. Although there were five congenitally blind individuals involved in the classes, these people were not asked to participate in the study as they had never seen a human figure. No males were included in the study as there were only two men in my art therapy groups, and this number was not significant to the study in terms of statistical comparison. There were twenty subjects who were blind, but they became blind later in life. The remaining twenty subjects who participated in the study were visually impaired.

Table I shows the degree of visual impairment according to age and race. Twenty-eight subjects were white. Twelve subjects were black. Of the eight subjects between the ages of twenty and thirty-nine five white subjects were blind, and two were visually impaired and the one black subject was visually impaired. There were ten subjects between the ages of forty and fifty-nine. Three of the white subjects in this age group were blind and five were visually impaired.

Table I
 Distribution of Age and Race
 According to Visual Classification

Age/Race	Blind	Visually Impaired	Total
White			
20-39	5	2	7
40-59	3	5	8
60-80	6	7	13
Total White	14	14	28
Black			
20-39	0	1	1
40-59	2	0	2
60-80	4	5	9
Total Black	6	6	12
Total Black and White	20	20	40

Note. Mean Age - 57 years

The two black subjects were blind. There were twenty-two between the ages of sixty and eighty. Of the white subjects, six were blind and seven were visually impaired. Of the four black subjects, four were blind and five were visually impaired. The mean age of all subjects in the research project was fifty-seven years.

Table II shows the subjects' educational levels. The range was from three years of completed education to fourteen years. The mean years of completed education was ten. A total of seven subjects, four blind and three visually impaired, completed three to seven years of education. A total of thirteen subjects, five blind and eight visually impaired, had completed eight to eleven years of education. Eleven subjects were high school graduates, five were blind and six visually impaired. Six blind and three visually impaired subjects, a total of nine, completed thirteen to fourteen years of education. No subjects completed more than fourteen years of education.

The information in Table II is pertinent to the study because it could be postulated that the raw scores achieved by the subjects can be influenced by their educational background or their IQ. That is to say, that a direct correlation could be drawn between the IQ and/or the number of years of formal education achieved by a given subject and the degree of detail demonstrated in the artwork.

Table II
Subjects by Years of Education Attained

Years	Blind	Visually Impaired	Total
3-7	4	3	7
8-11	5	8	13
12	5	6	11
13-14	6	3	9
Total	20	20	40

NOTE. Mean years of education-10 years

Responses to Questionnaire

The forty subjects were called by telephone after the experiment to respond to a questionnaire which is shown in Figure 1. (see Appendix A) Table III shows the responses to the first five questions relating specifically to the subject's past art experiences. The responses to questions 6 and 7 are recorded in other tables as these two questions were not related to the past art experiences of the subjects. The answers to question 6, regarding the years of education completed by the subjects, are shown in Table II. The responses to question 7, concerning the subjects' preference for the art media of either clay or raised line paper are shown in Table IV.

As shown in Table III, twelve blind and seven visually impaired subjects had prior experience with clay. The total number of subjects who had prior experience with clay was nineteen. There were eight blind and thirteen visually impaired subjects who did not have prior experience with clay, for a total of twenty-one. Only one blind subject had previous experience in modelling the human figure in clay. No visually impaired subject had modelled a human figure in clay. Of the total number of thirty-nine subjects who had not modelled a human figure in clay, nine were blind and twenty-one were visually impaired. Five blind and three visually impaired subjects, a total of eight, had prior experience with raised line paper. Fifteen blind and seventeen visually impaired did not have prior experience

Table III
 Subjects' Responses to
 Questions about Art Experiences

	Blind	V.I. ^a	Total
1. Subjects who had prior experiences with clay			
a. yes	12	7	19
b. no	8	13	21
Total	20	20	40
2. Subjects who had modelled a human figure in clay			
a. yes	1	0	1
b. no	19	20	39
Total	20	20	40
3. Subjects who had prior experience with raised line paper			
a. yes	5	3	8
b. no	15	17	32
Total	20	20	40

Table III (continued)

	Blind	V.I. ^a	Total
4. Subjects who have drawn a human figure on raised line paper			
a. yes	0	0	0
b. no	20	20	40
Total	20	20	40
5. Subjects who have had prior art experience			
a. yes	4	2	6
b. no	16	18	34
Total	20	20	40

^aVisually Impaired

Table IV
Subjects' Preference of Art Media

	Blind	Visually Impaired	Total
Clay Preferred	14	15	29
Raised Line Paper Preferred	2	1	3
No Preference	4	4	8
Total	20	20	40

with raised line paper, making the total number of subjects who did not have prior experience with raised line paper thirty-two. The total number of subjects who had not drawn a human figure on raised line paper was forty. Four blind and two visually impaired, a total of six, had prior art experience. A total of thirty-four subjects, sixteen blind and eighteen visually impaired, did not have prior art experience.

The responses to question 7 are shown in Table IV. The subjects' preference of media was either for clay, raised line paper or no preference. Fourteen blind and fifteen visually impaired subjects preferred clay. The total number of subjects who preferred clay was twenty-nine. Two blind subjects and one visually impaired preferred raised line paper, making the total number of subjects who preferred raised line paper three. Four blind and four visually impaired subjects, a total of eight, had no preference.

Confounding Variables

When comparing the various components which confounded the analysis of the study, I found it necessary to eliminate some of the independent variables. One such variable involved the length of time that the subjects had attended the art therapy classes. There were nineteen subjects who had attended the art therapy classes sponsored by the St. Louis Society for the Blind for the past two years. Twelve subjects had attended the classes for a period of

one year. Nine subjects had attended the classes for a period of six months or less. These figures were not considered significant because no subject had modelled a human figure in clay or had drawn a human figure on raised line paper in any of the previously attended classes. It is important to mention the length of time attended the classes because the subjects may have reacted to the directions according to how long they had known the experimenter. A possibility of anxiety about trying a new medium could be directly related to how well the subjects not only know the experimenter, but also, how well the subjects know the other subjects in their groups.

Another variable which could be considered is the type of disease or cause of the blindness or visual impairment. Again, it is deemed an unimportant consideration in terms of the current research project as the diseases of the eyes usually do not physically hinder any subjects from using their tactile sense. The only exception to this statement would be the subjects suffering from diabetes which frequently causes diabetic retinopathy of the eyes and also causes a numbness in the hands and various other complications. The more common causes of blindness and visual impairment among the forty subjects were diabetic retinopathy, retinal diseases, glaucoma and cataracts. Some of the subjects had two causes for vision loss such as glaucoma and cataracts. A few subjects had lost their vision from causes which were not considered typical. These causes were stroke, measles, polio, ulcer on the eye, and nerve damage.

A third variable which was not considered was the length of time for the visual impairment. The time span varied from one year to sixty-eight years. Because of this extreme range in years a reliable study of this factor was an impossibility. Those subjects blind from birth were excluded from the study.

A fourth element which was not incorporated in the statistical analysis was the setting where the subjects met. The setting varied from group to individual settings. Twenty-seven subjects met in seven different groups at six different locations. Libraries, church basements, and the St. Louis Society for the Blind served as the settings for the groups. The size of the groups varied from two to eight subjects. The other thirteen subjects were unable to attend a group meeting because of such factors as lack of transportation or illness. I met on a one-to-one basis with these subjects in their homes. The areas of the city and county included in the study were north and south counties and north and south city. While I recognize that one setting would have been preferable this was a variable that was beyond my control.

Research Design

By researching the most appropriate media choice for producing a human figure I am establishing the groundwork or initial stages where-upon a more scientific and sophisticated experimental design can be implemented. It was important that this initial investigation be thoroughly

discussed because there are no other papers written concerning this topic.

The postulated effects or relationships noted could be interpreted as due to bias by some readers as I used the subjects who come to the art therapy classes. Except for excluding five congenitally blind women and two visually impaired men from the judging, any blind or visually impaired adult who came to the sessions and volunteered to be a participant was included in the research.

That there were twenty blind and twenty visually impaired was a fortunate occurrence. I did have to ask one blind client, who hadn't yet joined my classes, to participate in the experiment so that there would be an equal number of blind and visually impaired. I also manipulated the groups so that half the subjects experienced the clay first and the raised line paper second and vice versa. This manipulation was done with random groups rather than with homogeneous age groups, race groups or educational backgrounds. Since I did not control the variables of age, race and education, these factors could possibly effect the study. By having a factorial split of the operation of the variables of clay and raised line paper I hoped to balance the other factors.

Procedure

The length of time involved in collecting the data was one month, from June 5th to July 1st. There were 7 group sessions conducted with the average attendance from two to eight persons. A total of twenty-seven subjects

did the research experiment in a group setting. A total of thirteen additional persons did the experiment in a one-to-one setting. The group and the individual sessions involved the following characteristics.

Each session lasted one hour and twenty minutes. During the first twenty minutes I read the consent form shown in Figure 2, (see Appendix A), and the subjects signed the form. The "Declaration of Informed Consent" gives the subjects a brief description of the experiment and informs them of their rights as private citizens and willing participants. The elements of confidentiality and anonymity were stressed.

The twenty blind subjects were split into two groups to experience the clay and the raised line paper. Likewise, the twenty visually impaired were split into two groups to experience the clay and the raised line paper. Thus, ten blind and ten visually impaired experienced modelling a human figure for a time limit of thirty minutes before they experienced another thirty minutes drawing a human figure on raised line paper. Another group of ten blind and ten visually impaired experienced drawing a human figure on raised line paper for the first thirty minutes and modelling a human figure for the second thirty minutes.

Whether the subjects produced the human figure in clay first or second became an important factor in testing the reliability. However, the directions given were always the same, specific, and non-directing words. The subjects were first given some plastic tablecloth to cover the table.

Each subject was then handed approximately one pound of clay. The clay was described as being a white sculpture clay that could be fired in a kiln to achieve a permanent state. The subjects were told that they could use as little or as large an amount of clay as they wished. Clay modelling tools, bowls of water and popsicle sticks were placed in front of every subject who expressed a desire to use them. The verbal directions for modelling the human figure in clay were given as follows: "Please make a human figure. It can be a person who is a man, woman or child. You may use as little of the clay or as much of the clay as you wish. Today I can't give you any more directions as to how to complete the figure. We can have a lesson about modelling a human figure at another time." As they modelled with the clay I walked around the room observing the subjects' progress. Upon completion of their figures the subjects scratched their assigned numbers into the clay, washed their work area and their hands.

Likewise, the directions for drawing a human figure were stated in non-directive terms regardless of the order of drawing procedure. Each subject was given a piece of raised line paper and a black Bic pen. The assigned numbers were written in the lower right hand corner. The verbal directions for drawing the human figure on the raised line paper were given as follows: "Please press quite hard with the Bic pen on this plastic paper so that you will be able to feel where you have drawn. Some people find it helpful to feel where they have drawn using the opposite

hand from their writing hand. Please draw a human figure. It can be a person who is a man, woman or child. Make the drawing any size you wish. Today I cannot give you any help or suggestions regarding drawing, but I'll be happy to give you drawing instructions some other class session." As they drew the human figures I observed their progress. When the subjects complained that they were having difficulty finding their place I suggested that they press harder.

Upon completion of their human figures the subjects were assigned numbers ranging 1 through 40. The assigned number was dug into the back of the clay human figures and written on the lower right hand corner of the raised line paper. The artwork was given a number to disguise the artist's identity and aid the judges in scoring the 80 pieces. With a number assigned to each subject the clay figures could be lined up numerically with the raised line paper human figures.

Judging Procedure

On July 23rd the 40 clay human figures and the 40 raised line human figure drawings were arranged on three long tables in consecutive and corresponding order. The clay figure produced by subject number 1 was placed to the left of the raised line drawing produced by subject number 1 and so forth for each subject's artwork. The clay work and the drawing of subjects numbers one through fourteen were placed on table one. The artwork of subjects numbers 15 through 28 were placed on table two. The artwork of

subjects 20 through 40 were placed on table three.

Three art therapists judged the clay human figures and the raised line drawing human figures on July 23rd, 24th and 25th. The judges were asked to evaluate the figures at separate time periods in order to prevent any possible biased judging. Each therapist was given the Goodenough-Harris Test Manual (Harris, 1963) so that they could study the directions and the examples for details and proportion. I explained to each therapist that ideally I had wanted to score all seventy-three items for the man and the seventy-one for a woman, however I had deemed it too time consuming as a total score of one hundred forty-six or one hundred forty-two item categories per subject would have totalled a possible five thousand eight hundred and forty item categories. Thus, I developed an abbreviated rating sheet which is shown in Figure 1.

The seventy-three or seventy-one body parts delimited by Goodenough-Harris were grouped into five categories in the abbreviated rating sheet. A scale was used which ranged from 1 to 4. The number 1 referred to a part or to parts of the clay figure or to the paper figure which was not shown by the subject. The number 2 referred to a part or parts which was shown or indicated with some detail. The highest rating, the number 4, referred to a part or parts which was shown or indicated with great detail.

The five elements or categories which were rated were: facial features, arms and hands, legs and feet, torso and proportion and position. These elements were the

Subject # _____

Art Therapist # _____

Please use the following rating scale after every item.

- 1 - not shown
- 2 - shown
- 3 - shown with some detail
- 4 - shown with great detail

Clay Human Figure

- 1. Facial Features _____
- 2. Arms and Hands _____
- 3. Legs and Feet _____
- 4. Torso _____
- 5. Proportion and Position _____
- Total Score _____

Raised Line Paper and Pen Human Figure

- 1. Facial Features _____
- 2. Arms and Hands _____
- 3. Legs and Feet _____
- 4. Torso _____
- 5. Proportion and Position _____
- Total Score _____

Figure 1. Rating Sheet Used by the Three Judges.

same for the clay human figure and for the raised line paper human figure. The first four elements were judged for details whereas the fifth element, proportion and position, was not rated for detail as much as it was rated for proper or realistic proportion.

The verbal directions which were given to each therapist were as follows: "First, please study the Goodenough-Harris Manual before you study the abbreviated rating sheet. Notice that you will mark the subject's number in the upper left hand corner of each sheet. Score the clay figure first as it will always be to the left of the raised line paper figure. Each figure is to be judged for its own merit rather than how it relates with the corresponding art work."

As all three judges were familiar with the Goodenough-Harris test it was only necessary to explain that I was using the information in the test to rate how well the subjects used the media in order to depict the details and proportions of a human figure. I emphasized that I was not testing IQ. No personal preference was indicated for media selection, nor was any help offered concerning judging decisions. It was explained to the judges that their subjective evaluations should remain free of any outside influence, and that such judgements would be accepted as sufficient for evaluative purposes.

The first judge began the evaluation process at table one, and proceeded to tables two and three respectively. The second judge began at table three, and proceeded to

tables two and one, respectively. The third judge began the evaluative process at table two, and proceeded to tables three and one, respectively. The random judging was deemed necessary because it was felt that the judges developed a rating system after scoring approximately ten articles.

The judges' scoring sheets were gathered together with the questionnaires to provide a completed profile on each participating subject. The questionnaire was deemed necessary because it was felt that prior art experience might have some bearing on the outcome.

Computer Research Procedure

The subsequent step required the guidance of a statistics and computer expert who could provide a system for coding the scoring sheets and other pertinent information concerning the subjects, including age, educational levels, race, media preference, prior art experience and order of doing the experiment. Using this coding sheet the computer expert programmed forty-three questions into computer language. The computer program which was used is called SPSS, or: Statistical Package for the Social Sciences. The results of the computer analysis are presented and discussed in the following chapter on the study.

Photographic Procedure

A thirty-five millimeter camera was utilized to record the results of the art work as a final procedure for the experiment. The forty photographs are shown in Appendix C with the subject number and visual impairment classification

of the subjects. The first twenty photographs show the art work of the group which experienced the clay first and the raised line paper second. The second group of photographs, numbers 21-40, show the art work of the group which experienced the raised line paper first and the clay second.

Chapter 4

RESULTS OF COMPUTER ANALYSIS

Raters and Rating

Three judges rated forty clay and forty raised line paper human figures for the amount of detail present in five specific elements: 1. facial features, 2. arms and hands, 3. legs and feet, 4. torso, 5. proportion and position. A score of 1 to 4 was the possible range assigned to each element. A total score of 5 to 20 was the possible range for the sum of the elements for both the clay and the raised line paper human figures.

As shown in Table V inter-rater reliability was assessed by analysis of variance (ANOVA) procedures. For both the blind and visually impaired subjects, rater number three assessed the average detail for clay significantly higher than the other two raters ($\bar{x}_1 = 10.67$, $\bar{x}_2 = 10.85$, $\bar{x}_3 = 11.85$). The rating mean for clay was 11.12. Results indicated that the raters' judgements for clay were significantly different from one another, $F(2, 117) = 4.06$, $p < .05$. Similarly, raters' judgements for raised line paper were significantly different, $F(2, 117) = 4.95$, $p < .01$. Rater number three assessed the average detail for raised line paper significantly higher than the other raters, ($\bar{x}_1 = 9.36$,

Table V
Clay and Paper Scores by Raters

Relationship	Test	DF	P	Difference Significant
Mean clay score by rater 1	$\bar{x}_1 = 10.67$			
Mean clay score by rater 2	$\bar{x}_2 = 10.85$			
Mean clay score by rater 3	$\bar{x}_3 = 11.85$			
Rating Mean	$\bar{x}_4 = 11.12$ F = 4.06	2, 117	.01	Yes
Mean paper score by rater 1	$\bar{x}_1 = 9.38$			
Mean paper score by rater 2	$\bar{x}_2 = 10.13$			
Mean paper score by rater 3	$\bar{x}_3 = 11.45$			
Rating Mean	$\bar{x}_4 = 10.32$ F = 4.95	2, 117	.01	Yes

$\bar{x}_2 = 10.13$, $\bar{x}_3 = 11.45$ and the rating mean 10.32).

Confounding Variables

In considering the results of the current study it is necessary to evaluate some of the relevant differences between subjects. Table I, (see Appendix B) indicates that there were no significant differences in age, race, or education for visual classification. The t test used in this table and all tables were t tests for unmatched groups. (Taylor, et. al., 1978)

Subjects' education levels had a significant bearing on measures of prior clay, raised line paper, and general art experiences and media preferences. As shown in Table II (see Appendix B) the average education of those subjects who had prior raised line paper experience was 12.63 years versus an average education of 9.53 years for those who had no prior raised line paper experience. The t test comparing these means showed the difference to be significant, $t(38) = 2.99$, $p < .01$. Also revealed in Table II was a significant difference between the years of education achieved by the subjects and their preferences for either clay or raised line paper. The subjects with no preference had significantly less education than those with a preference, $F(2, 37) = 5.41$, $p < .01$.

In comparing the age of the subjects according to their prior art experiences and medium preferences two significant differences were revealed (see Table III, Appendix B) : 1. The average age of those subjects with

prior clay experience was significantly younger than that of those with no clay experience, ($\bar{x}_1 = 49.53$, $\bar{x}_2 = 64.48$), $t(38) = -3.05$, $p < .01$. Similarly, the average age of those subjects with prior paper experience was significantly younger than that of those with no paper experience, ($\bar{x}_1 = 40.38$, $\bar{x}_2 = 61.63$), $t(38) = -3.61$, $p < .001$.

Tables IV and V (see Appendix B) indicate that the mean clay and paper human figure scores were not effected by the subjects age, education or prior art experiences.

Dependent Measures

The dependent measures were the amount of detail and proportion in the clay human figures and the raised line paper human figures. Table VI shows the average clay and paper scores for five elements: 1. facial features, 2. arms and hands, 3. legs and feet, 4. torso, 5. proportion and position. Respectively, the average clay scores for elements 1 through 5 were: $\bar{x}_1 = 2.14$, $\bar{x}_2 = 2.23$, $\bar{x}_3 = 2.02$, $\bar{x}_4 = 2.35$, and $\bar{x}_5 = 2.36$. The analysis of variance (ANOVA) indicated a significant difference between the elements, $F(4, 195) = 3.71$, $p < .01$. The average paper scores for elements 1 through 5 were: $\bar{x}_1 = 2.10$, $\bar{x}_2 = 2.07$, $\bar{x}_3 = 2.00$, $\bar{x}_4 = 2.20$, and $\bar{x}_5 = 1.96$. The analysis of variance (ANOVA) revealed no significant difference between the elements, $F(4, 195) = .83$. It should be noted that the highest composite score of the five elements for clay was proportion and position whereas the lowest was legs and feet.

I questioned whether a varied order of presentation

Table VI
 Mean Clay Scores and Mean Paper Scores
 for Details of the Five Elements

Relationship	Test	DF	P	Difference Significant
Mean facial features for clay	$\bar{x}_1 = 2.14$			
Mean arms and hands for clay	$\bar{x}_2 = 2.23$			
Mean legs and feet for clay	$\bar{x}_3 = 2.02$			
Mean torso for clay	$\bar{x}_4 = 2.35$			
Mean proportion and position for clay	$\bar{x}_5 = 2.36$			
Rating Mean	$\bar{x}_6 = 2.22$ $F = 3.71$	4, 195	.01	Yes
Mean facial features for paper	$\bar{x}_1 = 2.09$			
Mean arms and hands for paper	$\bar{x}_2 = 2.07$			
Mean legs and feet for paper	$\bar{x}_3 = 2.00$			
Mean torso for paper	$\bar{x}_4 = 2.02$			
Mean proportion and position for paper	$\bar{x}_5 = 1.96$			
Rating Mean	$\bar{x}_6 = 2.06$ $F = .83$	4, 195	.51	No

of the media would significantly effect the scores for clay and raised line paper. As shown in Table VII no differences were revealed for the average clay scores for blind and visually impaired subjects when the clay was presented first or second. Table VIII shows no difference for the average paper score for visually impaired subjects, although a significant difference was revealed for the average paper score for blind subjects, ($\bar{x}_1 = 8.10, \bar{x}_2 = 10.00$) $t(18) = -2.19, p < .05$.

Two additional significant differences were found. Age and education were confounding variables in the order of presentation. Table IX shows that those subjects who experienced the clay first were older than those subjects who experienced the paper first, ($\bar{x}_1 = 64.55, \bar{x}_2 = 50.20$). The mean comparison was significant, $t(38) = 2.91, p < .01$. The average years of education was more for subjects who experienced the paper first ($\bar{x}_1 = 8.75, \bar{x}_2 = 11.55$). Mean comparisons revealed a significant difference of 2.80 years of education, $t(38) = 3.51, p < .001$.

Table X shows the analysis of major concern which compares the average clay score versus the average paper score. The average clay score for blind subjects was 10.52 compared to 9.05 the average paper score for blind subjects. As predicted, the average clay score for blind subjects was significantly greater than the average paper score, $t(18) = 4.30, p < .001$. For the visually impaired the

Table VII

Order of Presentation for Clay
by Visual Classification

Relationship	N	Test	DF	P	Difference Significant
Mean clay score for blind when clay presented 1st	10	$\bar{x}_1 = 10.33$			
Mean clay score for blind when clay presented 2nd	10	$\bar{x}_2 = 10.70$ $t = -.54$	18	.60	No
Mean clay score for vis. imp. when clay presented 1st	10	$\bar{x}_1 = 11.00$			
Mean clay score for vis. imp. when clay presented 2nd	10	$\bar{x}_2 = 12.37$ $t = -1.67$	18	.11	No

Table VIII

Order of Presentation for Paper
by Visual Classification

Relationship	N	Test	DF	P	Difference Significant
Mean paper score for blind when paper presented 1st	10	$\bar{x}_1 = 8.10$			
Mean paper score for blind when paper presented 2nd	10	$\bar{x}_2 = 10.00$ $t = -2.19$	18	.04	Yes
Mean paper score for vis. imp. when paper presented 1st	10	$\bar{x}_1 = 11.03$			
Mean paper score for vis. imp. when paper presented 2nd	10	$\bar{x}_2 = 12.13$ $t = -.88$	18	.39	No

Table IX

Order of Presentation for Clay and Paper
by Age and Education Factors

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of age for clay 1st	20	$\bar{x}_1 = 64.55$			
Mean yrs. of age for paper 1st	20	$\bar{x}_2 = 50.20$ t = 2.91	38	.01	Yes
Mean yrs. of educ. for clay 1st	20	$\bar{x}_1 = 8.75$			
Mean yrs. of educ. for paper 1st	20	$\bar{x}_2 = 11.55$ t = 3.50	38	.001	Yes

Table X

Average Clay Scores vs. Average Paper Scores

Relationship	N	Test	DF	P	Difference Significant
Mean clay score by blind	20	$\bar{x}_1 = 10.52$			
Mean paper score by blind	20	$\bar{x}_2 = 9.05$ $t = 4.30$	18	.0004	Yes
Mean clay score by vis. imp.	20	$\bar{x}_1 = 11.68$			
Mean paper score by vis. imp.	20	$\bar{x}_2 = 11.58$ $t = .23$	18	.82	No
Mean Total Clay Score	40	$\bar{x}_1 = 11.12$			
Mean Total Paper Score	40	$\bar{x}_2 = 10.32$ $t = 2.68$	38	.01	Yes

average clay score was 11.68 versus the average paper score of 11.58. A comparison of the means revealed no significant difference, $t(38) = .23$. It was revealed that the total score of the combined group of blind and visually impaired subjects was significantly higher for clay than it was for raised line paper, ($\bar{x}_1 = 11.12$, $\bar{x}_2 = 10.32$), $t(38) = 2.68$, $p < .05$.

Chapter 5

DISCUSSION

There are problems intrinsic to art therapy research. One of the most apparent, according to Harriet Wadeson (1978), is that it is difficult to arrive at a complete diagnosis on the basis of an art product. Various other factors, such as how a person behaves, interacts with the therapist, uses the media, or discusses the art product, should be carefully considered. Any objective measurement is also impossible unless the formal elements of the work are separated. The elements which were isolated and rated for this research project were; 1. facial features, 2. arms and hands, 3. legs and feet, 4. torso, and 5. proportion and position. As Wadeson has warned, however, the whole art work is more than the sum of its parts. Therefore, a breakdown may turn out to defeat its purpose.

Problems are also intrinsic to the administration of an experiment and to the interpretation of the results. Anastasi (1968) has stated that even apparently minor aspects of a testing situation may alter the performance. The specific limitations of the current study will be discussed in this chapter.

The consistency and stability of the test measurement is affected by many characteristics of the subjects and

raters. One aspect concerns scorer reliability, or the consistency among the different scorers. The second aspect deals with the consistency of the subjects' responses to the experiment or test. (Fein, 1960) These two concerns are possible sources of increased variance, due to the non-constancy of contributory characteristics such as: age, education, general skills and abilities, attitudes, health, emotional stress, and motivation.

A number of writers (Kerlinger, 1973; Kilpatrick, 1977; Meehl, 1954; Stanley and Campbell, 1963) have suggested various ways of collecting, presenting, and interpreting information for a reliable investigation. At the same time, these authors state that errors can arise in any one, or all three aspects of the investigation.

When I began this research project it was advised that I limit and define one problem. The hypothesis which I constructed was: "When directed to model and to draw a human figure with both clay and raised line paper and pen, respectively, blind and visually impaired subjects, when using clay will produce results which have more detail and more appropriate proportion than they will when using raised line paper and pen; as judged by three art therapists using sections of the Goodenough-Harris Draw-a-Man Scale as their evaluative criteria." To test the hypothesis I used the clients, who regularly attend the art therapy classes, and who volunteered to be participants. The forty subjects participated in an

experiment wherein **they** modelled a human figure in clay and drew a human figure on raised line paper. The resultant art work was rated by three judges for amount of detail and appropriate proportion.

I questioned whether the raters had scored the details of the clay and raised line paper with like accuracy. In both sets of scores, it should be noted that the third rater recorded consistently higher detail scores (see Table V). She openly expressed her bias to me as she looked at the art work for the first time. She stated, "I hate to score them low because I am so surprised that the blind can do this well." Her personal bias may have been a major influence in the way in she rated. The difference noted between all the raters may also be explained by other factors. Fein (1960) stated that the establishment of inter-rater reliability is dependent on the training and competence of the raters, the nature of the data which is to be judged, and the raters' conceptual scheme which they employ while interpreting.

Another aspect to be noted regarding the different ratings was that the raters were provided an inadequate guide sheet by which to award increasingly higher scores for an increased number of elements present. In retrospect, were a pilot phase, or a pre-experiment conducted, by which means a more detailed guide sheet could have been constructed, the significant variance in scoring possibly could have been avoided. Such a guide sheet might have listed: 1. for no

details; 2. for two or three details, such as: eyes, and mouth; 3. for four or five details, such as eyes, nose, mouth, and eye brows; and 4. for six or seven details, such as: eyes with eye lashes, nose with nostrils, mouth with lips, eye brows, and ears.

The subjects' ages and educational levels were possible contributors to the variances in clay and paper scores. Tables II and III (see Appendix B) indicate four areas of significant differences. There was a difference in the number of years of education between those subjects who had used raised line paper and those who had not, ($\bar{x}_1 = 12.63$, $\bar{x}_2 = 9.53$) $t(38) = 2.99$, $p < .01$. It is to be noted that the average age was less for subjects who had prior experience with raised line paper, as shown in Table III in Appendix B. These differences were anticipated, as the raised line paper has only been used in the United States for the past ten years. Therefore, it seems logical that the younger and more educated subjects would have more of an opportunity for experiencing raised line paper.

The personal preference for art media was another area in which a difference was found. Of the total number of forty subjects, twenty-nine preferred the medium of clay. Only three subjects chose raised line paper and eight subjects were undecided. The eight who were undecided were significantly less educated (7.50) than those who preferred clay (10.72) and those who preferred raised line paper (11.67).

Two final areas of noted difference are found in Table III in Appendix B. The mean comparison was determined to be different for the years of age of subjects who had prior clay experience than it was for subjects who did not have prior clay experience ($\bar{x}_1 = 49.53$, $\bar{x}_2 = 64.48$). Similarly, those subjects who had prior paper experience were significantly older than those subjects who did not have prior paper experience ($\bar{x}_1 = 40.38$, $\bar{x}_2 = 61.63$). This difference is explainable in that many of the younger subjects had attended the Missouri School for the Blind where clay work was a part of their educational curriculum, as was working with raised line paper.

The total clay and paper scores were compared with factors concerning age, education, race, and prior art experiences. Tables IV and V, in Appendix B, show that no significant differences were found for any of these factors, when compared to the mean scores for clay and raised line paper. However, when the overall scores were divided into four sub-groups according to the order of presentation (Table VIII) a difference was found in one area. The order of presentation, which was expected to remain the same, regardless of any change in presentation, was affected in the area of scores achieved by the blind using raised line paper. It is believed that the scores were different because of the factors of age and education. That is, the first group of blind subjects scored 8.10 on the paper, compared to 10.00 for the second group of

blind subjects. As seen in Table IX, the mean years of education for the first group of subjects who experienced the clay first was 8.75, compared to 11.55 for the second group of subjects who experiences the raised line paper first. The mean age for the subjects who experienced the paper first was 64.55, compared to 50.20 for the mean age of subjects who experienced the raised line paper first. The mean paper scores shown in Table IX appear to be affected by age and education factors.

It is also possible that if all the subjects had been controlled for age and education the paper scores could have been higher. For a comparison of age and education affecting the art work please notice the raised line human figure versus the clay human figure for subject #11, who is blind. (See Appendix C) She was 78 years old and had attained a third grade education. Next, notice the art work of subject #35, who is also blind. This subject was 42 years of age, and had completed twelve years of education. Subject #11 depicted a simple human figure form in the clay, and an almost non-descript human figure on the raised line paper. Subject #35 depicted a more complex human figure with many details with the media of clay and raised line paper. The younger and more educated blind subject scored significantly higher than did the older, less educated subject.

The touch required in using the medium of raised line paper is a different touch than that required when using

the medium of clay. One sensitive finger is used to feel the raised line produced by the pen. Whereas, the entire hand, or both hands, are used in modelling with clay. As people get older various physical disorders such as diabetes, arthritis, and hardening of skin tissue, prevent a sensitive finger touch. Younger subjects have often had their visual impairment since childhood, and therefore, have trained their fingers to be sensitive by use of braille and other required tactile skills.

The results of the computer analysis, as presented in Table X, support the hypothesis. According to these findings, it can be projected that when most blind subjects model a human figure in clay they will use more detail and more appropriate proportion than when they draw a human figure on raised line paper. Mean comparison, by the use of a t test, revealed that there was a significant difference between the clay score for details and the raised line paper score for details ($\bar{x}_1 = 10.52$, $\bar{x}_2 = 9.05$) $t(18) = 4.30$, $p < .0004$. The statement can therefore be made, that though there may be random exceptions, caused by various factors, the tactile medium of clay is a more appropriate medium than is that of raised line paper for blind subjects.

Such a statement can not be made for visually impaired subjects, as the average clay and paper scores for detail were quite close ($\bar{x}_1 = 11.68$, $\bar{x}_2 = 11.58$). A t test comparing these means indicated no significant difference,

$t(18) = .23, p < .82$. The probable reason for the close scores was that the visually impaired used their remaining vision to see the lines which they drew on the raised line paper.

Table X indicates that when grouped together the blind and visually impaired used more detail while working with clay than when working with raised line paper, ($\bar{x}_1 = 11.12, \bar{x}_2 = 10.32$) $t(38) = 2.68, p < .01$. These figures, when compared to scores by the visually impaired, seem to indicate that the blind and visually impaired should be separated in any consideration for scientific research when using the blind as subjects. Visual impairment does not imply the same degree of handicap as blindness. It is unfair to both groups to consider the achievements of the visually impaired in the same light as the achievements of the blind. Each category, or classification of disability has its own special characteristics. To the art therapist, this means that media choice should be completely tactile for blind clients, whereas, visual media can be used effectively with many visually impaired clients.

The last table to be considered, Table VI, shows a contradiction to one of my expressed purposes for conducting this research project. Whereas I was extremely interested in researching the total scores for details, I did not separate the two categories of blind and visually impaired when comparing the details and proportions for the five elements. Six individuals were assigned component tasks

in the computer analysis stage of the research project. As a result of such a large number of people taking part, a lack of a unified understanding occurred regarding my intentions of reporting separate details and proportions scores for the blind and for the visually impaired.

Table VI shows only the composite elements scores for the blind and visually impaired. The lowest score of 2.02 was the mean score for legs and feet when using clay as the medium. The lowest mean score for the paper human figure was also for the legs and feet (2.00). Many subjects apparently neglected details on the legs and feet. Blind subject #25 stated that she always has difficulty depicting legs in her art work, and therefore, thinks of ways in which to avoid making them. Notice that in photograph #25, found in Appendix C, this subject depicted the clay human figure as a monk with a long robe, and the raised line paper human figure as a woman wearing a long dress. It can be speculated that this subject, and other subjects who scored low on legs and feet, may have expressed some subconscious attitude relating to legs or the use of legs.

The highest score for an element among the clay scores was for proportion and position. The mean score was 2.36. Conversely, the lowest mean score for the raised line paper was 1.96 for proportion and position. This score was the lowest score recorded for any element for both the clay and the raised line paper. The probable

reason for proportion and position being judged the lowest is because many of the subjects had difficulty keeping their place with their finger. Those subjects who did experience success in this area either had some vision or used a contour drawing method. A contour drawing method means that an artist draws the outside of an object. Even a few blind subjects used the contour method of drawing. Since the pen or pencil does not leave the paper in this method the chances of losing one's place is greatly reduced. The blind subjects who used the contour method of drawing were numbers 4, 5, 8, 16, 25, and 35 whose art work can be found in Appendix C. The blind subjects who used a gestalt or part by part drawing method seemed to have more difficulty in maintaining a unified whole human figure. The visually impaired subjects who had less vision and thereby used their fingers instead of their eyes also expressed difficulty with a gestalt method of drawing. Examples of poor proportion and position can be seen in the photographs which are found in Appendix C. Notice particularly the artwork of subjects numbers 2, 3, 6, 13, 14, 17, 18, 19, 22, 26, 27, 28, 34, 36, and 39.

Limitations

Without a background in research methods and statistics I rushed blindly ahead to study the blind. The learning experience therefore not only related to studying the tactile media of clay and raised line paper but also concerned applying the scientific method of research in a

step by step procedure.

The subjects could not be chosen randomly since the population of blind and visually impaired persons was limited. Therefore it was not feasible to control for the variables of age, education, race, prior art experience, length of time blind or visually impaired, eye disorders, or length of time attending the classes. The variables of sex and congenital blindness were eliminated. By deleting these categories of subjects I created another limitation as most experimental studies concerning blindness and visual impairment consider both sexes and congenital blindness as opposed to adventitiously blind.

Regarding the actual process of the experiment procedure the following limitations were noted. Instead of one setting for all forty subjects there were 7 group settings and 13 individual settings. This factor could not be controlled because of the forty mile radius of the various subjects' homes. Central locations within the 7 neighborhoods were established for the convenience of the twelve volunteer drivers. Thirteen subjects were unable to attend the neighborhood centers due to lack of transportation, illness, or appointments. These thirteen subjects were seen individually.

The time limitation of three months for the completion and analysis of the research was a serious limitation in itself as it produced several more complications. There was no pre-test or post-test for the forty subjects.

Similarly, the raters could not experience a pre-judging or pilot evaluation to establish a common rating system or framework.

The Goodenough-Harris Draw-a-Man Scale was abbreviated so that the volunteer raters would only have to mark ten categories as opposed to one hundred forty-six categories for each of the forty subjects. This could be considered a limitation as a correlation of the specific details included or omitted is not identifiable from the abbreviated form actually used for the ratings.

Regarding the telephone questionnaire, (see Figure 1, Appendix A) I was the person who called the forty subjects. Although I tried to be non-directive, and did not tell the subjects the hypothesis, a possible bias could have been introduced. Recognizing this limitation I asked the social worker of our six staff member agency to call the forty subjects, but she declined.

The scoring sheet which was developed for the raters' evaluations used a rating scale for details which was appropriate for the four elements of facial features, arms and hands, legs and feet, and torso. However, the rating for details was not appropriate for element #5, which was proportion and position. This might have proven to be a difficult scoring item for the three raters.

The computer analysis, itself, presented many more limitations. Because of the mixed-up communication I did not receive an analysis of variance of the five

elements for both the blind and the visually impaired, and therefore, I was unable to analyze the specific differences and similarities for both visual classifications. The possibility of human error occurring while coding the computer was also a limitation. After I grouped the results according to categories I noticed that two tests contained mistakes. I also received eight duplications of previous print-outs because the forty-three tests were put into the computer at three different times. Another limitation of the computer analysis was pointed out to me after I had received all the results. A Scheffe's T Test might have produced results which were significantly different from the standard t test for unmatched groups used by the Statistical Package for the Social Sciences.

Implications

Despite the limitations and possible errors of this investigation comparing the tactile media of clay and raised line paper, results indicated that the medium of clay enables blind subjects to produce results which have more detail and more appropriate proportion than the medium of raised line paper.

To psychologists or educational researchers this preliminary investigation presents a challenge to a traditionally held idea that a human figure should only be drawn by the clients or students for evaluation of IQ or personality. The question, then, develops: Could the Goodenough-Harris Draw-a-Man Scale be modified

for the blind which would use as media clay, plasticene, and the like, instead of the medium of paper and pencil? In my opinion, the depiction of a human figure, using an art medium is more appropriate than an oral description of a human figure, which was a test form adapted for use with the blind by Chase and Rapaport. (Scholl & Schnur, 1976)

To persons interested in projective techniques, such as: Anderson, 1951; Hammer, 1958; Harrower, 1960; Machover, 1949; and their successors, this study poses the possibility of personality projection with a three-dimensional medium. An interesting study could be researched concerning the frontal or relief approach to modelling a human figure versus a more complete three-dimensional approach. As can be observed in the forty photographs in Appendix C, most of the subjects projected a relief, or frontal body image as opposed to a complete three-dimensional body image.

The National Center for Health Statistics estimates that the projected number of severely visually impaired persons over age sixty-five will total 1,756,000 by the year 2000. (Lowman, 1979) To those individuals who will be among this projected number the study implies that one uses the sense of touch in an active manner to explore the world.

Finally, to art therapists and other therapists working with children or adults who are blind or visually impaired, the study suggests that psychotherapeutic and

creative activities should include the sense of touch. Of the two media researched, the tactile medium of clay seems to be more appropriate in use with the blind and visually impaired than is the medium of raised line paper. The blind subjects produced more detail and more appropriate proportions with the clay than with the raised line paper.

Chapter 6

SUMMARY

This research project afforded an opportunity to explore tactile media with blind and visually impaired women, and to study and compare the media of clay and raised line paper. Over seventy-five books and periodicals concerning tactile media and the blind were discussed, compared, and contrasted in the chapter titled: "Review of Literature."

An investigation was conducted in the field to test the hypothesis: "When directed to model and to draw a human figure with both clay and raised line paper and pen, respectively, blind and visually impaired subjects, when using clay will produce results which have more detail and more appropriate proportion than they will when using raised line paper and pen; as judged by three art therapists using sections of the Goodenough-Harris Draw-a-Man Scale as their evaluative criteria."

Forty subjects participated in the experiment. A split-half design was utilized in the investigation. Twenty blind and twenty visually impaired subjects were asked to produce two human figures each; one by means of clay and one by means of raised line paper. Three art therapists evaluated the resultant art work. Each rater scored the amount of detail and proportion higher for the clay figures than for the raised line figures. The significant difference found between the scores supports the hypothesis. However, the raters' means which were compared for consistency in scoring were found to be significantly different.

Therefore, it is questionable whether the hypothesis is supported because of the lack of reliability among the raters' scores, and also because of the confounding variables of age and education among the subjects and various other limitations of the study.

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APPENDIX A

Telephone Questionnaire

1. Have you had prior experience with clay?
2. Have you ever modelled a human figure in clay?
3. Have you had prior experience with raised line paper?
4. Have you ever drawn a human figure on raised line paper?
5. Have you had any art classes or art experiences other than my classes since your school days?
6. How many years of education did you complete?
7. Did you prefer working with the clay or the raised line paper?

Figure 1. Telephone Questionnaire Used After the Study to Determine the Subjects' Prior Art Experiences.

DECLARATION OF INFORMED CONSENT

I give my informed consent to participate in a study involving modelling in clay and drawing on raised line paper.

I consent to publication of study results so long as the information is anonymous and disguised so that no identification can be made. I further understand that although a record will be kept of my having participated in the experiment, all experimental data collected from my participation will be identified by number only.

I give my consent for photographs to be taken of my artwork with the understanding that the photographs will be anonymous.

1. I have been informed concerning the general purpose of this experiment.
2. I have been informed that there are no known expected discomforts or risks involved in my participation.
3. I have been informed that there are no "disguised" procedures in this experiment. All procedures can be taken at face value.
4. I have been informed that the investigator, Sherry Carrigan, will gladly answer any questions regarding the procedures of this study when the experimental sessions are completed.
5. I have been informed that I am free to withdraw from the experiment at any time without penalty of any kind.

Concerns about any aspects of this study may be referred to the Executive Director, St. Louis Society for the Blind, Suite 308, Humboldt Building, 539 North Grand Boulevard, St. Louis, Mo., 63103.

Experimenter

Experimental Participant

Date

Figure 2. Declaration of Subject's Informed Consent

APPENDIX B

Table I

Age, Age by Race, and Education
by Visual Classification

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of age for blind	20	$\bar{x}_1 = 55.75$			
Mean yrs. of age for vis. imp.	20	$\bar{x}_2 = 59.00$ $t = .60$	38	.55	No
Mean age for white subjects	28	$\bar{x}_1 = 54.82$			
Mean age for black subjects	12	$\bar{x}_2 = 63.33$ $t = -1.47$	38	.15	No
Mean yrs. of educ. for blind	20	$\bar{x}_1 = 10.30$			
Mean yrs. of educ. for vis. imp.	20	$\bar{x}_2 = 10.00$ $t = .33$	38	.75	No

Table II
 Average Years of Education
 by Prior Art Experience and Media Preference

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of educ. by prior clay experience	19	$\bar{x}_1 = 10.68$			
Mean yrs. of educ. by no prior clay experience	21	$\bar{x}_2 = 9.67$ t = 1.12	38	.27	No
Mean yrs. of educ. by prior paper experience	8	$\bar{x}_1 = 12.63$			
Mean yrs. of educ. by no prior paper experience	32	$\bar{x}_2 = 9.53$ t = 2.10	38	.01	Yes
Mean yrs. of educ. by prior art experience	6	$\bar{x}_1 = 10.83$			
Mean yrs. of educ. by no prior art experience	34	$\bar{x}_2 = 10.03$ t = .63	38	.53	No

Table II (Continued)
 Average Years of Education
 by Prior Art Experience and Media Preference

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of educ. by clay preference	29	$\bar{x}_1 = 10.72$			
Mean yrs. of educ. by paper preference	3	$\bar{x}_2 = 11.67$			
Mean yrs. of educ. by no preference	8	$\bar{x}_3 = 7.50$			
Rating Mean		$\bar{x}_4 = 10.15$	2, 37	.01	Yes

Table III

Average Age
by Prior Art Experience and Media Preference

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of age by prior clay experience	19	$\bar{x}_1 = 49.53$			
Mean yrs. of age by no prior clay experience	21	$\bar{x}_2 = 64.48$ $t = -3.05$	38	.01	Yes
Mean yrs. of age by prior paper experience	8	$\bar{x}_1 = 40.38$			
Mean yrs. of age by no prior paper experience	32	$\bar{x}_2 = 61.63$ $t = -3.61$	38	.001	Yes
Mean yrs. of age by prior art experience	6	$\bar{x}_1 = 64.67$			
Mean yrs. of age by no prior art experience	34	$\bar{x}_2 = 56.09$ $t = 1.14$	38	.26	No

Table III (Continued)
 Average Age
 by Prior Art Experience and Media Preference

Relationship	N	Test	DF	P	Difference Significant
Mean yrs. of age by clay preference	29	$\bar{x}_1 = 55.10$			
Mean yrs. of age by paper preference	3	$\bar{x}_2 = 54.00$			
Mean yrs. of age by no preference	8	$\bar{x}_3 = 66.88$			
Rating mean		$\bar{x}_4 = 57.38$	2, 37	.21	No

$F = 1.61$

Table IV
Clay and Paper Scores
by Age, Education and Race

Relationship	N	Test	DF	P	Difference Significant
Mean clay scores by subjects less than 40 yrs.	8	$\bar{x}_1 = 10.33$			
Mean clay scores by subjects more than 40 yrs.	32	$\bar{x}_2 = 11.29$ $t = -1.36$	38	.18	No
Mean paper scores by subjects less than 40 yrs.	8	$\bar{x}_1 = 10.50$			
Mean paper scores by subjects more than 40 yrs.	32	$\bar{x}_2 = 10.27$ $t = .21$	38	.84	No
Mean clay scores by subjects w/ less than 9 yrs. of education	13	$\bar{x}_1 = 10.97$			
Mean clay scores by subjects w/ more than 9 yrs. of education	27	$\bar{x}_2 = 11.16$ $t = -.30$	38	.76	No

Table IV (Continued)
 Clay and Paper Scores
 by Age, Education and Race

Relationship	N	Test	DF	P	Difference Significant
Mean paper scores by subjects w/ less than 9 yrs. of education	13	$\bar{x}_1 = 9.85$			
Mean paper scores by subjects w/ more than 9 yrs. of education	28	$\bar{x}_2 = 10.55$ $t = -.74$	38	.46	No
Mean clay scores by white subjects	28	$\bar{x}_1 = 11.26$			
Mean clay scores by black subjects	12	$\bar{x}_2 = 10.72$ $t = .87$	38	.39	No
Mean paper scores by white subjects	28	$\bar{x}_1 = 10.68$			
Mean paper scores by black subjects	12	$\bar{x}_2 = 9.47$ $t = 1.28$	38	.21	No

Table V
Clay and Paper Scores
by Prior Art Experiences

Relationship	N	Test	DF	P	Difference Significant
Mean clay scores by prior art experience	6	$\bar{x}_1 = 11.28$			
Mean clay scores by no prior art experience	34	$\bar{x}_2 = 11.07$ $t = .26$	38	.80	No
Mean paper scores by prior art experience	6	$\bar{x}_1 = 10.11$			
Mean paper scores by no prior art experience	34	$\bar{x}_2 = 10.35$ $t = -.20$	38	.85	No
Mean clay scores by prior clay experience	19	$\bar{x}_1 = 10.83$			
Mean clay scores by no prior clay experience	21	$\bar{x}_2 = 11.35$ $t = -.92$	38	.36	No

Table V (Continued)
 Clay and Paper Scores
 by prior Art Experiences

Relationship	N	Test	DF	P	Difference Significant
Mean paper scores by prior paper experience	8	$\bar{x}_1 = 11.08$			
Mean paper scores by no prior paper experience	32	$\bar{x}_2 = 10.13$ $t = .88$	38	.39	No

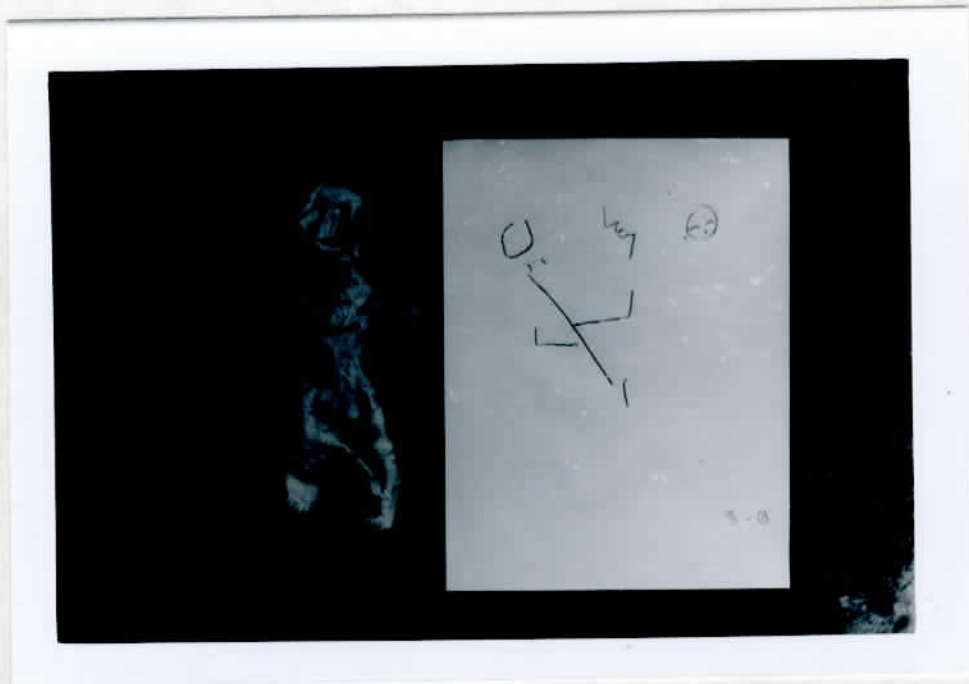
APPENDIX C



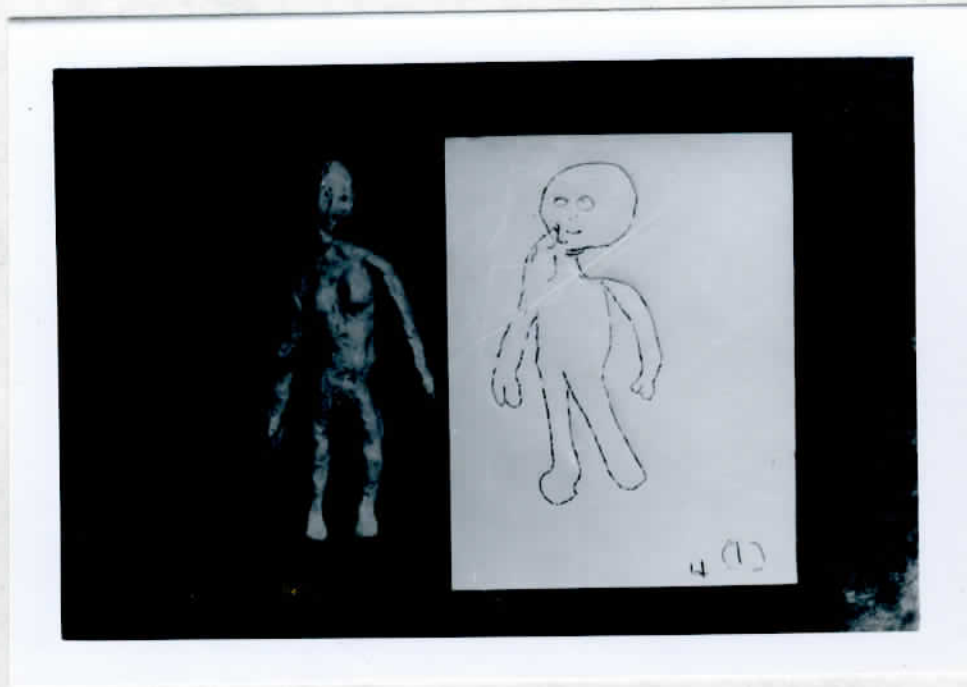
Subject #1 - Visually Impaired



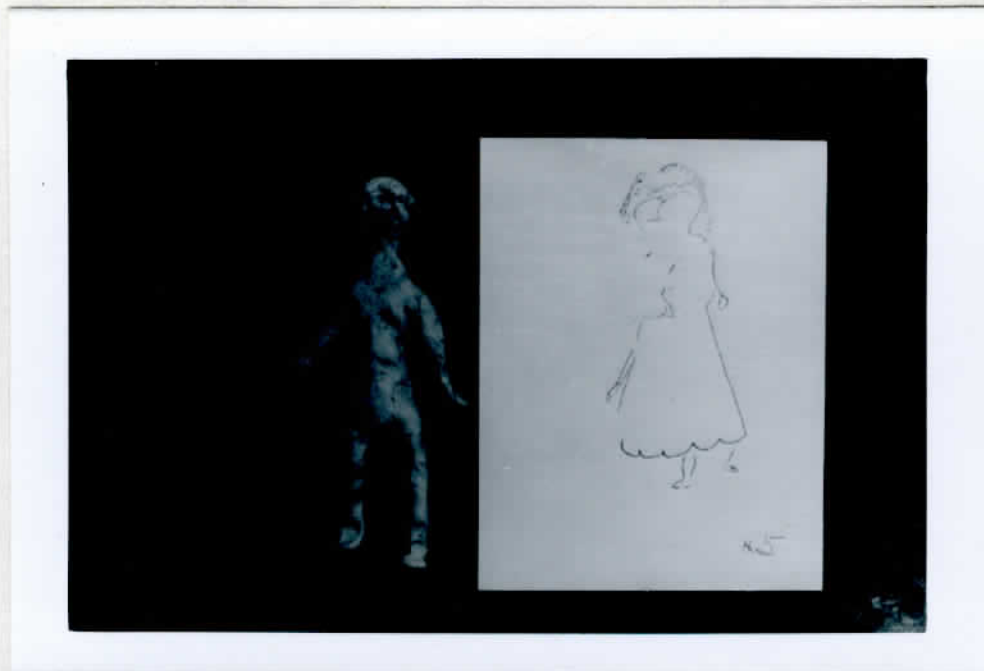
Subject #2 - Blind



Subject #3 - Blind



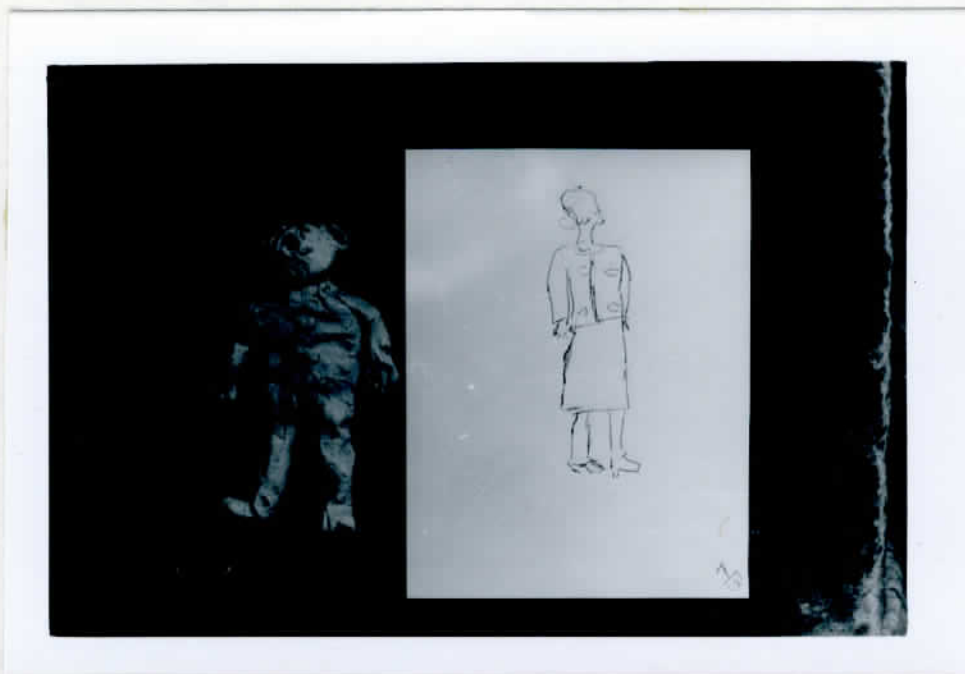
Subject #4 - Blind



Subject #5 - Visually Impaired



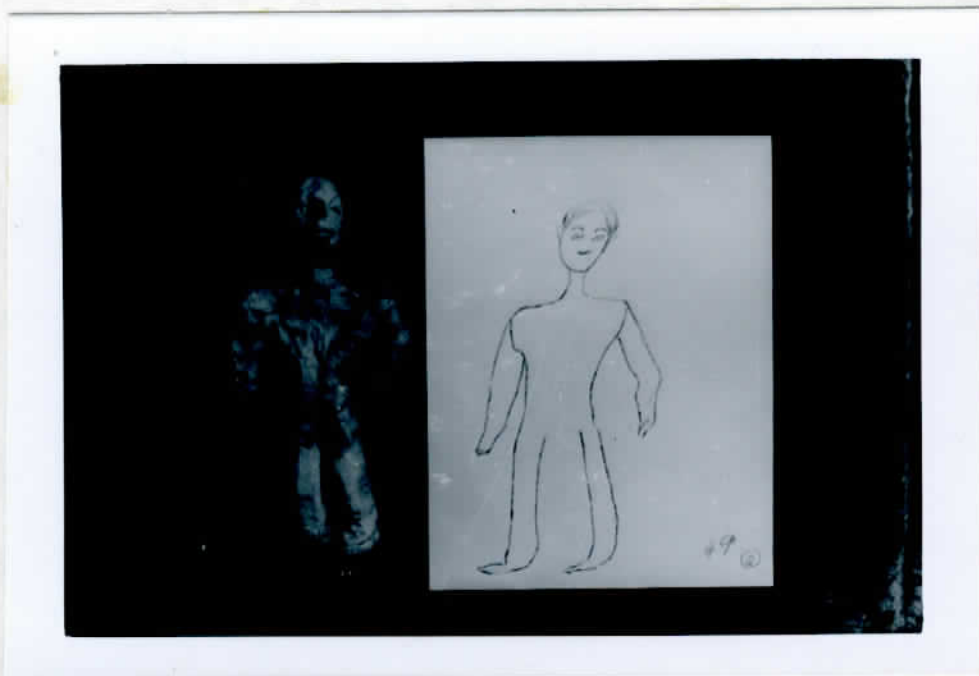
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Subject #7 - Visually Impaired



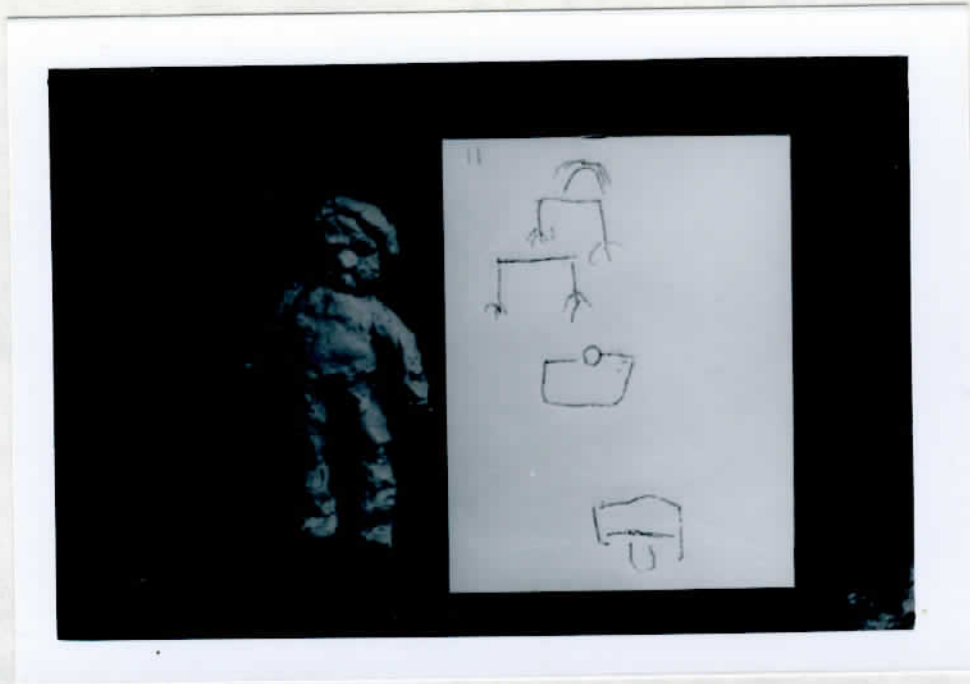
Subject #8 - Blind



Subject #9 - Visually Impaired



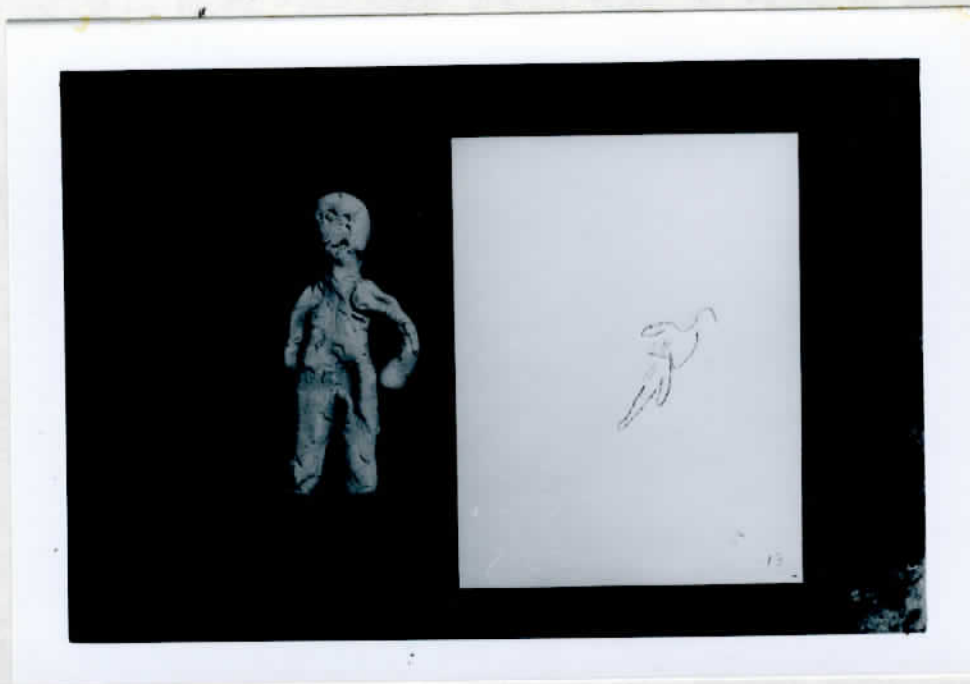
Subject #10 - Visually Impaired



Subject #11 - Blind



Subject #12 - Blind



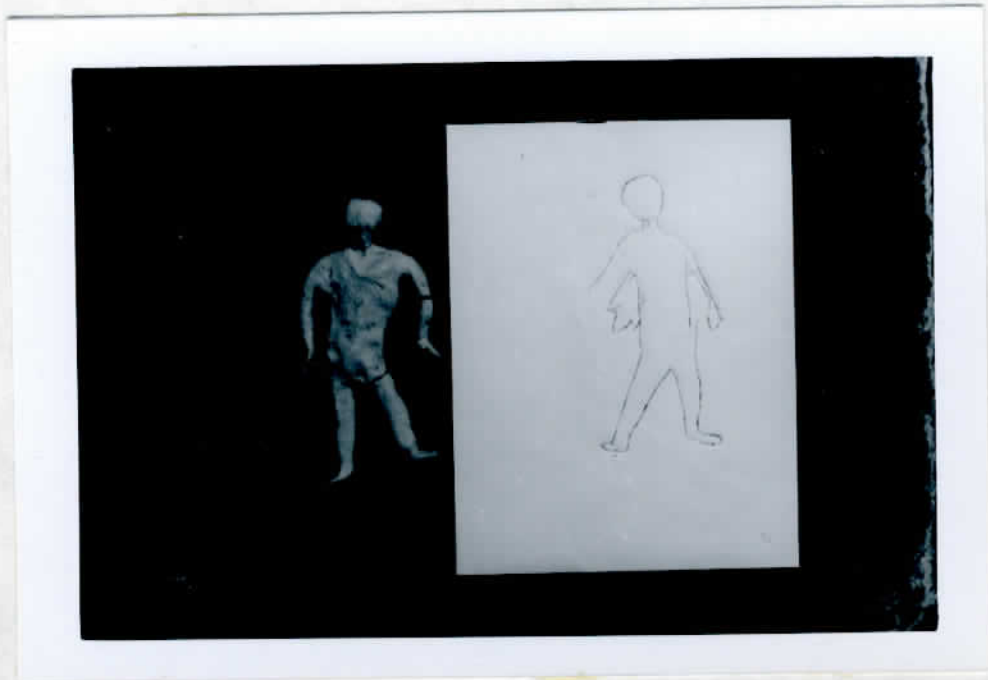
Subject #13 - Blind



Subject #14 - Visually Impaired



Subject #15 - Visually Impaired



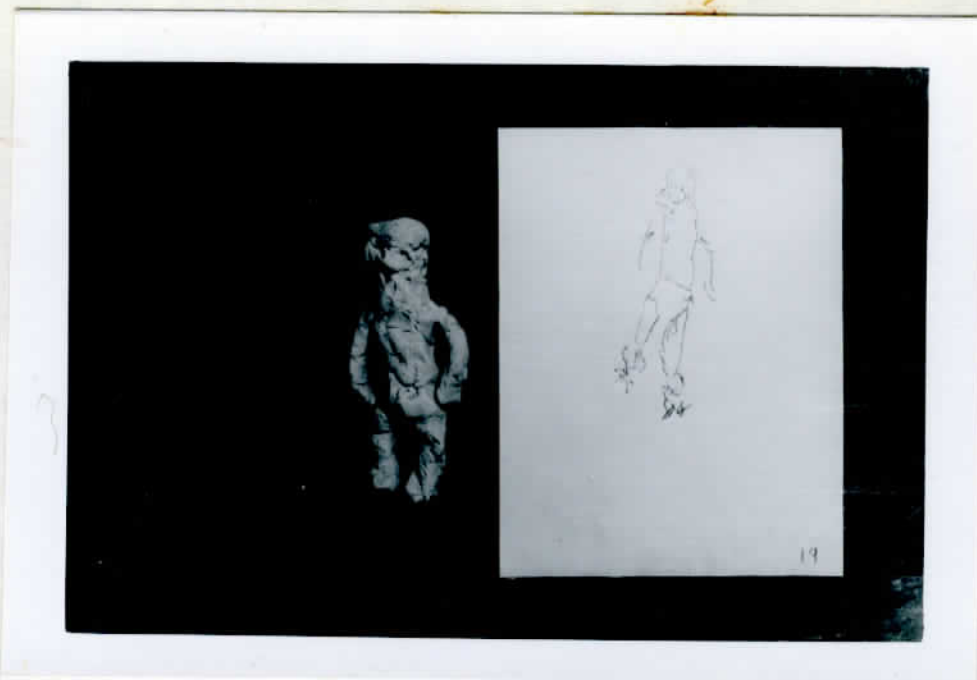
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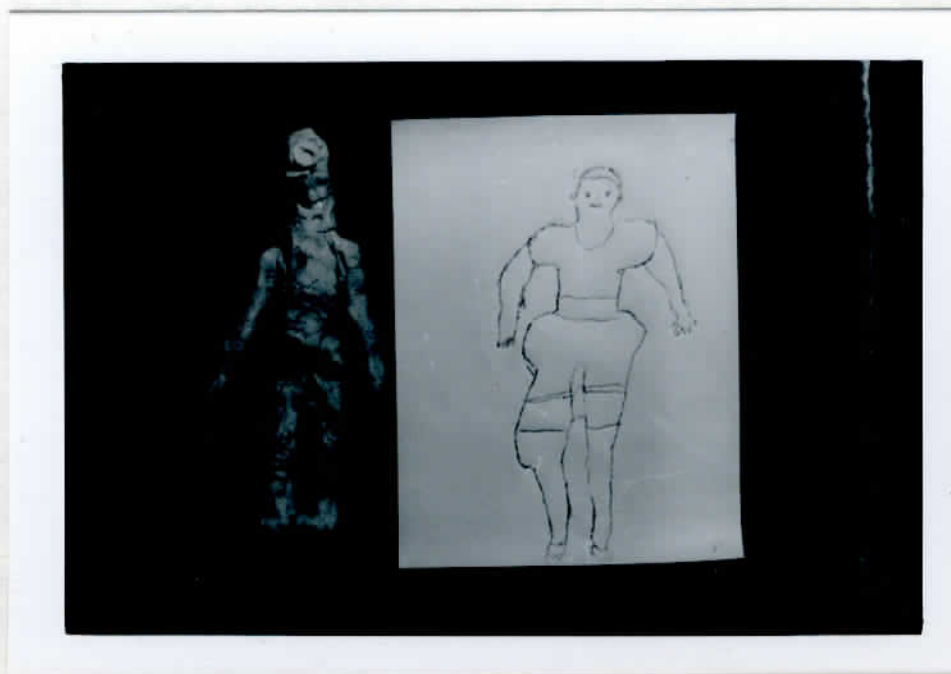
Subject #17 - Blind



Subject #18 - Visually Impaired



Subject #19 - Blind



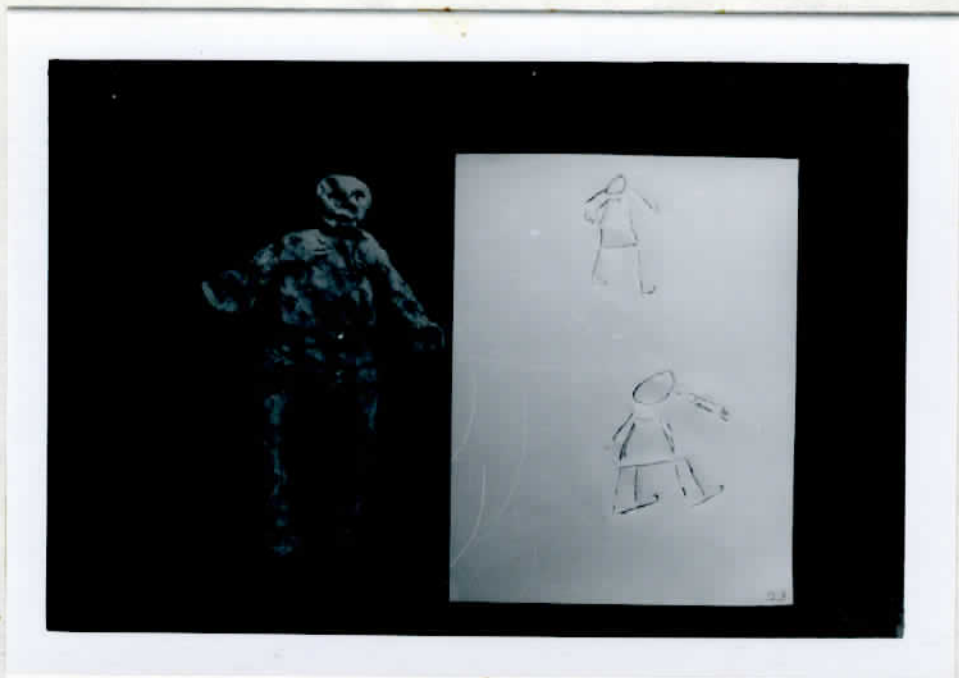
Subject #20 - Visually Impaired



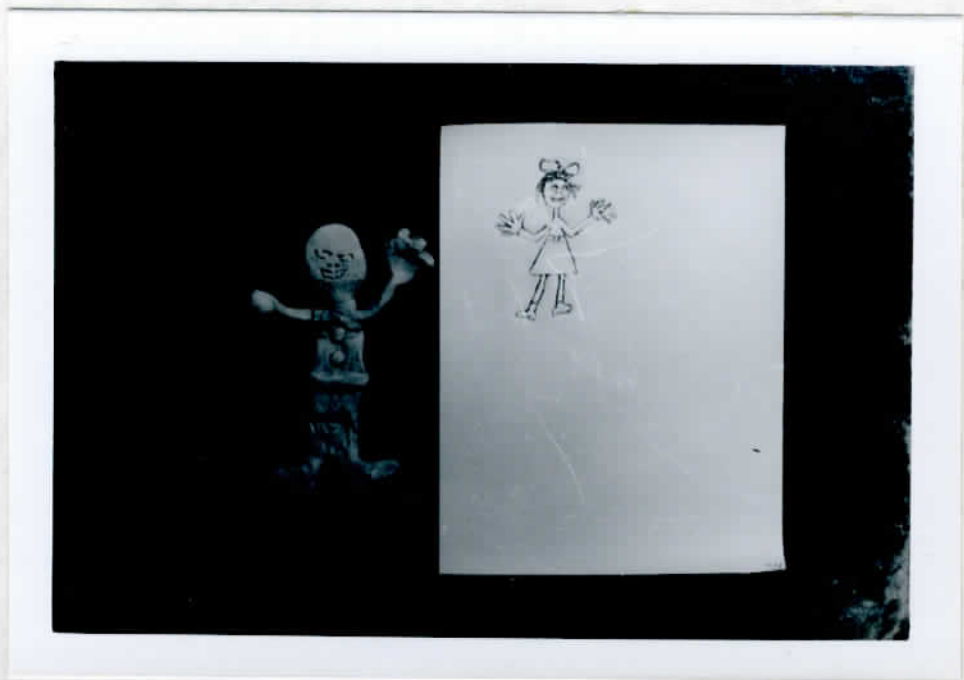
Subject #21 - Blind



Subject #22 - Blind



Subject #23 - Blind



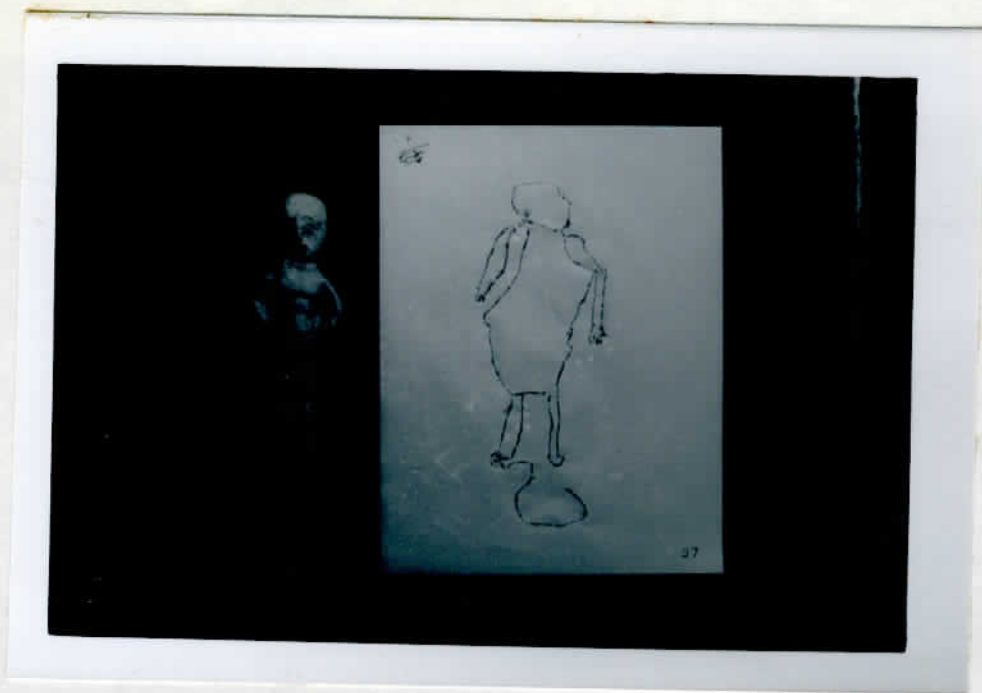
Subject #24 - Visually Impaired



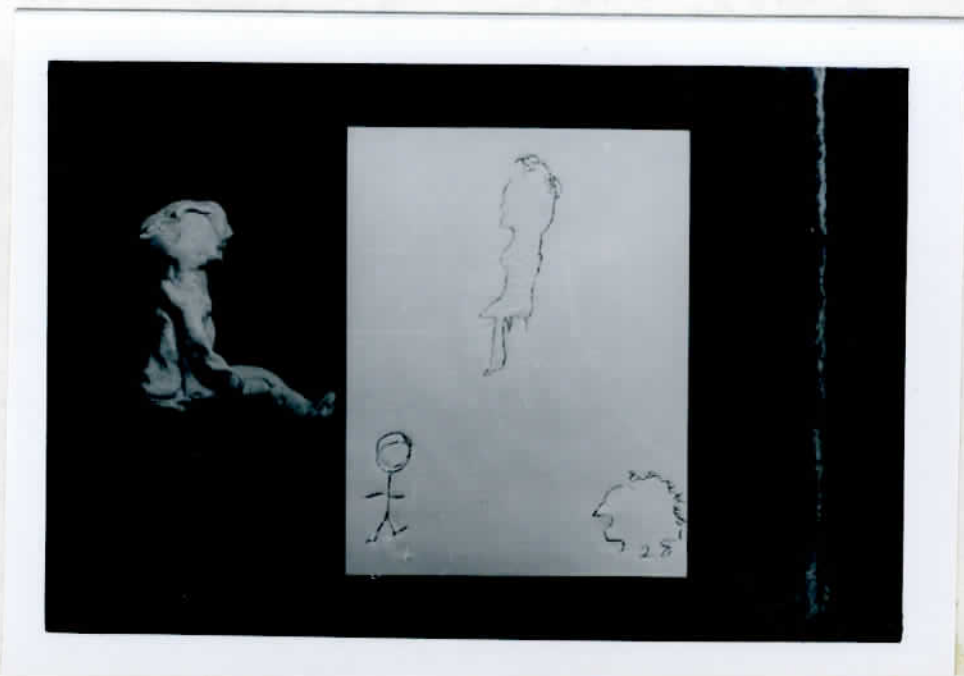
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Subject #26 - Visually Impaired



Subject #27 - Blind



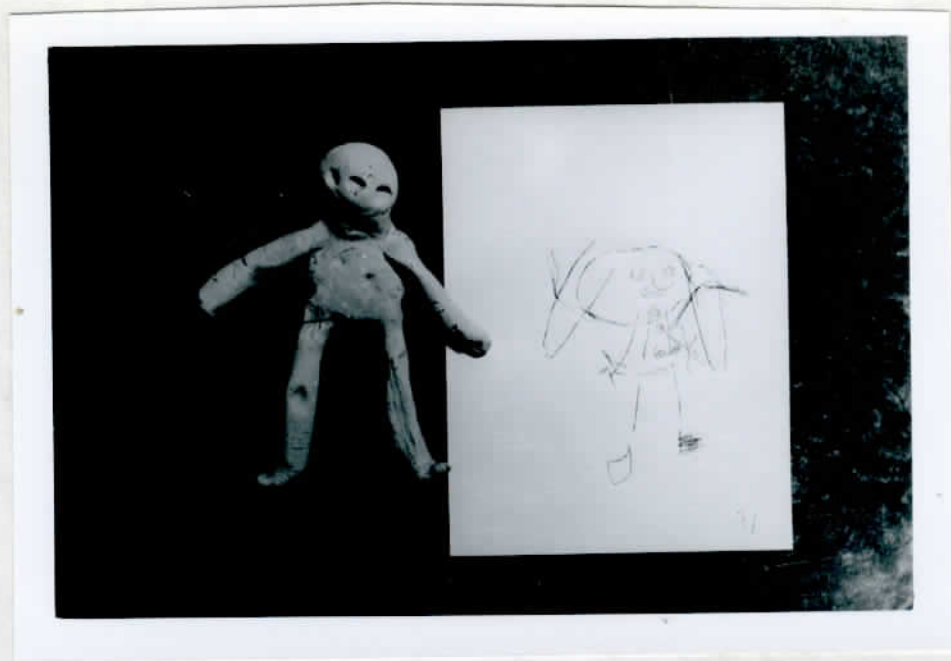
Subject #28 - Blind



Subject #29 - Visually Impaired



Subject #30 - Visually Impaired



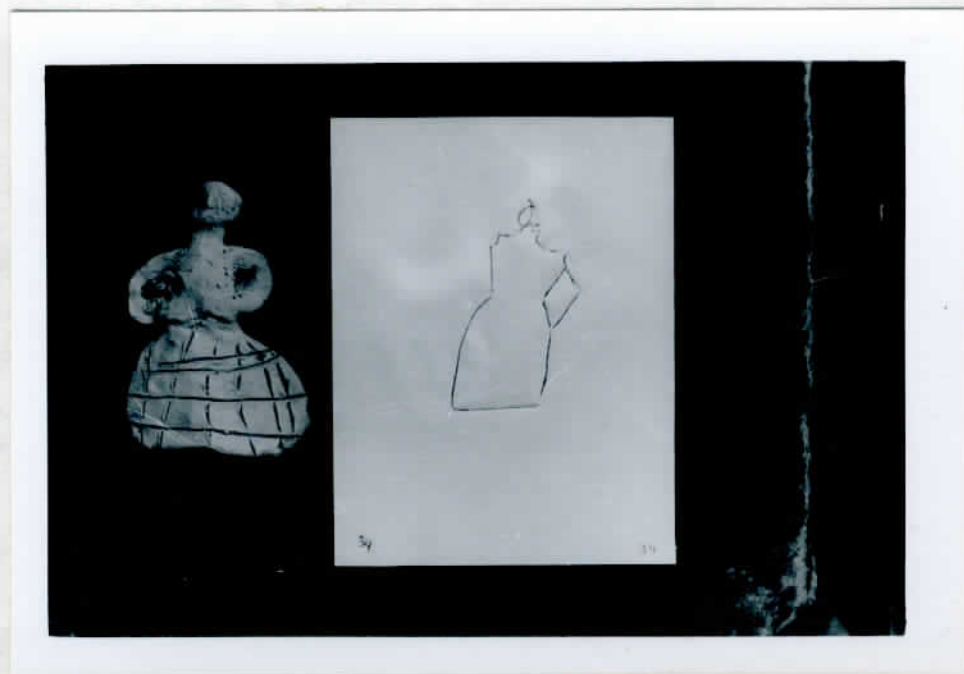
Subject #31 - Visually Impaired



Subject #32 - Blind



Subject #33 - Visually Impaired



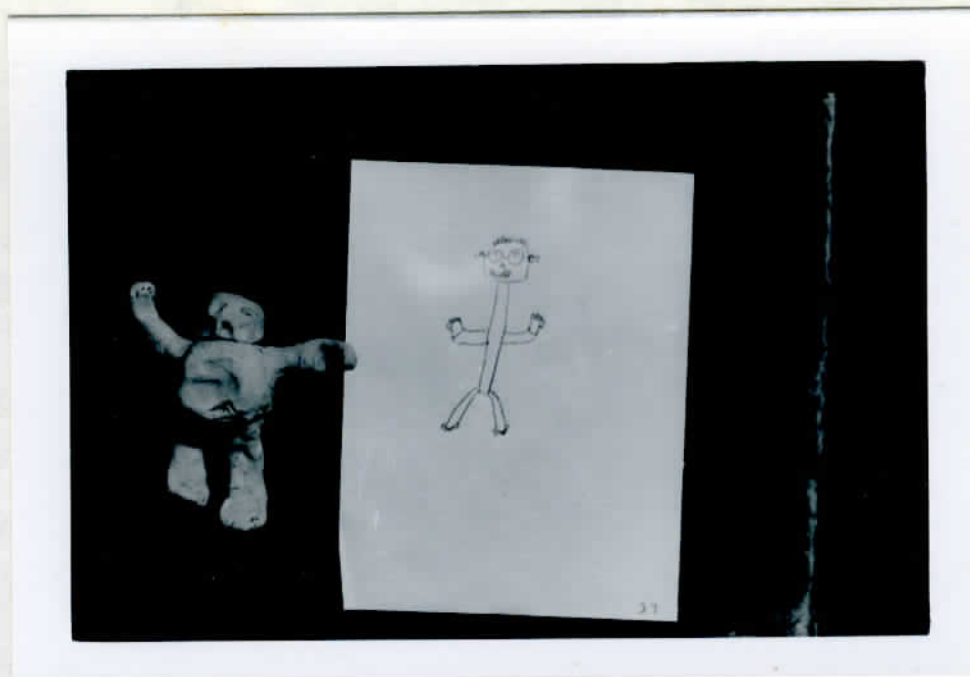
Subject #34 - Blind



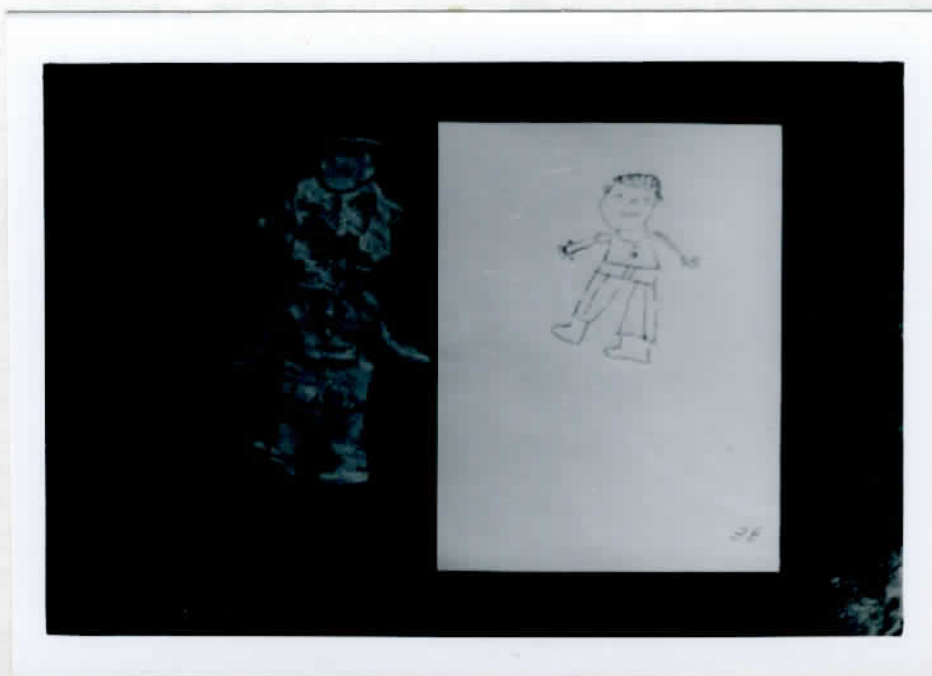
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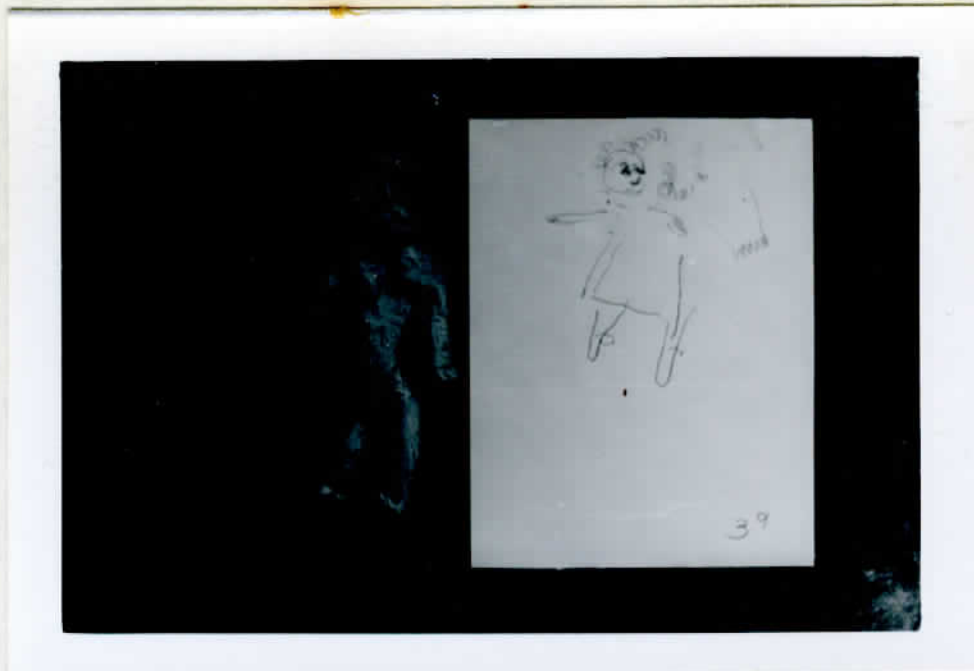
Subject #36 - Blind



Subject #37 - Visually Impaired



Subject #38 - Visually Impaired



Subject #39 - Visually Impaired



Subject #40 - Visually Impaired