AN EXPERIMENTAL APPROACH TO THE EVALUATION OF SPATIAL STRUCTURE IN THE PAINTINGS OF SCHIZOPHRENICS AND ALCOHOLICS: THE SCOTS AND THE ALASKAN ESKIMOS

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The first individual to acknowledge at the completion of this research project is the individual responsible for my initial interest in the field of art and psychopathology, R.W. Pickford. It was Professor Pickford's book, Studies in Psychiatric Art: Its Psychodynamics, Therapeutic Value, and Relationship to Modern Art (1967) that stimulated the interest of a college senior and resulted in an extensive senior thesis.[1] Consequently, I directed my efforts toward further study with Professor Pickford. At that time, 1971-1972, the graduate schools in the United States emphasised experimental laboratory work with animals. Professor Pickford allowed me to combine my interest in art and experimental psychology and, at the same time, provided me with the opportunity to benefit from his experience with science, perception, art, and psychopathological forms of expression.

After the retirement of Professor Pickford, Dr. Alastair Weir assumed the responsibility of supervising the preparation of the manuscript. His contributions to this paper are greatly appreciated.

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[1]For a partial list of publications by R.W. Pickford, the reader is directed to the references as well as Green and Pickford (1968) and Wyburn, Pickford, and Hirst (1964).

The following individuals were instrumental in providing a facility for testing subjects and/or access to psychiatric patients:

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SUMMARY

An extensive review of related literature offers an opportunity to examine work which has describe the schizophrenic personality disorganisation as a process of disintegration, involving a fundamental change in relationships with reality. There is a disintegration of the self-boundary, making it difficult for the schizophrenic individual to differentiate between himself and the outer world. This disintegration process is not always apparent because the schizophrenic abandons verbal communication. He still needs to communicate, however, and often replaces verbal communication with the nonverbal graphic form of expression.

Billig (1970) suggested a relationship between the stages of the schizophrenic's ego disintegration and specific changes in the graphic representation of space. These characteristic changes in spatial structure could, according to Billig (1970), be detected universally in the spontaneous paintings produced by schizophrenics.

The primary purpose of this research, designed to experimentally investigate Billig's (1970) spatial structure theory and compare the results with his findings, was to develop a nonverbal diagnostic tool to be used with schizophrenic patients. Perceptual size and distance constancy tests were included in the experimental procedure to provide a new source of information about the relationship between disturbances of the ego boundary, body image, the self, the

perceptual constancies, and space perception as described by Weckowicz and Sommer (1960). Consequently, the experimental procedure included tests of size and distance constancy as well as two painting tasks (free-choice and suggested subject). To isolate the effects of culture and to explore the possible similarity between two clinical groups that share symptoms, such as thought disorder, six groups were tested, comprising schizophrenics, alcoholics, and controls (individuals with no psychiatric history) from both Eskimo and Scottish cultures.

The primary hypothesis, which stated that there is a significant positive correlation between the amount of error made on a size constancy task and the ratings representing the disintegration of spatial structures in paintings, was not supported by the experimental data, although some of the secondary hypotheses were supported. For example, there was a significant difference between the spatial structure ratings of the Scottish schizophrenics and Eskimo schizophrenics. In spite of the fact that the spatial structures characteristic of the schizophrenic patient (Billig, 1970) were detected in the paintings of the Eskimo schizophrenics, there was a significant difference between the ratings for the Scottish and Eskimo schizophrenic groups. The paintings produced by the Eskimo alcoholic subjects received the highest percentage of the rating that represented the spatial structure characteristic of the most extreme stage of schizophrenic deterioration. Therefore, the <u>universal</u> application of Billig's (1970) theory was not supported by the

results of this study.

The research perspective emphasised the need for methodological detail and design associated with psychiatric art evaluation. It was submitted that the spatial structure rating scale, the nonverbal diagnostic tool, developed for this study would be most efficient if applied to one patient's paintings throughout the course of his treatment. Various explanations for the findings are discussed as well as numerous methodological proposals and directions for future research.

PREFACE

As I begin the process of "pulling together", describing, and discussing this research, I must acknowledge a smile. The obstacles encountered throughout this project have been enormous, and to approach this final phase of communicating this work to others assures me that I have overcome and solved all the difficulties that at one time seemed insurmountable.

The chronological existence of this research is overwhelming. My research proposal was presented to Professor R.W. Pickford in January of 1972, and this manuscript will be submitted to the University of Glasgow in December of 1984. During this period, the details of my work accompanied me as I travelled to Scotland, Alaska, Washington, New Hampshire, and Vermont. I have married, lived in eight locations, given birth to two daughters, worked in five hospitals, travelled to remote Eskimo villages, and reviewed the related literature in more than 20 libraries. I mention this so that the reader will know that this research represents a process of learning that has been intermingled with my life for the last 12 years. It should be understandable, then, that writing this preface may represent an act of closure for the writer as well as provide a source of information for the reader. The research process has been good but difficult company, and the feeling of closure is, I'm sure, enhanced by the extent and complexity of the task.

When this research was initiated, the importance of art therapy in the United States was not fully recognised.[1] The intention of combining the fields of art and psychology was not well received by artists or psychologists. Art therapy is now included in many college courses and graduate programs. Ulman and Dachinger (1975) noted, while recalling the history of the American Journal of Art Therapy, that "each time our printing deadline approached we wondered whether an article worthy of taking the lead position would materialize, and once a year for the first three years we had to use reprinted articles to fill the gap. Today it is hard to keep abreast of the backlog of worthy new material that awaits attention" (p. X). I feel that this statement reflects the change that has occurred during the research period and writing of this Ph.D. dissertation. The quantity and quality of material has multiplied. As will be noted, several references cited in the review of literature and throughout this paper were published after this research proposal was submitted and some resemble the present research in one respect or another. It appears that an experimental approach to the evaluation of graphic representation may represent the present stage of development in the science intended to assist the art therapist in the treatment of psychiatric patients. This Ph.D. dissertation, therefore, not only reflects an early stage of this develop-

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[1] Spelling: The spelling of words throughout this dissertation will comply with the British spelling. For the British reader, there is an attempt to be consistent in this approach, but it would be appreciated if the reader will bear in mind that the writer is accustomed to American spelling (e.g., recognise and recognize).

ment, but it, also, encourages the reader to apply experimental standards and procedures to pre-existing theories or hypotheses.

The rarity of the research data which has been accumulated for the purpose of this study is established essentially in two ways: (1) The research involves a combination of information from two clinical categories (schizophrenia and alcoholism), two areas of study (psychopathology and art), and two cultures (Scottish and Eskimo). The complex nature of this investigation, consequently, required a rather extensive review of the related literature.[1] I would like to encourage the reader to allow himself or herself the time to consider the survey of literature; in spite of its length, it is an essential part of this paper. It will not only enhance the reader's understanding of the experiment, but, it will also provide an understanding of the developmental process that is so essential for any field of science, in this case art therapy. (2) The fact that the Alaskan Eskimo people are represented in the study contributes to its uniqueness. As will be indicated in the review of literature, the amount of experimental research that has included the Alaskan Eskimos is extremely limited, at least in the related literature. There may be numerous reasons

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1Due to the complexity of the review of literature, the usual abbreviations used to indicate that a reference has been mentioned previously will not be used (e.g., ibid.). It should also be stated that the guidelines used for writing this manuscript were provided by the British Standards Institution (BS 4821), the Publication Manual of the American Psychological Association, and Turabian (1973).

for this apparent lack of research. For example, the rural Alaskan Eskimos live in remote regions of Alaska, which are only accessible by aeroplane or boat, and the facilities that would be necessary for conducting controlled experiments are not available. In the future, the individual interested in learning more about the Alaskan Eskimos may find these circumstances a hinderance. In addition, it may be difficult to study an isolated variable that may be affected by alcohol consumption, the assimilation of the Eskimo culture, or the transition from a "pure" race to a "mixed" race (the number of Eskimos that marry Caucasians is increasing). There is no attempt to present concrete evidence to the reader, but the indication is that this research project and ones similar to it will be impossible to attempt in the years to come. As a researcher, I feel privileged to have had the opportunity to acquire the data necessary for this study, and, as a person, I feel privileged to have had the opportunity to meet some Alaskan Eskimos and become acquainted with their culture.

"Europeans allow more time for virtually everything involving important human relationships. Many of my European subjects observed that in Europe human relationships are important whereas in the United States the schedule is important" (Hall, 1966, p. 1332). Without a schedule, in fact several schedules, this research material would have never reached the printed page. However, this quote does reflect the attitude that accompanied the process associated

with this research. The human relationships established during the last 12 years could not be adequately accounted for in these pages, but they were all considered more important than a schedule, a statistic, or the process involved in acquiring a degree.

To

my daughters

Larraby and Chelsea

When the pain is so intense that it no longer has access to the level of consciousness, when the thoughts are so dispersed that they are no longer understood by fellow men, when the most vital contacts with the world are cut off, even then the spirit of man does not succumb, and the urge to create may persist. The search, the appeal, the anguish, the revolt, the wish, may all be there and can be recognized in the fog of the emotional storm of the schizophrenic patient and within the crumbling of his cognitive structure. (Arieti, 1974, p. 351)

CHAPTER I

INTRODUCTION AND BACKGROUND[1]

ART

The Purpose of the Review of Literature and How It Represents the General Purpose of the Present Research

The present research project essentially represents two areas of study, art and perception. For this reason, it seems appropriate to begin a review of literature with a chronological survey of the studies related to the artwork of schizophrenics and alcoholics and the perceptual skills of the people represented in the present research, as well as how perception relates to artwork. The purposes of this review, then, are to: (1) inform the reader of the work previously contributed, (2) begin to establish the relationship between the artwork of patients and their perceptual skills, (3) prepare the reader for the evaluation of the present study. More specifically, the review of the art literature is intended to (1) acquaint the reader with the relationship between past research and its relevance to recent art

[1]The survey of literature pertaining to this review was carried through December 1984.

therapy techniques, (2) reveal a process in terms of the development of the field of art therapy, (3) provide a background of information to assist the reader in understanding the theory under investigation, (4) clarify the purpose of the present research and its significance for the art therapist (i.e., the purpose of the research is to develop a diagnostic tool to be used by art therapists), and (5) inform and convince the reader of the potential contributions of the art therapist to the field of psychology and psychiatry. It should be apparent, at this point, that the emphasis on art therapy throughout this thesis expresses a personal interest in the exploration and development of the field of art therapy. If asked to state briefly the underlying purpose of the present research, I would reply: to bring documentation, experimentation, and clarification of an art-oriented therapy into focus and to suggest that it is time for art therapists to take their place along side psychiatrists and psychologists in an effort to assist the patient.

Early Contributors to the Study of Schizophrenic Art

The study of paintings and drawings produced by psychotic patients has attracted the attention of psychiatrists since the nineteenth century. "The trends in the selection of problems and in the interpretation of the data reflect so clearly the changing approaches of investigators

from many lands that one might well be tempted to consider a survey of these studies as a fitting introduction to the history of psychiatry in this century" (Kris, 1952). The early interest in the work of psychotic artists[1] centered around the relationship of genius and insanity. Plato was the first to pose the question of whether or not one can distinguish between a person of genius and one marked as insane. The same question was asked by Tardieu in 1872 when he mentioned the possible significance of the writings and drawings of the insane. However, it was not until 1876 that the French psychiatrist Max Simon reported a systematic study of the work of the mentally ill. Case reports and drawings were presented to illustrate the correlation between the clinical diagnosis and the drawing characteristics. An Italian psychiatrist, Cesare Lombroso, (1880) published data collected from 108 mental patients and discussed in detail the characteristics of the productions. He reintroduced the question of insanity and genius and the relationship between primitive art and insane art as a problem for psychiatry (1887, 1895). Another historically significant work was published by Fritz Mohr (1906) and this paper discussed several aspects of the mental patient's drawing behaviour and included the patient's own interpretations of his work. He reported experimental data which supported the hypothesis that specific drawing characteristics make it possible to differentiate between the diagnostic

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[1]Unless otherwise stated, the word "artist" will refer to an individual involved in painting or drawing, regardless of the quality of the art product.

classifications and went on to construct drawing tests as diagnostic aids. (Anatasi & Foley, 1941a)

The classic work of Hans Prinzhorn appeared in 1922. He published Bildnerei der Geisteskranken, the most extensive collection of art by mental patients ever compiled; it included 5000 works by approximately 450 patients, primarily schizophrenics. Dominated by the search for the genius in the insane, Prinzhorn preferred to view the work of patient aesthetically and to consider the creative aspect of the entire personality. Some are of the opinion that this perspective has hindered rather than accelerated the interest in the clinical evaluation of the information presented to us by these works of art (e.g., Pappenheim & Kris, 1946). Schilder (1918), Morgenthaler (1921), and Pfeifer (1925) represent other significant contributions to this subject.

Vinchon (1926, 1950) and Karpov (1926) credited art productions with disclosing symptoms and psychological problems before they were recognised by the psychiatrist. Margaret Naumburg (1950) is recognised as a pioneer in establishing the relationship between art and psychotherapy. She believed that the use of art as therapy brings the patient's conflicts to a conscious level and allows them to be verbalised.

Cognitive abnormalities, according to Francis Reitman (1951, 1954), explain the unusual aspects of schizophrenic art. He stressed the difference between professional artists and schizophrenic artists. The intention of the professional is to restructure reality reflecting relationships of colour and form, and the schizophrenic artist

reveals an overall disintegration of structure and perceptual relations. The simplest comparison would describe the professional artist as involved in a process of reorganisation and the schizophrenic artist involved in a process of disorganisation.

These contributors to the early literature are mentioned because they are the most outstanding and represent the foundation for the work published in the years to follow. For a more extensive review of the early literature, the reader is encouraged to consult Anastasi and Foley (1940, 1941a) and Volmat (1955, 1960).

The Relevance of Projective Techniques and Art Therapy to the Present Research

The theory to be investigated by the present research project will be discussed in great detail in the following pages. But, at this point, it should be stated that the theory involves the use of the schizophrenic's art work to establish the ego condition of the patient; the patient's paintings become the source of information for the therapist. The theory to be investigated suggests that there is a diagnostic value to paintings. For this reason, the reader may find some background information about projective drawings and techniques helpful in understanding the present research. Also, the theory to be investigated seems to be potentially useful to art therapists and, considering the recent enthusiasm for art therapy, the theory may be

hastily put into practice without prior experimental verification. It will be helpful for the reader, then, to review the literature related to projective techniques as well as the similarities and differences between these techniques and the techniques employed by an art therapist.

The Significant Contributions and Shortcomings of Projective Techniques

The theory of projective techniques states that the individual is presented with several ambiguous stimuli and is requested to respond to these stimuli. This procedure assumes that the individual will project his own needs and feelings and that these will be incorporated into the responses to the ambiguous stimuli.

Diagnostic Value

The diagnostic value of projective drawings began with Simon (1876); he systematically analysed the artwork of patients. He attempted to categorise the artwork and correlate the type of art with the clinical syndromes. Another significant contribution was made by Mohr (1906) when he designed a diagnostic drawing test. Projective drawings have continued to be developed,[1] tested and introduced to the clinical field. Some of the work related to projective

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[1]For example, Pickford Projective Pictures developed by R. W. Pickford (1963).

material, although labelled as empirically insufficient, acted as catalysts for other studies which attempted to support the hypothesis that human figure drawings are valuable diagnostic and therapeutic tools (Machover, 1949; McElhaney, 1969).

Projective Research

In spite of the quantity of literature discussing and defending the use of projective drawings, their validity is still in question.

> One of the major shortcomings of projective drawings is a failure of research to provide a general evaluation of the validity of this type of testing as a diagnostic and therapeutic modality. Consequently, there is a significant lack of reliable and acceptable criteria delineating between normality and abnormality as reflected in pictorial representations. The main tendency among the researchers has been to focus primarily on discovering and validating indices projective of psychopathology with little or no attention paid to the element of normality. Within this trend a particular orientation has been to examine only particular and isolated aspects of human figure drawings as representative of psychopathology such as: placement...size...structural components.... Among some of the exceptions to this trend was the study by Lapkin, Hillaby, and Silverman (1968) which examined general manifestations of the schizophrenic process in figure drawings of adolescents. (Cvetkovic, 1979, p. 247)

Superficially, it might seem that little training is required of someone administering a projective drawing tech-

nique and this alone should support the request for further research. The apparent ease of application and evaluation leaves projective techniques open for popular theories, improper administration and a publishing tool for psychologists working in a "publish or perish" environment. Consequently, inexperienced psychologists or students may accept and apply concepts which have no basis for confirmation. However, "the psychologist who keeps his feet on experimentally firm ground and yet willingly utilises a controlled and professional imagination, will find much usefulness in drawing techniques. The need for active and positive research integrated with the growing clinical use of drawing is therefore obvious" (Heidgerd, 1958, p. 483).

Projective testing attracts the interest of artists and scientists, but neither group respects the information or research contributed by the other. Therefore, "the area of projective testing finds itself in the middle of the art-science dilemma" (Heidgerd, 1958, p. 483). The reality of this controversy became evident when research committees and other professionals were introduced to the present research project. When the word "painting" was mentioned, the respect and enthusiasm for the present research dwindled. A similar reaction was encountered while speaking with artists and mentioning the word "data." It has been suggested that the basic disagreement stems from the nature of projective data which scientific techniques have not been yet able to handle statistically" (Brown, 1952, cited in Heidgerd, 1958, p. 484). Science is perceived "as attempting to cope with

the problem of quantitative reduction of dynamically organised material by traditional experimental methods. The clinician maintains that projective data has its greatest meaning in its configuration and that experimental analysis tends to destroy this configuration. The clinician, therefore, tends to 'clinical validation' which the research psychologist labels as fantasy, speculation, or assumption" (Brown, 1952, cited in Heidgerd, 1958, p. 484). Scientists and artists are rarely encouraged to share their previous findings or talent in an effort to investigate a common hypothesis.[1] A primary objective of this research is to encourage the artist and scientist to share their contributions.

The ambiguity of the test material and the unspecified nature of the individual's responses contribute to the problems surrounding the use of projective techniques for experimental research. One of the difficulties with past research involving projective material is obviously the number of variables represented. The purpose of traditional scientific research is to explore and measure a specific variable, an isolated variable. However, a response to an ambiguous stimulus makes this scientific goal virtually impossible, due to the fact that a response may have numerous possible origins. The test administrator must consider, for example, the following: "Not only is perception involved in the response, which in itself is a function of many vari-

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[1]Rieser (1972) is an exception to this statement.

ables, but also the process of response is involved" (Ainsworth, 1951, p. 151). Consequently, data obtained from projective material "is the product of a multiplicity of variables" (Ainsworth, 1951, p. 151).

Another imperfection recognised in the published projective research is the "disregard for interpretation of pictorial representations as projections of normal[1] cognitive processes directly involved in one's conception and representation of space and its configurations" (Piaget & Inhelder, 1967, cited in Cvetkovic, 1979, p. 248). It has been established that the "representation of the development and coordination of such euclidian shapes as a human figure with its structural components can provide useful insight into effects of psychopathology on cognitive development and functioning" (Cvetkovic, 1979, p. 248). Spatial representation in human figure drawings by normal[2] as well as schizophrenic subjects has been reviewed and studied using statistical procedures (e.g., Baldwin, 1964 & McElhaney, 1969). In an attempt to compare normal and pathological cognitive functioning, Cvetkovic (1979) analyzed the structural components of human figure drawings, such as the size of the drawings, placement, symmetry, transparencies, and front and profile views. The results indicated that there was no significant difference found between the pictorial

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[1]The word "normal" was not underlined in the original text.

[2]It should be noted that normal subjects, unless otherwise defined, are individuals with no psychiatric history.

representations of the normal and schizophrenic groups. Ninety-two percent of the human figures drawn by both normals and schizophrenics were placed in the center of the drawings, symmetrical and accurately proportioned. The findings suggested that normal and schizophrenic subjects held a normal conception of space and the strategies of construction were nearly identical for all groups. (Cvetkovic, 1979, p. 254) The conclusion from this study was as follows:

> If structural schematas [sic] of a human figure are acquired before the occurrence of any significant psychopathology, a basic spatial representation (reproduction of the simplest euclidian shapes) will not be significantly influenced and impaired by psychodynamic disorders at any later stage of life. Support for this notion can also be found in the fact that in spite of a wide range of disorders represented in the schizophrenic group which was tested, not even one patient reduced his or her drawings to mere scribbles. Such rudimentary representation would be indicative of cognitive functioning on very elementary levels where basic spatial schemas are still nonexistent, or only in the process of formation (Arnheim, 1964; Jung, 1973; Kellogg, 1969; Morris, 1961; Piaget and Inhelder, 1967, 1973). (Cvetkovic, 1979, p. 254)

The above study is mentioned for two reasons. First of all, the conclusion that the conception and representation of space is not affected by psychopathological processes is in contrast to most of the related research (e.g., Baldwin, 1964; Hammer, 1958; McElhaney, 1969). The study questioned the validity of using isolated structural components, such as hands, in an evaluation of cognitive func-

tioning and for diagnostic purposes. Cvetkovic (1979) emphasised a need to look at the healthy areas of cognitive functioning and view these in relationship to other areas of possible impairment. (p. 254) Secondly, Cvetkovic's research (1979) clearly confronted the difficulties that projective research encounters and represented an effort to use statistics to clarify or deny the usefulness of projective techniques. The study (Cvetkovic, 1979) represented an emphasis on objective evaluation of methods employed by many for many years. Unfortunately, he concluded that "the validity of projective indices was not confirmed" (Cvetkovic, 1979, p. 253). However, this study reflects my research perspective and the need for further confirmation of the diagnostic usefulness of projective techniques.

More recently, Amos (1982) asked the question: "If the artistic productions of schizophrenics can be viewed as an attempt to establish a nonverbal form of communication, how might one come to understand and make use of such a communication?" (p. 132) He complained that "at present the diagnostic, prognostic, and therapeutic utilization of such materials is widespread, although published reports as to how this is accomplished remain meager. ...the information provided in the available research literature often requires substantial powers of deduction" (p. 132).

Amos (1982) attempted to help solve this problem by offering descriptions and accounts which might increase the data base with the hope that it might lead to new hypotheses. He reviewed the literature related to schizophrenic

art from four perspectives (content, composition, style, and colour) and reviewed the work of numerous researchers. The sections of the article which discussed the composition of schizophrenic art included information directly related to the present research. Billig's work was briefly discussed, along with Jakab (1968, 1969) and Arieti (1976). Amos (1982) concluded that schizophrenic artwork is most valuable when utilized to assist the therapist in understanding the world of a schizophrenic. Artistic endeavors should be viewed as having communicative value but should not be used to assess the clinical condition of the patient. In addition, the works of art may be "not only prognostically significant but also lead to interventions which enhance the problem solving process for both therapist and patient" (p. 142). Amos (1982) went on to suggest that the spontaneous works of schizophrenic patients may be used in several therapeutic ways, with the exception of establishing the presence or absence of the disease.

The diagnostic, prognostic, and therapeutic value of projective drawings is still a subject surrounded by controversy. It would seem that those convinced of the validity of using artwork to attempt to understand the schizophrenic patient have relied on case histories and empirical evidence. As has been witnessed in other fields of science, perhaps it is time to move on; the period of empirical evidence and case histories has lead the way to some interesting hypotheses and now it is time to face new problems of evaluation and documentation.

The Similarities and Differences between Projective Techniques and Art Therapy

A significant portion of research in the field of projective techniques has been related to the House-Tree-Person Test and to figure drawings. These tests have stimulated a good deal of research which has provided a variety of information on group differences and environmental factors. (Vernier, 1952 cited in Heidgerd, 1958) The successes and failures of the projective techniques have contributed to and greatly influenced the development of art therapy. Kris (1952) observed that the psychological process at work while painting, whether it be in a patient or normal artist involves the mechanism of projection. If paintings followed standard projective methods, they might be expected to provide hunches, ideas or perhaps even variables for analysing other data, just as projective techniques have done. In this role, paintings may provide additional data beyond the interview and observation.[1]

Standard projective protocols and paintings provide very similar stimulus material which have the potential of providing insight into various aspects of an individual's

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[1]For a comprehensive review of cross-cultural research and projective techniques, the reader is referred to Lindzey (1961).

personality. Art therapy and projective techniques share the psychoanalytic perspective, reflect the same research dilemmas, share a peripheral relationship to psychiatry, and share a tangent position in the psychiatric setting. For these reasons, I have felt it necessary to discuss projective techniques and feel that my evaluation of the paintings included in the present research resembles the research in this area, especially the interest in rating the art product. However, the purpose of the present research is primarily to assist the field of art therapy in approaching an experimental attitude. It is necessary to discourage new art therapists from adopting published findings without requesting or questioning the experimental methodology.

There are well documented differences between art therapy and projective drawings. The art therapist encourages the patient to discover the meaning of his spontaneous art production, instead of offering her interpretation.

> Analytically oriented art therapy deals with the release of the unconscious by means of projected spontaneous images into graphic and plastic expression. Art therapy can be employed either as a primary or an auxiliary form of psychotherapy....Art therapy accepts as fundamental to its treatment methods, the psychoanalytic approach to the psychology of anxiety and guilty feelings, as well as to the psychodynamics of repression, projection, identification, sublimation and condensation. Such mechanisms are as evident in the visual expressions of patients during art therapy as in the verbal expressions of psychoanalytic treatment. Spontaneous graphic or plastic expression is released with the transference relation and is dealt with by means of free association. (Naumburg, 1958, p. 511)

If considered a diagnostic tool, spontaneous art productions have two primary functions: "either as imaged patterns of responses typical of the reactions of schizophrenic...alcoholic or other patients; or as transformations in art productions which may serve as an objective index of changes in patients during therapy" (Naumburg, 1958, pp. 512-513).

Consequently, the fundamental distinction between drawings produced in art therapy and those obtained in psychological testing is that test drawings are requested and those produced in art therapy are totally spontaneous. Standard stimuli are shown to the patient in projective testing, whereas the patient is allowed a personal projection while constructing his own drawing during an art therapy session. The patient will be able to discuss his work and offer his own information without the therapist's interpretations reflecting a theoretical framework. For example, after drawing an isolated tree, a patient identified himself as the tree and said that he had no connection with anything around him. Thus, he projected himself into his drawing as well as his interpretation in a way that is not possible when a standard stimulus is presented. (Fink, Levick, & Goldman, 1973, p. 112) When psychoanalytically oriented art therapy is practiced, it is believed that the patient and therapist experience a transference relationship and, also, free association is encouraged. Art therapy, then, is more specifically related to psychoanalytic therapy procedures than projective drawings. (Naumburg, 1958, p. 516)

Margaret Naumburg is recognised as a pioneer of art therapy and its usefulness in psychotherapy. Her publications (e.g., 1950, 1953, 1966) established psychoanalysis as the most appropriate technique for interpreting art productions and set the guidelines for the use of art therapy as an aid to psychotherapy. For this reason, the literature has been dominated by psychoanalytic interpretations (e.g., Kris, 1952; Pickford, 1967b; Robbins, 1973). A number of informative surveys and bibliographies pertaining to the development of art therapy have been published elsewhere[1] and an additional review is not justified.

Characteristics of the Spontaneous Drawings and Paintings of Schizophrenics

Generally, the cases mentioned in earlier literature of form or content were those with unusual drawing talent or an interesting case history, for example, Cocteau, Schmidt, Steck, and Bader (1961) and Pickford (1967b). Authors such as Vinchon (1950), on the other hand, declared that it was not possible to perceive a difference between most of the art productions of patients in various clinical categories.

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[1]For example, Gantt and Schmal, 1974; Harms, 1975; Naumburg, 1950.

Consequently, drawings and paintings should not be used for diagnostic purposes. A further criticism is related to the definition of a particular clinical category. For example, if paintings were collected from various hospitals for evaluation, the possibility exists that the criteria used to diagnose schizophrenia would not be consistent. This factor alone might have contributed to the impression that specific characteristics did not present themselves in the artwork of schizophrenics.

One of the earliest descriptions of schizophrenic art was offered by Prinzhorn (1922). He combined material which had been gathered from group surveys and case studies. The following description represents a significant contribution to the study of schizophrenic art:

> He dismisses such common characteristics as lack of symmetry and distortions of perspective, regarding them as the probable result of inadequate training. The insane share such characteristics with normal, artistically untrained adults. Content he considers more significant, although he does point out that well integrated, complex representations of hallucinations and delusions cannot readily be distinguished from normal bizarre art as illustrated in primitive art. He finds that the themes most commonly depicted by schizophrenics are the erotic and the religious. Perseverative repetitions are found among patients with fixed ideas. The drawings often showed a lack of critical sense, being executed impulsively and without regard to coherence, unity, or reality. Frequently the drawing seemed to occur purely by free association. ...the tendency for certain patients to decorate the entire available surface, lending a tapestry-like effect to their work. The tempo of the drawing with a frenzied speed. Finally, the most essential characteristic of schizophrenic art...is

> its autistic nature. The schizophrenic, like the child, frequently fails to differentiate between reality and fancy in his representations, and unlike the normal artist, is not interested in conveying a message to others. (Anastasi & Foley, 1940. p. 14)[1]

Bader[2] and his associates (1961) studied the artistic productions of three psychotic patients in mental hospitals. From this study various characteristics of the artwork of the psychotic have been suggested. They found that in the schizophrenic's drawings "space is recreated freely and unrestrainedly with no notion of linear, aerial, or colour perspective. The schizophrenic is not concerned with depth, he never tries to shape his figures so as to create the illusion of volume, nor does he ever depict case shadows" (Cocteau et al., 1961, p. 42). Bader found this tendency to exclude shadows a special point of interest and examined it in more detail. He continued by saying that "line undoubtedly takes precedence over colour, even when the colouring is extremely vivid. The linear contours are always emphasized and sharply defined, the surfaces bordered

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[1]For an excellent review of the early efforts to report findings related to the art of the mentally ill, the reader is referred to Anastasi and Foley (1940, 1941a, 1941b, and 1941c).

[2]Bader is not the first author mentioned in the Cocteau et al. reference; however, he represents the primary force in the publication, and I feel more comfortable using his name.

by clear boundary lines" (Cocteau et al., 1961, p. 47). Several other characteristics, such as stereotypy[1] and geometrical figures and lines are examined and well illustrated through the use of the outstanding examples of drawings and paintings of schizophrenic patients. Bader, like Prinzhorn, intended to analyze the creative process in the schizophrenic and normal artist and to illuminate without explaining the mystery of all artistic creation.

Fragmentation is the formal characteristic mentioned most frequently in the literature (e.g., Arieti, 1974, p. 280; Pickford, 1967, p. 178) and appears to be a consistent indicator of schizophrenia. (Pereira, 1975, p. 176) The painting may represent dissimilar, disconnected fragments or incomplete objects or what appears to be more than one composition on the same paper. (Arieti, 1974, p. 280; Pereira, 1972, p. 7) Arieti (1974) described this graphic phenomenon as a perceptual alteration due to the patient's inability to perceive wholes. He described a gradual process of disintegration of wholes; rooms and people are divided into parts, and in acute stages even smaller objects are divided into fragments. "Some patients have reported to me that during the acute episode they were aware that they were losing perception of wholes and were making conscious

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[1]Stereotypy has been defined as "a constant reiteration of structured and unstructured forms reenacting the same unconscious conflict" (Pasto, 1958, p. 46).

efforts to reconstruct these wholes, but the attempts were only partially successful. At times the parts that replaced the missing ones were not appropriate, and distorted wholes resulted" (Arieti, 1974, p. 280). Pereira (1975) offers an alternative explanation for the fragmentation found in schizophrenic art. Pereira's paper[1] claimed that the fragmentation present in drawings is primarily the result of disturbances of attention and the inability to maintain a major set. A more comprehensive discussion of this interpretation will be found in the pages to follow.

In spite of the problems related to defining, collecting and evaluating the drawings of schizophrenic patients, by the 1950's the general characteristics of these spontaneous works were outlined and accepted. (Volmat, 1955) In general, schizophrenic paintings "tend to be bizarre and full of apparently meaningless and unrelated images, symbols and representations of people and objects. Disconnectedness and fragmentation are frequent and certainly accord or express the confusion of thoughts from which these patients suffer" (Pickford, 1956, p. 193). Religious, sexual and bizarre symbols are common (e.g., Guttmann & Maclay, 1937) and have been the primary interest

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[1]This interpretation of fragmentation first came to my attention while attending the Seventh International Congress of Psychopathology of Expression held in Boston, Massachusetts (1973).

of the psychoanalytic studies and the field of literature is still interested in their interpretation. It is tempting but not possible in the framework of this thesis to discuss these aspects further. The reader is referred to Cocteau et al. (1961), Pickford (1967b), and Reitman (1950) for a more comprehensive description of these various aspects of art considered to represent this particular pathology.

The Creative Process and Schizophrenic Thinking

Schizophrenic thinking has been compared to the creative process, but there are also significant differences. In the first phase of the process, "the traditional order of linear sequence as it exists in verbal language is interrupted; shapes are loosened and fragmented. The disconnected images lack differentiation; space becomes undifferentiated and infinite, producing chaos and confusion" (Billig, 1971, p. 149). In the second phase,

> the ego attempts to defend itself against the resulting anxiety. The creative ego picks up the fragmented, multiple links, merging and adapting them into cohesive entities as they reach conscious levels. However, the schizophrenic has lost this ability to reconstruct the fragmented images into cohesive patterns. Conflicting ideation and opposing concepts cannot be repressed, resulting in ambivalence. The patient becomes perplexed; an adequate sequence cannot be established; disproportioned, unstructured concepts reach consciousness. This leads to a disturbed imagery. The conceptual fragmentation shows little cohesiveness. This inability to establish integrated and cohesive entities makes the schizophrenic different from the creative artist. (Billig, 1971, pp. 149-150)

Fragmented objects and distorted imagery have been incorporated into the work of the various schools of art, but there is a primary distinction between the creative process experienced by the artist and the work of the schizophrenic. The ego structure of the schizophrenic is disorganised and does not allow "an adequate restructuring of the fragmented concepts" and, consequently, schizophrenic expression replaces artistic creativity. (Billig, 1971, p. 150) The schizophrenic artist shares only the experience of fragmentation with the creative artist. However, in the second phase of the creative process their experience is unrelated; the artist's integrated ego strives for and achieves reintegration, whereas the schizophrenic artist has lost this integrative ability. (Billig, 1971, p. 150)

From this point of view, the relationship between integration and disintegration would be especially important to the art therapist. Perry (1973) described the similarity between creativity and schizophrenia and the function of art therapy.

> Both creativity and schizophrenia deal with integration, disintegration, and reintegration. Therapy fosters the reintegration; art helps do so by giving expression to the inner spaces of psychic life, freeing hidden images and aiding both therapist and patient in the reintegration process. (p. 61)

For the creative artist as well as the schizophrenic artist, the crucial difference between creativity and chaos is that aspect of the process dependent upon reintegration; for the

schizophrenic the result is frequently fragmentation.

Interpretations of Schizophrenic Art

Generally, it is possible to discuss the interpretation of psychotic art by referring to one of three theoretical models. The primitive-regression hypothesis provided the early interpretation of paintings and drawings produced by "abnormal" individuals. When psychoanalytic concepts were applied to explain these artworks, the primitive-regression hypothesis received further support. However, the psychoanalytic interpretation is dealt with separately because it has its own unique characteristics. The third hypothesis, ego-regression, will introduce the theory and work of the psychiatrist Otto Billig. This hypothesis represents the catalyst for the present research.

The Primitive-Regression Hypothesis

Max Simon (1876) initiated this explanation for the similarities between abnormal and primitive art and Lombroso (1887) is credited with developing the hypothesis. Lombroso believed that the function of primitive art and abnormal art was identical, that is to use pictures to assist in communication. Simon (1876) went on to elaborate this aspect of the hypothesis by comparing the drawings of children with

those of patients.

Luquet (1913, 1927, 1930) renewed the interest in the drawings of primitives and children. His interpretation of these works focused on the concept of "intellectual realism." Objects, according to this concept, are drawn as the individual knows them or remembers them, not as they are actually perceived. Consequently, the drawing may not include some aspects of an object or may include a variety of perspectives; a mixing of planes is not uncommon.

The graphic representations produced by mental patients were approached by Marie (1929) in a similar way: "the insane artist usually turns towards primitive forms of art. This is illustrated by alterations of perspective, drawing both eyes in a profile view, a multiplication of feet to indicate running, and similar devices. The artistically untrained insane frequently drew fragmentary pictures similar to those of children" (cited in Anastasi & Foley, 1940, p. 17). The mental patient, then, at times draws his composition as he thinks it should be and not as it would actually be perceived.

Adherence to this hypothesis is not uncommon and authors such as Cocteau et al. (1961), Billig (1971) and Storch (1924) provide convincing examples to defend this model. Von der Mühlen (1975) concluded that "dieses Ergebnis festigt den Gedanken, dass es sich hier um Regressionsphänomene und nicht nur um Ungeübtheit handelt"[1] (Von der

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[1]Translation. [...this result indicates that one deals here with the regression phenomena and not with an untrained person.]

Mühlen, 1975, p. 65). The primitive and childlike representations are not simply the result of a lack of training in art.

The Psychoanalytic Hypothesis

It should be mentioned that this interpretation is also considered a regression hypothesis, but it is unique in that it claims that the drawings of schizophrenics and other mental patients reflect the same or a similar process as that involved in dreaming. Pickford (1967b) discussed artwork and dreams using Freud's four basic processes: (1) symbolic transformation, (2) condensation, (3) displacement, and (4) secondary elaboration. (pp. 14-15) Symbolic transformation is a major concern of the psychoanalytic approach and the process of symbolization governs the development of the schizophrenic artist's composition.

Billig's Ego-Disintegration Hypothesis

Otto Billig's hypothesis is not included in the above interpretation of schizophrenic art because his descriptions of schizophrenic art are unlike those presented by his psychoanalytic colleagues, even though his interpretations may be influenced by psychoanalytic theory. Regres-

sion, as described by Billig, is a process in which the impression of reality is altered due to the fact that there is a loss of cathexis and a disintegration of the ego boundaries. These changes which occur are reflected in the spatial structures of the paintings and drawings produced by schizophrenics, two-dimensional space replaces three-dimensional depth. The interpretation of these spatial structures concentrates on analysing the ego of the artist and his relationship with his environment.[1] (Billig, 1968) As reality loses its significance and meaning, the art productions reflect characteristic regressive structures.

In addition to the spatial relationships depicted in paintings, Billig also considered regression as it is expressed through movement. (Billig, 1973a) The very regressed schizophrenic represents an abundance of motion resulting in insignificant, uncontrolled scribblings which completely lack spatial organization. As the patient begins to re-establish more adequate object relationships, the painting may reveal "repetitious and distorted movement drawn out on ornamental designs, stereotype rigidity, and ambivalent 'double profiles'" (Billig, 1973a, p. 25). "Only the reintegrated ego that develops adequate integration achieves mastery over initiating movement and regulates its rhythm of flow of energy. Fragmentation and rigidity disappear. The restituted cathexis permits a reaching into space, re-establishing stable object relationships and en-

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[1]Billig's references to schizophrenic disintegration are based on the work of Federn (1952) and Storch (1924).

dowing reality with its appropriate values" (Billig, 1973a, p. 25). It is possible, according to Billig, to detect changes in the schizophrenic artist's movement which correlate with changes in ego disintegration and re-integration.

At the Second World Congress of Psychiatry, Billig and Watkins (1957) reported on graphic materials obtained exclusively from urban North American schizophrenics. They pointed out that Reitman (1954) had emphasised the importance of separating the features of psychotic art from the patient's culture. He asserted that the diagnostic significance of drawings can only be determined in relationship to the artist's background. With this in mind, Billig and Watkins felt that cross-cultural studies of schizophrenic art would be worthwhile and would perhaps supply additional information about the changes in the schizophrenic's conception and representation of reality. Billig (1966) admitted that the material obtained from non-Western cultures[1], especially tribal cultures in rural regions, was not as complete as it might have been. However, "similar structural characteristics can be observed (base line and transparency...). Such characteristics appear regardless of the artistic experience and dexterity. Less technical experience may lead to less cohesive designs, but the basic spatial structure shows very similar regression in both Western and socially isolated non-Western groups" (Billig, 1966, p. 610). The basic structures appear to be similar in spite of cultural back-

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[1]Kenya (East Africa), Hong Kong (China), Lebanon (Middle East), and Chiba-Ken (Japan)

ground. There is a motivational difference, however, between the tribal artist and the schizophrenic's creative endeavor.[1] The artistic expression of the tribal artist is directed "toward communal, social, and spiritual needs, such as curing ceremonies, magic control of wars, and hunts" (Billig, 1966, p. 610). The schizophrenic, on the other hand, is not concerned with the needs of others or society in general, only with establishing a channel for communicating his own needs to others. (Ruesch, 1955, cited in Billig, 1966, p. 610) The fact that similar spatial structures were found in the artwork of schizophrenics in various cultures, encouraged Billig to conclude that these alterations in the spatial structure of graphic representations are universal. This conclusion was reached previously by Prinzhorn when he postulated the existence of characteristics shared by mankind at a "pre-rational level of creation." After comparing collected material, he described a basic artistic process which will emerge in a common form in the work of primative artists, whether they are uncivilized, mentally ill or otherwise. This theory resembles Jung's idea of the collective archetypes. (Cardinal, 1972, p. 19)

In addition to the similarity of the structures found in tribal and schizophrenic art, Billig also compared his findings to the early high civilizations, such as the Egyptians, and similar spatial patterns of representation

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[1] If the reader is interested in a further comparison of shamanism, schizophrenia, and art therapy, the following references are recommended: McNiff (1979) and Silverman (1967).

were found. "This raises the issue concerning the phases of structural similarities between early art and schizophrenic disintegration. Structural patterns do not suggest identical characteristics, but only a common nucleus for experiencing reality and the manner by which schizophrenic thinking is structured" (Billig, 1966, p. 611). Billig's interpretation of schizophrenic art, then, is based on and supports a regression hypothesis. A theory which claims that the spatial structure of a schizophrenic's graphic representation reflects a specific clinical condition associated with the process of ego disintegration is certainly unique and warrants recognition.

The Work of Otto Billig

The initial stimulus for this research was a publication by Otto Billig (1968), "Spatial Structures in Schizophrenic Art." Additional related material by this author revealed essentially the same information with variations in perspective. His emphasis on the structural aspects of schizophrenic drawings, as opposed to the more traditional emphasis on content, provided me with a new direction for research related to pathological forms of expression.

Schizophrenia has been described as a process of disintegration which involves a fundamental change in relationships with reality (e.g., Federn, 1952, Storch, 1924). It is difficult for the patient to establish meaningful relationships due to the withdrawal of ego cathexis; the result is a disintegration of the ego boundaries. (Federn, 1952) The following account will provide an insight into this condition:

> For me, madness was definitely not a condition of illness; I did not believe that I was ill. It was rather a country, opposed to Reality, where reigned an implacable light, blinding, leaving no place for shadow; an immense space without boundary, limitless, flat;....In this stretching emptiness, all is unchangeable, immobile, congealed, crystallized. Objects are stage trappings, placed here and there, geometric cubes without meaning.
>
> People turn weirdly about, they make gestures, movements without sense;....And I-I am lost in it, isolated, cold....A wall of brass separates me from everybody and everything. In the midst of desolations,...I am terrifyingly alone; no one comes to help me. (Sechehaye, 1951, p. 33)

Another patient expresses this experience of altered reality as follows: "When I went to work in the morning, the street became endlessly wide, the human beings went without aim or purpose, without direction, then everything seemed to stand still, without movement, rigid, everything became narrower and narrower. I lost the feeling for distance and nearness, one time it seems far away, unending, then everything was

again really close...." (translated from Von der Mühlen, 1975, p. 59) It has been documented that these changes in the perception of realty occur in stages and not in one enormous step. (Von der Mühlen, 1975, p. 66) Gradually, that which was at one time familiar becomes completely unfamiliar.

The Process of Regression and the Schizophrenic's Graphic Productions

Reality relationships disintegrate and with this disintegration patients frequently express an inability to communicate verbally (e.g., Nijinski, 1936). However, a need to communicate does not disintegrate and often the schizophrenic patient replaces the verbal mode of communication with the nonverbal graphic form of expression. Similarly, when the schizophrenic re-establishes meaningful contact with reality, when he establishes good object relations and ego boundaries are once again established, the patient may no longer find drawing or painting necessary and resumes his verbal communication.

Billig demonstrated a correlation between specific changes in the graphic representation of space and the disintegration of the schizophrenic's ego boundaries. The clinical condition of the patient, with specific reference to the extent of disintegration of his ego boundaries and withdrawn cathexis, corresponds to a specific way in which the patient represents space in his artwork. In addition, as the patient is progressing in his clinical recovery,

with an increased cathexis of the real world, there is a corresponding progression in the structuralization of space. (Billig, 1970, p. 219) One of the significant aspects of Billig's theory is the emphasis on the process of regression as it applies to the schizophrenic illness and to the spatial structures found in the patient's spontaneous graphic productions.

Withdrawal of Object Cathexis[1]

At the beginning of the regression, a withdrawal of object cathexis occurs and as a result reality appears lifeless and empty; "objects become less structured, and details become lost" (Billig, 1970, p. 190). "The patient defends himself against the threatening realization of loss of reality relationships by an increasing awareness of his changing surroundings" (Billig, 1968, p. 2). His feelings of depersonalization are reflected in the lifeless appearance of the world. The schizophrenic becomes anxiously aware of the immense space which surrounds him. The drawings emphasize distance, objects are elongated and landscapes show and exaggerated empty space, referred to by Billig as the "vista effect." People are represented by mere outlines, distorted and elongated with little or no variation in colour, if they appear in the composition at all (see Figures 1 and 2). (Billig, 1968, p. 2)

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[1]These clinical conditions were outlined by Billig (1970) to demonstrate the regressive levels of ego and spatial disintegration (see Figure 8).

Figure 1. An example of elongation and exaggerated vista effect. (Beginning Withdrawal of Object Cathexis) (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

Figure 2. An example of shadowy figures. (Beginning Withdrawal of Object Cathexis) (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

Disintegration of Ego Boundaries

The next stage of regression is best illustrated by a patient of Billig's. As the psychosis developed, the disintegration of the ego boundaries continued, and the schizophrenic showed a deep concern for the nature of the world, its unfriendly and cruel tendencies. He was anxious about his feelings of isolation and his defense involved travelling "to a 'small planet surrounded by the mystery of vast interstellar space.' He prayed that he would be somehow 'released from the stresses around him.' His severe feelings of rejection 'angered' him so that he wanted to destroy the world" (Billig, 1968, p. 3). Figure 3 shows the graphic representation produced at that time by this patient. The schizophrenic at this level of disintegration concentrates on depicting cosmic destruction.

Inadequate Balance Between Outer and Inner Reality

Contacts with reality diminish and with them any form of reality testing becomes inadequate. The patient's inner needs begin to control object relations. "The weakened ego boundary fuses outer (objective) and inner (subjective) reality"[1] (Billig, 1968, p. 5). The structures

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[1]Ulman (1975) defined art therapy and noted the following: "It is a means to discover both the self and the world, and to establish a relation between the two. In the complete creative process, inner and outer realities are fused into a new entity" (p. 13). This is how Billig described the disintegration of the ego boundary; yet, Ulman described the fusion as the essence of the creative process.

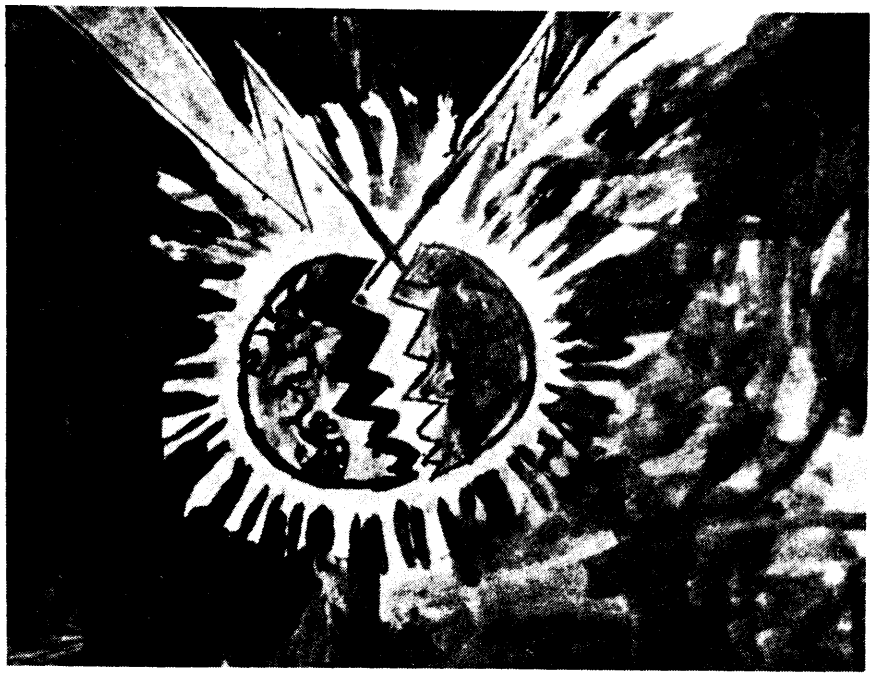

Figure 3. An example of "cosmic catastrophe." (Disintegration of Ego Boundaries) (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

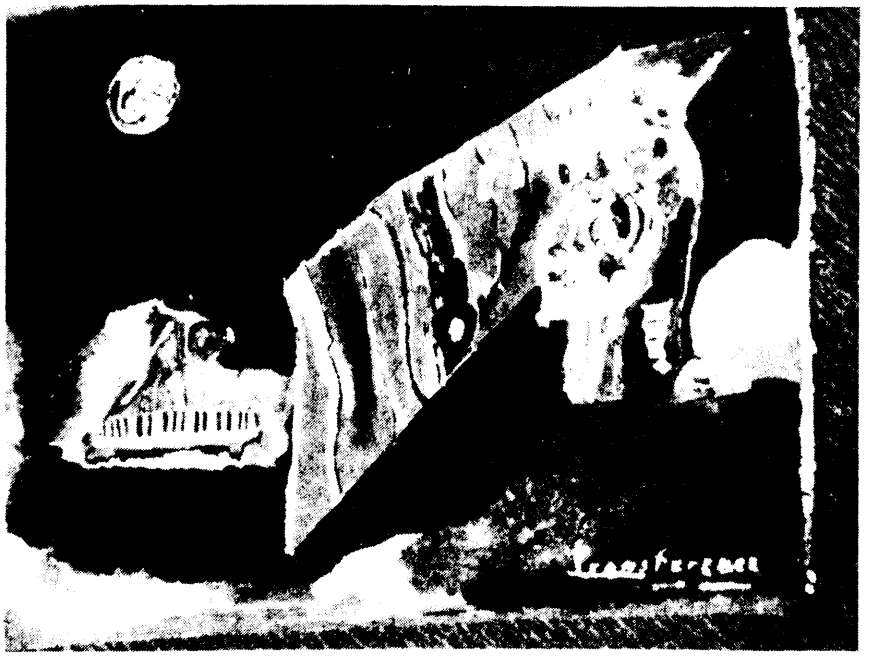

Figure 4. An example of mixing geometric planes. ("Established Relationships Become Dissolved") (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

within the schizophrenic's painting reveal "poorly defined objects, lacking in shading, often disproportionate in size; the cohesive perspective becomes lost; sideview and cross-section, horizontal and vertical views are intermingled. Objects meet the subjective needs and emotional charges of the patient's conflicts" (Billig, 1968, p. 5). Various inconsistent elements of the composition are simultaneously represented (e.g., front and side views of an object) and, therefore, there is a mixing of various geometric planes (see Figure 4).

At the same level of disintegration, reality is ignored by the schizophrenic artist and the objects represented no longer comply with the rules of visual existence. Objects are now transparent, the viewer is not limited to the exterior of houses, for example, but is provided with a view of the interior and exterior at the same time. The limitations placed on a viewer by external reality is apparently removed by the disintegrated ego boundaries. (Billig, 1968, p. 6) The result of this approach to graphic representation is transparency or "x-ray pictures" (see Figure 5).

Residual Attempt to Maintain Reality Relations

As the disintegration continues, the schizophrenic makes a final effort to organize objects in space, "it is as though the patient held on to the 'base line' for emotional security" (Billig, 1968, p. 11). The composition rests on a single line, generally drawn across the lower third of the

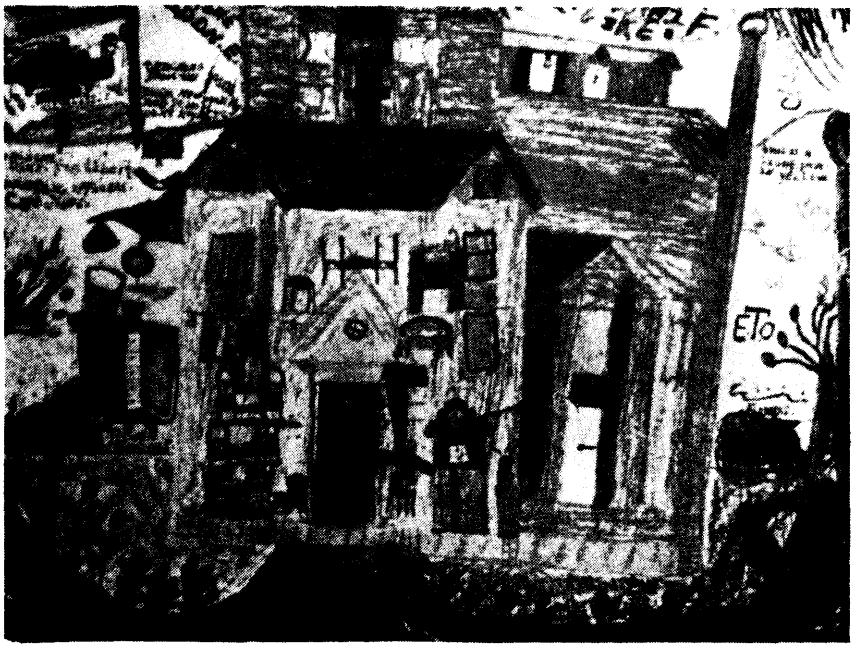

Figure 5. An example of transparency or an "x-ray picture." (Disintegrated Ego Boundaries and Withdrawn Cathexis) (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

canvas or paper. Everything arranged on the base line[1] is drawn in a vertical direction; once the horizontal base line is established, the dominant direction for objects is vertical. (Billig, 1968, p. 7) If the reader will refer to Figure 6, it is obvious that the represented "objects are disproportionate in size" (Billig, 1968, p. 11). The shoe is not realistically depicted in comparison to the size of the tree, clock, or snake. "The sizes of the objects are unrealistic and not determined by their relative relationship to each other, but rather by their emotional significance for the patient" (Billig, 1968, p. 13).

Oceanic Feelings

Withdrawal of cathexis is at this point complete and results in a total loss of reality relations. Spatial representation is of no concern to the schizophrenic patient. The clinical condition would be described as severely withdrawn, uninterested in (his) surroundings and with a disregard for personal appearance. The artwork of a patient in this condition would

> consist of disorganized strokes without any particular arrangements, or of splotches of color.

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[1]Multiple base lines may occur when the schizophrenic is capable of establishing meaningful relationships with people. (Billig, 1968, p. 11)

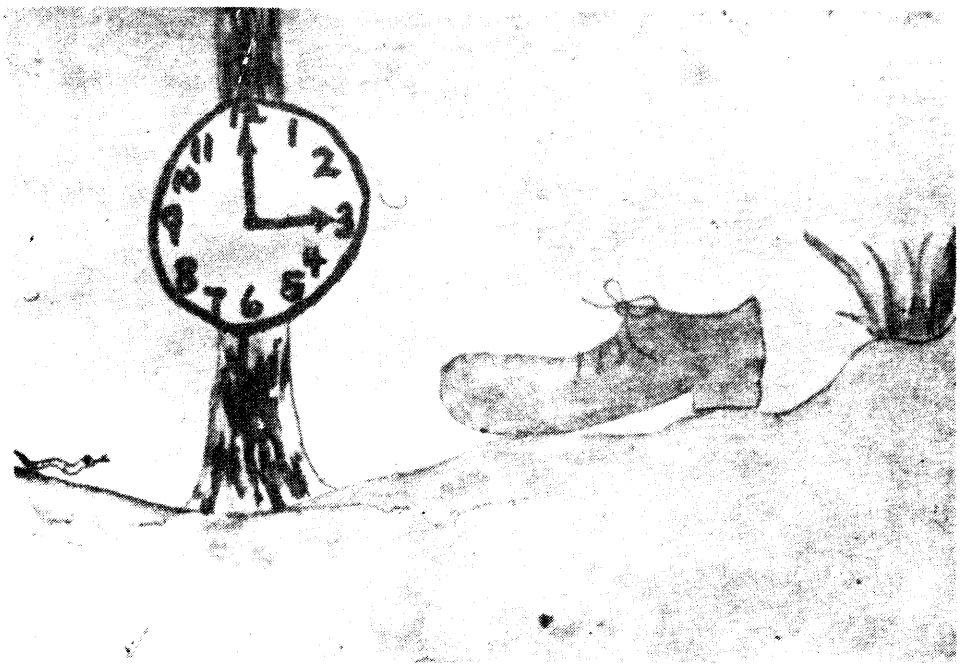

Figure 6. An example of a base line with vertical direction. ("Residual Attempt to Maintain Reality Relations") (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

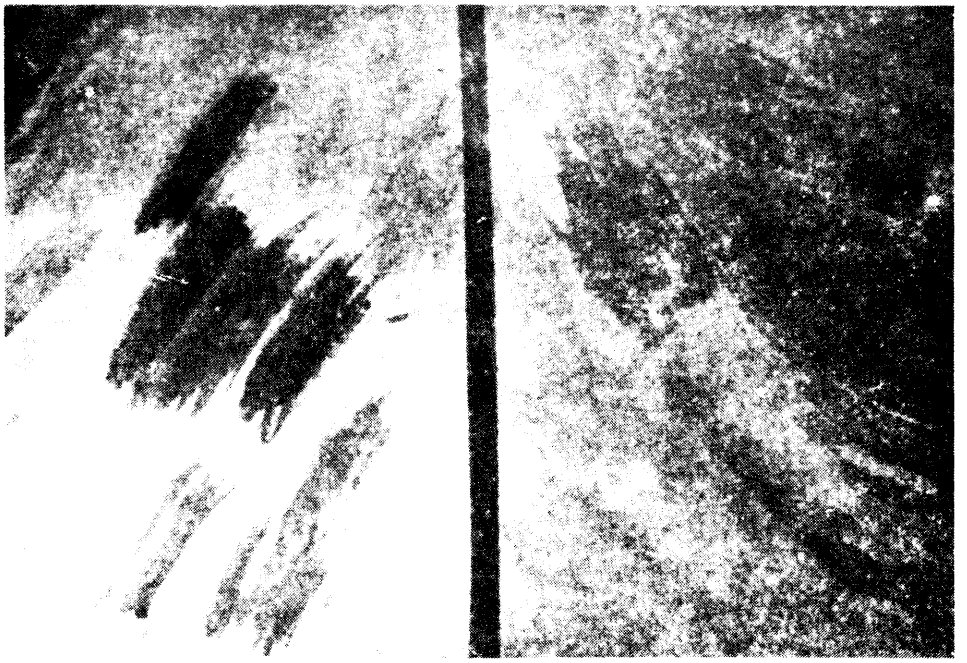

Figure 7. An example of splotches or the disintegration of space. (Complete Withdrawal of Cathexis) (From "Structures of Schizophrenic Forms of Expression" by Otto Billig, Psychiatric Quarterly, 1970, 44 (2), 187-222.)

> Splotches may be named arbitrarily....The spatial conception is 'multi-directional';[1] no single direction dominates. The withdrawn cathexis no longer separates environmental objects and abolishes the established spatial organization. The regressed schizophrenic can no longer differentiate himself from his environment and has become one with it ('oceanic feeling')[2]. (See Figure 7.) (Billig, 1970, p. 201)

Billig referred to the spatial structure in the paintings of these patients as multidirectional space.

The Clinical Course Reflected in a Series of Paintings

The clinical courses of specific patients are reviewed in the light of the corresponding changes in spatial structures in drawings. (Billig, 1968, 1970) As the disintegration of the ego can be traced so can the schizophrenic's progress and the re-integration of the ego boundaries. The same spatial structures may be identified but in reverse order, until the final drawing before discharge indicates an attempt to represent three dimensional space. (Billig, 1970, p. 220) At this point in time, the clinical records may note the patient's social adjustment, adequate affect and a well integrated cognitive condition. When one examines a series of paintings produced during the recovery of a schizophrenic patient, it is possible to detect a rein-

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[1]Nijinski (1936), cited in Billig (1970).

[2]Freud (1928), cited in Billig (1970).

tegration of spatial structure (Billig, 1970, p. 220), so the use of space in the graphic arts aids in further understanding the present condition and course of this illness (see Figure 8 for a summary of the spatial structures and corresponding clinical conditions).

Cross-cultural Support for Billig's Spatial Structure Theory

In 1973, Billig published an article with Burton-Bradley which reported their study of the native painters from New Guinea, a large isolated island. Schizophrenic graphics were evaluated according to the spatial structures outlined by Billig in his previous work. The study is particularly interesting as a cross-cultural addition to Billig's non-Western investigations. There are two specific points which are relevant to the present research project. First of all, Billig mentioned for the first time that it is possible to detect more than one level of spatial representation in one painting. "Since the cathexis is not evenly withdrawn and since attempts of secondary restitution or 'redefinition' (Burnham, 1969) are being made continuously, different stages of regression in the concept of reality and its spatial structures may be manifested in the same graphic" (Billig & Burton-Bradley, 1973b, p. 317). Secondly, the schizophrenic painters of New Guinea who were illustrated in the article relied heavily on decorative techniques, such as would be used in the decoration of masks and traditional de-

Spatial Structure	Clinical Condition	Art of Early Civilization
Multidirectional Space	Oceanic Feelings	Pebble Stone of Magdalenian Period
Base Line with Vertical Direction	Residual Attempt to Maintain Reality Relations	Pyramic, Obelisk, Stonehenge
Transparencies "X-ray Pictures" Mixing of Planes	Inadequate Balance Between Outer and Inner Reality	Australian Bark Paintings Perspective Tordue (Egypt)
Cosmic Destruction	Disintegration of the Ego Boundary	Mythology: East Indian, etc., but Always Combined with Regeneration
Emptying Space Shadowy Figures Elongation	Beginning Withdrawal of Object Cathexis	Elongated Stick Figures (Cave Paintings)

Figure 8. A summary of spatial structures and clinical conditions. (From "Structures of Schizophrenic Forms of Expression" by O. Billig, Psychiatric Quarterly, 1970, 44, 187-222.)

Regressive Levels of Disintegration	
Clinical Condition	Spatial Structure
Oceanic Feelings	Multidirectional Space
Severe Repression of Reality Relations	Base Line with Vertical Direction Geometric Designs
Appearance of Global Concepts	Inarticulated Structures
More Advanced Disintegration of the Ego Boundaries	"Horror Vacui"
Inadequate Balance Between Outer and Inner Reality	Impoverished and Condensed Design Mixing of Planes "X-ray Pictures" (Transparencies) Vertical Projection
Disintegration of Ego Boundaries	Perseveration Spatial Relations Destroyed Cosmic Destruction
Beginning Withdrawal of Object Cathexis	Emptying Space Shadowy Figures, Elongation, and Distortions

Figure 9. A revised summary of spatial structures and clinical conditions. (From "Psychotic Indigenous Painters From New Guinea" by O. Billig and B.G. Burton-Bradley, Art Psychotherapy, 1973b, 1, 315-328.)

signs. Geometric designs are often incorporated into the artwork and, in one example, "ornamental curlicues are emphasized and perseverated, filling the space between the two sets of eyes" (Billig & Burton-Bradley, 1973b, p. 321). The emphasis on geometric design in this culture perhaps led Billig to revise his previous levels of spatial disintegration. He does not discuss the changes, which can be seen if the reader refers to Figures 8 and 9, but it is my opinion that they resulted from this most recent research in New Guinea.

The authors (Billig & Burton-Bradley, 1973b) concluded that the findings supported the universal hypothesis previously formulated. "Spontaneous graphics obtained from psychotic patients who live in areas of comparatively marked cultural isolation, such as New Guinea, show regressive patterns not unlike those of Western civilization. The content of the drawings is culturally influenced as long as the patient remains relatively well integrated. Acculturation, which has a strong impact on the individual and his society, resists the psychotic personality disintegration to a considerable degree. But as the psychotic process advances, a regression to universal factors of the spatial structure can be seen and cultural differences recede" (Billig & Burton-Bradley, 1973b, p. 328). The impact of the culture on the individual appears to lose its significance when the psychotic process intervenes.

A Theory Similar To Billig's Spatial Structure Theory

Before leaving this review of Otto Billig's work, I feel it necessary to note the similarity of his work and the work of Ernest and Edith Zierer. In one article, out of the numerous articles published (e.g., 1950, 1951, 1955, 1975), the authors attempted to describe and evaluate various spatial concepts in drawings using their Body-Space Test. The theory represented is "that ego-development and ego-regression are reflected in art activity by five different spatial concepts representing five different developmental stages" (Zierer & Zierer, 1955). The developmental stages included: (1) Peripherally Oriented Panorama (First Oral Stage), (2) Centrally Oriented Panorama (Second Oral Stage), (3) Transparent Stratification (First Anal Stage), (4) Horizontal Stratification (Second Anal Stage), and (5) Body-Space Realism (Phallic Phase). (Zierer & Zierer, 1955, pp. 234-235) The last three stages are the same as Billig described in his work, transparency, vertical projection, and three-dimensional space. Statistical analysis of the test findings proved the validity and reliability of the Body-Space Test. Also, as a result of this study the following conclusions seemed justified: (a) The Body-Space Test "proved to be a statistically reliable diagnostic device in determining whether we deal with neurotic manifestations or psychotic regression" (Zierer & Zierer, 1955, p. 241). (b) This test "permits an early diagnosis of psychotic processes" (Zierer & Zierer, 1955, p. 241). It is

not possible to discuss the work of these authors in detail. If the reader would like to explore the similarities and differences between the work of Billig and the Zierers, they would provide an interesting comparison of two theories.

The Unique Aspects of Billig's Theory

Previous literature consisted of interpretations of well-known artists, works of art, or individual case histories. Some characteristics described by Billig have been described previously; Foltin (1953), for example, mentioned the base line (p. 267). The work of Billig is unique in that one component of graphic representation, spatial structures, is described as an indication of a process, one of disintegration and reintegration. Painting characteristics are not described and illustrated independently but as a segment of a process, the clinical course of the patient's illness.

Various components of graphic representation can be considered useful in determining the extent of the patient's disturbance. Colour and specific objects often indicate affect, whereas the organization of the artwork, symbolic content, and spatial relations provide evidence of "the ability of the ego to integrate unconscious material with reality" (Fink, Levick, & Goldman, 1973, p. 105). According to Billig, spatial structures and relationships in paintings and drawings reflect various stages of the ego's disinte-

gration. He did not concentrate on the content or symbolic meaning of the graphic composition, which may vary from culture to culture (e.g., Perez & Marcus-Ofseyer, 1978, p. 88), but the spatial structures of the composition which he claimed are universal. Billig would agree that "spatial structures are the architecture for describing the visible world" (Bearden & Holty, 1969, p. 87).

Eskimo Art

"The art of other cultures, particularly if it is very different from our own, reveals a great deal about the perceptual worlds of both cultures" (Hall, 1966, p. 79).

The Alaskan Eskimo Artist

Some of the spatial structures outlined by Billig (1970) are seen in the graphic art of the Eskimo. For this reason, I felt it necessary to include Alaskan Eskimos in this study. The question now becomes, If the nonpatient Eskimo artist illustrates his world in a style similar to Billig's schizophrenic patients, then will the same spatial structures occur if this Eskimo experiences a schizophrenic episode?

Alaskan Eskimos have received far less attention in the art literature than the Canadian Eskimos. Alaska is referred to as the "Last Frontier" and, perhaps, our know-

ledge of Canada is greater because she has had more years of exploration. Also, many believe (e.g., Carpenter, Varley, Flaherty, 1959), as Burland (1973) revealed in a book on Eskimo art, that "the work of Eskimo artists today is part of an artistic and cultural heritage which goes back thousands of years and links Eskimos right across the Arctic world from Greenland[1] to Siberia" (see Figure 10). The entire "circumpolar culture, which comprises most of the peoples living in the arctic regions between the sixtieth and sixty-fifth parallels," shares common crafts, implements and rites. (Giedon, 1962, p. 522) Consequently, the assumption is that what has been written or revealed about Canadian art applies to Eskimo art, and this diminishes the need for further research in other Eskimo territories.

Dorothy Jean Ray (1961, 1967a, 1967b, 1969), on the other hand, has not followed this assumption.[2] Her contact with the Alaskan Eskimo, living in Alaska for eight years and returning frequently, has made her an authority on the culture and history of these people. In 1967, she published an illustrated article, "Alaskan Eskimo Arts and Crafts," in a special issue of The Beaver; in the same issue there is a selected bibliography related to Alaskan and Canadian Eskimo art. "Graphic Arts of the Alaskan Eskimo" (1969) presents the reader with an excellent historical perspective and a

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[1]Peter Freuchen (1961) lived with the Greenland Eskimos and provided a unique account of the Eskimo culture.

[2]Wendell H. Oswalt (1967), also, did not follow this assumption; his book is a comprehensive description of the Alaskan Eskimo and his culture.

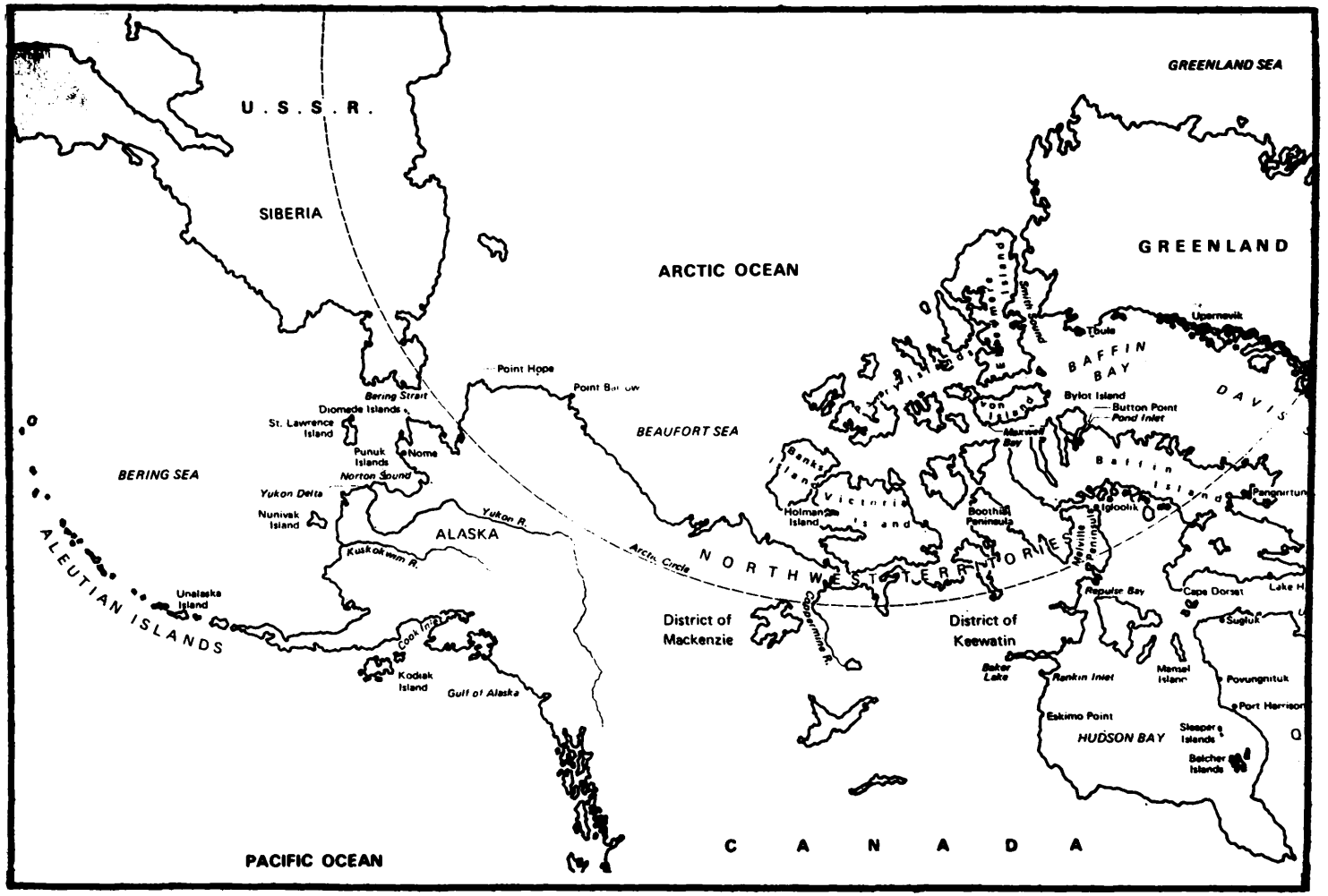

Figure 10. Map showing the link between the Eskimos in the arctic world. (From Eskimo Art by C. Burland, London: Hamlyn Publishing Group Limited, 1973.)

review of contemporary Alaskan Eskimo artists. There is no question that Ray is the primary expert in this limited field of knowledge.

The Alaskan Eskimo and his relationship to art is reflected in these words by Ray (1969):

> Art was also related to the Eskimo's unique perception of subtle differences in his environment-in ice and snow, in gray distances of rolling tundra, and in changes of the ocean waves. Early in life, an Eskimo boy became aware he was of marriageable age, he could correctly interpret mysterious shapes in the everchanging Arctic landscape, and accurately gauge a gamut of measurements. In other cultures, these perspective skills might have existed outside creativity to be channelled into destructive activities like raiding or war. (p. 6)

Ray provided a fascinating insight into the special place that art holds in Eskimo life, although the Eskimo language does not include words for "art" and "artist." The examples of graphic art selected and illustrated by Ray (1967b, 1969) include numerous pieces of engraved walrus ivory and a glimpse of contemporary professional Eskimo artists; these artists encompass the Eskimo culture in their subject matter but represent it from Western standards. There is no question that the author has made an enormous contribution, and her first hand observations of this unique and rapidly disappearing culture and its art are very informative. However, the artwork selected by Ray does not include drawings or paintings by the nonartistic individual, and this has made it difficult to make direct comparisons with the paintings collected by Billig. For this reason, I must rely on the

material related to the Canadian Eskimos as support for the hypothesis to be discussed in the following pages.

The Canadian Eskimo and His Concept of Space

In 1959, an anthropologist, Edmund Carpenter, an artist, Frederick Varley, and a photographer, Robert Flaherty[1], published an extraordinary book, Eskimo.[2] From the text and illustrations, the reader quickly realises that the Eskimo's perceptual world and our own are quite different and that a significant aspect of this difference is the Eskimo's use of his senses to determine his spatial orientation. In the Arctic, on occasion, there appears to be no horizon and the earth and sky are one.

> The two are the same substance. There is no middle distance, no perspective, no outline, nothing the eye can cling to except thousands of smoky plumes of snow running along the ground before the wind-a land without bottom or edge. When the winds rise and snow fills the air, visibility is reduced to a hundred feet or less and travel becomes dangerous. (Carpenter, 1955, p. 138)

The Eskimo, in spite of his environmental obstacles, travels

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[1]Robert Flaherty was responsible for the first true documentary in the history of film and film maker of "Nanook of the North." (Halliwell, 1977)

[2]Edmund Carpenter also published a book in 1973, Eskimo Realities, but the contents are essentially the same as the 1959 publication.

long distances cross such land. He uses reference points established by nature. "By and large these are not actual objects or points, but relationships: relationships between, say, contour, type of snow, wind, salt air, ice crack" (Carpenter et al., 1959, p. 9). The feel of the snow as he walks, and the smell and direction of the wind supply him with the appropriate cues to cope with this undifferentiated visual scene. "The Aivilik have at least twelve different terms for various winds. The Aivilik "do not reckon distance between points by miles or other abstract, inflexible units of measure, but regard it as fluctuating, related always to climate, society, religion" (Carpenter, 1955, p. 133). An Eskimo who has returned from a trip will say that it "took so many 'sleeps'" (Carpenter, 1955, p. 133), and so space is described in reference to time. They integrate time and space as one thing and live in acoustic-olfactory space, rather than visual space" (Hall, 1966, p. 80). The significance that Western man attaches to time, the Eskimo attaches to space. (Carpenter et al., 1959, p. 22)

The time-space orientation of the Aivilik Eskimo involves the following three factors: (1) They "do not conceptually separate space and time, but see a situation or machine as a dynamic process." (2) The Aivilik Eskimos have "acute observation of details." (3) "Their concept of space, not as static enclosure such as a room with sides or boundaries, but as direction, in operation" (Carpenter, 1955, p. 140). Carpenter stated that the Aivilik Eskimos do not tend to describe space in visual terms because space is not recognised as static. Space is not measurable, and there

are no units formally set aside for spatial measurement (as there are none for time). (Carpenter et al., 1959, p. 13)

Carpenter explained that he was not suggesting that the eyes of Eskimos are optically superior to his, only that the detailed observations are meaningful to the Eskimo, and they are expert observers as a result of "unconscious training" (Carpenter et al., 1959, p. 17). Furthermore, "they enter into an experience, not as an observer, but as participant. This is the only way I can describe, or rather account for, the wonderful naturalism of their carvings and mimicry of animals. Here the artist or hunter participates in seal-ness, becomes one with the seal, thus finds it easy to portray, for he is now, himself, Seal" (Carpenter et al., 1959, p. 17). Acuteness of observation is then, perhaps, the result of years of unconscious perceptual learning for the participant observer.

Acuteness of observation is accompanied by an astounding retention of the observed material. If you were to sing an unfamiliar song to the Aivilik, you would hear it reproduced perfectly and without rehearsal. "When a man travels by sled into unfamiliar country, he continually looks back to see how the country will appear on his return. These brief glimpses, vividly recorded and faithfully remembered, are enough so that he can find his way back with ease" (Carpenter et al., 1959, p. 17). Exposure to new stimuli may be abrupt, however, details are perceived at a glance and retained for some time.

Space, for most people, is understood to be that which exists between visible objects. When there is nothing to perceive, it suggests empty space. With the Eskimos oral tradition plays a very strong and binding cultural role and, for this reason, it makes "the eye subservient to the ear. They define space more by sound than sight" (Carpenter et al., 1959, p. 12). Carpenter gave us an example of this difference between the Eskimo and Western man. If we were to say, "Let's see what we can hear," the Eskimo would say, "Let's hear what we can see" (Carpenter et al., 1959, p. 12). The following excerpt from Carpenter et al. (1959) explains how auditory space differs from visual space:

> Auditory space has no favoured focus. It's a sphere without fixed boundaries, space made by the thing itself, not space containing the thing. It is not pictorial space, boxed-in but dynamic, always in flux, creating its own dimensions moment by moment. It has no fixed boundaries; it is indifferent to background. The eye focuses, pinpoints, abstracts, locating each object in physical space, against a background; the ear, however, favors sound from any direction. (p. 12)

The Aivilik Eskimo lives in acoustic space rather than visual space. However, acoustic space does not replace visual space for the Eskimo, the significance is simply reversed. Sound may contribute to the visual space perceptions of most people, but the Eskimo uses sound as his pri-

mary source for spatial information and vision is the secondary contributor.

A Comparison of Eskimo Art and Schizophrenic Art

The Attitude Toward the Art Object

Most people we know probably look at objects, such as paintings and drawings, as possessions, often very expensive ones. We own these objects; we can do whatever pleases us with them. Art to the Eskimo, however, represents a transitory relationship, a temporary act. Their interest lies in the act of creation and not in the resulting product. "Art to the Aivilik is an act, not an object; a ritual, not a possession" (Carpenter et al., 1959, p. 20). The sample of schizophrenic patients that I have met and tested held that very same attitude. They enjoyed the process and procedures outlined for painting, but not one asked to keep their creations. In fact, several presented them to me as if they were gifts; there was no apparent attachment to the art object in either the Scottish or Eskimo schizophrenic groups. This observation also applies to the nonpatient group of Eskimos; this attitude was not apparent in the Scottish nonpatient group. With this last group there was an interest in the destiny of the paintings, a concern for the work of art. The schizophrenics and Eskimos, then seemed to have an interest in the creative process, but they seemed to have no need to possess the art object.

The Significance of the Size of the Painted Objects

In traditional Eskimo art three-dimensional perspective does not exist. Realism might exist in a religious carving of an animal, such as a seal, but only because the realism is necessary for "cabalistic power" (Carpenter et al., 1959, p. 30). When the artist transfers his objects to a flat painting surface, he tells the viewer what is important, relevant or mysterious by selecting and emphasizing appropriate objects. One way in which this visual information is brought out on flat surfaces is by the size of the objects represented. For the Aivilik Eskimo, "the hierarchy of size is intimately associated with the hierarchy of size is intimately associated with the hierarchy of power, strength and importance: the spatial scale has a structural correspondence to the scale of values" (Carpenter, 1955, p. 144). Eskimo art, then, does not portray only what is visible; it provides the viewer with "what is known and true, and since truth here involves all senses, plus tradition and imagination, it embraces all cognition" (Carpenter et al., 1959, p. 29). It is not difficult to compare these characteristics to schizophrenic art. The actual size of objects drawn on a base line, for example, may not be realistic but instead appear distorted in their size relationship (see Figure 6). Perhaps an explanation for this selection of object size may be the significance of the represented objects for the artist. Stimulus meaning or symbolic value and its relationship to perceptual discrimination of schizo-

phrenics has been investigated with varying results (e.g., Dunn, 1954; Harris, 1957; Perez, 1961; Rausch, 1956). The following comparison, however, may be suggested: the actual size of the represented objects appears to be less important than the communication of the object's significance or lack of significance for the Eskimo and the schizophrenic artist.

Spatial Structures in the Graphic Artwork of Eskimos and Schizophrenics

Multiple Base Lines

Billig (1968) described a patient's graphic work which illustrates the use of several base lines. (p. 11) Multiple base lines also occur in the artwork of the Eskimos (see Figures 11 and 12). The first example of multiple base lines (see Figure 11) strongly emphasizes the actual lines between the animals and the base lines extend from the very edge of one side of the paper to the other. The schizophrenics patient, according to Billig (1970), draws his base line so that it extends across the entire canvas or paper; in most cases, however, only one base line will be used by the schizophrenic artist. The second example of this characteristic (see Figure 12) especially impresses the viewer with the endlessness of an arctic landscape by the horizontal layering of the people and their environment. Each base line or layer informs us that we are looking further and further into the arctic horizon. It should be noted that the purpose of the base line is not always the same for the

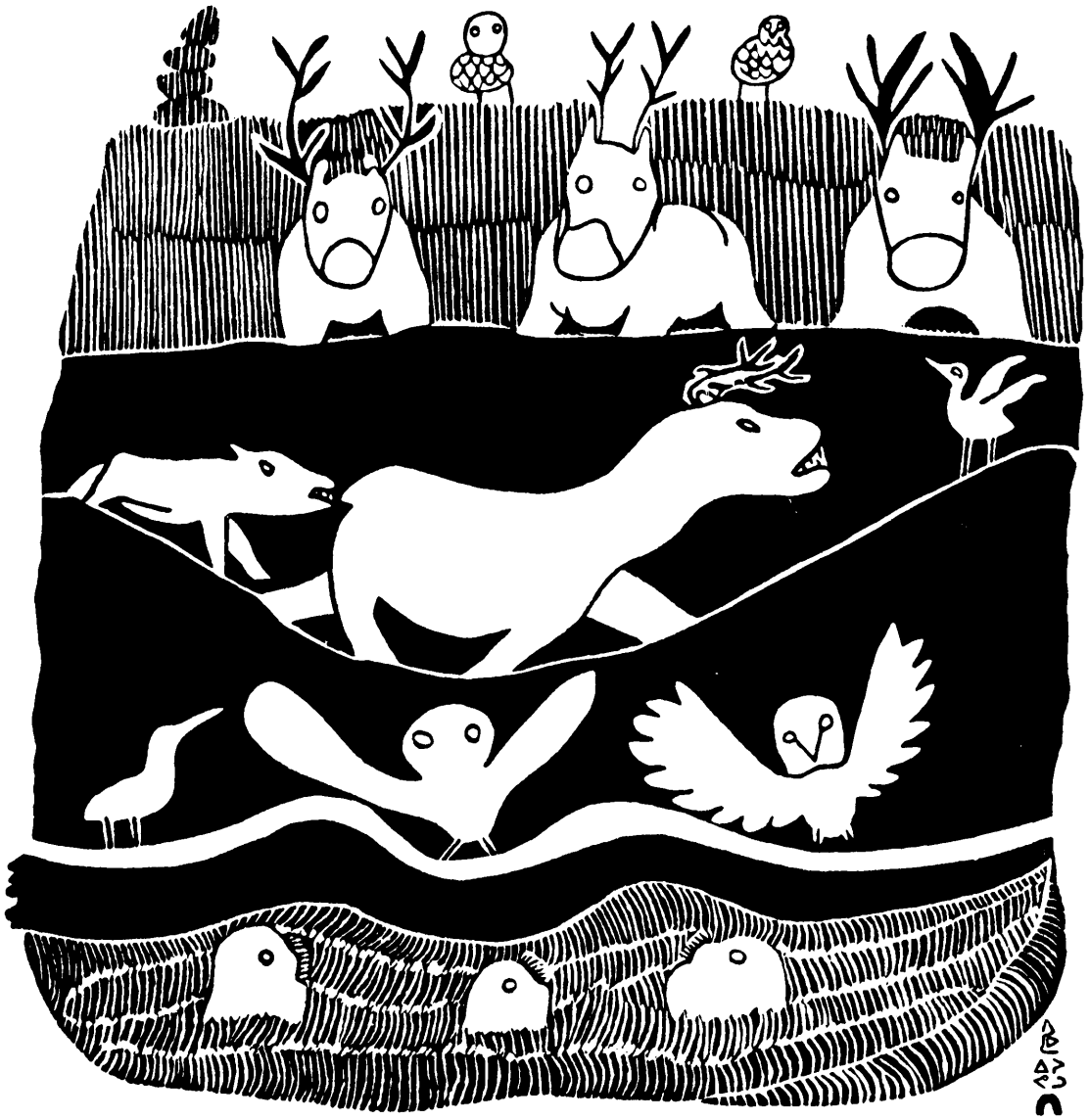

Figure 11. An example of multiple base lines. (From Pitseolak. Cape Dorset, Canada: West Baffin Eskimo Co-operative Limited, 1973.)

Figure 12. An example of multiple base lines. (From "Nauja: Painter at Rankin Inlet." The Beaver: Magazine of the North, Autumn, 1967, pp. 48-53.)

Eskimo and schizophrenic artist; the Eskimo artist is primarily interested in portraying distance, but the schizophrenic may be demonstrating a "last attempt to organize space" or impose structure on reality. (Billig, 1968, p. 7)

Geometric Patterns

Alaskan and Canadian Eskimos rely on geometric designs to decorate and enhance an object, whether it is a common tool or a pictorial representation (Burland, 1973; Eber, 1971; Houston, 1971; Ray, 1969). Geometric designs were discussed by Billig and Burton-Bradley (1973) in their study of New Guinea schizophrenic artists. Earlier, Billig (1973a) discussed how geometric designs are related to the patient's expression of movement. "The use of geometrical [sic] designs creates rigid order and serves the poorly integrated ego repressing threatening inner impulses which it cannot tolerate adequately" (Billig, 1973a, p. 11). Examples of this characteristic are provided by Billig (1973a), where squares and rectangles predominate or represent the only subject matter of the painting. (pp. 11-12) Other drawings which emphasize a geometric design are included in the schizophrenic artwork reproduced by Cocteau et al. (1961). The Eskimos and the schizophrenics, for different reasons, find geometric patterns an important part of graphic representation.

Transparency

Representations of the Aivilik Eskimos' visual world are often in "x-ray" form. This is related to the tendency toward "intellectual realism," putting all that one knows in the picture, whether it can be seen or not. A man pictured as he hunts seal on ice will include all that is above the ice formation (man and his dogs) and, also, that which is below the ice (the seal approaching the hole in the ice to breath the air) (see Figures 13, 14, and 15). Objects may possess transparency when they overlap, making hidden parts visible. A hunter may be shown inside his igloo, a child in the mother's womb or a bird with an egg inside her. "Two wrestlers may be sketched with four arms showing. This transparency means the simultaneous perception of different spacial locations. Space fluctuates in continuous activity as one sees each figure now as the closer, now as the farther" (Carpenter et al., 1959, p. 29). In comparison, the tendency to illustrate what is known as opposed to what can be seen, "intellectual realism" (Luquet, 1913, 1927), has been discussed in the previous pages as a characteristic of schizophrenic art. Transparency or "x-ray pictures" have been described by Billig (1966, 1968, 1970, 1971, 1973b) as indicating an "inadequate balance between outer and inner reality" experienced during the process of ego disintegration. (Billig, 1970, p. 219)

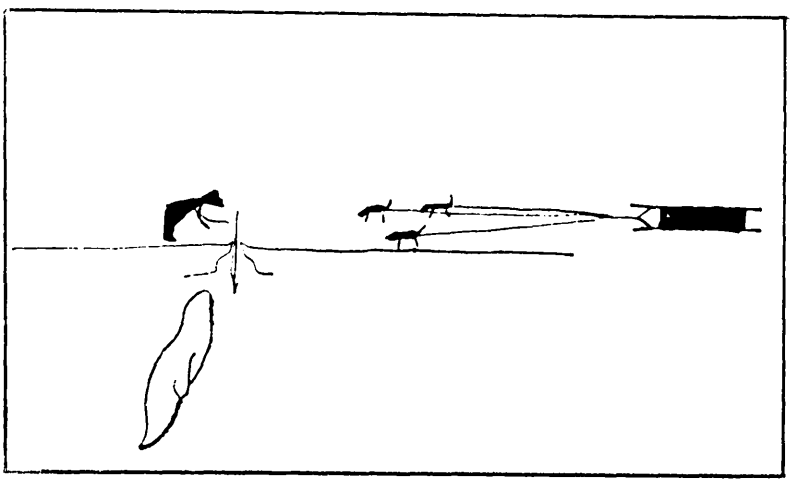

Figure 13. An example of transparency. (From Eskimo by E. Carpenter, F. Varley, and R. Flaherty, Toronto: University of Toronto Press, 1959.)

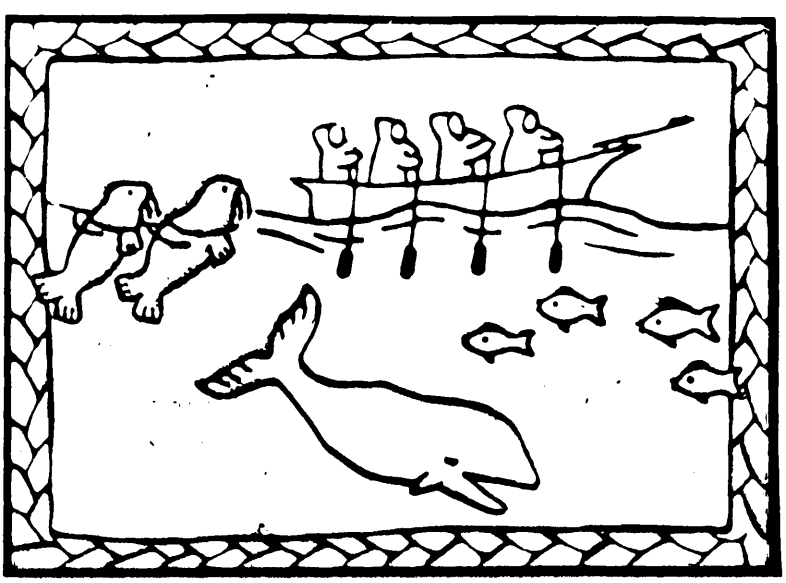

Figure 14. An example of transparency. (From original artwork.)

Figure 15. An example of transparency. (From Eskimo Prints by J. Houston, Barre, Massachusetts: Barre Publishers, 1971.)

Multiple Perspective

The most obvious and most difficult characteristic of traditional Eskimo art to accept for the viewer is the use of multiple perspective. Early Eskimo art was dominated by ivory carvings, usually of sea mammals, and these objects would not stand but roll about for they had no base. Each object lacked a single, intended perspective. The reason for this is that they were meant to be handled and worn, not placed in one location. An absence of perspective is of no concern to nonliterate people[1] because they often have little difficulty perceiving figures which have been inverted. (Carpenter et al., 1959, p. 24) "Another reason is their attitude toward the 'given.' For example, walrus tusks are carved into aggregates of connected but unrelated figures; some figures face one direction, others another. No particular orientation is involved, nor is there a single 'theme.' Each figure is simply carved as it reveals itself in ivory" (Carpenter et al., 1959, p. 24) (see Figure 16). The artist may carve several figures, and each figure (by traditional Western standards) may be oriented in a different direction; the position of the tusk, however, is not changed while carving. If a person who was not an Eskimo was to handle these carved tusks, he would be forced to continually turn it in order to position the figure in relation

[1]Nonliterate people are defined by anthropologists as people that do not have a written language. (Stein & Urdang, 1971, p. 977)

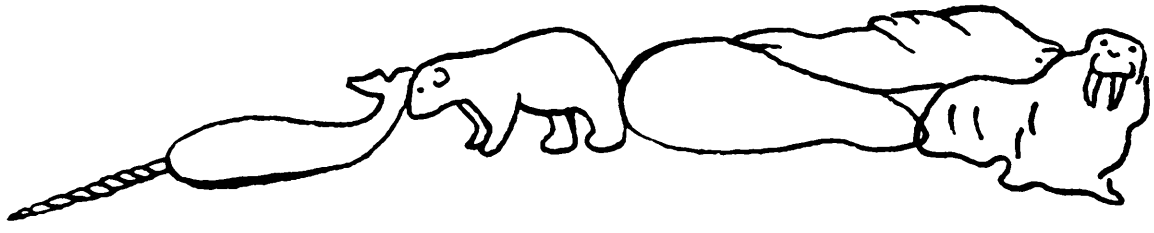

Figure 16. An example of multiple perspective. (From Eskimo by E. Carpenter, F. Varley, and R. Flaherty, Toronto: University of Toronto Press, 1959.)

to himself. Aivilik Eskimos do not require this self-orientation. Similarly, if a photograph is handed to an Aivilik, he will examine it without turning it, even if the photograph is upside down. (Carpenter et al., 1959, p. 24) An additional example of multiple perspective can be seen in Figure 17, an etching of a caribou on a knife handle. This caribou appears to be grazing, but when the handle is turned 90 degrees counter-clockwise, the caribou is standing with head high in a watchful position. The Aivilik Eskimo takes great delight in such "visual puns," created "from simultaneous perception of multiple meanings within one form" (Carpenter et al., 1959, p. 26). An Aivilik would not need to turn the figure to recognise both positions. The approach to carving described here exists in Alaska today among the Eskimos, and they have influenced the carving techniques of other contemporary soapstone carvers in Alaska.

The Aivilik Eskimo artist eventually attempted the flat surface of paper, and a transition in his approach to drawing was required.

> He might have solved this problem either by adopting single perspective to preserve his relative fidelity to the subject, or, on the contrary, by greater freedom with regard to perspective and illusion. The latter is what he decided to do. Having made this decision, he had another choice: he could redesign the figure he had chosen to reproduce by first dissecting it and then reassembling its significant parts, juxtaposing and superimposing them on a flat surface, as in Northwest Coast Indian art, always keeping within an 'enclosed' space; or he could achieve multidimensions by repeating the figure, showing different activities, different perspectives, without

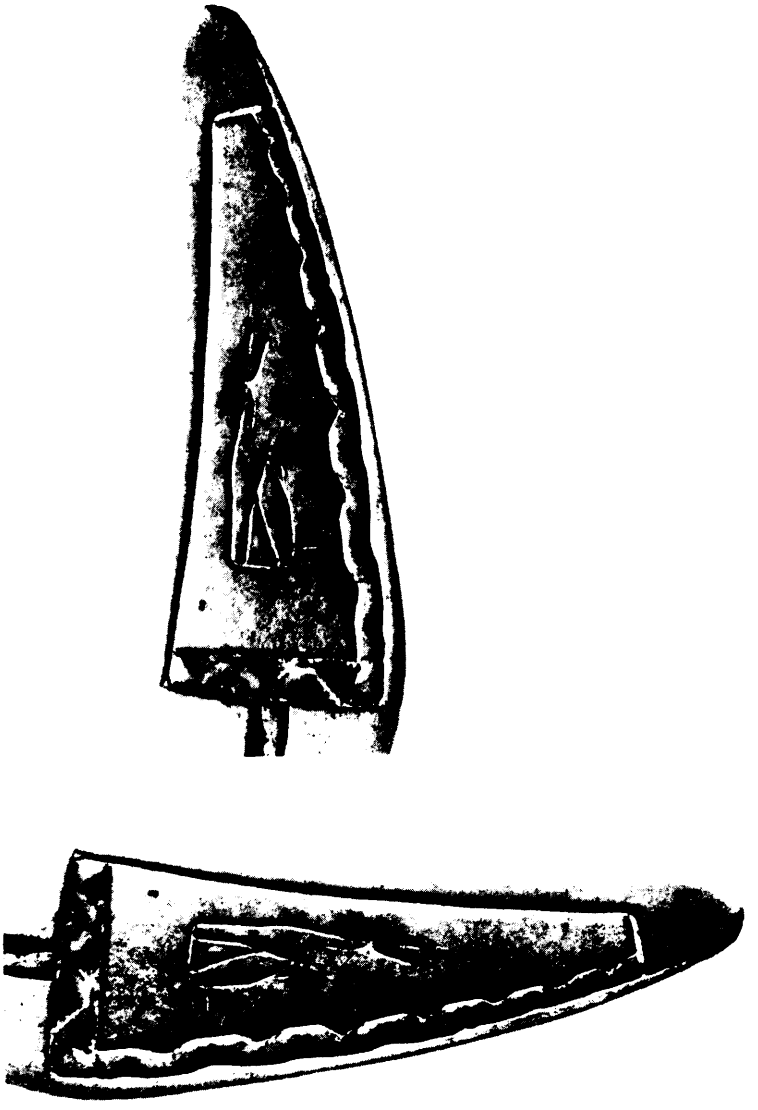

Figure 17. An example of multiple perspective. (From Eskimo by E. Carpenter, F. Varley, and R. Flaherty, Toronto: University of Toronto Press, 1959.)

> any enclosure. This is what he did. (Carpenter et al., 1959, p. 27)

The observer becomes involved in a dynamic visual experience. Aivilik artists do not reproduce what can be seen from a single perspective, but "they twist and tilt the various possible visual aspects until they fully explain the object they wish to represent" (Carpenter et al., 1959, p. 30). Multiple perspective forces the observer's eye to be in motion, glancing here and there until unconsciously he becomes a part of the scene (Carpenter et al., 1959, p. 30).

Aivilik Eskimos frown upon a single vantage point, three-dimensional perspective is completely absent in traditional Aivilik art. It is perfectly acceptable to mix planes, to "draw a tent from one side and include, as well, an end view of the tent in order to show its shape. Or they may draw the tent from one angle, other objects from other angles" (Carpenter et al., 1959, p. 30). The objects (dog, tent, man) are given the perspective which would seem most characteristic to the artist (see Figure 18). Aivilik narrators or storytellers also frown upon single perspective; they describe a figure from several angles, often presenting discontinuous images, allowing the story itself to develop unhindered by a specific perspective. (Carpenter et al., 1959, p. 30) The mixing of perspectives or planes has more than one purpose for the Eskimo; it provides information in the same way as a story and it is sometimes used to express perceptual humor. The Eskimo artist is very comfor-

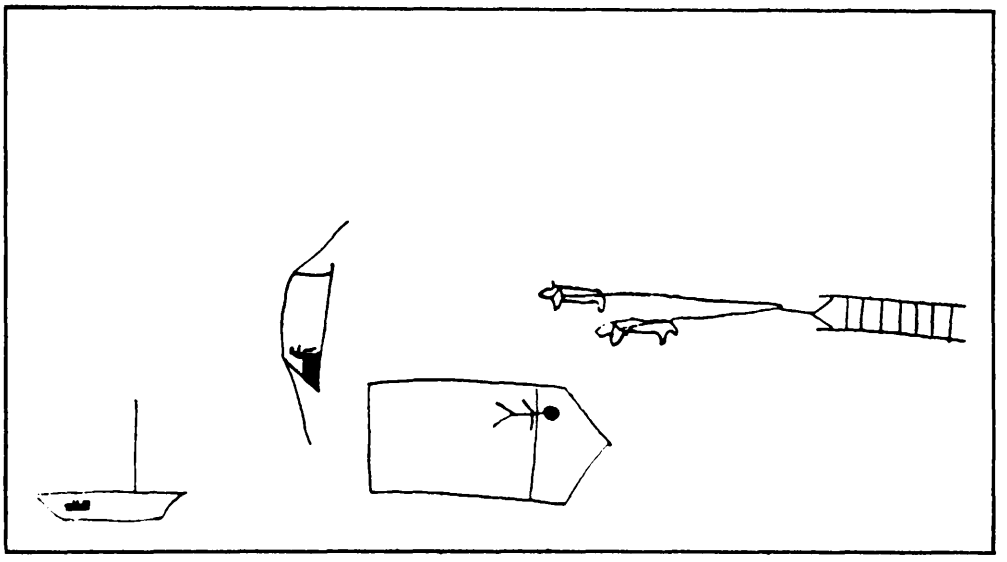

Figure 18. An example of multiple perspective. (From Eskimo by E. Carpenter, F. Varley, and R. Flaherty, Toronto: University of Toronto Press, 1959.)

table with multiple perspective, and this is also true of the schizophrenic artist when the balance between inner and outer reality becomes a problem. (Billig, 1970, p. 219)

Carpenter et al. (1959) once asked an Aivilik Eskimo to sketch everything that had happened while he had been away. The artist drew several "independent scenes, often unrelated, not in sequential order, but scattered about on paper without any particular orientation" (Carpenter et al., 1959, p. 28). These sketches were organised in a haphazard fashion with no apparent background to orient the objects in space, "figures are generally independent of one another. Each experience is confined to its own space-time life, without reference to wider spatial relationships; their comprehension is not connected with an understanding of the surrounding space. Each lives in spatial independence" (Carpenter et al., 1959, p. 28). Spatial relationships are not recognised as essential for viewing or understanding the artist's composition. As with the schizophrenic artist, "the spatial conception is 'multi-directional'; no single direction dominates. Where previously the cathexis had separated environmental objects, now its withdrawal abolishes the established spatial organisation. The regressed schizophrenic can no longer differentiate himself from his environment and has become one with it" (Billig, 1970,p. 201). At this point, the efforts of the schizophrenic are usually lines scattered in a number of directions, which is unlike the illustrations of the Eskimo, but similar in that there is no indication of a spatial orientation and no sense of relationship existing between the various aspects of the

composition. The schizophrenic at this level of ego disintegration has lost all relations with reality due to a complete withdrawal of cathexis.

Hanfmann (1939) studied schizophrenic thought disorder as shown in the performance of schizophrenics on the Healy Pictorial Completion Test II. She found that "the patient actually does not attribute any position within real space to the object inserted. He may declare emphatically that the object is only in the mind, in the thoughts of the person. When such solution of the question is not possible, as in general belongingness and in summarizing responses, the reply given shows that the question of localization is felt by the subject to be simply inadequate-to have no meaning. He stresses that the object inserted, although it has a definite function, has no position in space, it is just put into the picture for a definite purpose" (Hanfmann, 1939, pp. 257-258). When the subject's task is placement, there is no apparent spatial factor considered. (Hanfmann, 1939, p. 258)

Hanfmann (1939) analysed the localization responses of schizophrenics and discussed the psychopathological significance of their disregard of spatial relationships as related to disturbances of thought. Spatial relationships in graphic representations provide "a definite frame of reference for the objects and make the picture a representation of a section of real space" (Hanfmann, 1939, p. 259). The frame of reference dictates the possibilities, positions, sizes and status of the objects, "it functions as a system-forming factor. When...this factor drops out, limitations

also disappear, and objects are enabled to enter meaningful relationships which would have been impossible within the realistic conception of the scene. The representation of the thoughts or wishes of the persons depicted, or the representation of the meaning of a whole scene, such as we found in the placements of the patients, are the correlate of this liberation from the bonds of the temporal-spatial reality" (Hanfman, 1939, p. 259).

The relation of this liberation to other disturbances in schizophrenia is reviewed and the question of whether liberation is an abnormal response. Hanfmann (1939) compared the patient's work to medieval art, "where the artist has combined in the same picture scenes actually separated in time and space, placed objects and persons on top of each other, and in general attempted to render the spiritual meaning of the scene, not its character as a real occurrence" (Hanfmann, 1939, p. 259). Because this is similar to medieval, nonrealistic and modern art, it might be considered a "normal" phenomenon. The patients, however, present a different problem in some ways. "They do not <u>voluntarily</u> adopt the given attitude and maintain it; their placements may be realistic in some patterns, 'absurd' in others. When they change from one attitude to the other, they are not explicitly aware of the change. The occasional loss of the spatial frame of reference is here an instance of the general disorganisation and dissociation of the different systems and of the ineffectiveness of all system-forming factors" (Hanfmann, 1939, p. 260). The difference,

then, between the Eskimo and the schizophrenic is a cognitive one. The Eskimo maintains a consistent and conscious attitude, or frame of reference, in terms of the spatial relationships of objects and the schizophrenic does not; in spite of this difference, the graphic representation of objects by the Eskimo and schizophrenic may often appear similar.

Empty Space

A related characteristic of Aivilik art is a tendency not to fill in the spaces between the figures or scenes sketched on the paper. Each sketch stands alone with emptiness as a background. (Carpenter et al., 1959, p. 28) Objects placed in no apparent spatial context, with exaggerated views of space is what Billig referred to as empty space and it indicates a beginning withdrawal of object cathexis in the process of disintegration. (Billig, 1968, p. 2) This aspect of the artwork of the schizophrenics bears only a slight resemblance to that of the Eskimos, in my estimation.

Spatial Structures in the Artwork of Children and Adults in Western Cultures

The spatial structure characteristics that have just been outlined are not unique to Eskimo art; they may be found, in fact, in the artwork of children (e.g., Rhoda

Kellogg, 1970). In addition, there is no doubt that some of the spatial structure characteristics documented in this thesis are also found in the artwork of adults in Western cultures. These characteristics, however, may not be as prevalent in the artwork of schoolchildren and adults in Western cultures as they are in Eskimo artwork because of art education in schools. Perhaps, also, the ocnnection between art and culture is not as strong in some cultures as it is in the Eskimo culture. Therefore, the process of the evaluation of spatial structure characteristics in Eskimo art may be easier in terms of recognition and documentation.

The research by Carpenter (1955) represents some very valuable information related to these spatial structure characteristics. However, it must be recognised that it is not the intention of the researcher to provide a single perspective on Eskimo art; Carpenter (1955) did, however, provide the only documented material on Eskimo spatial structures, not Alaskan Eskimos but Greenland Eskimos. This fact will soon be corrected, however, because a professor of art at the University of Alaska is in the process of writing a book about Alaskan Eskimo art. At this point, one can only hope that the spatial structures in Eskimo artwork will be discussed in this new book.

In the original manuscript for this thesis, the art of children and the spatial characteristics similar to those outlined by Billig (1970) were incorporated into the text. The review of this information proved to be fascinating and enlightening but had little direct bearing on the experiment, and it seemed that other significant information would be more beneficial to this thesis. This aspect of the thesis reveals one way in which the subject matter would be extended and one example of the temptations that had to be avoided.

SUMMARY

The purpose of this portion of the INTRODUCTION AND BACKGROUND was to share the cognitive steps in the process of formulating the primary purpose for this research project. The reader has been given the information necessary to allow him to understand the relationship between a potential nonverbal diagnostic tool, established from Billig's (1970) spatial structure theory, and projective techniques as well as the contribution this tool might make to the field of art therapy. Various approaches to the interpretation of schizophrenic art were briefly reviewed; Billig's theory of ego disintegration, on the other hand, was discussed in detail, using specific spatial structures in paintings. The spatial structures that were described by Billig (1970) as characteristic of the spontaneous artwork of schizophrenics were compared to the spatial structures in the artwork of Aivilik Eskimos from Greenland. This comparison was significant because it represents one of the specific reasons why the Alaskan Eskimos were selected for this research project.

The reader may be reminded that the Alaskan Eskimos were not solely selected because of their artwork. One of the most crucial questions addressed by this research is the following: Billig asserted that a disintegration in the

schizophrenic's ego is accompanied by specific spatial structures. Will an Alaskan Eskimo schizophrenic subject, selected from a culture in which the specific spatial structures outlined by Billig can be seen in the traditional artwork, utilise the same spatial structures outlined by Billig? How will the Alaskan Eskimo schizophrenic's spatial structures compare with those of a schizophrenic subject from a culture in which the people are less familiar with these spatial structures (e.g., transparency)? In other words, if control subjects with no psychiatric history are familiar with specific spatial structures (i.e., the ones outlined by Billig) and have used them for generations for graphic expression in their culture, will the process of ego disintegration produce the same deterioration in spatial structures (as outlined by Billig) as one would see in the artwork of a schizophrenic subject from a culture that does not intentionally utilise the same structures in paintings?

The present research was designed to explore other possible explanations for the spatial structures outlined by Billig (1970), and perceptual testing was an important part of the experimental procedure. Therefore, the previous research which discussed the Greenland Eskimos and the Scots and their perceptual abilities provided some valuable insight. In addition to the possible perceptual similarities documented by previous researchers, Alaskan Eskimos were selected as an appropriate population because of the spatial structures in their artwork and the extent to which they were similar to those outlined by Billig (1970). The focus established by the present research does <u>not</u> in any

way suggest that the spatial structures outlined in this section are only to be found in the artwork of Alaskan Eskimos. However, the Eskimos represented in Carpenter's (1955) research and the spatial structures outlined by Billig (1970) clearly suggested that the Alaskan Eskimos could provide insight into spatial structure deterioration in paintings produced by schizophrenics and encouraged the researcher to focus on this particular population of people.

PERCEPTION

The Perceptual Skills of the Scots and the Eskimos

Berry's Hypotheses and Findings

Perhaps the most obvious question raised by the present research project is, Why compare the Eskimos and the Scots? The initial interest in these two seemingly different populations came from Berry's hypothesis (1966)[1]; this hypothesis stated that "differences in visual perceptual skills would exist between societies with differing ecological and cultural characteristics and that these perceptual differences would not be random in kind or degree, but might be predicted from an analysis of the ecological requirements and cultural practices of each group" (p. 208). To test this hypothesis, Berry selected two culturally and ecologically

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[1]Berry has published several cross-cultural studies (e.g., 1971) as well as an excellent book (1976a), which outlined the relationship between ecology and cognition.

contrasting societies, the Temne of Sierra Leone and the Eskimo of Baffin Island, and he administered numerous perceptual tests, (e.g., Kohs Blocks, Witkin Embedded Figures Test, Morrisby Shapes, and Raven Matrices).[1]

Table I

The Groups Tested in Berry's Study

Group	Transitional (urban)	Traditional (rural)
Temne	Point Loko	Mayola
Eskimo	Frobisher Bay	Pond Inlet
Scots	Edinburgh	Inverkeilor

The above table outlines the cultures represented in Berry's (1966) study. Berry (1966) selected two samples from each society tested, a traditional sample (rural) and a transitional sample (urban). One of the reasons for rural and urban subjects was to explore the possible "effects of westernization on perception within a culture" (Berry, 1966, p. 209). Briefly, the Eskimos, as opposed to the non-hunting Temne, represented a hunting ecology. In an ecology of this kind, the people possess good spatial skills and visual discrimination, and "their cultures are expected to be supportive of the development of these skills through the

[1]For a description of these perceptual tests refer to Berry, 1966, p. 218.

presence of a high number of 'geometrical spatial' concepts" (Berry, 1976b, p. 128). A third group consisting of Scots was tested because the researchers believed that this sample was necessary to assist in the comparative analysis of the data and previous Western research findings. (Berry, 1966, p. 208)

A critisism of Berry might be that he neglected to include a definition of 'good' spatial skills; he did, however, discuss at length various aspects of spatial ability. While the reader feels enlightened by Berry's statements about spatial abilities, the reader should be somewhat disturbed by his tendency to make undefined, general statements; for example, they demonstrate 'good' spatial ability. To include the information provided by Berry would present the reader with a great deal of information that does not directly concern the present investigation. The background information related to the Berry study is meant to answer the most obvious question: Why were the Scots and Eskimos selected for the present research project?

The hypotheses directly related to the spatial skills tested were as follows: (1) "The Eskimo will score significantly higher than the Temne for comparable degrees of westernization." (2) "The Eskimo will more closely approximate the Scottish scores than the scores of the Temne samples of equivalent westernization" (Berry, 1966, p. 220). The results indicated that all of the tests administered for both hypotheses were significant beyond the .01 level of confidence. "Not only do the Eskimo scores exceed the Temne

scores, but they much more closely approximate the scores of the educated and literate Scots than those of the Temne who are at a comparable level of westernization" (Berry, 1966, p. 220). With reference to hypothesis one, the distributions of Kohs and Matrices scores reveal that the Scots and Eskimos tend to form one group while the Temne hold their place at the other end of the distribution. With reference to hypothesis (2), Berry (1966) stated:

> Not only have the Eskimo exceeded Temne spatial scores, but they very nearly matched Scottish performance. This result is remarkable, and even seems somewhat improbable when the large differences in material and educational opportunities are considered. But it is to be remembered that this result was predicted on the basis of Eskimo alternatives to Scottish opportunity, the gradual development of spatial skills on the land, aided by linguistic, artistic and socialization practices. (pp. 223-224)

Berry (1966) concluded that "the most striking feature of these graphs is the great gulf between Temne and Eskimo performance, and the minimal difference between the Eskimo and the Scots (cf. hypothesis 1 and 2)" (p. 227). The Eskimo not only exceeded the performance of the Temne but have almost duplicated the Scottish scores. These results were not expected by the researchers. Cultural characteristics "do not inhibit the development of the skills required by their environments" but "allows people to develop and maintain those skills which they have to" (Berry, 1966, p. 228). Berry did not develop the argument that perceptual skills

are environmentally determined but merely stated that the cultural and ecological factors mentioned significantly influence their development.

Cultural Differences in Perception

Race has, also, been discussed to account for perceptual differences between cultural groups. Thouless (1933) recognized a definite racial difference in perception when he compared Indian and British students. He discussed the features of Oriental (i.e., Chinese, Japanese, Indian and Persian) art which are markedly different from Western art. There is a lack of perspective, either totally or partially (i.e., "objects of the same real size at different distances are drawn with very little difference in size," Thouless, 1933, p. 330), and an absence of shadows in paintings. The explanations most frequently offered for this approach to painting is that "its aim is symbolic and not representational" (Thouless, 1933, p. 331). However, Thouless (1933) believed that laboratory experiments supported a simpler explanation. "There is a measurable difference in the perceptions of these races, and this difference is such that they see objects in a manner much further from the principles of perspective than do the majority of Europeans and also that they tend not to see shadows. The difference in question is in the extent to which they are subject to what

has been called 'the tendency to constancy' or the tendency to 'phenomenal regression to the real characters of objects'" (Thouless, 1933, pp. 330, 332). The conclusion, then, was that there existed "a real racial difference in perception between the British and Indians and that this difference is exactly the difference which would lead to the observed difference in drawing technique between Western and Oriental artists" (Thouless, 1933, p. 336).

The group of Indian students revealed "a significantly greater tendency to 'phenomenal regression to the real object' than a control group of British students" (Thouless, 1933, p. 337). These findings suggested to Thouless that the two characteristics of Oriental art discussed as being different from Western art (lack of perspective and shadows) are "determined by a real racial difference in perception and not merely by a tradition of 'symbolic' representation" (Thouless, 1933, p. 337). It seemed reasonable to Thouless (1933) to suggest that "the difference in drawing technique is a result of the difference in perception" (p. 336). Berry (1966), however, concluded that as a result of the significant differences between the rural and urban samples, and especially the lack of difference between the Scots and the Eskimos on the tests of spatial ability, "it is considered that a purely racial explanation is not acceptable" (p. 228).

It should be carefully noted, at this point, that the term 'racial' used by Thouless and the term 'cultural'

used by Berry are essentially conventional labels and should be recognised as purely descriptive. These two variables, race and culture, have not been isolated or supported by empirical evidence. Therefore, Thouless was not justified in using the term 'racial', and Berry was not justified in using the term 'cultural'.

Segall, Campbell, and Herskovits (1966) concluded upon reviewing the literature "that if cultural differences in perception are to be found, they are likely to be the result of culturally mediated differences in experience, rather than manifestations of biological differences among cultural groups" (p. 68). The cultural influence on size constancy was also investigated by Winter (1967). An African sample and a European sample were administered the size constancy test in three different environments (i.e., a lecture theatre, outdoors with a near background and outdoors without a near background) to investigate the effect of these different situations on size constancy scores; this study of the environmental effects on size constancy revealed no significant differences.

The results of Winter's (1967) research also indicated that "western culture might almost be a handicap in the perception of size and in size constancy, but this is not reflected in the cross-cultural comparison, in which the National Institute for Personnel Research staff fared better than black labourers and white students" (p. 56). However, her results did show "certain cultural differences in perception, and that these differences are not necessarily

racial or black-white differences" (p. 56). Winter (1967) speculated that the differences might possibly be "due to a complex interaction of cultural, environmental and hereditary factors" (p. 56).

Garai (1976) and Garai and Scheinfeld (1968), however, would not agree; they discussed the difference between spatial perception of men and women. Winter's (1967) findings do not strongly support Garai (1976) and Garai and Scheinfeld (1968) because the male and female groups performed with "marked but inconsistent differences" (p. 55), which also did not support Thouless's (1932) finding that females tend to perform better. (p. 55) Winter discussed possible reasons for the inconsistent differences but nevertheless did not provide clear evidence or insight into the question of sex differences. A more recent study by Hier (1979) looked at the genetic explanation for a lack of sex difference among the Eskimos in spatial ability. According to this researcher, "superior spatial ability may be inherited as an X-linked recessive trait" (Hier, 1979, p. 593). He developed his argument for no sex difference between men and women in the Eskimo culture with this as his foundation.

Deregowski (1982) published an article which focused on the theoretical issues surrounding cross-cultural psychology and discussed perception to illustrate his points. He stated that cross-cultural psychology "does not confine itself to specific areas of behaviour as, say, psychology of perception, or social psychology or ergonomics do. It does

not have its proprietary specialized techniques as do physiological psychology and clinical psychology. In short it is not a discipline nor a subdivision of a discipline, but only an approach within the broad discipline of psychology" (Deregowski, 1982, p. 31).

Cross-cultural psychology, according to Deregowski (1982), deals primarily "with the same issues as psychology in general, and a cross-cultural investigator carries out in 'psychologically new' cultures those tasks which his intracultural colleagues perform or have performed within the compass of their own culture" (p. 31). The function of cross-cultural psychology is not to illuminate or understand a particular culture or cultures thus far unexplored, but rather its function is to investigate psychological processes. (Deregowski, 1982, p. 31) In other words, cross-cultural psychology should not be composed of a collection of studies describing variations between cultures, but, rather, the focus should be on a psychological process and various cultures may be investigated to shed light on a particular process. The yet unexplored or unfamiliar cultures are helpful because they offer an opportunity to further study these psychological processes or a particular process.

There has been evidence that psychological processes vary among cultures. "Such variation being indicative of the range of the psychological processes is interesting in its own right, but in addition it provides us with opportunities of studying processes within those cultures in which they assume particularly intense, particularly accessible or particularly interesting forms"

(Deregowski, 1982, p. 32). Deregowski (1982) provided some analogies related to this reasoning within the field of psychology; for example, "the relatively short life-cycle and the relatively large chromosomes make the fruitfly particularly useful in studying genetics" (p. 32). The point, again, is that a culture is not studied by a psychologist merely because it is unfamiliar; a culture is studied because of a specific contribution that the culture might make to the study of a psychological process.

Deregowski (1982) warned that culture may not be the only cause for psychological variation. He stated that "there are no studies convincingly showing that psychological differences between populations are of a purely cultural origin, as opposed to genetic or environmental origins. The employment of the terms 'culture' and 'cross-cultural' does, however, become acceptable if one thinks of them as being akin to the usage of biological sciences and not to the usage of anthropology" (p. 32).

Deregowski's (1982) article is mentioned here not only because of the fact that it provided a view of cross-cultural psychology and perception, but also it supported the theoretical perspective of the present thesis. The intention of the present thesis is to provide new insights in terms of a psychological process, ego disintegration, as reflected in the spatial structures of paintings. The Eskimo culture was selected to assist in the effort to understand this process. The Eskimo people were selected intentionally, not randomly, because one of the techniques

documented for studying this process, spatial structures, was "particularly intense" and "particularly accessible" (Deregowski, 1982, p. 32). And, also, as Deregowski (1982) pointed out "perception has a venerable place in cross-cultural studies" and "an analysis of art forms may indicate certain perceptual characteristics which would not otherwise be noticed" (Deregowski, 1982, p. 36). He went on to state that "little has been done in this area by cross-cultural psychologists, although one would expect exotic art to be a rich source of hypotheses, not only pertaining to beliefs and aesthetic values, but also to cognitive issues" (p. 36).

In addition, one of the initial motivating forces behind the present research, and the reason for attempting to develop a nonverbal diagnostic tool, was the discovery that non-English speaking patients in psychiatric hospitals (e.g., rural Alaskan Eskimos) were given standardised tests based on unfamiliar cultural information. Deregowski (1982) was also concerned about using standardised tests which originated in the West to evaluate or investigate a non-Western people or the tendency to translate tests and results using a Western perspective. Although the present research project was initiated prior to the publication of Deregowski's (1982) article, the intentions and goals of the present research are consistent with the points presented in his article. The primary goal of the present research was to test and perhaps expand a nonverbal diagnostic tool that could be used to assist in the diagnostic evaluation of the condition of the schizophrenic patient's ego, regardless of his language or culture.

An additional point of agreement between Deregowski's viewpoint and the goals of the present research is his concern for the confusion and misunderstanding created by "stopover" or "vacation" researchers (Deregowski, 1982, p. 34). Again, it is always refreshing to find agreement, especially when the source was discovered after great lengths have been taken to comply with one's intentions. The present research was conducted in Scotland and Alaska; it was necessary to live in Scotland for two years and Alaska for six years (the longer stay in Alaska reflects the difficulty of data collection, not a personal preference). The length of time spent in both cultures made it possible to become familiar with the people and their cultures and contributed to the accuracy of the interpretation of the findings. Deregowski (1982) made an excellent point: When interpreting results as well as performing experiments, the cross-cultural researcher must make a committment to the people as well as the experiment. The present research project was, in my opinion, very successful in accomplishing this goal.

Deregowski's (1982) article mentions various cross-cultural studies related to perception (e.g., Segall, Campbell, & Herskovits, 1966) as well as his own work with the measurement of spatial abilities and perceptual illusions (e.g., Deregowski, 1969, 1972, 1980a, 1980b, 1981; Serpell & Deregowski, 1980; Young & Deregowski, 1981). In spite of the fact that the perceptual studies do not directly relate to the perception of the schizophrenic or the Scottish and Eskimo cultures, it does very strongly

reflect the theoretical positions and some of the primary goals of the present study.[1]

For the present research, it seemed advisable to select and compare two groups with similar skills in space perception. The Scots and the Eskimos, according to the results of Berry's (1966) research, represent two populations with similar spatial abilities. If the perceptual constancy tests in the experimental procedure of the present study indicate that the nonschizophrenic control groups from both cultures are not significantly different in their space perception, but the spatial structure ratings from these two groups are significantly different, then it may be suggested that cultural factors rather than space perception affect the spatial structures in drawings. However, if the nonschizophrenic subjects from both cultures show no significant difference in their perceptual or drawing performance, and the schizophrenic subjects from both cultures are not significantly different in their perceptual constancy performance from the control group representing that culture, but they are significantly different in the spatial structure ratings, then it may be suggested that their spatial structures may be the result of the disintegration process in schizophrenia and not a difference in space perception. From the findings of Thouless (1933), one might expect similar spatial structures or drawing techniques from

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[1]A computer search in the United States located the Deregowski (1982) article in 12 locations, but not all these locations will lend the article. The University of Arizona (Tucson, Arizona, zip code-85721) will loan the article to any university library.

populations with similar perception. Sampling two very different cultures with similar perceptual abilities contributes to the control of a major extraneous variable which might influence spatial representation.

It must be clearly noted, however, that this speculation about the influences of space perception and schizophrenia on drawing behaviour does not exclude other possible explanations for the variations in spatial structures in drawings. The manner in which an individual or group of individuals structure space in a drawing may be the result of other factors, such as art training or pathological factors that have yet to be explored. The intention of the present study, however, is to test, verify, and extend Otto Billig's theory of spatial disintegration. The related literature addresses the perceptual distortions experienced by schizophrenics and the universal spatial structure characteristics found in schizophrenic drawings. In order to provide art therapists and other professionals with research which supports Billig's theory, the present research was designed to explore and clarify the perceptual and cultural influences on the spatial structures in the drawings of schizophrenics. In addition, an effort was made in the design of the present experiment to control influencing factors such as art training. This approach to the research published by Billig in no way suggests that schizophrenia is a normal state; the alterations in space perception and graphic distortions caused by the ego disintegration process in schizophrenia may not be the only factors which affect drawing behaviour.

One of the reasons that Thouless is mentioned is to establish the fact that some evidence has indicated that there is a cultural difference in peception, as opposed to Berry's findings which indicated that certain aspects of perception (i.e., space perception) may indicate a lack of difference between certain cultures. The primary point is to offer the reader some background information in terms of cultural differences in perception and also to assist the reader in following the line of reasoning which contributed to the selection of the two populations tested. The only relationship suggested is as follows: Berry and Thouless provided different evidence regarding the racial explanation. There is no intention of linking the groups studied by these two researchers or directly extrapolating from the comparisons. This information is offered only in an effort to establish the right to speculate about the possibilities.

The Schizophrenic's Perception of Space: The Unanswered Question

Perception has numerous definitions and interpretations; it may, for example, represent a stimulus orientation or a creative process whereby the individual's behaviour is determined by his interpretation of the situation. "Perception is a process actively carried on by the individual linking him with the world about him. Personality is not a process but rather a description of a particular pat-

tern of processes, of which perception is perhaps the most important" (Ittelson[1] & Kutash, 1961, p. 5). Perception has been described "as that part of the process of living by which each one of us from his own particular point of view creates for himself the world within which he has life's experiences and through which he strives to gain his satisfaction" (Ittelson & Kutash, 1961, p. 6). The emphasis on an interaction between the individual and his surroundings is particularly important when examining the perception of space. The present research will not approach perception from a physiological basis, but, instead, it will attempt to understand the relationship between the individual and his world.

Schizophrenic patients, psychiatrists and physicians have commented upon the symptoms found in this illness which suggest a perceptual basis for disorders of thought and affect. (Venables, 1964) Autobiographical accounts (e.g., Sechehaye, 1951) and psychiatric descriptions (e.g., Arieti, 1974; Chapman, 1966b; Holzman, 1970) have provided numerous examples of the perceptual world of the schizophrenic. However, these reports do fail to enlighten the reader as to the underlying nature of the patient's sensory dysfunction.

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[1]There are several excellent sources of information about space perception, but I would direct the reader to Ittelson (1960) and Wyburn, Pickford, and Hirst (1964) for a more detailed description of the perception of space.

It is still not certain "as to whether we are dealing with a primary change in the quality of sensory input or a more complex secondary distortion of perception induced by fantasy and intense emotion" (Ornitz, 1969, p. 260). The unanswered question still appears to be, Is that which is perceived distorted as a result of disturbed reality testing, or is the disturbed reality testing the result of a primary perceptual distortion? Are the peculiar and distorted graphic representations produced by the schizophrenic a reflection of his fantasies and a world he has created, or are they actually errors in perceiving the world, misinterpretations of sensory information? "The common attitude in writers on this subject is to interpret in terms of fantasy, without distinguishing between imagination in the sense of a newly created picture and what is in fact the misconstruction of a perception" (Beck, 1964, p. 92). Ornitz (1969) has the opinion that for the autistic child and the adult schizophrenic the symptoms expressed or described reflect a distortion of perception. Using Rorschach responses and investigations Beck (1964) concluded "that poor apprehension of the presented real world is what chiefly distinguishes the schizophrenic's percepts and his thinking; that, and not living in the world of fantasy" (p. 102).

The question of the source of the schizophrenic's perceptual information directly applies to the present research project. Perceptual errors are significant in the schizophrenic's interpretation of his world. (Beck, 1964)

Are the spatial structures found in schizophrenic art the result of a disintegrating ego (Billig, 1970), or do they reflect errors in space perception (Beck, 1964)? These questions represent only the psychoanalytic and cognitive interpretation of perceptual dysfunction. To attempt to understand and to sort out the information related to this question, it is necessary to review perceptual dysfunction in schizophrenia and, more specifically, space perception.

Perceptual Dysfunction in Schizophrenia

Wing (1978) edited a book, Schizophrenia: Towards a New Synthesis[1], and the publication represented an attempt to consolidate in one source the progress made in research related to schizophrenia. The contributions toward the understanding of schizophrenia included social, biological, and psychological research. At this point, it might be helpful to briefly mention some of the explanations for perceptual dysfunction, in addition to the psychoanalytic and cognitive explanations.

Wing (1978) included a chapter by Iversen which discussed research related to the biochemical and pharmacological approaches to schizophrenia. Iversen's conclusion mentioned that there has not been, as yet, a biochemi-

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[1]If the reader is interested in an overview of the various approaches to schizophrenia, this reference is recommended.

cal abnormality identified in schizophrenia. He indicated that there is no doubt that a search for a metabolic defect is meaningful because "the major disturbances of brain function which must underlie schizophrenic psychoses must be associated with biochemical rather than neuropathological abnormalities" (Iversen, cited in Wing, 1978, p. 115). Iversen went on to say that if a metabolic abnormality is identified, it will not be easy to discover just what that will tell us about the disease. "The identification of a specific biochemical disturbance might help to explain the nature of the brain malfunction which underlies the symptoms of the disease, but we would still not understand how this biochemical abnormality came about" (Iversen, cited in Wing, 1978, p. 116). Iversen presented several unanswered questions, and, then, left the reader with the following statements: "It would certainly be naïve to suppose that a metabolic defect could be regarded as 'the cause' of schizophrenia. On the other hand, we can regard neurobiological research as a most promising means of unravelling these complexities and look forward, with some confidence, to further progress" (Iversen, cited in Wing, 1978, p. 116).

The genetic theories developed to explain schizophrenia are varied and reveal that there is more than one way of analyzing the data. It is necessary to look at the theories individually and that can be done by either reviewing the research presented by each theorist or by reading the overview provided by Shields (cited in Wing, 1978). However, essentially, the theories hypothesize about what

occurs genetically to account for the various schizophrenic psychoses. The possibilities include: (a) a particular gene, (b) "various rare genes", or (c) "a combination of relatively common genes" (Shields, cited in Wing, 1978, p. 86). The reader may select a particular theory, but Shields indicated that the tasks for the future are the same no matter what theory is selected. At present, he indicated that "we have to accept a degree of uncertainty concerning the unity or diversity of the schizophrenias and the manner in which the majority of cases are inherited. Advances in other fields may well be decisive" (Shields, cited in Wing, 1978, p. 86). Shields (cited in Wing, 1978) ended his chapter with several questions which have yet to be answered. For example, why is it that "the closer an individual is related to someone with schizophrenia, the higher the risk of developing the condition" (p. 86)? Another thought-provoking question is: Why do "children of schizophrenics who are adopted, while still very young, by unrelated persons who are not schizophrenic, still have an increased risk for schizophrenia" (p. 87)?

Julian Leff (cited in Wing, 1978) reviewed the social and psychological influences related to the course of schizophrenia. He discussed studies which investigated the disorder in terms of social deprivation (e.g., Leff & Vaughn, cited in Wing & Hailey, 1972; Sommer, 1969; Wing & Brown, 1961), events in the life of the individual (e.g., Birley & Brown, 1970), and the role of the family (e.g., Bateson et al., 1956; Lidz et al., 1957; Wynne et al., 1958), just to mention some of the studies reviewed. The

explanation for schizophrenia placed the emphasis on the social environment of the individual. The review also discussed the difficulties surrounding the collection of data and the practical implications as well as the replication of studies.

The emphasis in the present research on schizophrenia is cognitive and psychoanalytic, but this emphasis in no way intends to suggest that these are the only research perspectives or the most important ones to address. An explanation of Billig's theory required a psychoanalytic explanation for the spatial structures in the artwork, and the hypotheses related to perceptual constancy required a cognitive explanation of perceptual dysfunction in schizophrenia. The intention, as stated previously, was to validate a psychoanalytic theory, that would be useful in diagnostic procedures, by testing it under experimental conditions and exploring perceptual dysfunction as a possible explanation for the spatial structures in paintings. For the purpose of the present research, the reader is provided with psychoanalytic and cognitive approaches to understanding schizophrenia.

Perceptual Tasks and Experimental Research with Schizophrenics

The literature related to perception and psychopathology offers an enormous and confusing array of published work. Heterogeneity of findings and methodological errors in most studies (Holzman, 1970, p. 216) contribute to the lack of clarity about perceptual dysfunction in schizophrenia. When Kraepelin and his pupils applied

experimental methodology to the question of sensory change in schizophrenic individuals, they found no evidence of perceptual alterations. (Weckowicz & Blewett, 1959, p. 910) In 1911, Bleuler denied the existence of perceptual changes (p. 14). And Houck (1971) concluded that the perceptual deficit said to accompany the schizophrenic syndrome is the result of deficiencies in the following areas: (1) "the selection of the schizophrenic sample tested, (2) the failure to properly match the reference group or groups against which the performance of the schizophrenic subjects is compared, and (3) the failure to demonstrate that those differences observed were the results of hypothesized deficit and not due to some uncontrolled ancillary variable" (p. 586). Houck (1971) felt that the performance of the patients had been compared to inappropriate reference groups; when schizophrenics were compared to carefully matched groups, Houck found no evidence of perceptual deficit. (p. 586)

On the other side of the argument, there are those who defend the theory of perceptual changes (Hoffer & Osmond, 1966) and distortions (Buss, 1966) and their use as diagnostic tools (Lewis & Piotrowski, 1954). McGhie and Chapman (1961), in their theory of schizophrenia, claimed that perception is the cause of the schizophrenic's "psychological and interpersonal pathology rather than a consequence" (p.111). In the development of schizophrenia, perceptual changes precede other symptoms; according to Ornitz (1969), these changes involve basic sensory information (e.g., sound intensity, colour, light, and depth perception) and "more than one sensory modality is involved

and...subsequent hallucinatory and delusional phenomena are rooted in the preceding sensory changes" (Ornitz, 1969, p. 260). In other words, Ornitz's theory stated that "the delusion is derived from and preceded by the perceptual distortion" (Ornitz, 1969, p. 261). It is not possible to review all the studies related to perceptual dysfunction in schizophrenia. At best, it is necessary to alert the reader to the inconsistency of findings, the fact that various theories are based on these findings and the reasons for the inconsistency of these psychological and clinical studies.

The variability of the schizophrenic's performance in experimental tasks has been recognised so often that it is a well accepted aspect of research with these individuals. Excessive variability is found not only from one experimental investigation to another but within the performance of individual schizophrenics and within groups of schizophrenics. (Holzman, 1970, p. 218; Taylor, Rosenthal, & Snyder, 1963, p. 73) Taylor et al. (1963) have outlined three means of coping with this experimental problem of excessive variability: (1) statistically, (2) "variance control by experimental design," and (3) "systematically attempt to increase, decrease, or control variability of performance through experimental manipulation of factors which are thought to contribute to variability, or which attempt to determine environmental, instructional, or personality factors which are correlated with variability of performance" (pp. 163-164). In the study conducted by Taylor et al. (1963) there was an effort to deal with the problem of variability by allowing the schizophrenic subjects to vary their own behaviour but only in a controlled

procedure. The results were interesting in that the schizophrenic group exhibited significantly less variability of performance than the control group. (Taylor et al., 1963, p. 168) Another attempt to explain variability was discussed by Jackson (1960), and he directed the researcher's attention to the task of reviewing and carefully "defining meaningful dimensions of schizophrenia" (e.g., acute versus chronic and good premorbid adjustment versus poor premorbid adjustment) (p. 239). Shakow (1962) reported "coefficients of variation for groups of schizophrenics to be consistently three times that of normals in psychological studies" (p. 2).

It is difficult for two independent researchers to report similar results with such a high degree of variability between groups, within groups and within the performance of an individual. This excessive variability along with the methodological problems of diagnosis, matched groups, drugs, and small groups (Holzman, 1970 pp. 218-219) sheds some light on the problems of experimental research with schizophrenics involved in perceptual tasks and the inconsistent findings.

Subjective and Descriptive Accounts of the Altered Perception of Space in Schizophrenia

The subjective experiences of schizophrenic patients (Freedman, 1974; Meares, 1973; Sechehaye, 1951) and their physicians' accounts of the symptoms (Arieti, 1974; Chapman, 1966a; Weckowicz, 1957) provide insight into a perceptually

altered world. Reported changes in the perception of depth and visual perspective frequently state that objects and people appear flat and distant, making the world seem two-dimensional and artificial (e.g., Coate, 1964; Czernik & Steinmeyer, 1976; Davidson, 1912; Hayward & Taylor, 1956; Heveroch, 1913; Sechehaye, 1951; Von der Mühlen, 1975). Heveroch (1913) provided the following description of the schizophrenic experience: "People and objects diminished in size and receded from me into an infinite and boundless distance. I looked about me with horror; the world receded everywhere...Objects appeared to be faraway and flat. If I spoke to anyone, the person in question looked to me like a cut-out picture without relief" (pp. 430-431). Schizophrenics complain that depth cues are missing and there is a noticeable lack of perspective. (Von der Mühlen, 1975) One patient expressed his difficulty in perceiving and grasping the third dimension in this way: "I forced myself to grasp space, the whole, the structure of the material, though I recognized that all my strivings were useless; I had the feeling of total loss of perspective....When I went to work in the morning, the street became endlessly wide, the human beings went without aim or purpose, without direction, then everything seemed to stand still, without movement, rigid, became narrower and narrower, I lost the feeling for distance and nearness, one time it seems faraway, unending, then everything was again really close, but I couldn't tell the distance" (translated from Von der Mühlen, 1975, p. 59). Another patient mentioned by Von der Mühlen (1975) remembered that "while at rest I heard noises, the ladder became

flat, as flat as a ruler, without extension, length and breadth were outlined. I did not recognize my siblings; they became smaller and smaller, transformed like a crawling animal then suddenly gigantic....It seems as if reality has dissolved itself" (translated from Von der Mühlen, 1975, p. 59). A twenty-nine year old female schizophrenic claimed that "sometimes I'm sure there is no world because space is missing, it is as if everything were a plane, a flat wall without movement" (Von der Mühlen, 1975, p. 63).

Von der Mühlen (1975) listed his conclusions after interviewing acute schizophrenics and one of these is directly related to a characteristic of their artwork. There is "increasing difficulty with outlining geometric patterns" and "putting things in geometric order (i.e., no it's not a square but a triangle" (translated from Von der Mühlen, 1975, p. 67). This account is directly related to the emphasis placed on geometric designs as described by Billig (1973a,b). It seems reasonable that if a person is having difficulty with a particular aspect of perception, he may very well concentrate on and emphasize this in his artwork. This may provide an example of the relationship between perception and art.

Freedman (1974) reviewed several autobiographical accounts of visual alterations and cognitive experiences of schizophrenic patients. One patient claimed "that his sense of sight had become linked to his other senses in a new way. He reported that if people or objects were off to one side, or out of sight, they seemed not to exist, and he could not

hear them or smell them. They seemed real only when they were in his direct line of vision" (p.334). This descriptive data collected by Freedman provided information from some well known sources and some new insights into the subjective world of the schizophrenic; it included both the cognitive and perceptual aspects of their altered experiences.

Sechehaye's (1951) young schizophrenic patient, Renee. found familiar objects and people difficult to recognise from the age of five. At seventeen, she reported that space appeared endless, vast and extremely bright with light. Familiar things seemed unreal, like theatre sets scattered about, resembling meaningless geometric cubes. Renee's subjective descriptions involve many perceptual distortions, in addition to a loss of meaningfulness. (Sechehaye, 1951, p. 33) The interpretation offered by Sechehaye was fascinating and provided details about the process of ego disintegration and the effect on space perception. "When...particular areas of the ego have been drained of energy, objects no longer appear in inter-individual relationships. The spaces separating and arranging them on different planes are eliminated. This is why each object appears as a whole in itself, cut away, detached, larger than life, and why space seems limitless, without depth or control, without the successive planes lending a third dimension"[1] (Sechehaye, 1951, p. 95). Renee as well

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[1]The reader is directed to Sechehaye's interpretation for a comprehensive description of the stages of ego disintegration and the perceptual changes which accompany this illness.

as Perceval (1961) claimed that their difficulty with drawing was the result of their lack of ability to perceive spatial relationships in their world.

These accounts of a varied perceptual world should assist the reader in understanding what it must be like to experience this illness[1] and why the schizophrenic may be anxious and wish to escape space by withdrawing to the corner of a room or a similar small space. (Arieti, 1974, p. 249) It is important to make an attempt to understand these perceptual experiences if an attempt is to be made to understand the individual and his behaviour.

Space Perception in Schizophrenia

> "Der Unsichere erlebt die Welt näher und somit aufdringlicher." [The uncertain one experiences the world closer and therefore more forcefully.] (Matussek, 1963, cited in Von der Mühlen, 1975, p. 58)

Gibson (1950) defended the theory that an emphasis on space perception is basic to the question of all perception. He stated the problem in these terms: "The physical environment has three dimensions; it is projected by light on a sensitive surface of two dimensions; it is perceived nevertheless in three dimensions. How can the lost third-

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[1]The reader is referred to Appendix I for a detailed description of what it is like to experience schizophrenia.

dimension be restored in perception? This is the problem of how we perceive space" (Gibson, 1950, p. 2).

The Western culture usually refers to perceptual or conceptual space. Perceptual space is defined by Welwood as "the space 'out there' that we can see, and to a lesser extent feel in a tactile way with our bodies. Perceptual space, is characterised by three-dimensionality, juxtapositions, form and distances, and directionality (forward, back, up, down, left, right, under, around, and so on)" (Welwood, 1977, p. 97). On the other hand, conceptual space refers to "a postulated abstract continuum, defined primarily by mathematics and physics, that accounts for the locations and relations of physical objects....Since mathematics and physics have established the basic perceptual model for the world that modern Western man accepts as real, their definition of space has become dominant. Since perceptual and conceptual space can be objectively defined and measured, they are generally thought to comprise all that space 'really is'" (Welwood, 1977, pp. 97-98). Numerous definitions and terms, such as "psychological space" and "lived space" (Welwood, 1977) have been discussed in relation to the types of space experienced by man. However, most would agree with Hall's (1966)[1] statement: "Man's feeling about being properly oriented in space runs deep.

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[1]Hall consulted the Oxford Dictionary (pocket edition) and listed all the terms related to space. He discovered nearly 5000 terms that could be classified as referring to space, 20 percent of the words listed in the entire dictionary. (Hall, 1966, p. 93)

Such knowledge is ultimately linked to survival and sanity. To be disoriented in space is to be psychotic" (p. 150). A disturbance in the perception of space is reflected in the phenomenon referred to as perceptual constancy.

Perceptual Constancy and Schizophrenia

Constancy of perception infers "the ability to perceive an object...from more than one point of view" (Weckowicz & Sommer, 1960, p. 34). One of the fundamental "mechanisms of adjustment" to the external world is constancy of perception. It makes it possible for the individual to perceive objects as stable in the environment instead of continuously changing stimulation. (Weckowicz, 1957, p. 475) "It maintains the perceived environment within wide limits constant, thus it is a homeostatic mechanism of great importance for the biologic adaptation of the organism" (Weckowicz, 1957, p. 475). Brunswik (1944)[1], as cited in Raush (1952), revealed that the phenomenal perception of a person or thing is represented neither by the object itself or by the retinal stimulus, but rather falls between the proximal stimulus values ("values represented on the retina") and the distal stimulus ("the values as determined by objective processes of measurement") (p. 176). The phenomenal perception of an object, then, is represented

[1]Thouless (1932, 1933) preceded Brunswik (1944) with descriptions of individual and racial differences in "phenomenal regression."

neither by the "real" object nor by the retinal stimulus, but is usually a compromise between the two (Raush, 1952, p. 176) In perception, the individual's orientation is in the direction of the "real" object, and "it is only when other cues are greatly reduced, or when the subject assumes a highly sophisticated experimental attitude that a phenomenal percept can approach the stimulus value-the size of the retinal image" (Weckowicz, 1957, p. 475). In constancy of perception experiments, such as the ones included in this research, it is not the "phenomenal" or "apparent" size of the object, but the "judged size" which is our concern, "the physical size of a comparison object judged to be equal to the standard" (Weckowicz, 1957, p. 475). The assumption is that the "phenomenal size" of the object will directly influence the "judged size" (Weckowicz, 1957, p. 475).

Constancy of perception refers to both size constancy and distance constancy. The relationship between distance and the perceived size in visual space in "normal" individuals has been investigated by Brunswik (1944), Gibson (1950), Gilinsky (1951, 1955), Holway and Boring (1941), Ittelson (1951), and several others. These authors concluded that size constancy and distance constancy share a close relationship. Size constancy relies on an ability to consider the distance of the perceived object. "A retinal image of the same size can be produced either by a small object at a near distance or a large object at a far distance, so there is a reciprocity between the perceived distance and perceived size. They are two aspects of the same phenomenon. Moreover, the ability to perceive the size of

an object as constant at different distances depends on the ability to perceive in the terms of the three-dimensional Euclidian space, where the units of distance remain constant and where there is no foreshortening of space with increased distance" (Weckowicz, Sommer, & Hall, 1958, pp. 1174-1175). The perceptual tasks related to these two constancies are recognised as representing the process of depth perception. (Johannsen et al., 1964, p. 561)

The present research is directed toward understanding the perception of space in schizophrenics, and, therefore, these measures were selected as appropriate methodo-logical tools. The perception of size and distance by schizophrenic patients has received an enormous amount of attention in the literature, usually reporting the results of perceptual tasks related to the constancy phenomenon. These authors have described, discussed (e.g., Arieti, 1974; Crookes, 1957; Ittelson & Kutash, 1961; Vernon, 1970), and reviewed (e.g., Jackson 1960; Kantor & Herron, 1965; Snyder, 1961; Venables, 1964) research dealing with schizophrenics and the constancy phenomenon. For this reason, an additional detailed review is not felt to be necessary; I will attempt to be as brief as possible.

Size Constancy

According to Weckowicz, Sommer, and Hall (1958), "size constancy denotes the ability to perceive the size of an object stable within wide limits in spite of the change

of the size of the retinal image with the distance from which the object is seen" (p. 1174). The viewer then perceives a person or object as the same size in spite of the distance from the viewer. A car 10 feet away is perceived as approximately the same size as the same car seen at a distance of 100 feet, even though the retinal image is much larger for the closer object. A familiar object is recognised as being a standard size, regardless of its distance from the viewer, if perceptual size constancy has not deteriorated. So, size constancy may be understood as the tendency to have phenomenal regression to the "real" size of an object without any consideration of its distance from the individual. Size estimation, on the other hand, involves the comparison of an object (the size of which is variable) with a standard, either visible or imagined. The size constancy as well as the size estimation research related to schizophrenics will be reviewed, but the primary focus of the review will be on size constancy because the present experimental procedure includes a size constancy task.

Raush (1952) is credited with the first experiment investigating size constancy of paranoid, nonparanoid schizophrenics, and a control group of normals. He did not define the group as chronic, but statements indicated that the patients were essentially chronic. A disk of light situated at a distance of 20 feet in front of the subject acted as the standard stimulus; the subject controlled a disk of light placed on a table 4 feet away from the sub-

ject. The experimental trials took place under cueless conditions (no lights in the room) and cue conditions (lights on in the room). Raush (1952) formulated the following hypotheses: (1) Paranoid schizophrenics will have higher constancy scores than normals (confirmed). (2) Nonparanoid schizophrenics will have lower constancy scores than normals (not confirmed). (3) The group scores will show greater similarity when there is an increase in the number of cues (confirmed, but only significant for the paranoid-control groups). (Raush, 1952, pp. 184-185) The results revealed that the schizophrenic and control groups showed overconstancy[1] under both the cue and cueless conditions. The only significant differences existed between the paranoid and nonparanoid schizophrenics, and the controls and paranoid schizophrenics in the cueless condition; the paranoid subjects revealed higher constancy than any of the other groups. Raush (1952) interpreted these "as indicative of a process of compensation. One method of compensating for threats to the stability of the individual's ego-structure may be the projection of an artificial stability into the environment" (Raush, 1952, p. 185). This study, then, looked at the relationship between perceptual constancy and the structure of the ego.

The above study reflects a defensive theory of schizophrenic perception. If a schizophrenic finds it difficult to cope with his environment, he withdraws and defends

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[1]The example used by Raush (1952): "if a chair ten feet away looked considerably larger than a chair two feet away" (p. 178).

himself from external stimulation. It was this theory that led Bruner (1951) to predict that a withdrawal from object relations would result in a lower size constancy in schizophrenia. (p. 142) Raush's experimental investigation found the reverse to be true; the schizophrenics had a higher degree of constancy, an attempt to structure their world through projecting stability. A comprehensive theory of defense may provide an explanation for any deviation from normal constancy, whether it is lower or higher; higher constancy indicates that the self is being defended by projecting stability onto the external world and lowered constancy could be explained as withdrawal from reality. (Ittelson & Kutash, 1961, p. 40)

Lovinger (1956) criticised the findings of Raush (1952) and Sanders and Pacht (1952) and claimed that the lack of reduction in size constancy for schizophrenics could be explained by the fact that the subjects were in good contact with reality to ensure successful experimental interaction. A size constancy experiment was devised to determine whether schizophrenics in poor contact with reality (defined by ratings and whether or not the patient was in an open or closed ward) are also perceptually in poor contact with reality. Lovinger (1956) hypothesized that if minimal distance cues were maintained experimentally, then poor contact schizophrenics would show less perceptual size constancy than normals or good contact schizophrenics. (p. 87) All subjects participated in three cue conditions, maximal (complete lighting), minimal (reduced lighting), and no cue con-

dition (complete darkness). The results were that "under experimental conditions involving minimal distance cues schizophrenics in poor contact manifested less size constancy than either schizophrenics in good contact or normals" (Lovinger, 1956, p. 90). In the maximal and no cue condition treatments, no differences were found between the means of the groups. Even schizophrenics in poor contact may notice peripheral cues when all the lights in a room are turned on; and in complete darkness, schizophrenics and normals both have the disadvantage of no cues. The mean of the poor contact schizophrenics was significantly lower than the normal or good contact schizophrenics under the minimal cue condition. (Lovinger, 1956) So, the hypothesis was supported. in the minimal cue experimental condition, poor contact schizophrenics will show less size constancy than good contact schizophrenics or normal individuals.

Further analysis of the data revealed no significant difference between the constancy scores of the paranoid and nonparanoid schizophrenics under any of the cue conditions. (pp. 89-90) These findings are in contrast to Raush (1952). "Raush felt that his nonparanoid group could be described as being more regressed and in poorer contact with reality than the paranoids. Thus, perhaps Raush's findings may have been more a function of contact with reality rather than of the diagnostic subgroups" (Lovinger, 1956, pp. 89-90). The results of Lovinger's investigation suggested that the schizophrenic's loss of contact with reality involves not only complex psychological functions but basic processes of perception as well.

Weckowicz (1957) selected a sample of 32 chronic schizophrenics (11 women and 21 men), with a mean hospital stay of 7 years and 9 months, 32 nonschizophrenic[1] patients (18 women and 14 men), and 32 normal controls (10 women and 22 men); he asked them to adjust a nearby rod to match the standard rod situated at a distance of 7.5 or 15.0 meters from the subject. This experiment was to test the following hypothesis: "Chronic schizophrenics with some personality deterioration and thought process disorder show diminished size constancy of perception when compared with normal controls and non-schizophrenic [sic] mental patients" (Weckowicz, 1957, p. 477). The results of this study supported this hypothesis; the schizophrenics involved showed a "diminished size constancy of perception" when compared to normals and nonschizophrenic patients. (Weckowicz, 1957, p. 483) The hypothesis stated that impaired size constancy occurs in schizophreincs, and that the retinal image is more of a factor in determining the judgment of size than it is for normals and nonschizophrenics. To confirm this hypothesis, the following statements should be verified: (1) "The schizophrenics underestimate the sizes in comparison with the other groups," and (2) "they do so to a greater extent at the longer distance (15m), than at the shorter distance (7.5m)" (Weckowicz, 1957, p. 479). An analysis

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[1]The nonschizophrenic subjects included patients suffering from one of the following mental disorders: depression, mania, anxiety state, alcoholism, character neurosis, hysteria, psychopathic personality, or drug addiction. (Weckowicz, 1957, p. 478)

of the data revealed a difference in the predicted direction. Schizophrenic subjects tended to underestimate the size of the standard rod more frequently at the 15m distance than at the 7.5m distance. Normal subjects, on the other hand, tended to overestimate the size of the standard rod more frequently at the 15m distance than at the 7.5m distance. (Weckowicz, 1957, p. 481) Also, the schizophrenics performed with a greater degree of variability than normals and nonschizophrenics. This is consistent with the tendency of these patients "to show great variability of performance on psychological tests" (Weckowicz, 1957, p. 485). It should be noted that Weckowicz recognised the problems related to prolonged hospitalization and the difficult task of procuring matched samples for the chronic schizophrenic subjects. In this experiment the length of hospitalization for the schizophrenic and nonschizophrenic groups was not a controlled factor and, thus, it is not possible to isolate it from the disorder. The findings are generalised and describe all schizophrenics.

Hozier (1959) studied the perception of spatial relationships in schizophrenics as it relates to the body concept. A group of 25 female schizophrenics and 25 control subjects were asked to participate in the Figure Placement task, the Doll task, and the Draw-A-Person task. It was found that schizophrenics have significant difficulty perceiving space and organizing the body with respect to space.

(Hozier, 1959, p. 192) The problems of spatial perception and organization were especially evident from the results of the Figure Placement Test. (Hozier, 1959, p. 193) The experimental materials used led to conclusions which were in direct conflict with the findings of Weckowicz (1957). Hozier (1959) found that the schizophrenics overestimate the size of objects perceived at a distance and underestimate distance; however, Weckowicz (1957) found that schizophrenics tended to underestimate the size of objects and overestimate distance. According to Hozier (1959) these results agree "with the prediction that the schizophrenics tend to fuse with the world, i.e., that they are unable to maintain sufficient distance between themselves and the world" (p. 193). It was also noted that with different experimental materials or tasks, it is possible that Weckowicz's results would be confirmed.

In a later study, Weckowicz and Blewett (1959) investigated the correlation between concept formation and size constancy in schizophrenia. They believed that if paranoid schizophrenics with some thought disorder had an unaffected size constancy (Raush, 1952), then schizophrenics with poor size constancy may be thought disordered. Their subjects were 40 chronic schizophrenics, and the results revealed a positive correlation between an impaired abstract thinking ability and poor size constancy. "The impairment of abstract thinking would affect...the formation of self-

concept" (Weckowicz & Sommer, 1960, p. 37). Perhaps the most significant aspect of this research lies in the interpretation of the results. Weckowicz and Blewett (1959) interpreted the findings as indicating that the lack of ability to "attend selectively" or "to select relevant information" is a determining factor of poor size constancy and thought disorder. (p. 933) The role of attention and its affect on perception will be discussed in more detail elsewhere.

Contradictory findings were published by Leibowitz and Pishkin (1961). Using a maximal cue condition (complete lighting), they found no significant difference in size perception between psychiatric aides and chronic schizophrenics. The schizophrenic subjects were very withdrawn, not in contact with reality, but size constancy was completely maintained. Lovinger (1956) would question the possible influence of distance cues existing in a fully lighted room and offer this as an explanation for the inconsistent findings.

Ittelson and Kutash (1961) edited a book which reported various research projects related to perceptual changes accompanying psychopathology. Perez contributed a study of size constancy in schizophrenics and normals. It is a complex investigation with several hypotheses; one aspect investigates the interaction between the size constancy judgments of schizophrenics and the type of instructions used in the experiment. The conclusion stated that schizo-

phrenics show a higher degree of constancy than non-schizophrenics, "regardless of the type of instructions used or the content of the standard stimulus" (p. 54). The primary importance of this study is its attempt to evaluate the experimental procedure and its relationship to the schizophrenic's performance, a methodological contribution.

Size constancy was not the focus of a study by Cleveland (1962), but the interpretation of data offered relevant information. Cleveland (1962) found "that a basic perceptual shift of some kind underlies the difference in schizophrenic and nonpsychotic size judgments" (p. 282). In other words, schizophrenics generally tended to overestimate the size of objects, irrespective of the object, and the hospital controls underestimated the size of the object. It was also evident "that this perceptual shift is more pronounced when judgment is made of personal, intimate objects such as body parts, than when judgments involve a neutral, external object....size overestimation in the schizophrenic groups is a selective phenomenon not entirely explained by the concept of size constancy. The failure of schizophrenics to exaggerate significantly the size of a baseball does not fit smoothly the constancy hypothesis. Nor does size constancy explain why nonpsychotics underestimate hand size, for example, while overestimating head size" (Cleveland, 1962, p. 283).

Previous studies have investigated the meaningfulness of the stimuli and perceptual constancy. Harris (1957) and Raush (1956), for example, claimed that schizophrenics tend to overestimate the size of objects with uncommon symbolic value. However, Cleveland's interpretation of his findings are more specifically related to the present research. He approached the results from the standpoint of body-image boundaries and the loss of these boundaries that occurs in schizophrenia. The distortions and disintegration of the boundary between self and the outer world has been described by Billig (1970), as well as others (e.g., Bleuler, 1950), as one of the fundamental explanations for some of the behaviour characteristics of the schizophrenic. If a diffusion of the body-image boundaries occurs in a schizophrenic regression, then it is possible that the patient will not be able to make the distinction between himself and the outer world; the entire world then becomes one with him, and he knows no physical limits. (Cleveland, 1962, p. 283) It is reasonable to assume that with boundaries weakened and rendered indefinite, the schizophrenic's images of his body expand. Asked to judge the size of various parts of his body or of the total height of his body, he consistently exaggerates. One schizophrenic was asked to estimate the size of his stomach and responded by saying, "I don't know exactly, but it's miles and miles"

(Cleveland, 1962, p. 283). Cleveland (1962) does not claim that all overestimations of size can be explained by the loss of body-image boundaries. Different reasons may be found for other groups of people.

In a pilot study, for example, Cleveland selected psychologists and graduate students to estimate the size of heads using photographs. The group overestimated the size of the heads to the same degree as the schizophrenics; the importance of the head in an academic environment might explain this finding. (Cleveland, 1962, p. 284) Cleveland (1962) concluded that nonpsychotic subjects usually underestimate the size of the parts of the body, whether using photographs of body parts or adjusting rods in a completely dark room. Objects unrelated to the body (neutral), such as a baseball, are judged more accurately. "The estimates of schizophrenics exceed both the estimates of body size made by controls and their own actual body size when judging pictures of body parts or adjusting luminous rods. Estimates made by schizophrenics do not exceed those by controls for the actual size in estimation of a baseball. Schizophrenics are also much less precise than controls in making size judgments of body parts" (Cleveland, 1962, pp. 284-285). These results are discussed in relation to a loss of body boundary and a "ballooning of body image" (p. 285).

An experiment designed to reassess size constancy in psychotic and nonpsychotic individuals (Hamilton, 1963)

replicated the findings of Weckowicz (1957); chronic schizophrenics demonstrated decreased size constancy. Objects (standards) were located 1 meter from the subject and the variable located 3 meters from the subject (controlled by the experimenter). Judgments were carried out under two conditions, a cueless condition (a tunnel with no light) where there was a reduction of peripheral distance cues and a cue condition (complete light). If chronic schizophrenics experience a reduced size constancy as a result of an inability to perceive peripheral cues (due to limited attention), then their perceptual skills should not differ significantly from normal individuals when the latter are tested under a condition with restricted distance cues. The following groups were represented in the study: (1) 20 chronic non-paranoid schizophrenics, (2) 10 chronic paranoid schizophrenics, (3) 4 manic-depressive psychotics, (4) 10 neurotics, and (5) a control group of normal indivduals. Hamilton (1963) formulated the following hypotheses:

(1) Chronic non-paranoid [sic] schizophrenics have reduced size constancy for a variety of objects compared with normal and non-psychotic [sic] subjects.

(2) Size constancy of chronic non-paranoid schizophrenics does not differ significantly from the size constancy of paranoid schizophrenics and of other psychotics.

(3) Normal subjects and non-psychotic patients do not differ significantly in size constancy.

(4) Size constancy of a combined psychotic sample of patients is significantly reduced compared

with the size constancy of a combined normal and non-psychotic group of subjects.

(5) Non-paranoid schizophrenics and psychotics generally show reduced responsiveness to perceptual cues in a situation requiring constancy in the perception of size. (p. 27)

Hypotheses (1), (2), (3), and (4) were supported by the experimental data. "Previous evidence that chronic and acute non-paranoid [sic] schizophrenic men show an impairment in the fundamental perceptual process of assessment of size over distance (i.e., Lovinger, 1956;...Weckowicz, 1957) has thus been supported" (Hamilton, 1963, p. 35). The performance of the neurotics, normals and manic-depressive psychotics revealed no significant differences. However, under cue conditions the psychotic subjects showed a significant tendency to underconstancy when compared to the normals and neurotics, whose constancy scores tended to approach perfect values for constancy. When distance cues were eliminated (cueless condition), the findings verified previous studies in which the absence of distance and peripheral cues produced a tendency toward "considerable error" even in normal subjects. "The greater reliance on retinal cues in these conditions is reflected in predominantly high over-constancy [sic] values" (Hamilton, 1963, p. 30). In the cueless condition two objects out of seven employed, a penny and a packet of cigarettes (both familiar objects to all), provided the expected significant difference between the normals and psychotics in constancy scores. The other objects were shapes and stimuli less familiar in terms of

fixed size. It is of interest to note, also, that Hamilton (1963) confirmed the findings of Thouless (1932) of a negative correlation between size constancy and intelligence. This suggests that published results do not appear to be influenced by the difficulty in matching the intelligence of schizophrenic and other groups.

Johannsen has investigated the effects of institutionalization and chronicity on schizophrenic perception (Johannsen, Friedman, & Liccione, 1964; Johannsen & O'Connell, 1965). In the 1964 study, the purpose was to look at the effects of chronicity on perception. The graphic illustration of the data suggests "a gradual degeneration of performance with restitutional efforts taking place during the last stage of chronicity. It is difficult to suggest a reason for this phenomenon" (Johannsen et al., 1964, p. 568). The data supported the presence of "widespread perceptual deficit in schizophrenia, but one which might become apparent only after long duration. The pattern of deficit differs from task to task" (Johannsen et al., 1964, p. 569). Significantly poor performance, then, only occurred with the extremely chronic group, "although the pattern of decrement was clearly linear up to that point" (p. 569). There is no available information related to the relationship between depth perception, distance constancy, and size constancy, "but a functional connection appears logical since the same visual cues are operative in all three areas" (Johannsen, 1964, p. 568). The findings are compared with previous constancy research and the authors claimed that the results of this study are consistent with

the earlier studies of Raush (1952) and Lovinger (1956); no perceptual deficit was found in acute and early chronic schizophrenics.

Kopfstein and Neale (1971) investigated size estimation in 120 male acute and chronic schizophrenics as well as a group of nonschizophrenic psychiatric patients; it was found that no significant difference existed between the groups in the size estimation. When the subjects were subdivided in terms of premorbid adjustment and paranoid classification, the results were the same. All of the subjects who participated in the experiment increased their estimation of size over the three trials. (p. 434) In the chronic group, the thematic content of the stimuli caused a significant effect, with the overestimation of nonthreatening scenes when the estimation was compared to the threatening scenes. (Kopfstein & Neale, 1971, p. 435) reviewed some frequent problems related to size estimation research, and they explained the inconsistency of findings as a result of these methodological problems. (p. 435)

The focus of the more recent research related to size constancy or size estimation seems to have turned to interpersonal relationships and the ego development of the schizophrenic child; these studies will be discussed in the following pages in connection with body-image disturbances. In light of this, it does seem appropriate to review the perceptual constancy theories and the possible relationship between perception and ego disintegration, as reflected in the spatial structures in paintings.

Distance Constancy

Distance constancy for the purpose of this discussion will be defined as "the mechanism responsible for the ability to make estimations approximating physical distance units independent of the viewing distance" (Weckowicz & Hall, 1960, p. 272). Constancy in these terms refers to "'seeing' the object simultaneously from several distances" (Weckowicz & Sommer, 1960, p. 34). Individuals showing poor distance constancy will report "estimations greater than physical distance units and the lengths of these estimations will increase with the viewing distance, according to the visual angle" (Weckowicz & Hall, 1960, p. 272). In normals, it has been experimentally shown that perception is neither completely determined by visual angle constancy nor by distance constancy, but by both, although the principles of distance constancy are probably more influential. (Weckowicz, Sommer, & Hall, 1958, p. 1175)

Weckowicz, Sommer, and Hall (1958) designed a distance judgment experiment to be conducted out-of-doors. The two experimental groups, 20 schizophrenics and 17 normal controls, were asked to judge successive intervals of 1 yard using a mobile marker. Weckowicz et al. (1958) stated that there is a correlation between size constancy and distance constancy. Schizophrenics have shown poorer size constancy than nonschizophrenics. Therefore, the following statements

should seem reasonable: (1) "They have poorer distance constancy than nonschizophrenics," and (2) "those schizophrenic patients who have poor size constancy should also have poor distance constancy" (Weckowicz, et al., 1958, p. 1176). The results indicated that distance constancy is poorer in schizophrenics than nonschizophrenics and that there is a significant correlation between poor distance judgment and poor size constancy in schizophrenics. The size-distance correlation did not come as a surprise to Weckowicz, "since distance can be considered as size in the horizontal plane" (Weckowicz & Hall, 1960, p.272). Hamilton (1963), who questioned his subjects at the end of his size constancy experiment about distance, criticised Weckowicz et al. (1958) because he discovered nonsignificant correlations between size constancy measurements and distance judgments performed on the same apparatus. They are in agreement, however, that nonparanoid schizophrenics underestimate distance and that paranoid patients overestimate distance. Weckowicz, et al. (1958) admitted that the difference between the schizophrenic and nonschizophrenic groups might be due to the number of years that the schizophrenic patients had been hospitalized and a "lack of practice in making judgments of distance" (p. 1180).

To further test their previous results, Weckowicz and Hall (1960) applied more rigorous experimental controls and techniques to a new experiment. They felt it necessary to confirm the fact that poor distance constancy could be

attributed to the schizophrenic illness alone and not the result of hospitalization and other possible effects of mental illness. A new sample was selected; the subjects included 20 chronic patients[1] (9 women and 11 men). These subjects had a mean hospital stay of 10 years (SD = 7.3), no indication of mental deficiency or organic brain disease, and no insulin shock treatment. The mean length of stay in the hospital for the nonschizophrenic subjects[2] (9 women and 10 men) was 6 months (SD = 1.5). One of the primary concerns of the investigators, at this point, was to verify the fact that poor distance constancy was a perceptual disorder specifically associated with the schizophrenic illness.

In the previous experiment by Weckowicz, Sommer, and Hall (1958), the results had indicated that there was only a significant difference between schizophrenics and normals in the 1-yard judgments after the distance from the subject was more than 10 yards. Therefore, in this experiment, Weckowicz and Hall (1960) decided to use 11 yards as the closest distance to the subject and 20 yards as the final distance to be judged. The subject was requested to stop a cart when it reached a distance of 1 yard from a peg. The distance judgments were significantly different for the schizophrenic and nonschizophrenic patients. "These results

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[1]Most of the chronic schizophrenic patients visited the grounds of the hospital on a frequent basis.

[2]The nonschizophrenic group consisted of individuals suffering from one of the following mental disorders: depression, manic-depressive psychosis, epilepsy, psychopathic personality, alcoholism, immature personality, or hypochondriacal reaction. (Weckowicz & Hall, 1960, pp. 272-273)

show that in schizophrenic patients judgments of one yard intervals in depth are determined to a greater extent by the visual angles than the same judgment in non-schizophrenic [sic] patients" (Weckowicz & Hall, 1960, p. 274). The conclusion would be that distance constancy in schizophrenic patients is poorer than in nonschizophrenic patients.

However, Weckowicz and Hall (1960) considered a further modification of the experiment. Reaction time of schizophrenic patients is slow and it might be possible that the revealed difference between the 1-yard estimations in both groups was the result of a delay in reaction time on the part of the schizophrenics, and the cart travels further from the peg due to a slower response. So, yet another experiment was designed to test this possibility. The experimental technique was modified in such a way that the cart was pulled toward the red peg, as opposed to away from it. If reaction time is a contaminating variable, pulling the cart in the opposite direction should influence the data in the opposite direction. The results revealed that "the change in the direction of movement of the cart did not make the slightest difference as far as the performance of both groups in relation to each other was concerned" (Weckowicz & Hall, 1960, p. 274). This experiment, then, produced the same results as the previous distance constancy study (Weckowicz, Sommer, & Hall, 1958); distance constancy is poorer in schizophrenics than in normals. In addition, the following may be stated: "The results are to a great extent

reproducible even when the technique is changed, with the cart being pulled away from the red peg instead of being pulled towards the red peg" (Weckowicz & Hall, 1960, p. 275). A reasonable assumption, then, is that "with a possible exception of some patients with organic damage to the brain, poor distance constancy is quite specific for schizophrenic illness" (Weckowicz & Hall, 1960, p. 275). Also, this statement is in agreement with the 1957 study by Weckowicz; the study revealed that size constancy is poorer in schizophrenic patients than in nonschizophrenic patients and normal controls. It can thus be said that the chronic schizophrenic's perceptual field lacks depth or the third dimension; his world is flatter than the world of the nonschizophrenic individual. Weckowicz and Hall (1960) discussed the implications and possible related mechanisms responsible for the impairment of depth perception in the schizophrenic patient. The work of Weckowicz is reviewed in more detail than most of the studies mentioned because it is directly related to the present research, and the apparatus used by Weckowicz provided a model for the apparatus used in the size and distance constancy segment of the present experiment.

Nelson and Caldwell (1962) designed an experiment which differed from earlier distance constancy tests. It required the positioning of a target to approach the same distance as a target in a fixed position; apparently this is an easier task than doubling or halving standard distances

(Weckowicz, Sommer, & Hall, 1958) or judging distance by indicating the number of feet in a measurement (Hamilton, 1963). This experimental procedure gave no indication of a lack of depth perception in acute schizophrenics. A tendency did exist for the acute schizophrenic to be more accurate than the normals when the stimulus was a post, a possible indication of overconstancy in these acute patients.

The lack of ability to make accurate judgments about physical properties regarded as fundamental measures, such as space, mass, and time is recognized as an indication of mental disease. Clinical observations of the schizophrenic refer to disorientation and loss of contact with reality. It is possible, whether a psychological or physiological explanation is offered, that when constancy of perception deteriorates or breaks down for the schizophrenic, the result is confusion, feelings of instability and bizarreness of his surroundings, especially at the onset of the illness. (Bruner, 1951) For numerous years, clinicians have utilized evidence of disturbances in spatial perception as an indication of the loss of reality contact, using questions such as, "Where are you?" Yet, according to Hozier (1959), "the intimate relationship between confusion about oneself, the loss or disturbance of one's orientation in space, and the breakdown of the sense of reality has received, with few exceptions, little exploration" (p. 185). This statement is

particularly true in the last decade, either because the constancy research appears to have provided data for both versions of the disturbance versus no disturbance controversy or because the problems surrounding methodology are too great to present accurate evidence of perceptual performance. Some authors have explained the inconsistency of findings as the result of methodological problems. This inconsistency is reflected, for example, in the contradictory data presented by Weckowicz (1957) and Leibowitz and Pishkin (1961); Weckowicz found deficiencies in size constancy in schizophrenics, and Leibowitz and Pishkin (1961) found that chronic schizophrenics were not significantly different from psychiatric aides in their perception of size. For this reason, it is not possible to discuss the findings of the constancy research without some evaluation of the methodology employed. The methodological problems discussed by previous researchers and the contradictory data may explain the recent lack of publications related to distance constancy and schizophrenia.

Body Image and Space Perception

The development of the ego has been described as "an evolution from an undifferentiated state to one of increased differentiation and definition. The process implies a progression towards self-realization, self-actualization, that is, the attainment of a personal identity or 'self' as the

ultimate goals of man's strivings and highest level of personal existence" (Cavallo & Robbins, 1980, p. 113). Disturbances of the ego, the self-concept, and the body image have always been considered the core of the psychopathology of schizophrenia. (Weckowicz & Sommer, 1960, p. 17) The boundaries between the person and his surroundings become vague and the persons's body parts may feel as though they do not belong to him, or that he is part of other people or, even, the entire universe. There is for the schizophrenic, a diffusion of the self and his environment.[1]

Empirical Examples of the Deterioration of the Self-Boundaries

Horowitz (1963) described a man who painted beyond the boundaries of his paper on to his trousers with the wooden end of his paint brush. (p. 236) Art therapists have mentioned patients who use very vigorous brush strokes but never exceed the boundaries of the paper while painting. My interpretation of this behaviour is that perhaps the paper replaced lost self-boundaries, and the brush strokes

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[1]For a more comprehensive description of the ego and its boundaries, the reader is referred to Federn (1952). Sechehaye (1951) provided a glimpse of the disintegration and reconstruction of a schizophrenic's ego (p. 123), as well as examples of a lack of ego boundaries (pp. 112, 119).

reflected the chaos within the individual. Other illustrations were mentioned by Fink, Levick, and Goldman (1973). One patient, for example, reflected the loss of ego boundary when he failed to contain his work within the painting canvas but instead smeared paint on tables and furniture, "as if they were part of the art material" (p. 107). Painting behaviour such as this provides the art therapist with documented details of the schizophrenic's condition and opens a channel of communication between the psychotherapist and art therapist.

The Bodily Self and Disturbances in Spatial Relations and Organisation

From these examples, it is not difficult to see how a loss of ego distinction can result in a disturbed body image, sometimes reflected in paintings as a skeleton figure (e.g., Reitman, 1947, p. 416). Hozier (1959) designed a study to test the schizophrenic's perception of spatial relationships and how it is specifically related to "the problem of the bodily self" (p. 186). The assumption of the study which led to the hypothesis was as follows: "The psychological model of reality is the experience of one's bodily self as differentiated, bounded, and separated from everything that is not the self" (Hozier, 1959, p. 186). From this assumption, Hozier (1959) hypothesized the following:

> The loss of the sense of reality in the schizophrenic individual involves a breakdown in the bodily self as a consequence of insufficient cathexis of the body. This does not mean that the schizophrenic individual does not have affective cathexis available to him. He does, but he is not using it in cathecting his body. As long as the body is not sufficiently cathected to become bounded and differentiated from everything that is not the body, there exists no frame of reference from which to judge the reality of one's own psychological experiences. Consequently, as long as the self/nonself differentiation does not exist, all types of problems involved in the separation of self from nonself will be in some way affected, and among these problems is the problem of spatial relations and organization. (p. 186)

A stable sense of reality established by the boundary between the self and the outer world is directly related to the establishment of spatial relationships. If a loss of cathexis did not occur, a "breakdown of the bodily self" would not occur; if there were "no breakdown of the bodily self," disturbances in spatial organisation and relations would not occur. (Hozier, 1959, p. 193)

The study by Hozier (1959) involved 25 hospitalized schizophrenic women and 25 nonhospitalized women. Three tasks (Figure Placement, Doll, and Draw-A-Person), all of which involved active participation with spatial relations and organisation, were presented to the subjects. If disturbances occurrd in the Doll and Draw-A-Person tests, the author presumed that it reflected "the spatial problem of

dealing with the body" (Hozier, 1959, p. 194). A disturbance in the Figure Placement task indicated "the spatial problem of dealing with the relationship of the body to the world" (Hozier, 1959, p. 194). The results revealed that there was a significant difference in the errors between the schizophrenic and control groups on both the Draw-A-Person and Doll tests; and Hozier (1959) believed that this indicated that schizophrenics experience a noticeable difficulty in the perception of the body and the organisation of it in terms of space. (p. 192) The performance of the schizophrenics on the Doll and Draw-A-Person tests revealed that they misplaced and omitted essential body parts and distorted size. (Hozier, 1959, p. 192) These spatial perception disturbances in relation to the body and the outer world are interpreted by Hozier (1959) as a symptom of the "breakdown of the bodily self," the result of "a diminution of narcissistic cathexis of the body" (p. 194).

Evidence of Body-Image Disturbances in Schizophrenic Patients

Body-image disturbance in 30 schizophrenic, 28 neurotic, and 25 normal women was investigated by Fisher and Seidner (1963). The hospitalized patients "tended to have experienced sensations of diminished body size more frequently than the normal subjects" (p. 256). It is noted that these results and their implications contradicted pre-

vious findings which claimed that schizophrenics overestimate the size of the parts of their body when requested to provide formal estimations of body size in an unstructured situation, where few cues were available for estimating their accuracy (e.g., Burton & Adkins, 1961; Cleveland, Fisher, Reitman, & Rothaus, 1962). (Fisher & Seidner, 1963, p. 256)

The question asked by the researchers was, "Why should a sense of diminished size be found in one context and its apparent opposite in the other?" (Fisher & Seidner, 1963, p. 256) Fisher and Seidner (1963) admitted that they could not provide an answer. With Epstein (1955) as a basis for their speculation, they presented the following possibility: "a subjective feeling of body smallness might motivate an individual to make compensatorily large body size judgments in a situation which encouraged uncritical and even wishful response. Thus, in terms of subjective experience a schizophrenic might indicate concern with feelings of smallness, but his actual judgments of size made in an unstructured setting might be distorted in the direction of exaggerated bigness" (Fisher & Seidner, 1963, p. 256). The reader is reminded that this is only speculation from which future hypotheses may be formulated and tested.

A group of 100 schizophrenics, 100 normals, and 60 psychoneurotics were tested with the Holtzman Inkblot Technique (Shukla, 1972). The schizophrenic groups received scores which were significantly different from the other two

groups. For example, the schizophrenic patients received high Penetration scores which indicated that they "frequently refer to literal insult to Body-Image-Boundary [sic]" (Shukla, 1972, p. 241). There was not, on the other hand, a significant difference in the scores between the normal and psychoneurotic groups; the neurotic patients, then do not differ significantly from normal subjects in "their perception of body-image-boundary (Penetration of Body Boundary)" (Shukla, 1972, p. 241).

This approach to understanding body image is not new (e.g., Holtzman, Thorpe, Swartz, and Herron, 1961). Fisher and Cleveland (1958) studied personality and body image using Penetration inkblots to interpret the dimensions of the body boundary. They claimed that the relationship between ego and body image is a close one. The authors mentioned the fact that several other writers have described the schizophrenic's break with reality as primarily the result of the overwhelming difficulty in distinquishing the boundary of his ego. Cleveland (1960) found that Penetration scores decreased as the patient improved, and schizophrenic patients who were ready to be discharged from the hospital showed a significant decrease in Penetration scores. Shukla (1972) mentioned that Pankow (1961) "observed that art productions of schizophrenic patients were characterized by disrupted boundaries" (cited in Shukla, 1972, p. 242). Holtzman et al. (1961) reported that when chronic schizophrenics were compared to individuals with no psychiatric history, they had significantly higher Penetration scores. So, it is refreshing to note that the evi-

dence appears consistent; schizophrenic patients have higher Penetration scores in comparison to normal and psychoneurotic subjects. The indication of these findings is that schizophrenic patients "perceive their Body-Image-Boundary [sic] as diffuse and fragile" (Shukla, 1971, p. 242).

In another study, Hamersma and Papson (1973) investigated size estimation as reflected in perceived body size. They related body-height perception to the theory of maternal dominance developed by Lidz; the Lidz theory focused on the role of the dominant mother during the development of the schizophrenic male. The Hamersma and Papson (1973) study included 20 normal and 20 chronic undifferentiated schizophrenic males (mean age=48 years) and used transparencies to compare perceptions of a maternal figure and self-perceptions. The findings support Lidz's theory; the schizophrenic subjects underestimated their own body size and overestimated the size of a maternal figure more often than the group of normal subjects. Also, when Hamersma and Papson (1973) projected transparencies of a maternal figure and the subjects own figure simultaneously, the schizophrenic subjects underestimated their own perceived body-height more often than the group of normal subjects. Although the findings of the Hamersma and Papson (1973) study are not directly related to the present research, the study does suggest that there is a relationship between perception and the development of the schizophrenic's ego.

More recently, Spear and Hymowitz (1982) examined

the object relations of schizophrenic patients using multiple levels of ego states. The article addressed the contributions of psychological testing in the evaluation of the schizophrenic patient's object relations and discussed the findings in relationship to the treatment of these patients. The conclusion of Spear and Hymowitz (1982) is consistent with the efforts of the present research, an attempt to diagnose the condition of a schizophrenic's ego with respect to levels. Spear and Hymowitz (1982) concluded that the initial psychological evaluation of a schizophrenic patient "ought to include a determination of the level and range of the schizophrenic's ego states, which may then lead to the development of differential treatment strategies" (p. 33). This conclusion reiterates the primary reason for investigating the levels of ego disintegration as depicted in the spatial structures in paintings (i.e., the work of Otto Billig, 1970). It is suggested that Spear and Hymowitz (1982) would support the use of a spatial structure rating scale; the present research (initiated in 1972) was designed for the purpose of developing a spatial structure rating scale to be used as a nonverbal diagnostic tool.

Also in 1982, Grand published an article in which he concluded that the basis of the cognitive impairment in schizophrenia is "a profound disturbance in the articulation of the body ego" (p. 327). He considered the development of the schizophrenic's disorder and the role played by early body experiences. The body-image disturbance is the result of "an early failure to adequately integrate the multiple

sensory inputs for the experiences that form the basis for orientation and focus in reality" (p. 342).

The Relationship Between Perceptual Constancy, Body Image, Self-Concept, and Self-Boundary

Weckowicz and Sommer (1960) evaluated the close relationship between the self-concept and body image. Self-concept is connected to the problem of identity, continuity, individuality, and the perception of yourself as being independent from the environment. (Weckowicz & Sommer, 1960, p. 17) There is sufficient clinical data to support the fact that the self-concept of a schizophrenic is disturbed. Delusions of the disintegration of the body, delusions related to changing the individual's sex, and feelings of depersonalisation are not uncommon in this mental disorder. However, Weckowicz and Sommer (1960) emphasised that "disorders of selfhood" are even more important than these delusions and feelings of depersonalisation. (p. 18)

According to Weckowicz and Sommer (1960), some of the perceptual changes related to the body may be due to "a breakdown of perceptual constancy in schizophrenia" (p. 20). Impaired constancy of perception would explain the schizophrenic's belief that his arms or legs changed in size or that fingers became smaller or larger. It is not difficult to understand how these perceptual alterations result in feelings of estrangement from a person's own body. The schizophrenic who describes the world around him as moving

when he turns his head or the faces of the people around him changing in size, "may be expressing a view of the world perceived literally, i.e., without the operation of the various constancies of size, color, shape, etc." (p. 20) These researchers, then, approached the self and ego disturbances in schizophrenia from a different perspective, as opposed to Freud or Federn; they considered these disturbances the result of impairment in perceptual functioning. (Weckowicz & Sommer, 1960, p. 20)

Their paper (Weckowicz & Sommer, 1960) reported seven experimental procedures, using mirrors and various questions and tasks related to the body, designed to test for disturbances in body image and self-concept. All the experiments indicated that both self-concept and body image are altered in schizophrenia. In the body image procedures it was found that when the subjects estimated the size of their distal body parts, the schizophrenics perceived theirs as smaller than did the normal controls and nonschizophrenic subjects. (Weckowicz & Sommer, 1960, p. 31) One explanation for this, using Federn's (1952) theories for example, would be that schizophrenic individuals experience "a narrowing of the self-boundary with the distal parts of the body being less ego-involved, less cathected, and, therefore, less valued" (p. 31). There are other theories mentioned as possible explanations, but Weckowicz and Sommer (1960) offer what they believe to be a more valuable theory.

The authors (Weckowicz & Sommer, 1960) claimed that the distortions of body image in schizophrenics is attributed "to a breakdown of size constancy and distortions in perception of space" (p. 31). Earlier studies of Weckowicz and his colleagues, as previously mentioned, have shown that size constancy and distance constancy are poorer in schizophrenics than nonschizophrenics. Objects are viewed more in terms of their visual angle because distance is not given the same consideration as it is with other individuals. (p. 31) Therefore, distal parts of the individuals's body are perceived smaller in relation to the parts near the eyes" (Weckowicz & Sommer, 1960, p. 31). Impairment of size constancy, then, may directly affect how an individual perceives his body.

Weckowicz and Sommer (1960) speculated about the possibilities pertaining to the relationship between perceived space and perceived body (body image), <u>if</u> the size constancy theory were acccepted. They reviewed various approaches to space perception, including the most common theory of association between proprioceptive and visual sensations, Piaget's developmental theory of "spatial co-ordinates," the Gestalt-oriented theory of Werner and Wapner (1952), and neurological investigations; Weckowicz and Sommer (1960) concluded that all of these theories indicated that the perception of space and the perceived body (body image) are closely associated. (pp. 32-33)

Alterations and disorders of body image are well documented in the literature; some clinicians have described disturbances which are directly related to poor perceptual constancy and altered space perception. Bleuler (1950) was cited in Weckowicz and Sommer (1960) and provided an excellent example of this distortion of body image in schizophrenia.

> The hallucination of bodily sensations present such kaleidoscopic multiplicity that no description could possibly do justice to them....The patients are beaten and burnt, they are pierced by red-hot needles, daggers or spears; their arms are being wrenched out; their heads are being bent backwards; their legs are being made smaller; their eyes are being pulled out so that in the mirror it looks like they are entirely out of their sockets; their heads are being squeezed together; their bodies have become like accordions being pulled out and then again pressed together. (Underlining mine.) (p. 33)

Weckowicz and Sommer (1960) claimed that these alterations of the perceived body described above are the same ones they would expect to find in an individual with poor size and shape constancy; the body parts changing in shape and size with various angles and distances of viewing. (p. 33) "One can postulate a close relationship between constancy of perception, the perceived body and perceived space" (Weckowicz & Sommer, 1960, p. 33).

Turning to a discussion of self-concept, Weckowicz

and Sommer (1960) reported that when schizophrenic patients described themselves or referred to areas of their body, they gave fewer self references as compared to the control groups. The indication of this finding is that the self-concept of the schizophrenic "is more limited" (p. 33). "Their bodies are less ego-involved. Self is poorly delineated and less structured" (Weckowicz & Sommer, 1960, p. 33). The authors looked at the theories surrounding the development of the self as a "social process" (p. 33). In addition to the process of socialization, internalization of specific social values, or the process of identification, there should also be the process whereby the individual emerges "as a self-conscious independent entity in the matrix of social relations" (Weckowicz & Sommer, 1960, p. 33). To be a "self-conscious independent entity" is accomplished by having "the ability to see oneself...through the eyes of other people" (Weckowicz & Sommer, 1960, p. 34). Piaget described thought and language in young children as being egocentric. The ability to perceive another person's viewpoint gradually develops. Following this line of thought, Weckowicz and Sommer (1960) proposed that "the emergence of self may depend on the development of a stable body image and, therefore, on more general cognitive processes, like constancy of perception and the ability to form concepts. The ability to interact in a social situation may depend in the first place on the ability to perceive oneself and others as stable phenomena, having certain continuity in time" (p. 34). Perceptual constancy implies the ability to

see an object in space from more than one viewpoint. The real essence of the constancy phenomena is "the awareness of more than one aspect of an object, more than one point of view from which it can be observed....It may also be the essence of the ability to perceive oneself from outside as a separate object or entity" (Weckowicz & Sommer, 1960, p. 34). Perhaps, according to Weckowicz and Sommer (1960), "the perception of stable objects related to each other in space" and the "perception of one's body as a stable object, and perception of other people" are related to the same fundamental mechanisms. (p. 34) Role-playing, role-taking and other facets of social relationships could be described as "an abstraction of relationships between perceived human bodies, as geometry is an abstraction of relationships between physical bodies. The roots of the physical and social spaces may be the same" (Weckowicz & Sommer, 1960, p. 34). In the earliest and most basic social relationships, the primary participant is the body of the individual; a good example is the mother and infant relationship. (Weckowicz & Sommer, 1960, p. 34)

The boundary is an important part of the self. This aspect of the self was investigated by Fisher and Cleveland (1958); they maintained that the degree to which the self-boundary was defined was dependent upon the relationships established with early social objects. If social relations were well defined and well structured, then the self-boundary will also be well structured and well defined. A

social relationship which is well structured is a relationship in which the roles are clearly indicated as well as the reciprocal and complementary nature of the relationship. (Weckowicz & Sommer, 1960, pp. 34-35) "There is a distinct and clear 'interface' between the two reciprocal roles. It allows the individual to 'see' himself from the vantage point of the other without losing his identity" (Weckowicz & Sommer, 1960, p. 35). This perspective is referred to as role-taking by sociologists; role-playing, on the other hand, describes the ability of an individual to fill specific social roles (e.g., a student). In the case of social roles, the role of others and the individual's role are not muddled but kept clearly defined. "A stable body image, which is clearly defined and separated from a stable outside world, is very important in bringing about well-defined social relationships and social roles ....it is also important in bringing about a well-defined and clearly delineated self" (Underlining mine.) (Weckowicz & Sommer, 1960, p. 35).

To bring all this together in terms of constancy of perception, Weckowicz and Sommer (1960) described the relationship in this way: Constancy of perception is poor in the schizophrenic individual. Objects are not stable and are not well defined. This perceptual difficulty also applies to the schizophrenic's own body image as well as his image of others. Their relationships and social roles are inadequately defined; the reciprocal and complementary nature of roles is ambiguous. As a result, the schizophrenic becomes

confused in role-playing and role-taking; the self is not well defined. The self-boundary becomes loose and may disintegrate entirely. "The individual while looking at himself through another's eyes in the process of role-taking may lose his identity. He may literally identify himself with the other" (Weckowicz & Sommer, 1960, p. 35). This confusion about identity may involve a physical aspect of self, thinking that someone else has your feet, or an emotional aspect, feeling that you no longer control your body or thoughts (i.e., they are controlled by alien forces). It may also explain "autoscopy;" the schizophrenic "has an hallucination of another person and recognizes this person as himself" (Weckowicz & Sommer, 1960, p. 35). Weckowicz and Sommer (1960) claimed, then, that the disturbances in the body image (perceived body) and the concept of self can be understood as "a disturbance of perceptual constancy occurring in the subject's phenomenological space, which includes both the perceived physical space and the perceived social space" (p. 35). With this approach, it was felt that it would not be necessary to use the concepts of "projection and introjection" (Weckowicz & Sommer, 1960, p. 35).

Weckowicz and Sommer (1960) concluded their discussion with a look at the relationship of self-concept and body image to the perception of the outer world. They described the schizophrenic's perceptual process as "a vicious circle" (p. 36). Schizophrenic perception, according to Weckowicz and Blewett (1959) and Crookes (1957), does not have the same degree of meaning and is literal as compared

to the perceptions of normal individuals. "Poor constancy of perception leads to the lack of stability of the perceived objects and of the subject's own perceived body. The objects are lacking in meaning or their meaning is distorted. This is aggravated by the fact that the body image to which the percepts of objects are referred is poorly differentiated. The distortion of object perception affects the perception of the subject's own body, and the distorted perception of the subject's own body distorts further the perception of objects. (Weckowicz & Sommer, 1960, p. 36) It is possible that this is related to abstract thinking, specifically the impairment of it as discussed by Eickhoff (1952). This would be consistent with the findings of Weckowicz and Blewett (1959); they claimed that there is a positive relationship between abstract thinking and size constancy in schizophrenic subjects. "The impairment of abstract thinking would affect in its turn the formation of self-concept" (Weckowicz & Sommer, 1960, p. 37).

Therefore, Weckowicz and Sommer (1960) formulated a very interesting hypothesis which correlated the perception of the body and self-concept to the perception of space and constancy of perception. They indicated that the knowledge and perception of the world, of self, and of the body are closely related; they all influence each other and they are all altered in schizophrenia. (Weckowicz & Sommer, 1960, p. 37) The work of these researchers is directly related to the present research, which looks at the possible relationship between spatial structures in paintings, perceptual constancy, and the schizophrenic's ego boundary condition.

A reasonable statement to make from the above literature and other reviewed sources (e.g., Altman, 1975) is that disturbed people, in this case schizophrenics, have a self-boundary system which is different from most individuals. Their willingness to be touched or approached is different. (Altman, 1975, p. 69) Altman (1975) wrote that abnormality, of any kind, is accompanied by either "(1) greater interpersonal distance from others or (2) greater variability in distance kept from others" (p. 71). The author preferred to think that abnormality in personality is perhaps "associated with greater distortion in personal spacing than with the unidirectional 'greater distance' notion....those with social-emotional problems probably have personal-boundary processes that are different from those of nondeviant groups" (Altman, 1975, p. 71). An inkblot test was used to investigate body boundaries (Frede, Gautney, & Baxter, 1968), and individuals with a distinct knowledge of their body boundary were more willing to experience closer contact with people than the individuals with an unclear sense of their body boundary.

Altman (1975) stated that individuals suffering from emotional disorders and/or "distorted boundary processes," as well as anxious or threatened individuals, "maintain greater distances from others" (p. 73). In spite of the fact that he believed that this relationship had been "reasonably confirmed," Altman (1975) recognised the need for

further research relating personality correlates to the use of personal space. (p. 73) There is, in addition, "sufficient empirical evidence to suggest that personality characteristics are reflected in how people regulate their personal-space boundaries" (Altman, 1975, p. 74). Furthermore, "if personality...contains the idea of desired or ideal levels of contact with others, then personal space can be viewed as a mechanism that acts in the service of the central governing process" (Altman, 1975, p. 74). Personal space variations, then, would contribute to our knowledge of personality processes. (Altman, 1975, p. 74)

Experimental Studies of Personal Space

Early studies of personal space revealed some related findings. Horowitz, Duff, and Stratton (1964) designed four experiments to explore personal space. In experiment I, on frontal approach distances, they compared 19 schizophrenic patients with 19 enlisted military men with similar cultural backgrounds and ages. The subjects were asked to approach an object (a hat rack) and a person. The results indicated that both groups moved significantly closer to the object than to the person. A greater variability of response was noted in the schizophrenic group, and this group had a mean distance which was significantly greater than the group of military men. However, when the data regarding the approach to a person was analysed, there

was no significant difference in approach distance between the two groups. (Horowitz et al., 1964, p. 652) Experiment II, on multidirectional approach distances, was designed to discover if the "personal space around the body circumference" would be different for two groups of women "with a known difference in their relationships with people" (Horowitz et al., 1964, p. 652). For this purpose, 10 schizophrenic females and 10 volunteer female workers from a medical centre were chosen to be subjects. During the experiment, they were asked to approach three individual objects: (1) a hat rack, (2) a male, and (3) a female. Each object was approached from eight different directions on three different days. A graph was used to plot the eight distances around a figure representing the body of the subject. A line, then, connected these points and surrounded the figure; this area around the subject was referred to as the body-buffer zone. (Horowitz et al., 1964, p. 653) Three buffer zones were drawn for each subject; the figures represented were (1) an inanimate object (hat rack), (2) an animate object (a male), and (3) another animate object (female). A mean buffer zone for all three days was constructed for each object, for both groups. A significantly greater ($p<.01$) buffer zone represented the responses of the schizophrenic group than the volunteer workers group. (Horowitz et al., 1964, p. 654) Experiment III, on approaches to male and female, followed a similar method of approach. This particular experiment did not include schizophrenic subjects and, for that reason, will not be reviewed. However, in Experiment IV, on self-rating of per-

sonal space, 25 schizophrenic and 25 nonschizophrenic military men were provided with material and asked "to draw a line around the figures which showed the distance they liked to keep between themselves and others in ordinary conversations or approaches" (Horowitz et al., 1964, p. 655). Horowitz et al. (1964) wanted to determine whether the previous methods of establishing a body-buffer zone would be similar to self-ratings drawn by the subjects. The findings revealed that the area around the figure indicated on the paper was significantly greater for the schizophrenic group. (Horowitz et al., 1964, p. 655)

Horowitz et al. (1964) discussed the implications of their findings and mentioned that Bender (1952) and Schilder (1950) considered "an internal concept of the spatial organization of the world to be part of the body image" (cited in Horowitz et al., 1964, p. 655). If the body-buffer zone were to be considered "a separate facet" of this body image, "the body-image constellation would be regarded as comprising not only an internalized projection of the body's boundary and position but also a sensitized projection of the immediate area around the body" (Horowitz et al., 1964, p. 655). Thus, Horowitz et al. (1964) regarded the boundary established by the body-buffer zone as part of the individual's body image and as significant as the boundary established by the individual's physical body. "The 'body-buffer-zone' idea suggests that one's concept of self can extend into nonmaterial space as well" (Horowitz et al., 1964, p. 655). This concept is supported, according to the

authors, by linguistics. The common phrases, "to keep at arms length," "get off my back," "he gets under my skin," and "he is beside himself" reflect feelings about personal space and the body.

Horowitz et al. (1964) experimentally explored personal space and discovered that schizophrenic individuals with recognised avoidance and withdrawal problems in interpersonal relationships, tended to maintain greater distances from objects and people, regardless of the direction of approach; they have a greater body-buffer zone than nonschizophrenics. These observations led to the formulation of the following hypothesis: "Each human being has, as part of his body-image constellation, an internal projection of the space immediately around him" (Horowitz et al., 1964, p. 656). "This space is designated the 'body-buffer zone' and the 'penetrability,' shape and size of this zone is probably related to immediate interpersonal events, current ego and drive states, and the individual's psychologic and cultural history" (Horowitz et al., 1964, p. 656).

In another study, Horowitz (1968) investigated psychopathology and spatial behaviour. Mental patients, recently admitted to the hospital, were asked to approach another person until they felt uncomfortable. He repeated this procedure every three weeks until the patient left the hospital. Initially, the schizophrenic patients required more distance than other psychotic groups. However, when the patients were clinically improved, the distance decreased and the self versus other boundary processes gradually resembled that of nonpatients. Schizophrenics are

afraid of being hurt and, consequently, maintain the most extreme type of withdrawal from others. These individuals not only keep greater distances from others but at times are too close. (Sommer, 1959) Sommer, in another publication (1969), claimed that this was especially true in the decoy studies; in these studies, female and male schizophrenics sat very close to a strange or slightly familiar male decoy. "This behavior on the part of the schizophrenic violates the personal space of others who become offended by his excessive closeness" (Sommer, 1969, p. 70). The author speculated about this behaviour and indicated that this may reflect "the schizophrenic's lack of a stable self-image and clear self-boundaries. A person unsure of who he is may not be clear as to where he ends and the next person begins" (Sommer, 1969, p. 70). The relationship between personal space and ego boundaries was expressed by Sommer (1969); "the invasion of personal space is an intrusion into a person's self-boundaries" (p. 27).

Satoshi Fukui (1983) designed a study to investigate the characteristics of personal space; the study included 62 psychiatric patients (12 neurotics, 9 depressives, and 41 schizophrenics). In spite of the methodological problem, represented by the wide variation in the size of the groups, the results did identify four major types of personal space: "wandering", "person-following", "voluntary bedridden" and "free-communicating". The results indicated that 83% of the neurotics handled their personal space as "free-communicating" people, while 66.6% of the depressed subjects volun-

tarily remained bedridden. Satoshi Fukui (1983) found schizophrenics in all four types of personal space behaviour. The findings suggested that several schizophrenics feared closeness with other individuals and found it impossible to discover a secure space; therefore, they tended to wander all over the hospital ward. "The type of personal space was correlated to the individuality of the defense mechanisms against the closeness complex and was highly related to Ss' sex, age, premorbid character, and interpersonal relationships" (English Abstract, Satoshi Fukui, 1983). The most important point for the reader to remember is the schizophrenic's fear of closeness.

It is very tempting to elaborate on the spatial behaviour of schizophrenics because it is related to this research and a fascinating subject. However, this review must also recognise its boundaries and merely direct the interested reader to authors such as Hall (1966), Horowitz (1968), and Sommer (1969), and the literature related to proxemics, environmental psychology, and spatial behaviour.

The Condition of the Schizophrenic's Ego Boundary and His Perception of Space

After reviewing the above studies which discussed the body boundary and the spatial behaviour of schizophrenics, an analogy seemed like an obvious cognitive extension to this relationship. When referring to personal space, the word boundary is applied (e.g., Sommer, 1959), just as in ego boundaries; both boundaries are theoretical constructs to assist in the understanding of the ego and the individual's spatial orientation. There is an apparent process which is initiated by a disturbance of ego boundaries, then a disturbance of body image or self, which results in disturbance of perceptual constancies and, consequently, in a disturbance of space perception. (Weckowicz & Sommer, 1960) Is there, then, a correlation between the condition of the schizophrenic's ego boundary and the schizophrenic's perception of space and, consequently, his interpretation of space, his personal space boundary?

It seemed necessary to inquire further into this question in an empirical sense. The result was the primary hypothesis for the present study: If there is such a process connecting ego disturbances with a disturbance of space perception, then the schizophrenic with the most disturbed ego, the acute schizophrenic, will have <u>low</u> constancy scores, because perceptual constancy is directly related to accurate space perception, and <u>high</u> scores on a rating scale designed to measure the spatial structures outlined by Billig. The schizophrenic's artwork should reflect the

state of his ego boundaries as well as his perceptual interpretation of space.

Attention and the Role It Plays in Perception for the Schizophrenic

Disturbed attention or a pathology of attention[1] has been emphasised by several authors as an explanation for the perceptual disturbances in schizophrenia. These disturbances may be caused by (1) a failure to attend selectively to environmental stimuli (McGhie & Chapman, 1961; McGhie, Chapman, & Lawson 1964), (2) an inability to maintain a major set for a response to a specific stimulus when completing stimuli are present in the individual or his environment (Shakow, 1962), or (3) an inability in the individual to shift his attention from one source of sensory input to another source (Mettler, 1955). However, Chapman (1966b) offered a comprehensive study of the early symptoms of schizophrenia and Ornitz and Ritvo (1968) discussed the behaviour of young schizophrenic patients; this information suggests that environmental stimuli overwhelm the schizophrenic and that "the inability to direct attention or maintain sets against distracting or irrelevant stimuli could be a concomitant rather than an explanation of the basic pathology" (Ornitz, 1969, p. 269).

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[1]For a comprehensive inquiry into the pathology of attention, the reader is referred to McGhie (1969).

Cameron (1938, 1939, 1944) as one of the first investigators to conclude that the earliest symptoms recognised in schizophrenic patients are related to a primary disturbance in inhibitory and selective functions of attention. The concept of "over-inclusion," [sic] formulated by Cameron, described the patient's tendency to accept several elements which are irrelevant to the primary thought in the schizophrenic's thinking. The following conclusions were reached by Shakow (1962) upon the completion of his own psychological investigations into this illness. "It is as if in the scanning process which takes place before the response to stimulus is made, the schizophrenic is unable to select out the material relevant for optimal response. He apparently cannot free himself from the irrelevant among the numerous possibilities available for choice" (Shakow, 1962, p. 17). These conclusions are consistent with the perceptual constancy studies of Weckowicz and Blewett (1959), and their suggestion that the schizophrenic's primary difficulty is an inability to select relevant information from the perceptual environment. Venables and his colleagues (1959, 1962, 1963) conducted studies on the schizophrenic patient's arousal level and, in addition, concluded that the behavioural abnormalities witnessed were the result of "variations in the range of attention" (McGhie, Chapman, & Lawson, 1965, p. 383). Cameron's concept of over-inclusive thinking in schizophrenics was further developed by Payne and his colleagues (1960, 1961, 1963), and they formulated the hypothesis that this type of thought disorder is the result of "a defect in some hypothetical central filter mechanism, the

function of which is to screen out irrelevant data both internal...and external...to allow for the most efficient processing of incoming information" (cited in McGhie et al., 1965, p. 383).

Chapman (1966b) described the dysfunction in the filtering process in the following way: "At one moment the patient's consciousness may be flooded with an excess of sensory data" and, then, "within a brief space of time, the same patient may find himself almost completely cut off from sensory experience" (p. 227). Weckowicz and Blewett (1959) illustrated that there is a correlation between size constancy, concept formation, and the ability to perceive embedded figures. They formulated the hypothesis that in schizophrenia the cognitive process, and consequently perception, is less selective, less analytical, and more global than in the normal person. The explanation for this was that schizophrenic patients are incapable of turning off information which is unrelated to the present task. To apply this to perception, schizophrenics are incapable of excluding all parts of the visual field except that part which requires concentration. Schizophrenics with an inability to select and concentrate on relevant data are referred to as field-dependent[1]. Schizophrenic perception and field-dependence will be discussed in more detail under the heading: Field-Dependence and the Perceptual Performance of Schizophrenics and Alcoholics (p. 186).

The findings of the McGhie and Chapman (1961) study

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[1]For a more detailed description of this concept, the reader is referred to Witkin, Lewis, Hertzman, Machover, Meissner, and Wapner (1954).

confirm the correlation between size constancy and abstract thinking in early schizophrenics and suggest that perceptual and cognitive disturbances are secondary disorders and that the primary disturbance is "in the control of the direction of attention....It would seem to us in fact that all other apparently irrational features of schizophrenic behaviour also represent attempts made by the patient to cope with, and rationalize, his changing experience. Many of the apparently bizarre and meaningless activities of schizophrenic patients become more rational if we consider their function in aiding the patient to find a new level of adaptation" (McGhie & Chapman, 1961, p. 113).

Symptomatology related to the onset of schizophrenia is documented in detail by McGhie and Chapman (1961) and Chapman (1966b). Both publications mention the symptoms which indicate that the schizophrenic's consciousness is flooded by sensory data, and, thus, any attempt at perceptual discrimination is abandoned. The term "flooding" seems most appropriate and is mentioned repeatedly in the perceptual dysfunction literature. Patients in the Chapman (1966b) study complained of "taking in too much of my surroundings," or "I can't shut things out of my mind" (Chapman, 1966b, p. 240). The patient's awareness is bombarded by extraneous and unrelated stimuli. Sensory intake is either flooding the patient's consciousness or the patient experiences a break with any sensory experience; in other words, there is either too much or too little stimulation for efficient processing. It is interesting to note that Chapman's patients indicated that these perceptual

disturbances occurred prior to the onset of any noticeable illness, and alterations in the quality of sensory data preceded the more complex abnormality of visual perception. Withdrawal, a common behavioural component of schizophrenia, was explained by Chapman (1966b) as a reaction to this incoming stimuli, an attempt to avoid overstimulation. (p. 248)

In a follow-up study, Chapman and McGhie (1962) designed a battery of tests to assess what effect distracting stimuli would have on attentive behaviour. The experimental groups included were 20 schizophrenic patients, 20 nonschizophrenic patients, and 20 normal controls. As a group, the schizophrenics' scores significantly differentiate them from the other two groups. However, "there was a wide scatter in the individual performance of the schizophrenic patients. Some of the schizophrenic patients returned scores on the tests which were at least as high as that of the lowest scoring subjects in the nonschizophrenic patient group" (Chapman & McGhie, 1962, p. 499). Consistency of performance in the schizophrenic group was most obvious when the subject did not have to contend with a distracting stimulus. If "the task was confined to one sensory channel and was not subject to external distraction, the schizophrenic patients performed at a relatively adequate level....It was only when his attention was required to be selective, particularly when the selectivity involved information in competing sensory channels, that he showed the characteristic deterioration in performance....auditory

input appeared predominant in disrupting attention" (Chapman & McGhie, 1962, pp. 497-498). The most noticeable failure on the part of the schizophrenic was his inability to eliminate the irrelevant external stimuli from the task at hand. (Chapman & McGhie, 1962, p. 498) These findings may explain the results of a study conducted by Neale and Cromwell (1969); acute schizophrenics showed "a clear preference for stimuli of low complexity" (p. 246). The researchers discussed their findings and interpreted them as demonstrating "a decreased capacity for information processing among acute schizophrenics" (p. 246). Due to their inefficient processing of information and inability to eliminate irrelevant information, a preference for "low complexity" stimuli is an understandable finding.

Freedman and Chapman (1973) claimed that their findings were inconsistent with the McGhie and Chapman (1961) conclusions. They reported only three patients with the attentional disorder described by McGhie and Chapman (1961) and half of the schizophrenics made no mention of a problem with attention. This is in contrast to an earlier statement that the problem of focusing attention was mentioned more often than any other perceptual or cognitive disorder in the approximately 60 cases of subjective experiences reviewed by Freedman (1974). Freedman and Chapman (1973) did not agree with the theory that the perceptual-cognitive abnormalities in schizophrenia are the result of a dysfunction in the screening process. "The results of the present study suggest that a deficit in focusing attention, while not univer-

sal among schizophrenics, may be important for understanding the pathology of some patients" (Freedman & Chapman, 1973, p. 54). Furthermore, if this deficit is important for only some groups of schizophrenics, then this deficit may assist in establishing meaningful subgroups of this illness. (Freedman & Chapman, 1974, p. 54)

Research related to schizophrenics often receives the criticism that the subject is in no condition to cooperate in a testing procedure, and, therefore, it is unrealistic to expect a schizophrenic to supply responses to a test for any length of time. The implication is that the validity of the findings must be questioned. Support for this criticism comes from Boardman, Goldstone, Reiner, and Fathauer (1962) and their experimental test of spatial judgments with schizophrenics. The authors are not concerned with perceptual constancy but with conceptual disorder. Boardman et al. (1962) indicated, as a result of their findings, that acute schizophrenics show "a reduction in conceptual constancies" while chronic schizophrenics demonstrate "the greatest disruptions in judgment, seemingly due to a temporary conceptual lapse" (p. 276). The spatial judgments of chronic schizophrenics represented "sudden, transitory, spontaneously reversible alterations in the subject's frame of reference or judgment standard during a single presentation of a stimulus series" (Boardman et al., 1962, p. 275). The schizophrenic subject indicated that the concept necessary for judgment in the task becomes lost and the responses become erratic and unpredictable" (Boardman et al., 1962, p. 275). An explanation, then, might include losing

the concept or a sudden and temporary alteration in the schizophrenic's frame of reference. (Boardman et al., 1962, p. 275) However, Chapman and McGhie (1962) tested each subject twice, a 1-hour session on both occasions. They felt it necessary to note that they "found surprisingly little evidence to support this view.[1] Although many of our schizophrenic patients were either markedly withdrawn or disturbed in their behaviour, their co-operation was sustained throughout the two testing sessions" (Chapman & McGhie, 1962, p. 497). The patients seemed to comprehend the standard instructions completely and responded appropriately to the presented task. The authors did recognise that this might be more of a problem with more acute or deteriorated schizophrenics. (Chapman & McGhie, 1962, p. 497)

In a recent article, Gjerde (1983) reviewed numerous studies related to attention and arousal deficits in schizophrenia. He criticised these studies because they reflected two major premises: (1) There is a specific information process deficit in schizophrenics, and (2) there is an acceptance of "cold cognition" as a framework for experimentation. The question set forth by Gjerde (1983) was: Is schizophrenia an information-processing disorder or an arousal disorder?

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[1]The view that the schizophrenic subject is not capable of co-operating during a testing procedure or responding to a test for any length of time.

Gjerde (1983) must be commended for carefully examining the experimental design and attentional processes and the relationship to the subjects, especially schizophrenics. He stated that researchers have neglected to examine the ways in which arousal may disturb cognitive processing.

> The reason for this, it seems, may be the application of a theoretical framework--information processing as a linear sequence of discrete stages or processes--that is strictly nomothetic and that, moreover, is characteristic by the framework of 'cold cognition.' This approach is useful in examining general regularities among essentially normal subjects. When it is applied in the study of groups that are likely to differ in their arousal levels, however, the research conclusions are readily open to question--and to reconceptualization. The integrative review of the literature on attention, arousal, and schizophrenia set forth in this article strongly suggests that the role or arousal must be addressed prior to the postulation of the existence of specific information processing deficits in schizophrenia and that the acceptance of the framework of 'cold cognition' is largely unwarranted. It is possible, therefore, to say that the studies advocating the existence of a specific, structural information processing deficit in schizophrenia are subject to an interpretive error. Most studies reporting an attentional deficit in schizophrenia have not matched schizophrenic subjects and control subjects on arousal. Since the two comparison groups can be presumed to differ in their levels of arousal, it is difficult to ascertain whether the resulting group differences are due to differences in the effects of arousal on performance on attention-demanding tasks or to a specific information processing deficit characteristic of the schizophrenic disorder only. One study that included overaroused controls (Depue, 1974) failed to find evidence for a specific schizophrenic disorder. This finding provides additional support for the conclusion that the differences in information processing between schizophrenic and normal subjects may be mediated by differences in arousal. If Posner's (1981) distinction between arousal as a background variable present at the time information is presented and arousal as a result of processing itself

> is seen in conjunction with the finding of Zahn et al. (1981a, 1981b) that arousal in schizophrenia is determined more by endogenous factors than by external stimuli, we may speculate that it is arousal as a background variable, rather than arousal as a specific response to processing itself, that interferes with processing in schizophrenia. (Gjerde, 1983, pp. 68-69)

Gjerde (1983) proposed that the capacity would be an alternative theoretical framework which would assist in the interpretation of attentional dysfunction in schizophrenia. "Instead of postulating a specific structural deficit restricted to a discrete stage of processing, capacity theory suggests a nonspecific dysfunction that will be manifest in a wide range of tasks involving different cognitive operations" (Gjerde, 1983, p. 59). Citing Kahneman (1973) and Posner and Snyder (1975), Gjerde (1983) noted that many cognitive operations compete for the schizophrenic's "limited" attentional resources. Using the capacity theory as a framework, the schizophrenic's poor performance may be the result of "(a) ... a general absence or diminution of cognitive capacity, (b) ... a failure to mobilize existing attentional resources, or (c) ... the allocation of attentional processes to task-irrelevant activities. Whichever of these is correct--and they may all be correct--poor performance will mainly occur whenever the attentional requirements exceed the available capacity; that is, under conditions of capacity overload" (Gjerde, 1983, p. 59).

For the researcher interested in testing predic-

tions, the capacity theory offers an opportunity to examine the conditions under which schizophrenic subjects will demonstrate poorer performance than nonschizophrenic subjects. "The magnitude of the performance deficit can be expected to correlate positively with the attentional requirements of specific cognitive operations; the greater the attentional requirements, the poorer the performance" (Gjerde, 1983, p. 59). This particular prediction was discussed and empirical findings related to information processing deficits in schizophrenics were examined; the experimental tasks discussed specifically outlined attentional requirements. In particular, Gjerde (1983) stated that "capacity dysfunction can be expected to affect attention-demanding processes such as use of imagery, mnemonics or other elaborative devices, clustering, and rehearsal" (Gjerde, 1983, p. 59). It may be stated that for schizophrenic individuals, "capacity dysfunction should not affect less attention-demanding processes such as recognition, sensitivity to frequency occurrence, coding of spatial information, or activation of word meaning--processes that appear to require none or minimal attention capacity (cf. Hasher & Zacks, 1979)" (Gjerde, 1983, p. 59). Attentional deficits in schizophrenics may then be most obvious when the individual is processing information which requires effort and short-term storage. The reference to the coding of spatial information and recognition are of particular importance for the perceptual components of the present research.

Gjerde (1983) emphasised the importance of recognising "that the demonstrated parallels between schizophrenics and hyperaroused nonschizophrenics in cognitive performance do not imply any definite conclusions about the direction of causality between arousal and cognitive processing" (p. 69). According to Gjerde (1983), the question should be: "Does the arousal disorder create difficulties in processing, or alternatively, does the experience of processing difficulties lead to arousal?" (p. 69). He quickly added that it is possible for both possibilities to occur. Most of the articles reviewed by Gjerde (1983), that described the relationship between cognitive processing and arousal, have "attributed primary causality to arousal" (p. 69). However, "the quality of performance ... may decline either because arousal disrupts cognitive processing in various ways... or because the schizophrenics at high levels of arousal, may shift their resources away from the assigned performance goal to restore a more normal state of arousal" (Gjerde, 1983, p. 69). According to this opinion, schizophrenia would represent different emotional and cognitive coping responses to a disturbed state of arousal. (Cromwell, 1978)

Hyperarousal, then, becomes a real factor in evaluating the cognitive processes in schizophrenia, and it may be caused by "the subjective experience of information overload or, alternatively, from a basic blockage in the processing of information" (Gjerde, 1983, p. 69). McReynolds (1960, 1976) has examined the relationship between schizophrenia, anxiety, and assimilation. McReynolds primarily

addressed the effects of anxiety on performance; it is relevant to mention his work here because both arousal and anxiety may have a negative effect on the quality of performance, not to suggest that the effects are the same. McReynolds focused on his cognitive processing model, generally referred to as assimilation; "anxiety, according to this model, is largely determined by the magnitude of the backlog of unassimilated perceptual data, or in other words, one cause of anxiety is information overload" (Gjerde, 1983, p. 69). In McReynolds' (1960, 1976) definition of assimilation, it was stated that the cause of schizophrenia was primarily a large amount of unassimilated material, and he assigned a primary role to capacity overload. McReynolds believed that anxiety was a consequence of this experience.

Gjerde (1983) supported McReynolds' theory which stated that there is a relationship between anxiety, assimilation, and schizophrenia and believed that "it permits us to conceptualize some of the clinical manifestations of schizophrenia in functional terms" (Gjerde, 1983, p. 69). He described how some symptoms of schizophrenia are thought of "as attempts to reduce or avoid increases in high backlogs of unassimilated material" (Gjerde, 1983, p. 69). Withdrawal, according to this theory, may be described "as a systematic avoidance of input that may be unassimilable, and delusions are viewed as cognitive reorganizations that permit assimilations of otherwise unassimilable material" (Gjerde, 1983, p. 69).

The Gjerde (1983) article is recommended to the reader for two primary reasons: (1) The author offered an excellent review of the past research related to attention and arousal in schizophrenia. (2) The author presented a very convincing argument for the need to evaluate the cause and effect process or the direction of causality related to experimentation (i.e., "Does the arousal disorder create difficulties in processing, or... does the experience of processing difficulties lead to arousal?") (Gjerde, 1983, p. 69). Gjerde recognised that both directions of causality are possible but criticised past research for neglecting to discuss this process and for accepting a more straight forward approach to dysfunction by adopting the belief in the presence of a particular information processing deficit in schizophrenia. This article made it apparent that experimentation within the framework of "cold cognition" should be examined carefully.

Gjerde (1983) represents the theoretical approach of the present research; in other words, the process of experimentation needs to be carefully evaluated in relationship to the specific nature of the people involved in the process, the cause and the effect possibilities carefully examined. Gjerde's (1983) suggestions for future research emphasised the need to directly examine the relationship between attentional capacity dysfunction and arousal in schizophrenia. "It is important that...research efforts include an examination of the direction of causality between arousal and cognitive processing" (Gjerde, 1983, p. 70). With this

approach in mind, future research may decide whether schizophrenia will be diagnosed and treated as an information processing disorder or an arousal disorder.

Variability in Performance

Other researchers in this field (e.g., Venables & Wing, 1962) have indicated that (1) the tendency toward a high level of distractibility demonstrated by schizophrenic patients is limited only to the acute phase of the psychosis, and (2) distractibility is not a factor in the chronic stage of the illness. Rapaport concluded that attention is impaired in acute schizophrenia by anxiety and turmoil.[1] (cited in Meldman, 1970, p. 164) One of the purposes for an investigation by McGhie, Chapman, and Lawson (1965) was to discover if there was any variation in the pathology of attention as the schizophrenic progressed from the acute to the chronic stage of the psychosis. Jackson (1960) described the acute and chronic stages of this illness in terms of anxiety.

> The acute cases resolve some anxieties, some of the time, in ways which are realistic and adjustive-or at least in ways not distressing to people in general. The patient who resolves most anxieties, most of the time, with unrealistic and unadjustive responses becomes a chronic patient. Here, the unrealistic and unadjustive nature of his behavior

[1]For additional information about the relationship between anxiety, perception and schizophrenia, the reader is referred to McReynolds (1960).

> tends to precipitate more and more problem situations in which further anxieties are aroused. The pattern of living becomes a succession of disarticulated, disorganized responses which serve to reduce anxieties, temporarily, without resolving the problems. Disorganized perceptual and cognitive processes become the basis of the predominant response styles. (Jackson, 1960, p. 241)

Altman (1975) stated that numerous studies confirm the fact that "anxiety-prone people place greater distance between themselves and others, that close distances are perceived as more anxiety-provoking, and that stress-producing conditions yield greater distances from others" (p. 72). He was not referring to schizophrenics specifically, but all individuals experiencing this disorder must be in a stressful condition. If the acute schizophrenic experiences greater stress due to several factors (as well as the newness of the condition), then perhaps acute patients would tend to exaggerate distance more than chronic patients. If stress-producing conditions occur throughout the illness, then this additional variable of anxiety[1] may influence the variability of performance on tasks related to space or distance.

The experimental groups in the McGhie, Chapman, and Lawson (1965) study included 36 schizophrenic patients (23 chronic), 20 nonschizophrenic psychotic patients, and 40 volunteer nurses. Chronicity, in this case, was defined as the illness lasting for more than 5 years. Each subject participated in a battery of tests in two 1-hour sessions.

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[1]There is no way of accurately measuring this variable.

The findings supported and contributed to the previous study (Chapman & McGhie, 1962), which found that auditory distraction affected the schizophrenic's ability to attend selectively, thus affecting the performance on such tasks. The test scores revealed that there were "no distinct differences in the distractibility scores between the chronic and the remaining schizophrenic patients. There was a slight tendency for the chronic patient to be more distractible, but the differences between the two groups was by no means marked and in no case statistically significant" (McGhie, Chapman, & Lawson, 1965, p. 386). The additional information established by this study was that the schizophrenic's ability to attend selectively to "visual information is affected by auditory distraction, but not by distraction in the visual modality" (McGhie, Chapman, & Lawson, 1965, p. 386).

With this information, the researcher should take care not to allow any extraneous noise into the experimental setting. If further evidence showed that chronic patients were significantly more distractible than acute patients, a possible explanation of this could be that the acute patient is more frequently involved in hallucinations and, therefore, less interested in external distractions; internal distractions may be more difficult to measure. Attention may be more directed to the internal stimuli and not consistently related to the experimental conditions. Constancy scores would, in this case, be worse with the acute patient because he is undergoing both internal and external changes.

Attention in schizophrenics, according to Bleuler (1924), "appears normal for matters of interest to the patient, that is in the milder cases for the majority of experiences, and in the more severe cases for affect-toned activities.[1] Where affect is lacking, the drive to follow internal and external processes and to direct one's senses and thoughts is also deficient: that is active attention is impaired" (cited in Meldman, 1970, p. 164). Bleuler and Meldman, then, contributed another variable to the question of attention and distractibility. It is necessary to evaluate the sensory data presented to the schizophrenic, the external characteristics, as well as the internal state of the schizophrenic, for example anxiety level and the stage of the psychosis.

Usually, an individual is aware of only a small but relevant portion of sensory stimulation from the environment. The schizophrenic patient, however, discovers himself involuntarily attending to irrelevant aspects of his perceptual world. "This widening of the range of conscious perception tends to disturb the constancy and stability of the perceptual matrix, thus causing a changing sense of subjective reality" (McGhie & Chapman, 1961, p. 107). Venables (1964) noted that the presumed correlation between poor size constancy and alterations in attention "is the notion that

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[1]The example of an affect-toned activity given by Meldman (1970) was a plan to escape.

it is by perception of objects and cues in the peripheral field that the reduced retinal image of an object is corrected and appears to maintain its size when viewed from a distance. If, owing to narrowing of attention, peripheral cues are not perceived, this correction will not take place and the distant object will appear smaller" (Venables, 1964, p. 14). He further noted that poor distance judgments may be explained in terms of narrowed attention and lack of response to peripheral cues. (Venables, 1964, p. 19).

Schneider (1978) speculated about including schizophrenics in cognitive experiments and commented on the related problems. He claimed that the cognitive researcher attempts to measure the cognitive disorder which "interferes with its own measurement" (p. 483). The interference may occur in a subtle or an obvious way. Schneider (1978) discussed the theories of selective attention (including Broadbent's, 1958, early model), but he suggested that the reader focus on the newer models, which indicate problems with attention other than the filtering system. Kahneman's (1973) "allocation policy" is suggested as being unusual in schizophrenics. (Schneider, 1978, p. 484) "An unusual allocation policy would mean that schizophrenics would consider certain inappropriate stimuli to be worthy of attention, and they would direct an unusual amount of effort to those stimuli" (p. 484). If material that a schizophrenic finds important is present, then his allocation policy changes, and he devotes his attention to it. "It may be that the nature of the material considered important-not the

actual ability to attend to it-is where the problem lies in schizophrenic attention" (Schneider, 1978, p. 485).

In the cognitive laboratory, each schizophrenic will select stimuli worthy of attention according to his own individual predispositions, which vary from subject to subject. Each schizophrenic participating in an experiment may, consequently, be using his own guidelines. "The withdrawn subject might allocate more attention to internally generated stimuli than to external ones" (Schneider, 1978, p. 485). Other schizophrenics might attach more attention to the appearance of the experimenter, the colour of the walls, and so on. Schneider (1978) provided a valuable review of the selective attention models (e.g., Broadbent, 1958, 1971, 1977; Deutsch and Deutsch, 1963; Kahneman, 1973), and the conclusion is drawn that there may be more than one difficulty with attention for the schizophrenic. The attentional deficit may vary from schizophrenic to schizophrenic, there may be more than one type of attention dysfunction, or each subject may have his own predispositions regarding appropriate stimuli when approaching an experimental task. All of these possibilities make it impossible to generalise about selective attention in schizophrenia, but they provide a possible explanation for the variability of performance between and within groups of schizophrenic subjects.

In addition to perceptual and cognitive alterations, research findings have repeatedly reported the variability of performance among schizophrenic subjects. "The hetero-

geneity of schizophrenic scores suggests the possibility that the disturbances of attentive behaviour noted may be limited to certain forms of schizophrenia" (McGhie, Chapman, & Lawson, 1965, p. 389). When attentive behaviour is experimentally measured with reference to the subclassifications of schizophrenia, the majority of investigators have concluded that schizophrenics in the paranoid and hebephrenic groups "tend to form discrete and homogeneous groups whose performance on tests is strikingly different" (McGhie, Chapman, & Lawson, 1965, p. 389). The work of McGhie, Chapman, and Lawson (1965) supported the finding that the hebephrenic patient shows a severe impairment in the ability to attend selectively to his world.[1] So, inconsistency in the perceptual performance of schizophrenics as well as the inconsistency of research findings may be directly related to the defective modulation of sensory stimulation and the variation in the subjects' ability to attend to the experimental stimuli.

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[1]Due to the fact that the paranoid and hebephrenic forms of schizophrenia appear to represent unique groups among the schizophrenic classifications, they were not included in the present research design.

Attention and Its Relationship to Drawing Behaviour

The inability to selectively attend to stimuli, as well as difficulties with the filtering mechanism, and cognitive and perceptual inconsistency are all closely related; these concepts are discussed hypothetically in the clinical investigations (e.g., Chapman, 1966b). Similarly, but not to the same extent, perceptual disturbances have been detected and linked with drawing tasks (e.g., Anastasi and Foley, 1941c, p. 196).

Pereira (1972) applied the interference theory of Buss and Lang (1954), which combined the work of Bleuler (1950), Goldstein (1964), and Shakow (e.g., 1962, 1963), to establish that the psychological deficit in schizophrenia is caused by disturbances in selective attention, the ability to maintain a major set, and the inability to follow a scheme or plan. "It is the theory of psychological deficit in schizophrenia which is supported by more empirical validation than any other theory" (Pereira, 1975, p. 177). Pereira formulated an explanation for the characteristic of fragmentation in the schizophrenic's graphic art using this theory of interference. The cognitive theory stated "that

fragmentation is basically due to failure of selective attention and an inability to maintain a major set[1], and should occur more frequently in non-structured [sic] areas of a picture completion task than in areas that are unambiguously structured" (Pereira, 1975, p. 181). Pereira's intention was to offer an alternative to the traditional psychoanalytic exploration of schizophrenic art by using experimental data to formulate a theory.

According to Pereira (1975), with the present knowledge of schizophrenic perception, we should not expect a schizophrenic to view a drawing in such a way that it would appear fragmented. This statement was made in response to Arieti's (1974) description of fragmentation in acute schizophrenics; he described it as a gradual disintegration of an entire object into smaller units. Arieti (1974) gave the example of a patient observing a nurse and physicians and seeing only segments of them, such as an arm or a leg. There is an apparent lack of documentation of this phenomenon, and Arieti (1974) suggested that this is due to the fact that it is difficult for the acute, excited patient to remember the fragmentation. Some schizophrenics were aware that their perception was fragmented; they reported unsuccessful attempts to reconstruct the wholes, often replacing the missing parts with inappropriate parts, and the result was distorted objects. (Arieti, 1974, p. 280) According to Pereira, if schizophrenics do perceive a fragmented world,

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[1]For an excellent definition of major set and a related review of literature (1930 to 1971), the reader is referred to Shakow (1971).

then the task of copying an object, or whatever, should produce a fragmented drawing. However, Pereira (1975) found that the drawing ability of schizophrenics significantly improves when copying an object; this improvement should not occur if objects appear fragmented. Pereira formulated the following hypotheses: (1) "Fragmentation (the most frequent formal alteration in schizophrenic drawings) is basically due to the disturbances of attention and to the disturbance of the ability to hold a major set. These disturbances in turn compromise the selection and integration of the visual material of the pictures." (2) "Interference in drawing is more likely to occur where the structural constraints of the representation are minimal. In terms of the temporal sequence of the picture execution, interference is more likely to occur when an element or detail is being completed"[1] (Pereira, 1975, pp. 177-178). At the time that the detail is being completed, "the major set is lost and task-irrelevant material intrudes. Having lost the outline and being unable to recapture it through the integration of what he had drawn previously, the patient can only continue to draw by association to the individual elements and to the details already drawn. The more profound the loss of the set, the greater will be the disintegration, and the fragmentation of the patient's graphic production" (Pereira, 1975, p. 178).

The experimental tasks included two picture comple-

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[1]This hypothesis is based on Maher's (1968) theory of language alterations in schizophrenia.

tion tests, a puzzle and the Stroop Color-Word Interference Test[1], which measured the subject's vulnerability to interference. A small sample of 14 male nonparanoid and 14 male paranoid schizophrenics participated in these tests. Nonparanoid and paranoid schizophrenics do not have similar patterns of attention. As previously mentioned, the nonparanoid schizophrenic demonstrates an inability to select appropriate information and is distracted easily; the paranoid patient, on the other hand, is characterised by extreme selectivity and consequently is not as distractible. (McGhie, 1969; McGhie, 1970; Neale & Cromwell, 1970) If these findings are applied to representational tasks, Pereira claimed that "the performance of non-paranoid [sic] schizophrenics should be characterized by instrusion of task-irrelevant details, while the performance of paranoid schizophrenics should be characterized by omission of details and fewer intrusions. These deviations should show greater correlation with attention variables than with any other variables of the subject itself or with situational variables" (Pereira, 1975, p. 178). Pereira was primarily concerned with fragmentation but went on to analyse other

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[1]"Words naming colors are printed on a test sheet, no word being printed in the color it names but an equal number of times in each of the other colors named. Thus each word presents the name of one color printed in ink of another color. Hence, a word stimulus and a color stimulus both are presented simultaneously. For other test sheets the source colors are printed as groups of squares or crosses. The difference in time for reading the words printed in colors, and to name the colors of the crosses 'is the measure of interference of conflicting word stimuli upon naming colors'" (Stroop, 1935, cited in Pereira, 1972, p. 146).

drawing characteristics of schizophrenic art by applying the interference theory. He claimed, for example, that "the paranoid schizophrenic's tendency towards simplification and omission of anything beyond the basic structure is consistent with the general finding that geometrism and formalism are more frequently used by paranoid schizophrenics" (Pereira, 1975, p. 180).

Pereira's results supported his reinterpretation of the graphic representations of schizophrenics and led to an interesting conclusion. "The graphic alterations once thought to be specific to schizophrenia seem to be due basically to impairment of attention, to vulnerability, to interference, and consequently, they are likely to appear whenever such vulnerability is produced or increased, be it in schizophrenia, or in mild sleep deprivation, or probably in a variety of other conditions" (Pereira, 1975, p. 179). If the investigations into the disorder of attention in schizophrenia are considered, Pereira (1975) suggested that it is unreasonable to expect a schizophrenic patient to perform any task in a consistent way. Furthermore, a fragmented graphic representation would be expected because of an inability to maintain a set and the flooding of irrelevant thoughts and images. So, the patient's drawings, according to Pereira (1975) would include irrelevant elements due to this interference.

There is little doubt that attention plays a major part in the schizophrenic's perceptual world and his interpretation of various stimuli. The perceptual aspects related to attention must be considered as a significant de-

tail in the experimental design, the procedure, as well as the content of the stimuli presented. From a cognitive stand point, Pereira (1975) formulated a fascinating approach to the schizophrenic's graphic representations and the characteristic of fragmentation. It is not possible to evaluate the perceptual performance or the artistic performance of the schizophrenic without attempting to understand this variable.

A Structured versus an Unstructured Drawing Task

Clinical testing theories and procedures related to psychological assessment generally accept the assumption that the greater the ambiguity of the situation, event, object, place, and so on, to be observed, "the greater the influence of inner or behavioral determinants on the percepts that emerge" (Ittelson, Proshansky, Rivlin, & Winkel, 1974, p. 86). Perhaps this proposition, as well as the nonexperimental approach to this subject, explains the earlier emphasis on the spontaneous drawings of schizophrenics (e.g., Anastasi & Foley, 1940; Foltin, 1953; Maclay, Guttmann, & Mayer-Gross, 1938). Controlled drawings were previously limited to the work of mental defectives and children and were related to specific tests (e.g., the Goodenough Drawing Test). As a tool for examining the schizophrenic ego, as a method to fight psychotic symptoms by "reestablishing more normal perception and thought, and for

assimilating and mastering the trauma of his loss of function," it was felt that the works of art had to be spontaneous. (Wittels, 1975, pp. 217-218) Even though the drawing itself may be spontaneous, Arieti (1974) described art as an aid in overcoming the extreme anxiety related to the acute schizophrenic patient's perceptual distortions. If a patient is experiencing the world as a continual flood of distortions, then the drawing itself may stabilise the patient's perceptions. The content and structure of the drawing may indicate a loss of stability in his perception, but the drawing itself will allow the patient to concentrate on images and maintain a perceptual focus. (Wittels, 1975, p. 218)

There appears to be a great deal of support for the spontaneous approach to artwork; obviously, the psychoanalytically oriented therapists would be among the strongest supporters. A less obvious advantage of this approach is provided by Kwiatkowska (1962). The art productions of numerous "well" siblings of schizophrenics were compared. If the pictures were representational, they were generally "well-organized, unified, and show no gross distortions" (Kwiatkowska, 1962, p. 11). However, when the pictures were to be constructed from a scribble or were to reflect a feeling or mood, there was a dramatic change. "Only then one realizes how frail is the ego of these siblings. Whenever the defenses which keep them in touch with reality are loosened, their productions become disorganised, fragmented and bizarre" (Kwiatkowska, 1962, p. 11). Comparisons such as this remind researchers of the advantage of spontaneity

or spontaneous creativity.

As early as 1938, Abel expressed the need for a more structured testing procedure. "We wanted to control the situation, as in a test, but still give the individual a chance to do some imagining rather than merely perceive or recall spatial relationships" (p. 50). To do this, they provided the paranoid schizophrenic subjects with paper and requested "any kind of a balanced or even design he desired in the rectangle, but he must use only a certain number of lines. This number was to be nineteen straight and six curved lines" (Abel, 1938, p. 51). The results indicated that the task was a failure; it did not reveal any individual differences in the design making procedure. For these paranoid subjects, it was concluded that "a freer situation needs to be provided" in order to recognise individual differences. (Abel, 1962, p. 61) A structured or controlled situation in this case does not provide the necessary data.

Messner (1951) described the "therapeutic value of a guided creative program of self-expression as compared with delusional self-expression of the psychotic patient" (p. 235). The advantages of the spontaneous approach to creativity were recognised as well as "the fact that absorption in a healthy activity tends to dispel disorganized thought" (Messner, 1951, p. 235). However, the author's objective was "to create an interest channel to serve as an outlet of creative abilities which are socially acceptable" (Messner, 1951, p. 235). According to Messner, there are usually two extreme procedures involved in artwork: spontaneous uncon-

trolled expression and controlled technical creation. (Messner, 1951, p. 235) The "guided creative method" is described as a compromise which combined the advantages of these two extreme techniques. (Messner, 1951, p. 235)

Messner's (1951) method was designed to "encourage original expression of a realistic stimulus, individually chosen by the patient" (p. 245). The purpose of this approach was to interest the patient in reality again and to encourage him to eventually relinquish his fantasy world. "Normal responses again appear" (Messner, 1951, p. 235). Messner (1951) believed that having the patient choose his own subject and his own modifications of the actual object would in itself prove to be a diagnostic tool. (p. 235) In addition, this controlled method "strives for the restoration of the patient's self-confidence in reality" (Messner, 1951, p. 236). Structure of the creative situation is provided by this technique, but the artist still maintains a feeling of choice and control within the framework of the task.

When the task is simple or encompasses unambiguous stimuli, many of the deficits which appear in the schizophrenic's performance improve. (Holzman, 1970, p. 223) So, when the performance of schizophrenics is compared to normals on certain tasks, they show little deterioration in their responses. (Cohen, Rosenbaum, Dobie, & Gottlieb, 1959, cited in Holzman, 1970, p. 223) The explanation for the lack of performance decrement in sensory isolation experiments, for example, is that the schizophrenic individual is not confronted with too much stimuli or asked to

deal with a complex situation. This perceptual dysfunction is not due to an inability to cope with complexity but to the fact that his reaction to the sensory input is impaired. As a result of this impairment, his response is diverted to an incorrect course. (Holzman, 1970, p. 223)

It was perhaps this information which led Pereira (1972) to derive the following prediction from his fragmentation theory: In drawing completion tasks, the "areas lacking structure are more vulnerable to the intrusion of task-irrelevant details. Hence, the solutions of non-paranoid [sic] patients are expected to show more task-irrelevant additions in the areas lacking structural outlines than in those areas having such outlines. The productions of paranoids, by contrast, are not expected to show many task-irrelevant details. If paranoids do have a tendency to simplify tasks, it may be expected that they are more proficient in supplying structural outlines where needed than in supplying details to structural outlines" (Pereira, 1972, p. 65). As predicted, the unstructured (central) section of the Picture Completion Test I (window view)[1] proved to be the area where the task-irrelevant de-

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[1]Picture Completion Test I (window view). The subject is presented with an incomplete picture, and the task is "to figure out the parts which are missing, and draw them in so that when it is all finished, the picture makes sense" (Pereira, 1972, p. 134). "Two areas can be distinguished in the picture. In one (all around) only the main structural elements are given; on the other (centre), only the objects are drawn, without giving the structural supports of it" (Pereira, 1972, p. 134). For a more detailed description of the test and the scoring method, the reader may consult Pereira (1972).

tails were most frequently included (significant at the .01 level), for both the paranoid and nonparanoid groups. (Pereira, 1972, p. 80) The performance of the two groups was significantly different in terms of the addition of task-irrelevant material (chi-square obtained .05 level of confidence). All 14 nonparanoid subjects added details which were irrelevant to the tasks; this was not true of the paranoid patients. (Pereira, 1972, p. 79) The paranoid schizophrenics disclosed an unusual completion pattern. "They supplied the main structures where missing and, at the same time, omitted to fill in detail where the structure was given" (Pereira, 1972, p. 76). "As predicted for both groups, the addition of task-irrelevant details was a much more frequent finding in the areas without structural constraints" (Pereira, 1972, p. 92). Pereira (1972) discussed this finding as an analogy to language and claimed that "these two forms of expression seem to depend on structure even when they are as much disturbed as in schizophrenia" (p. 92). It should be noted that the sleep deprivation subjects tested by Pereira (1972), in a separate experimental study, did not support the prediction. Task-relevant omissions and irrelevant additions were not more frequent in those areas of the pictures which lacked structural restrictions. (Pereira, 1972, p. 102) It was suggested that the schizophrenic's tendency to depend on structure may indicate "a broad behavioral trace" (Pereira, 1972, p. 92).

Psychoanalytically oriented art therapists generally insist that free expression be the approach to therapy, just

as free association is a fundamental technique of psychoanalysis. However, Pereira (1975) made a strong recommendation: Allowing the patient to engage freely in creative activity, "not helping him to structure his visual thinking," does nothing else but increase "his difficulty in the selection and integration of the relevant aspects of representation into a structured whole" (p. 181). He suggested that free expression, especially of nonparanoid patients, is nothing more than "chaotic expression" (Pereira, 1975, p. 181).

The diagnostic and therapeutic benefits of structured art activity may be found in the work of Edith and Ernest Zierer. Their diagnostic and therapeutic techniques were developed from the theory that standardised tests of painting could guide art activity to disclose specific problems. The Zierers were particularly concerned with the patient's problem-solving ability in stressful situations. They believed that "the intensity of color integration and disintegration" in the patient's paintings could be evaluated with a rating scale; this technique could be used to detect "maladaptive reactions and attitudes and the strength of coping ability for everyday living as well as moments or periods of crises" (Zierer, 1973, p. 101). The art activity may be referred to as structured because the characteristic of this technique was "to assign controlled, standardised painting projects so structured to stimulate conflict-laden situations, typical of everyday living and common to everyone" (Zierer, 1966, pp. 200-201). The interpretation and evaluation of the paintings did not involve form or content

but, rather, "the relation of the color nuances to each other" (Zierer, 1966, p. 200).

Gruba and Johnson (1974) also support the belief that structure in the schizophrenic's creative activity is essential. They compared the performance of 20 schizophrenic males with 20 normal males on a revised form of the Q-sort technique. The hypothesis stated "that the self-concepts of schizophrenics contain more contradictory and incongruous elements than do the self-concepts of normals" (Gruba & Johnson, 1974, p. 254). This hypothesis was supported by the findings. One indication of the results was as follows: "It may be therapeutically useful to help the schizophrenic to resolve contradictions in his self-concept by providing him with clear-cut, unambiguous messages designed to eliminate perceived incongruities in his self-concept" (Gruba & Johnson, 1974, p. 254). Providing the schizophrenic patient with structure in his creative activities, then, may assist him in establishing a stronger self-concept or stronger self-boundaries.

As an art therapist, Honig (1977) has emphasised reality in her sessions by introducing exercises with human figures, landscapes, and real objects. As a result of frustrating past experiences, Honig (1977) decided "that the loose, permissive, creative or spontaneous approach often increased anxiety and confusion" (p. 100). In addition, "disintegrated, chaotic drawings give the schizophrenic patient a feeling of hopelessness and discourage any element of self-esteem, and therefore give more of a negative

effect" (Honig, 1977, p. 100).

Honig (1977) relied on a structured approach to art therapy. A chart designating four classifications of possible schizophrenic symptoms described corresponding characteristics of the artwork and the appropriate art therapy methods. For example, classification "B" described symptoms such as ego disintegration and regression, "underdeveloped perceptual apparatus," and problems maintaining attention. The corresponding characteristics of the artwork include transparency, distortion of objects and human figures, and "regressed drawings." The last column provided the appropriate methods of art therapy for the schizophrenic with these corresponding symptoms. The art therapist's function should be to "organize thought processes with clear, realistically defined projects. Structured and organized approach-avoid delusional, fantasy, unreal drawings. Awareness of surroundings is stressed" (Honig, 1977, p. 100). This effort to associate schizophrenic symptoms with specific therapeutic methods is an indication of a recent emphasis in the art therapy profession.

The move away from the content analysis and toward structural components is expressed by Simon (1969); "content shows the patient's preoccupation while painting, but the style reveals the patient's potential ability to integrate these attitudes with traumatic experience" (p. 124). Simon (1969) used the patient's style of painting to tell whether he could benefit from the art therapy experience or program. (p. 122)

The benefit of spontaneity is that it is conducive to the psychoanalytic interpretation and, thus, provides information about the individual experiencing this disorder. If a task is structured, on the other hand, differences between schizophrenic and normal groups decrease (e.g., Cohen et al., 1959; Schaefer, 1977), and the patient's self-esteem is enhanced (e.g., Gruba & Johnson, 1974). The structured approach is perceived as a benefit to the patient; it allows him to cope, organise, and reduce the confusing, disorganised, and disturbing nature of his illness.

SUMMARY

The primary reasons for examining the schizophrenic's perception of space and the unanswered questions addressed in this section are as follows: (1) Is that which is perceived distorted as a result of disturbed reality testing, or is the disturbed reality testing the result of a primary perceptual distortion? (2) Are the peculiar and distorted graphic representations produced by the schizophrenic a reflection of his fantasies and a world he has created, or are they actually errors in perceiving the world, misinterpretations of sensory information? (3) Are the spatial structures found in schizophrenic art the result of a disintegrating ego, or do they reflect errors in space perception? These questions have been addressed using cognitive and psychoanalytic interpretations of perceptual

dysfunction. An attempt has been made to understand and sort out the information related to these questions, and, therefore, the literature related to perceptual dysfunction, especially space perception, was reviewed.

Berry's hypothesis not only represented the research which initiated some of these questions, but it also addressed the most obvious question: Why compare the Eskimos and the Scots? If one is to investigate space perception and its relationship to drawing behaviour and is testing a theory that is said to be universal (Billig's theory), then looking at two populations with similar spatial skills would be most helpful. Berry found a "minimal difference between the Eskimos and the Scots," (Berry, 1966, p. 227) and his findings indicated that these two populations appeared to have similar spatial abilities. Berry's (1966) findings strongly suggested that the Eskimo people should be represented and the Eskimos also utilised spatial characteristics in their drawings that were considered characteristic of schizophrenic drawing behaviour.

The purpose of the present research, then, is to examine Billig's spatial structure theory by focusing on a psychological process and comparing people from two very different populations with similar spatial abilities, thereby examining the universal aspect of Billig's theory. As suggested by Deregowski, cross-cultural research should address a specific psychological process and be aware of the problems surrounding Western and non-Western tests. The goal of the present research is to verify Billig's spatial

structure theory and, hopefully, use it to establish a non-verbal diagnostic tool to be used with Western and non-Western cultures.

There are numerous perspectives which explain or describe the perceptual dysfunction in schizophrenia (e.g., Wing, 1978) but, for the purpose of the present research, the psychoanalytic and cognitive perspectives are considered the most appropriate and beneficial. Billig's spatial structure theory described the schizophrenic ego disintegration process in terms of spatial structures in paintings. The spatial skills related to space perception can be evaluated by using size and distance constancy tests. In addition, these two tests were selected for the following reasons: (1) The Eskimos and the Scots represent very different cultures and may be accustomed to interpreting space in a particular way (i.e., the rural Alaskan Eskimos may deal with distance but rarely find it necessary to judge vertical size, and the Scots may be familiar with the vertical size of objects but inexperienced in judging distance in a snow-covered environment). In an attempt to be "culturally fair" in selecting a test to evaluate space perception, it seemed appropriate to include both the size and distance constancy test. (2) The research literature related to distance constancy and schizophrenia was rather limited and any new research would represent a contribution to this area of research. (3) The most significant reason for employing the size and distance constancy tests was the relationship between perception and spatial structures; the work of Weckowicz (1957), Weckowicz, Somer, and Hall (1958),

Weckowicz and Somer (1960), and Weckowicz and Hall (1960) seemed to bring various segments of the research together. In other words, their publications discussed the relationship between the schizophrenic's ego, body image, self-boundary, self-concept, perceptual constancy, and personal distance; their work also addressed other cognitive and psychoanalytic questions raised by the present research. Looking at the condition of the schizophrenic's ego boundary and his perception of space, the question addressed by Weckowicz et al. was: Is there, then, a correlation between the condition of the schizophrenic's ego boundary and the schizophrenic's perception of space and, consequently, his interpretation of space, his personal space boundary? As the reader will discover, this question resulted in the formulation of the primary hypothesis for the present study.

Of course, it was necessary to review certain variables which might affect perception or drawing behaviour. Attention and related behaviour appear to represent the most documented research attempting to explain the variability in the performance of an individual schizophrenic as well as variability between groups of schizophrenics. There is little doubt that attention plays a major role in the schizophrenic's perceptual world and various aspects of attentional deficits in schizophrenia as well as the direction of causality (e.g., Gjerde, 1983) have been reviewed. A discussion of this variable was necessary in order to ade-

quately inform the reader and enable him to assess the results of the present research, in terms of the perceptual tests and the drawing task.

THE SIMILARITIES AND DIFFERENCES BETWEEN SCHIZOPHRENIA AND ALCOHOLISM

As will be seen in Chapter II, the subject groups included not only schizophrenics but, for comparison purposes, alcoholic Scots and alcoholic Eskimos--the reasons for this choice will be discussed in Chapter II. At this time, it will be advantageous to review the literature which has investigated the similarities and differences between alcoholics and schizophrenics.

There are numerous classifications and definitions that may be applied to distinguish the alcoholic from all other individuals. Jellinek[1] (1960), for example, devised four classifications of alcoholics which include the psychological and physical characteristics, distinguishing them according to the pattern of consumption and behavioural characteristics of the alcoholic. However, the definition most often adapted by researchers and clinicians is a broad

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[1]Jellinek (1960) is an excellent foundation text; it discusses the social, cultural, and economic factors as well as the nature of the disease and attitudes toward alcoholism as an illness.

one which regards alcoholics as excessive drinkers whose alcoholic dependence has resulted in a "noticeable mental disturbance or interference with mental and bodily health, their interpersonal relations and smooth social and economic functioning; or who show prodromal signs of such developments. They therefore require treatment" (World Health Organization, 1952, cited in Warder & Ross, 1971, p. 110). The disease may also be defined as it is under Section 303.2 in the Diagnostic and Statistical Manual of Mental Disorder of the American Psychiatric Association, "a pathological dependency on ethanol" (Criteria Committee, National Council on Alcoholism, 1972, p. 250). The emphasis in most definitions lies on the word dependency and the personal effects caused by a lack of control on the part of the individual.

McGuire, Stein, and Mendelson (1966) hypothesized that when the alcoholic was inebriated, there was an improvement in ego integration. DeVito, Flaherty, and Mozdzierz (1970) provided a description of schizophrenics who achieved the same results with a prolonged use of alcohol but reverted to a psychotic state when detoxicated. Both McGuire et al. (1966) and DeVito et al. (1970) claimed that the purpose of the alcohol was to provide a defense against anxiety. Horton (1943) acknowledged that anxiety is recognised as a primary factor in drinking patterns, and McReynolds (1960) discussed anxiety as it relates to perception and schizophrenia. Alpert and Silvers (1970) found that alcohol aided some schizophrenics in reducing the discomfort due to hallucinations. A difference, however, be-

tween alcoholics and schizophrenics is that the alcoholic experiences increased anxiety when contemplating a drink and the schizophrenic's anxieties decrease. (Menaker, 1967) Anxiety is a significant part of the life of the schizophrenic and the alcoholic, although its relation to alcohol is different.

Statistical accounts of the incidence of alcoholism and schizophrenia and the ratio of occurrence are provided by clinical observations. Gross (1967) claimed that schizophrenia occurs in individuals suffering from alcoholism; his findings confirmed the previous reports which claimed that approximately 14 percent of alcoholics are also schizophrenic. On the other hand, Sherfey (1955) admitted that probably all practising psychiatrists have detected alcohol abuse while examining a schizophrenic's clinical history, and perhaps the schizophrenic had been previously labelled an alcoholic until the obvious symptoms of schizophrenia were recognised. Almost 10 percent of Bleuler's (1950) alcoholics were also schizophrenic. The purpose of presenting these examples of statistical studies is to provide evidence that a significant number of schizophrenics are excessive drinkers and that many people who suffer from alcoholism also experience schizophrenic symptoms.

Opler (1957) as well as Bagley and Binitie (1970) concluded that schizophrenics with alcohol problems were the result of cultural factors. In response to Freed's (1975) questions about the use of alcohol to disguise schizophrenia, Rimmer and Jacobsen (1977) investigated an additional social factor; they looked at the incidence of alcoholism in

schizophrenics and their families. They compared 118 biological relatives with 33 schizophrenic adoptees and 140 biological relatives with 33 nonschizophrenic adoptees. No support was found for the claim that alcohol consistently masks the symptoms of schizophrenia. "Although alcoholism and schizophrenia can occur in the same individual, it appears to be an unusual or even uncommon occurrence. However, such cases undoubtedly present unique diagnostic treatment problems" (Rimmer & Jacobsen, 1977, p. 1784). The results of this study, then, are consistent with previous reports; these reports claimed that schizophrenics are no more likely to experience alcoholism than any other segment of the population.

When Freed (1975) published his comprehensive review of literature which focused on the relationship between schizophrenia and alcoholism, the diagnostic problems related to these two clinical disorders were discussed. During the initial stages of the present research, the diagnostic dilemma was evident in the clinical files of all the psychiatric hospitals visited; there seemed to be a confusion as to the correct diagnosis. This confusion was indicated by changes in diagnosis, question marks next to the diagnosis, and an uncertainty as to whether the patient was schizophrenic with an alcohol problem or an individual with an alcohol problem which brought on symptoms of schizophrenia. (Bleuler, 1916, expressed the belief that alcoholic hallucinosis might be merely a symptom of the disease of schizophrenia which is induced by alcohol.) The question,

then, was: Why was there such difficulty in separating or identifying these two clinical disorders? It did seem that more information was necessary if this problem was to be addressed, and it did, also, seem appropriate to look at the similarities and differences between schiozphrenia and alcoholism.

Field-Dependence and the Perceptual Performance of Schizophrenics and Alcoholics

Weckowicz and Blewett (1959) claimed that the schizophrenic's cognitive process and, thus, perception is less selective, less analytical, and more global than the normal person because the schizophrenic individual does not have the ability to turn off information unrelated to the present task. The authors were in agreement with Shakow (1962), when they stated that the schizophrenic individual's primary difficulty is an inability to select and concentrate on the relevant information from the perceptual environment, thereby excluding all parts of the visual field except that part which requires attention. In other words, the schizophrenic individual is "field-bound" (Weckowicz, 1960) or field-dependent. An earlier study (Bryant, 1961) attempted to show that the primary factor which distinguishes the process schizophrenic from the reactive schizophrenic is the ability to select or separate information from the visual field. It was postulated that this ability is in some way related to the schizophrenic's body-image concept. In addi-

tion, the reactive schizophrenic would perceive in a field-independent cognitive style, and the process schizophrenic would perceive in a field-dependent cognitive style. The hypothesis was confirmed, and Bryant (1961) looked forward to further research related to the reactive-process dimension of schizophrenia.

The cognitive style of the individual suffering from alcoholism has been investigated previously,[1] and the evidence indicated that the alcoholic is also field-dependent. One study (Kristofferson, 1968) suggested that if individuals with "various levels of field-dependence prior to drinking were to become alcoholics, they would attain a high level of field-dependence as a consequence of alcoholism. However, it may be that only, or mainly, individuals with a high prealcoholic level of field-dependence and the personality characteristics associated with it become alcoholic" (p. 390). Jacobson, VanDyke, Sternbach, and Brethauer (1976) concluded that "alcoholics were clearly the most field-dependent of all groups studied"[2] (p. 399). Donovan, Hague, and O'Leary (1975), on the other hand, concluded that not all alcoholics are field-dependent, as claimed by Witkin et al. (1954, 1959), but rather alcoholics

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[1]For example, Bailey, Hustmeyer, and Kristofferson, 1961; Harley, Cohen, and Silverman, 1974; Jacobson, 1974; Jacobson, Van Dyke, Sternbach, and Brethauer, 1976; Karp and Konstadt, 1965; Kristofferson, 1968; McWilliams, Brown, and Minard, 1975; Pisani, Jacobson, and Berenbaum, 1973.

[2]They compared 402 men and 160 women alcoholics with normal and psychiatric groups.

appear "to be distributed along the entire continuum of field-dependence to field-independence" (p. 358). The results of the Donovan et al. (1975) study suggested that "therapeutically relevant alcoholic subtypes could be identified upon the basis of perceptual differentiation and defense mechanisms" (p. 358).

A further comparison is represented by the selectivity of cues, which, in general, is involved in all perceptual processes. Perez (1961) inferred from previous size constancy studies that "schizophrenics are more responsive to peripheral cues[1] than are normals" (p. 41). Sigman and Oltman (1977) attempted to explain the variations in the effect of "visual contexts" on size perception by comparing them to the cognitive style dimension. "In two situations, relatively field-dependent observers made size judgments which were influenced by a frame surrounding the target figure, while relatively field-independent observers tended to be less influenced by the frame, making their judgments approximate the retinal size of the target" (p. 661). The results indicated that experiments involving the assessment of apparent size must also take into account the cognitive style of the subject as well as the "situational variations" (p. 661).

It may be submitted, then, that the schizophrenic and alcoholic are similar in their cognitive style of perceptual differentiation. Weckowicz and Blewett (1959) for-

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[1]Peripheral cues may be considered cues which are elements of the field, as opposed to those of the object itself. (Perez, 1961, p. 41)

mulated the hypothesis that perception is less selective, less analytical, and more global for the schizophrenic than for the normal person. Karp and Konstadt (1965)[1] investigated the effect that heavy drinking would have on field-dependence and summarised the findings of earlier psychological differentiation studies[2] with a description of alcoholics. They "displayed great difficulty in separating perceptual items from their surrounding contexts and also drew pictures of persons which reflected a global, rather than sophisticated and articulated concept of the body" (Karp & Konstadt, 1965, p. 412). The perception of the schizophrenic and the alcoholic are, thus, described as similar.

Kalliopuska (1982) provided an excellent review of studies dealing with the various components of cognitive style (e.g., field-dependence/field-independence and the influence of cognitive style on various measures of personality, the alcoholic personality in particular). Beginning with his review of Witkin et al. (1962), Kalliopuska noted that "a field-dependent or field-independent way of perceiving is one of a large constellation of interrelated characteristics, which together reflect an individual's level of differentiation (Witkin et al., 1962)" (Kalliopuska, 1982, p. 963). Witkin claimed that

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[1]He supported the "predisposition hypothesis" which stated that field-dependence precedes and contributes to alcoholism, rather than the more common "consequence hypothesis" (Karp & Konstadt, 1965, p. 412).

[2]Perceptual field-dependence and unsophisticated body concept were two areas previously revealed as reflecting a lack of psychological differentiation. (Karp & Konstadt, 1965, p. 412)

the "level of psychological differentiation is the cognitive component of field-dependent or field-independent perception" (Kalliopuska, 1982, p. 963). Subjects identified as field-independent are capable of bringing their bodies to an almost vertical upright position on a rod-and-frame task, which indicates "an immediate sense of the separateness of their bodies from the surrounding world" (Kalliopuska, 1982, p. 963). Field-independent subjects, on the other hand, appear to have a good reality testing, and they are more likely to make "analytical discriminations" in reference to the field.

According to Berent and Silverman (1973) and Berent (1976) individuals that are field-dependent also perform poorly on learning and perceptual tasks. (Kalliopuska, 1982, p. 963) In reviewing Witkin's (1965) work, Kalliopuska stated that individuals with an articulated cognitive style also possess (1) "an articulated body concept", (2) "a differentiated self-esteem", and (3) "a qualified sense of separate identity" (Kalliopuska, 1982, p. 963). "A less developed sense of separate identity in persons with global cognitive style is manifest in reliance on external sentiments and views of themselves" (Kalliopuska, 1982, p. 963). Kalliopuska (1982) emphasised the fact that the study of the relationship between field-dependence and other personality characteristics has received almost no attention (Berent et al., 1982; Long, 1974; O'Leary et al., 1980; Panek, 1982; Panek et al., 1976). Very few researchers have discussed the relationship between alcoholism, the lack of a separate identity, and narcissisism

(Kernberg, 1975; Kohut, 1971). When Kalliopuska (1982) published his article there were no books or articles describing a connection between field-dependence, narcissism, and alcoholism.

Theoretically, if an individual perceives his external world inarticulately, then he will perceive the internal functioning of his own body in an inarticulate way and, in addition, will be more passive in terms of interacting with his environment. This style of perception is also a primary factor in the etiology of alcoholism. (Kalliopuska, 1982) In 1954, Witkin et al. used three indexes of field-dependence (the Rod and Frame Test, the Body-Adjustment Test, and the Embedded Figures Test) and revealed that alcoholics were more field-dependent than nonalcoholic psychiatric patients and nonalcoholic controls. (Kalliopuska, 1982, p. 964)

Following the Witkin et al. (1954) study, as well as numerous others, several researchers have published statistically significant results indicating that alcoholics are field-dependent. For example, Bailey et al. (1961) used the Rod and Frame Test to significantly differentiate alcoholic men from controls; Goldstein and Chotlos (1965) used the Rod and Frame Test to differentiate alcoholic men from controls. Karp and Konstadt (1965) used the three tests used by the Witkins group (1954) and differentiated alcoholic men from controls, and the same suggestions were made by Barnes (1979). In addition, Karp and Witkin's associates performed numerous studies which revealed that the "alcoholics' field-dependence is relatively stable over time" (Kalliopuska,

1982, p. 964). Karp and Konstadt (1965) discovered no significant difference between young and old alcoholics in field-dependence when compared with matched controls. However, Bergman and Agren (1973) found that there was a significant relationship between field-dependence and the occurrence of delirium tremens in alcoholics suffering from alcohol hallucinosis. Abstinence, according to Karp et al. (1965), does not improve field-dependence, even after an average of 15 months; the abstaining alcoholic was no less field-dependent than the drinking alcoholic. Jacobson et al. (1970) agreed that "abstinence was not enough to reduce the field-dependent characteristics of alcoholics. (Kalliopuska, 1982, p. 965)

To conclude, the evidence seems to indicate that field-dependence may be a predisposition to alcoholism. Empirical studies suggest that this cognitive style is related to disturbances in identity and a weak self-concept. "A weak body-ego, later on a weak body image and self-concept, and field-dependence appear at an early stage in development before a child is able to differentiate himself from the environment" (Kalliopuska, 1982, p. 966). Similarly, empirical evidence has described the schizophrenic as having a weak ego boundary and weak body image as well as a field-dependent cognitive style. It is, therefore, suggested that the schizophrenic and alcoholic appear to have more similarities in personality characteristics and styles of perception than any other group of psychiatric patients.

Alcohol Hallucinosis and Schizophrenia

The comparison most frequently documented is the hallucinatory experiences shared by these two clinical classifications; these experiences make a correct diagnosis especially difficult. The historical attitudes that surround this clinical comparison and the etiological controversies are reviewed elsewhere (e.g., Alpert & Silvers, 1970; Deiker & Chambers, 1978). For example, Bleuler (1916), expressed in his textbook the belief that alcoholic hallucinosis might be merely a symptom of the disease of schizophrenia which is induced by alcohol. Alpert and Silvers (1970) mentioned the lack of clarity as to where alcohol abuse belongs in relation to the etiological factors; they also acknowledged the possibility that "schizophrenia produces a vulnerability to alcohol abuse" (Alpert & Silvers, 1970, p. 298). They believed that one reason for the schizophrenic's abuse of alcohol is that it decreases the discomfort brought on by their hallucinations. "As they drink more and more to escape their hallucinations, they become more likely candidates for an alcohol withdrawal syndrome" (Alpert & Silvers, 1970, p. 298). By the time the schizophrenics arrive at the hospital admitting office, "they present a confounded mixture of symptoms" (Alpert & Silvers, 1970, p. 298).

Alpert and Silvers (1970), using a questionnaire, compared the auditory hallucinations of 45 schizophrenics, with no recent history of alcohol abuse, with those experi-

enced by 18 individuals suffering from alcoholic hallucinosis,[1] with no indications of schizophrenic symptomatology. The hallucinations for the alcoholics occurred at the beginning of their illness, usually when they withdrew from alcohol; they would then arrive at the hospital within a few days, complaining primarily of hallucinations. It should be noted that the significance of hallucinations in the early stages may be somewhat exaggerated because the physically ill patient is anxious to gain admission and knows that this complaint will be more convincing in his plea for help. (Alpert & Silvers, 1970, p. 300) In contrast, schizophrenics experience hallucinations later on in the course of their illness, preceded by other symptoms. It is possible that the schizophrenic has experienced hallucinations for weeks or months, and, yet, hallucinations are rarely the primary complaint when he is admitted to the hospital. (Alpert & Silvers, 1970, p. 300).

The hallucinations of the alcoholic seem "to be characterized by sensory factors. Thus, the voices are localized in space and appear to emerge from a background of noises and unintelligible voices. Their frequency is relatively independent of emotional state, but an increase in the level of articulated visual input produces a masking effect. We know that localization, filtering, and masking effects, etc., are dependent on relatively peripheral audi-

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[1]A definition of alcoholic hallucinosis: When hallucinations, usually auditory, are present in a sensorium which is otherwise clear, a diagnosis of alcoholic hallucinosis is made. (Schuckit & Winokur, 1971)

tory structures" (Alpert & Silvers, 1970, p. 301). The frequency of hallucinations is greater for the alcoholic than for the schizophrenic, and they have an "attention-demanding quality, so that it is usually more difficult to distract an alcoholic from his voices" (Alpert & Silvers, 1970, p. 301). The demanding nature of the alcoholic's hallucinations might explain Bleuler's (1950) observation that the attention of a chronic alcoholic is directed to the present and lacks endurance. Bleuler (1950) observed that the hallucinations of the alcoholic include several voices speaking to each other rather than the patient, and they are spatially localized. This observation influenced Alpert and Silvers (1970) in the construction of a questionnaire describing various aspects of the alcoholic's hallucinatory activity. The results indicated "that the voices are elaborations provoked by sensory phenomena," and there is often a "failure of the message to achieve full intelligibility" (Alpert & Silvers, 1970, p. 301). For the alcoholic, hallucinations almost always occur outside of his body, and he can usually report the spatial localization of the content (e.g., behind him or to his left). The source is sometimes identified as coming from an existing source of noise (e.g., a knock on the door). (Alpert & Silvers, 1970, p. 300).

The hallucinations of the schizophrenic are more cognitive in nature; they are more like thoughts that can be heard. So, when schizophrenics describe their hallucinations, they "report greater intelligibility to their messages, poorer localization, and a sensitivity to emotional

arousal" (Alpert & Silvers, 1970, p. 300). The location of the voices for the schizophrenic is often the inside of his body; again we see the emphasis on the body in this illness. When the hallucinations are external in nature, the schizophrenic will tend to refer to a less specific source, the sky for example. (Alpert & Silvers, 1970, p. 300) (These observations are consistent with the localization observations made by Parker and Schilder, 1935.) The schizophrenic's hallucinatory episodes might be separated by days, hours, or weeks; it is easier to distract the schizophrenic from his hallucinations than the alcoholic. However, it has not been established as to whether "his increased frequency of hallucinations with social isolation is mediated through increased anxiety, with isolation, or decreased distraction, with lack of company" (Alpert & Silvers, 1970, p. 301).

Alcoholic hallucinosis was investigated by Schuckit and Winokur (1971), and they found little evidence of these two illnesses being found in the same people, as previously asserted (e.g., Bleuler, 1950). Alcoholics with a history of alcoholic hallucinosis did not have a prior history of schizophrenia or a high incidence of it in their families. The only factors differentiating them from the other alcoholics was a long history of drinking and several previous admissions. Consequently, this investigation provided no support for the theory that a correlation exists between alcoholic hallucinosis and schizophrenia. (Schuckit & Winokur, 1971).

Upon reviewing the characteristics of male alcohol-

ics, Freed, Triplett, and Freeman (1971) concluded that a consistent pattern of alcoholism appears to result in a diagnosis of schizophrenia. Furthermore, "the alcoholic hallucinosis accompanying an episode of acute intoxication has presented a close parallel to schizophrenia for many observers" (Freed, 1975, p. 867). Statistically it has been reported that hallucinatory behaviour occurs in 76 percent of the schizophrenics and 84 percent of the alcoholics. (Mott, Small, & Anderson, 1965) Alcoholic hallucinosis, according to Kessel and Walton (1965), is not a withdrawal symptom, as postulated by Kraepelin (Alpert & Silvers, 1970, p. 298), nor a result of vitamin deficiency. Instead, it "is much more closely related to schizophrenia and, if it persists, it cannot be distinguished from that disease except by the history" (Kessel & Walton, 1965, p. 42). Alcoholic hallucinosis, however, is not considered to be a common manifestation. (Kessel & Walton, 1965, p. 42)

The existence of opposing views in the literature (related to alcoholic hallucinosis and schizophrenia) prompted Deiker and Chambers (1978) to devise interviews to inquire into the structure and content of hallucinations. Three structural characteristics of hallucinations, "frequency across sense modalities, degree of perceptual organization, and conformity with external reality", and two aspects of content, "hallucinatory object and emotional quality", were examined with the help of 28 alcoholics and 28 functional psychotics. The results indicated "no significant differences between the two groups in the number of

hallucinations, nor in the number of sense modalities in which total, formed or unformed hallucinations were reported ....The most consistent group differences were in content" (Deiker & Chambers, 1978, p. 1837). After considering the hallucinatory content of the two groups, the authors suggested the following: "The most frequent hallucinations of alcoholics (i.e., negative animal content) represent the concrete expression of diffuse negative affect during alcohol withdrawal, whereas those of functional psychotics (less-negative human content) are concerned with more general interpersonal themes" (Deiker & Chambers, 1978, p. 1838). A similar description of this distinction is offered by Mott et al. (1965). Alcohol associated hallucinations consist of "a fearsome burlesque of reality," whereas the schizophrenic hallucinations consist of "a series of instructions" or a "debate with unknown persons" (Mott et al., 1965, p. 599). In their concluding remarks, Deiker and Chambers (1978) stated the following: The belief that "a common mechanism underlies all hallucinatory experiences" dates as far back as Hume's "Treatise on Human Nature," published in 1739. The data from the Deiker and Chambers (1978) study does not offer any new insights into the etiology of hallucinations, but "the similarity of form of alcoholics' and functional psychotics' hallucinations does contribute to the growing agreement in the literature concerning the process of abnormal perceptual experiences" (Deiker & Chambers, 1978, p. 1837).

Surawica (1980) published a more recent discussion

of alcoholic hallucinosis, and he reviewed five case histories of patients between the ages of 23 and 55 to illustrate this phenomenon. Most cases of alcoholic hallucinosis emanate soon after abstinence, although some are recognised during drinking or after a rather long interval, which subsequently leads in some cases to a diagnosis of schizophrenia. Surawica (1980) noted several differences between alcoholic hallucinosis and schizophrenia, including age, duration, onset, premorbid personality, family history, and whether or not there was any evidence of thought disorder. The author noted that patients with alcoholic hallucinosis should be very carefully assessed.

The search for a meaningful relationship between alcoholism and schizophrenia has been a long one, from Hume in 1739 to Surawica in 1980 to the present investigation. In spite of the fact that some researchers have suspended the search because they feel that the comparisons fail to illuminate neither disease entity (e.g., Freed, 1975), others are still intrigued by the initial similarities and continue to apply new perspectives.

The Artwork of Alcoholic Patients

One of the functions of the present research is to compare the spatial structures in the drawings of alcoholics and schizophrenics. The literature, however, is limited and

primarily the result of rehabilitative programs of art therapy. An alternative to this approach is the use of human figure drawings to detect drawing characteristics which might reflect symptoms associated with various stages of alcoholism (e.g., Hardi & Saaghy-Hardi, 1975). The available findings related to the artwork of the alcoholic are limited, but they will provide the reader with a source of comparison for the present research.

The earliest study which did not rely on previous projective approaches (i.e., drawing a person) was an investigation of the paintings produced by alcoholic men. Devine (1970) collected 110 pictures from 50 male alcoholics; his intention was to confirm the impression that alcoholic patients showed a specific painting style in their work. A total of 55 paintings were produced by five members of the art therapy group (some had been commercial artists before admission); this group met each week for 2 hours in the art therapy unit. The other 55 paintings were contributed by alcoholic men on the wards; these men (with the exception of a few) had not had any previous experience with art and produced the requested artwork in a single session. (Devine, 1970, p. 115) The art therapist gave no assistance or instructions (except in reference to the use of the painting material), and the patient selected his own subject for the painting.

Most of the artists who attended only once, "painted a single form, placing it in the center of the page. Little effort was made to define the surrounding environment, or to organize the entire painting surface into a composition. Houses, faces, figures,...trees, flowers and boats...were among the often repeated themes, boats being the most popular of all" (Devine, 1970, p. 116). An attempt at realism was always made; no one attempted to produce an abstract painting. The members of the art therapy group often depicted a landscape, several styles appearing very similar. "These scenes are highly idealized and very orderly; their execution is excessively controlled, to the point of appearing mechanical. The often faulty perspective and lavish decorative detail are reminiscent of folk art. Most of these paintings have a rigid, static quality and here again the deliberation with which the painting was executed is almost painfully apparent" (Devine, 1970, p. 117). This aspect of the paintings might reflect the tense manner in which the patient handled the brush and his deliberate painting behaviour. (Devine, 1970, p. 116) If the patient is accustomed to a shaking hand, as a result of the tremors associated with symptoms of withdrawal, this might represent adaptive behaviour.

The two groups of alcoholics, the therapy group members that met weekly and the patients that attended only one painting session, seemed to differ significantly in several superficial respects. Yet, Devine (1970) felt that they had

a great deal in common. The artwork, for example, from both groups tended "to be markedly rigid" (Devine, 1970, p. 119). In addition, there was a similarity between the "conventional landscape themes" of the group members and the "commonplace objects" chosen and depicted as "isolated forms" by the alcoholics that attended only one painting session. (Devine, 1970, p. 119) For both groups, "subject matter and style seem to imply an anxious need for control over the dangerous world of impulse and feeling. The escape to a tamed, simplistic or prettified version of the natural world in painting also appears to mirror the escape into irresponsibility and momentary euphoria by means of alcohol" (Devine, 1970, p. 119). These reflections of feelings were confirmed when alcoholic patients stated their preference for the rigid and idealised landscapes by other alcoholics, as opposed to the "looser, less conventional" artwork produced by schizophrenics. (Devine, 1970, p. 119)

Devine (1970) included illustrative cases and examined the change in style as therapy continued. All the art productions tended to be rigid at the onset of therapy. The skilled artists were similar to the unskilled in this characteristic, but the paintings of the skilled artists provided "a sense of completeness while the other paintings look unfinished" (Devine, 1970, p. 119). The content analysis of the paintings depend primarly on the symbolic nature of the material represented. Devine (1970) recognised the need for a more systematic investigation, including definitions, controls, increasing the experimental groups to in-

clude patients in other diagnostic classifications, and a control group of nonpatients. However, this descriptive report served its purpose as a catalyst for future research.

A collection of paintings by alcoholics, "Psychopathology and Pictorial Expression: Paintings by Alcoholics," was published by Sandoz Publishing Company (1971). There were three contributors to this outstanding collection of coloured reproductions, and they will be reviewed in the order of their presentation. Enachescu presented nine paintings produced by a 35 year old male suffering from alcoholic psychosis. The paintings are described as reflections of his terrifying dreams, delirium tremens, changes of his body image, and personality; in other words, they reflected "the structure and the morbid content of his psychopathologic personality." An art therapist, Joyce Laing,[1] experimented with the use of paintings as a form of group psychotherapy. Laing provided a descriptive analysis of six paintings produced by six male alcoholics, in a unit[2] especially designed for the treatment of alcohol. The art therapy group in this unit constituted a significant part of the treatment program; it was an adjunct to the group psychotherapy. The author noted the methods used to combine these two approaches to communication. Vles, a clinical psychologist, looked at 50 alcoholics involved in a

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[1]Joyce Laing is an art therapist at the Ross Clinic in Aberdeen, Scotland. I had the privilege of making her acquaintance and benefiting from her professional experience.

[2]The Nuffield Unit for the Treatment of Alcoholism in Edinburgh, Scotland.

program at a clinic in Rotterdam. He divided the alcoholic patients into two groups, "those patients who exhibit symptoms of inhibition" and "those patients who draw attention to themselves by uninhibited behaviour." The first category of alcoholics were assigned the task of a free painting or drawing activity, while the second group was given a model to reproduce in a drawing. Vles believed that a difference in personality characteristics makes the assigned task a beneficial experience for the alcoholic patient. The paintings contributed by Vles to the collection were all taken from the former category of alcoholics. He noted that the separation of these two groups is not always an easy task. Before reviewing the reproduced artwork, Vles discussed the psychology of drawing, painting, and the personality structure of the alcoholic from a psychoanalytic perspective. One of his observations was that the alcoholic individual often feels inadequate when it comes to meeting the demands of the society, especially in regard to what is expected of him sexually. Again he divided the individuals suffering from alcohol abuse into two groups. The younger alcoholic, around 18 years of age, seeks female companionship but is afraid to fail in some way and, thus, uses alcohol to overcome his fear. The older alcoholic must deal with "the problem of diminished potency" and alcohol decreases related anxiety. Vles described six paintings, using psychoanalytic interpretations of the subject matter.

This collection, as a whole, provided excellent illustrations of the artwork of the alcoholic and was essentially a descriptive effort. The content of the artwork was

the focus of the authors, and there were no obvious structural similarities between these paintings and the schizophrenics characteristics previously mentioned. The paintings were bizarre and reveal an untrained approach to perspective drawing but these were the only superficial similarities.

Over an 11 month period, an art therapist, Forrest (1975), collected the artwork of a 26 year old man. Again, the account described the paintings in terms of the symbols and various meanings attached to the figures represented. The value of art therapy is strongly emphasised as well as the reasons why it was a success with this particular alcoholic individual. "Working creatively in art also proved less threatening to Harold than did the verbal therapy groups, and permitted a trust to develop towards me, both as a person and his friend" (Forrest, 1975, p. 24). It is noted that most alcoholics, Harold being a good example, are not aware of their feelings or "of themselves as a complete entity because of the alienation and separation they feel; both from the world and their bodies, when drunk" (Forrest, 1975, p. 39). A similar statement might be made about the schizophrenics's feelings of separation and alienation. Forrest (1975) emphasised that an art form is a tangible object which can not be ignored or denied. "In the case of the alcoholic, who is so often fuzzy in his recollections, art therapy can be of great value in dealing with the now, which may be forgotten within hours" (Forrest, 1975, p. 40). Without question, the essence of this article lies in the defense of art therapy as an effective form of communica-

tion, especially if this technique of interaction has never been developed by the individual.

Albert-Puleo and Osha (1976/77) published an article with the intention of providing information about their art therapy program with alcoholics, the techniques that they employed, and their findings. Again it was emphasised that it is "less threatening for a person to discuss a pictorial representation of a conflict than the conflict itself" (Albert-Puleo & Osha, 1976/77, p. 28). One of the fundamental goals in this art therapy program was "to elicit change in behavior by stimulating insight and self-awareness. Encouraging interpretations of the client's art expressions facilitates that devlopment of insight" (Albert-Puleo & Osha, 1976/77, pp. 28-29). In this art therapy program, new clients were often assigned a topic to paint (e.g., "portray the feelings of love"). As the client became more familiar with the program, he was encouraged to be spontaneous in his approach to his artistic adventure. (Albert-Puleo & Osha, 1976/77, p. 29) This appears to be a very successful way to provide structure and focus, at an appropriate time, for this group of patients. It is a natural transition for most individuals to move from structure, supervision, and instruction to knowledge of the material and the self-confidence to procede to spontaneity and creativity. The authors, of course, were more interested in themes and the relationship to the client's problems, such as fear, isolation, and anger. The only possible reference to structure, which has been previously noted, was a tendency for the paintings to represent "one

isolated object in the middle of a blank or sparse page" (Albert-Puleo & Osha, 1976/77, p. 30). It was suggested that this was a reflection of the loneliness and isolation felt by alcoholic individuals.

It should be mentioned that the investigations which included the paintings of alcoholics relied heavily on descriptions, usually psychoanalytic, of the patient and the significance of his artwork as it related to his illness. This approach was effective in establishing communicative channels for the alcoholic. However, the recognition of the benefits of art therapy was not widespread. Perhaps systematic control of numerous related variables and an attempt to verify previous findings statistically would encourage further acceptance and use of this diagnostic and therapeutic tool.

An excellent example of such an effort is the work of Cronin and Werblowsky (1979). The authors utilised artwork as a means for early detection of organic brain syndrome.[1] Early signs of organicity are subtle in adults, and consequently various other tests (e.g., neurological or the Bender-Gestalt Visual Motor Test) may not indicate organicity. (Cronin & Werblowsky, 1979, p. 105) A preliminary description of the subtle signs of organic dysfunction in the artwork of patients included: (1) disconnections, (2) static affect, (3) subtle perseveration, (4) difficulties in

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[1]Organic Brain Syndrome may be defined as "a general derangement of cerebral metabolism which produces a diffuse dysfunction or lowering of the function of brain tissue" (Engel & Romano, 1959, cited in Cronin & Werblowsky, 1979).

comprehension, and, also, (5) the patient's reaction to his artwork. (Cronin & Werblowsky, 1979, pp. 105-106) The characteristic most relevant for this discussion is perseveration; this is a frequent characteristic found in the paintings of schizophrenics. "The same lines, shapes, or configuration reappear from drawing to drawing. In gross organicity perseveration means the mechanical repetition of forms on the same drawing" (Cronin & Werblowsky, 1979, p. 105). This technique of detecting organicity would not only reflect any organic damage in the alcoholic, but it would, also, indicate if organicity accompanied other disorders, such as schizophrenia.

The case of a 45 year old female was reviewed to illustrate the above signs of organicity. After 5 weeks in the art therapy program, this schizophrenic patient showed signs of organicity in her pictures. Subtle perseveration, difficulties in comprehension, and static affect were the indicators which led to a reevaluation of her mental condition and psychological testing. The results of the Bender-Gestalt were positive (organicity exists), but all laboratory tests (e.g., EEG and CAT scan) were considered normal. During the woman's hospital stay, "her acute psychotic symptoms partially remitted. However, the organic features in her art work [sic] did not remit" (Cronin & Werblowsky, 1979, p. 107).

If patients seen by Cronin and Werblowsky (1979) indicated organic brain damage in their artwork, but did not show signs of organicity on routine mental examinations, they were given psychological tests. It was discovered that

11 patients out of 13 revealed signs of organicity on the Bender-Gestalt Test. All of the patients showed subtle signs of organicity throughout their stay in hospital. When Cronin and Werblowsky (1979) reviewed the clinical file of these patients; the most frequent finding in their history was an abuse of alcohol. "While the neurological examination only showed peripheral nerve damage, the art work corroborated by the psychological testing indicated the early onset of organic brain disease" (Cronin & Werblowsky, 1979, p. 107). The authors commented on the fact that a patient may present himself at the hospital with a functional psychotic illness, but the patient may also have an organic dysfunction which would affect cognition and behaviour. The art therapist has perhaps the first opportunity to alert the attending physician. A reevaluation of the patient's clinical history may result in information denied by the individual, especially in the case of the alcoholic, or not emphasised by the physician.

Cronin and Werblowsky (1979) did not hesitate to admit that their "tool...is only at the investigational stage" (Cronin & Werblowsky, 1979, p. 107). A follow-up study on participating patients would provide information regarding their clinical condition, and further signs of organicity need to be developed as well as verification of previous signs. The authors suggest some fascinating implications of their findings. This application of art therapy may be recognised as one way of approaching the diagnostic problem of distinguishing the alcoholic from the schizophrenic at the time of admission to the hospital. Cronin

and Werblowsky (1979) represent a new focus in art therapy; their work indicates a new partnership among the medical, psychological, and art therapy staff of a psychiatric hospital.

It is evident that further research into the artistic behaviour of the alcoholic is required. The studies mentioned here are primarily descriptive and the interpretation is an adjunct to psychotherapy. Cronin and Werblowsky (1979) provided a new emphasis on the use of art therapy; they indicated that it might be possible to detect signs of organicity which might be otherwise overlooked. There is no published work which focuses on the structural components of the alcoholic's artwork. Thus far, the reports have mentioned the tendency toward perseveration when organicity exists and the tendency to place figures and objects in the center of a blank canvas or paper.

The Perceptual Skills of the Alcoholic

In contrast to the abundance of literature related to the schizophrenic's perceptual ability, the information available on the perceptual characteristics of alcoholics is very limited. Most studies discuss the effects of alcohol on vision or the effects of alcohol on psychological processes and the "perceptual compensations" (Tyson & Gavard, 1976), while an individual is behind the wheel of an automobile or in a traffic situation (e.g., Carpenter, 1963; Colson, 1940; Newman & Fletcher, 1941; Tyson & Gavard,

1976). Various questions accompany these investigations: (1) What happens to response time under the influence of alcohol? (2) Do muscles react differently causing a slower reaction to what the individual sees? (3) Does the driver's reaction time increase because he cannot decide what the appropriate response should be?

Heacock and Wikle (1974), with the help of 8 alcoholic women and 12 alcoholic men, found that there was a significant difference between the placebo and the alcoholic groups; these results indicated that depth perception is altered by even a moderate consumption of alcohol. Heacock and Wikle (1974) postulated that the moderate amounts of alcohol may not affect the individual's ability to react, but the "perception of when to react. It may be that alcohol leads to an inappropriate reaction to stimuli in the environment" (Heacock & Wikle, 1974, p. 268). A misperception of the environment, not an impairment in physical response, may be responsible for the lengthened reaction time of the alcoholic.

In an attempt to differentiate the various types of alcoholics, Fuller, Lunney, and Naylor (1966) investigated the role of perception as a possible discriminator. Alcoholics, according to their results, do not represent a perceptually homogeneous group. "The evidence does suggest subtypes which may best be classified along an intact-deteriorated continuum of perception or possibly as what Witkin describes as 'field-dependent-independent' perception" (Fuller et al., 1966, p. 739). The subject of perceptual field-dependence-independence is an important aspect of

the alcoholic's response to his environment; it is directly related to perceptual response patterns in general and the basic perceptual characteristics of the alcoholic. However, this aspect of the perceptual abilities of the alcoholic is not within the scope of our discussion, in spite of its significance.

There has been an effort to investigate the perception skills of the alcoholic, but the primary focus has been on the relationship between alcohol and the driver's behaviour after consuming various amounts. The reasons for this appear obvious. Perceptual constancy has not been investigated because, as has been mentioned, it is believed that the alcoholic's response behaviour better explains his driving impairment.

SUMMARY

The cognitive style of the schizophrenic and alcoholic was selected as an important subject to address because it was related to the perceptual behaviour of the subjects. Schizophrenics and alcoholics are similar in their cognitive style of perceptual differentiation. Weckowicz and Blewett (1959) formulated the hypothesis that perception is less selective, less analytical, and more <u>global</u> (Underlining mine.) for the schizophrenic than the normal person. Karp and Konstadt (1965) investigated the effect that heavy drinking would have on field-dependence and summarised the

findings of earlier psychological differentiation studies with a description of alcoholics. They "displayed great difficulty in separating perceptual items from their surrounding contexts and also drew pictures of persons which reflected a global (Underlining mine.), rather than sophisticated and articulated concept of the body" (Karp & Konstadt, 1965, p. 412). Kalliopuska (1982) stated that there is "a less developed sense of separate identity in persons with global cognitive style," (Underlining mine.) and this "is manifest in reliance on external sentiment and views of themselves" (p. 963). The schizophrenic and alcoholic may be seen as similar in the fact that they experience poor self-esteem, lack the ability to have a sense of separate identity, and have an inarticulate body concept. An individual with an articulated cognitive style would not have difficulty with these aspects of his personality. (Kalliopuska, 1982, p. 963)

As emphasised by Kalliopuska (1982), the relationship between field-dependence and other personality characteristics has received almost no attention. From the research thus far it may be said that the schizophrenic as well as the alcoholic may be described as having a field-dependent cognitive style as well as what has been described as some similar personality characteristics. Abstinence, according to Karp and Konstadt (1965), does not improve field-dependence, even after an average of 15 months; the abstaining alcoholic was no less field-dependent than the drinking alcoholic. It may also be said, then, that field-dependence is a consistent cognitive style for the alcoholic

and the schizophrenic. Another comparison frequently documented in the research related to schizophrenia and alcoholism is the hallucinatory experiences shared by schizophrenics and alcoholics; auditory hallucinations make a correct diagnosis especially difficult. The common denominator, so to speak, is the fact that both alcoholics and schizophrenics experience auditory hallucinations. Hallucinatory activity is reported by 76% of the individuals diagnosed as schizophrenic and 84% of the individuals diagnosed as alcoholic. (Mott, Small, & Anderson, 1965)

Beyond the similarities documented, there have been numerous differences reported between the schizophrenic and alcoholic. For example, the alcoholic hallucinates at the beginning of his illness, but the schizophrenic hallucinates later in the course of the illness. (Alpert & Silvers, 1970) The alcoholic may hear voices localised in space (outside of body) which appear to emerge from background sounds but are unintelligible (difficult to understand) and are unrelated to his emotional state. The schizophrenic's voices, on the other hand, often come from inside his body, are cognitive in nature (i.e., thoughts), have intelligibility to their messages and sensitive to the emotional state of the individual. (Alpert & Silvers, 1970) Alpert and Silvers (1970) and Deiker and Chambers (1978) disagree about the frequency of the hallucinations; Deiker and Chambers (1978) found no significant difference between their schizophrenic and alcoholic groups in the frequency of hallucinations, but Alpert and Silvers (1970) found that alcoholic subjects more frequently experienced hallucinations than

schizophrenic subjects. Especially important for the purpose of the present research is the fact that the alcoholic's hallucinations are "attention-demanding" (Alpert & Silvers, 1970), and, therefore, it would be difficult to distract the alcoholic from his hallucinations; this is a good reason not to include alcoholic subjects experiencing hallucinations in the experiment. The schizophrenic subjects, on the other hand, are easier to distract from their hallucinations (Alpert & Silvers, 1970), and, therefore, do not present the same problem for the experimenter. The most consistent difference between hallucinations of alcoholics and schizophrenics reported in the research appeared to be the content of the hallucination. Alcoholics most often hallucinate about animals in a negative context, but schizophrenics most often hallucinate about humans, especially interpersonal themes. (Deiker & Chambers, 1978, p. 1838) An alcoholic may have a hallucination consisting of "a burlesque of reality" (Mott et al., 1965, p. 599), but the schizophrenic individual may have "a debate with unknown persons" (Mott et al., 1965, p. 599).

Surawica (1980) noted several differences between schizophrenia and alcoholic hallucinosis, such as onset, age, family history, and any evidence of thought disorder. The assumption here, I believe, was that schizophrenic patients would exhibit a form of thought disorder and alcoholic patients would not reveal symptoms of thought disorder. As the reader will find, the present research suggests that the schizophrenic and alcoholic may both exhibit thought disorder, but the form of thought disorder is

not the same. So, this aspect of Surawica's (1980) work should receive further attention and clarification.

The parallel drawn between alcoholic hallucinosis and schizophrenic hallucinations serves as an example of perceptual experiences shared by these two clinical conditions. Some physicians may speculate that alcohol abuse precipitated the schizophrenic episode and that alcoholism is a problem for many schizophrenics. Freed (1975) felt it necessary to review the sources of information on this subject but admitted that the findings appear inconclusive and contradictory and further research was encouraged. (p. 854)

The research related to the artistic behaviour of the alcoholic is very limited. The studies outlined in this section are primarily descriptive and the interpretation is an adjunct to psychotherapy. A new emphasis on the use of art therapy has been provided by Cronin and Werblowsky (1979); they suggested that it might be possible to detect signs of organicity which might be otherwise overlooked, Unfortunately, there has been no work published which describes the structural components of the alcoholic's artwork; perhaps the present research will fill this void. For now, it may be stated that the artwork of the alcoholic has a tendency toward perseveration when organicity exists and the tendency to place objects and figures in the center of the painting surface.

The information available on the perceptual characteristics of alcoholics is also very limited. The primary focus has been on the relationship between alcohol and the driver's behaviour after consuming various amounts of the

substance. Perceptual constancy, specifically, has not been investigated because it is believed that the alcoholic's response behaviour better explains his impairment.

RESEARCH SIMILAR IN CONTENT AND METHODOLOGY TO THE PRESENT STUDY

It will be necessary at this point to review previous investigations which directly resemble the present research, either in the use of rating scales, the use of judges, statistical analysis, the control of similar extraneous variables, or the experimental findings. These studies have responded to Hodnett's (1973) concluding comments in his discussion of the definition of art therapy. He emphasised the need for research and the need to rely on experimental psychology for assistance in laying the "ground rules." Research could then be reported, both empirical and experimental, and put "into a general pool from which statistical inference can be drawn as the mass of data accumulates" (Hodnett, 1973, p. 118). Art therapists and individuals in training for this profession are directed to this source for clarification of the nature and function of art therapy. This attitude of wanting to combine the "oldest of all man's self-expressive activities...with man's newest discipline-psychology for the service of mankind" is reflected in the studies reviewed here. (Hodnett, 1973, p.

118) Due to the fact that this thesis addresses the need for further development of the field of art therapy, a chronological presentation of findings should provide the reader with a clear understanding of the purpose and contributions of the present research.

The recognition of the necessity for a systematic analysis of the distinguishing characteristics of psychotic artwork is not as recent as might be expected; there has, however, been an increase in the number of supporters for such an approach to psychotic artwork. An initial effort was made by Anastasi and Foley (1941c); they published a survey of the literature on experimental investigations of the artistic behaviour of the abnormal. In a later study, Anastasi and Foley (1944) experimentally investigated the drawing behaviour of patients in mental hospitals, using controlled conditions and a matched group of normal control subjects. Each subject provided the experimenters with four drawings: (1) free-choice, (2) danger, (3) man, and (4) copying "a stylized floral design in six colors" (Anastasi & Foley, 1944, p. 170). The materials used for drawing were standardised for the 340 institutionalized patients (170 males and females) and the 340 normal controls (170 males and females); both groups were matched for age, education, marital status, artistic training, geographical distribution, and national background. (Anastasi & Foley, 1944, p. 170) The patient group, referred to as "abnormals" by

Anastasi and Foley (1944), included numerous clinical classifications. Fifty-one percent were diagnosed as schizophrenic, while those suffering from manic-depressive psychosis, alcoholic psychosis, psychoneuroses, involutional melancholia, and paresis were represented in decreasing frequency. The duration of hospitalization ranged from 1 day to 24 years, averaging approximately 17 months. (Anastasi & Foley, 1944, p. 171) Anastasi and Foley (1944) discussed the "abnormal" subjects in general terms; they did not differentiate schizophrenics from other clinical classifications. However, quantitative analysis of content was dis cussed as well as the time scores and the drawing technique applied by the subjects. It should be recognised that the authors did utilise frequency percentages and a chi-square analysis of a normal-abnormal distribution of drawing features. It is not surprising, however, that the "abnormal" patients more frequently contributed a "fairly heterogeneous group of drawings which can be broadly described as indicating 'unusual perception' of objects." (Anastasi & Foley, 1944, p. 193) The drawing characteristics which most frequently proved to be diagnostic indicators of abnormality included stereotypy of technique or content, "chaotic organization," scribbling, "decorative over-elaboration," and the paintings of "abnormals" more frequently consisted of unrelated objects. (Anastasi & Foley, 1944, p. 172) In the "abnormals'" free-choice drawings, "designs are subdivided into single geometric figures, such as circle, star, or

triangle, as well as more complex or repetitive decorative designs" (Anastasi & Foley, 1944, p. 172).

The authors (Anastasi & Foley, 1944) concluded that in spite of the fact that certain kinds of drawings appear to be diagnostic indicators of abnormality, these drawings are produced by only a small proportion of the institutionalized patients. Anastasi and Foley (1944) relied on frequency statistics, description of content, and drawing behaviour. "The majority of abnormal patients, although showing clearly psychotic behaviour in other respects, produced drawings which were indistinguishable from the normal in subject-matter [sic]" (Anastasi & Foley, 1944, p. 174). This study is, I feel, very significant in that it provided a foundation for further experimental research. Those interested in only one clinical category, such as schizophrenia, would criticise the variety of clinical classifications included in the patient group and the clustering of the heterogeneous subjects under the classification of "abnormal." However, the effort to provide quantitative information and the attempt to control variables, such as artistic skills and training of the artist, provided guidelines for future research. Anastasi and Foley (1944) were interested in the drawing behaviour related to creative activity as well as the final art product; they provided new direction and insights into the empirical and statistical evaluation of this process.

The most obvious questions raised by the Anastasi and Foley (1944) study were, Which clinical group contri-

buted most to the characteristics which were found to be different when compared to the normals and which acted as diagnostic indicators of abnormality? Foltin (1953) responded to these questions with a pilot experiment to become acquainted with methodological procedures. Three factors were recognised as affecting the reliability of chi-square calculations. The first factor was the paintings of the patients; these paintings were collected from the occupational therapy unit and not produced under controlled conditions. As the patient painted, he was surrounded by other artwork on the walls and often painted with another patient; this setting may have created the opportunity for shared ideas and designs. This is not an uncommon source of material for researchers interested in studying schizophrenic art; this variable is an important one. The second factor was the diagnosis of the patient taken from case histories. The information provided by the patient's file is often less than complete; the progress notes are sometimes "extremely scanty" (Foltin, 1953, p. 259). The problem with this situation is that the patient might not suffer the same symptoms at the time of testing as at the time of the last mental examination. And finally, the third factor was the statistical analysis which was based on small samples. The early studies related to schizophrenic art concentrated on the content of the artwork and the artistic behaviour of the artist; the more recent studies have focused on the evaluation of the procedures necessary to acquire accurate information.

A new experiment was designed by Foltin (1953) with a new series of collected paintings. Additional criteria for patient selection were established, such as excluding patients who had recently received electric shock therapy. Paintings were produced in an empty room, and it was not possible for the patient to observe other artists. The choice of what to paint was left up to the subject; the experimenter gave no suggestion of the content, only the location of the painting material. Each patient was required to attend four painting sessions lasting for 1 hour, at weekly intervals. (Foltin, 1953, p. 260)

There were some problems with Foltin's new methodology. Not all of the 42 schizophrenic patients completed the experiment; some patients dropped out because of a lack of sustained interest, reoccurring symptoms requiring complete bed rest, or transference to another facility. (Foltin, 1953, p. 260). Consequently, only twenty schizophrenic patients completed the painting sessions. Also, a graduate assistant and Foltin acted as judges; neither one had any interaction with the patients or knowledge of their names. However, increasing the number of judges and using external judges would have improved the process of evaluation. In addition, the judges used a "trait-sheet" to record painting characteristics, and if they did not agree on a particular characteristic, "no entry was made on the trait-sheet" (Foltin, 1953, p. 261). This method of judging the paintings could distort the results and final conclusions based on the study.

Foltin (1953) reached both positive and negative

conclusions from the results. A negative conclusion was that "not one of the sample painting-trait-symptom or syndrome relations claimed in literature and checked by the author found statistically significant support" (Foltin, 1953, p. 265). Foltin (1953) realised that most of the previous research included females and males in the schizophrenic sample and that his own study included only female subjects. He seriously questioned whether a male group would alter the level of statistical significance. It appeared to him "that claims of painting-personality relations that are not based on statistical tests are apt to be highly unreliable" (Foltin, 1953, p. 265) The positive findings indicated that patients suffering from schizophrenia "show a tendency towards unusual responses in an association test; they are likely to put unrelated items together, and they perform poorly on a test involving the discovery of absurdities...They put together in their paintings unrelated things without noticing the absurdity...use inappropriate objects" (Foltin, 1953, p. 266). In addition to this indication of a dysfunction in the schizophrenic's associative thinking, it is important to note that Foltin (1953) mentioned the use of a base line. Billig (1970), therefore, was not the first to recognise the use of a baseline, but he was the first to claim that it is representative of a degree of ego disintegration in the schizophrenic. (p. 276) The author also commented on the problems raised by generalising the findings beyond the experimental group; he applied his findings only to the white adolescent and adult female psychotics from Virginia

who participated in the study. (Foltin, 1953, p. 267)

Several investigators have conducted factorial studies of aesthetic judgments; the earlier studies are summarised by Pickford (1955) and Valentine (1962). Green and Pickford (1968) asked 42 male and female university students to rate 25 paintings in reference to nine characteristics (e.g., harmony of design and harmony of colour). A 5-point rating scale was used; a 0 indicated the nonexistence of a specific characteristic and a 4 indicated a very noticeable existence of a particular characteristic. The findings suggested "that in the selection of pictures for the Exhibition[1] or for this experiment, or both, there was a bias towards pictures showing more organisation than usually expected of schizophrenic art, or that schizophrenic art is not so fragmented and disintegrated as usually assumed in the accepted clinical view" (Green & Pickford, 1968, p. 894). In Pickford's (1955) previous factorial studies of aesthetic judgments, harmony of design and colouring, as well as emotional expression, tended to be the primary influence on the subject's judgments. "It is just these qualities of organisation which are lacking in their influence on the judges of the schizophrenic paintings in the present experiment" (Green & Pickford, 1968, p. 895). The usual use of harmony of colour and design was replaced by "dynamic effect and expressive distortion," and the authors suggested "that the subjects were less influenced by the

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[1]The Exhibition Room at the Davidson Clinic in Glasgow, Scotland.

organising factors than is usual in judging normal paintings" (Green & Pickford, 1968, p. 895).

It should be emphasised that factorial studies of aesthetic judgments are not considered to be directly relevant to the present experiment, but represent early efforts to investigate aesthetic judgments. It is appropriate to include the above references for two reasons: (1) Factorial studies of aesthetic judgments represent an attempt to evaluate art productions and, therefore, a review of literature related to the evaluation process should present the reader with literature attempting to do the same. An in depth review of the factorial studies of aesthetic judgment is not appropriate for this review of literature, but this particular approach to the evaluation of art should be noted in order to broaden the readers' perspective. (2) The Green and Pickford (1968) study is relevant for this review of literature because it deals with the judge's reaction to his task and the question of fragmentation; both of these factors will be discussed in terms of the present experiment. Other factorial studies, both preceding (e.g., Pickford, 1955) and following the Green and Pickford (1968) study (e.g., Psychology and Visual Aesthetics, Pickford, 1972; Studies in the New Experimental Aesthetics: Steps Toward an Objective Psychology of Aesthetic Appreciation, Berlyne (ed.), 1974; "Measuring Visual Aesthetic Sensitivity: An Alternative Procedure", Smets & Knops, 1976) do not provide background information directly related to the present experiment or contribute to its interpretation.

It is not only the results of experimental studies which require attention, but also the experimental process responsible for the results. In this respect, it is necessary to review and evaluate the judging process incorporated into many studies investigating the characteristics of paintings. Whenever any form of measurement is attempted, two aspects of the measurement should be considered, validity and reliability. The validity of any measuring instrument depends upon the faithfulness with which it measures what it claims to measure. In terms of the measurement of the judging process, the validity refers to the accuracy of the judges' estimates. A measurement is valid when the behaviour that it measures corresponds to the same behaviours as otherwise objectively defined or independently measured. The reliability of a measuring instrument, on the other hand, addresses the question of reliability. When evaluating the reliability of rating paintings, one must look at the consistency with which a particular judge will evaluate a particular painting when assessing and reassessing it at two different judging sessions, or the consistency with which two judges will provide the experimenter with the same evaluation of the same painting. An example of the difference between reliability and validity: If one set a clock forward 30 minutes, assuming the clock is in good condition, then the clock will be reliable or consistent in always telling its owner that it is 30 minutes fast, but the time will not be valid if compared to standard time. This example also indicates that a measurement may be reliable but not valid; an important point to remember.

An experimental approach was used by Ulman and Levy (1975) to evaluate the process of judging psychopathology from paintings. They acknowledged the widespread support for using paintings to assist in psychiatric diagnosis but were alarmed by the lack of appropriate experimental work to test this procedure. To the best of their knowledge, the original publication of this study in 1967 constituted the first forthright test of the ability of judges to diagnose psychopathology from paintings. (Ulman & Levy, 1975, p. 394) The assumption that drawings and paintings contain data related to psychopathological classifications is subject to criticism unless the simple diagnosis of normal versus patient can be made with an acceptable amount of accuracy. (Ulman & Levy, 1975, p. 394) Zierer and Zierer (1956) made the same observation based on several years of research. They stated that the standards for what is to be considered normal art have not been adequately set. (Zierer & Zierer, 1956, p. 481) Consequently, the standardisation of characteristics, which would allow one to differentiate between normal and abnormal art, is not possible. (Zierer & Zierer, 1956, p. 481) For this reason, the Zierers directed their efforts toward the evaluation of normal art.

Ulman and Levy (1975) collected 105 paintings from 105 adults "under reasonably controlled conditions" (p. 394). Fifty-one paintings were produced by acutely ill patients; the majority of these subjects were schizophrenic, but other disorders, such as mental retardation, were also

represented. The remaining paintings were produced by normal subjects taken from the nursing, medical and clerical staff members working at the hospital, vocational rehabilitation clients, and various students related to the health professions. These subjects had no known psychiatric history and matched the patient group in age. An art therapist (one of the authors) collected the paintings after the subjects worked individually, or in groups of two or three, in a room where there were no pictures displayed. If subjects worked in groups, they were situated so that it was very difficult to view the work of others. Every effort was made to give everyone the same directions and to maintain a neutral attitude during the entire experiment. Each artist was given identical materials, including pastel sticks and construction paper. (Ulman & Levy, 1975, p. 394) After the paintings were completed, the art therapist administered a short test; it had been proven that this test provided a reliable evaluation of intellectual functioning at the time of an actual experiment. (Ulman & Levy, 1975, p. 395)

Each painting was photographed in colour and presented as a transparency to the judges. Their task was to identify the artist as being normal or a patient; this judgment was to be based only upon the painting itself. (Ulman & Levy, 1975, p. 394) Ulman and Levy (1975) employed 84 judges in this study. "Of these, 26 were professional mental health workers (including four art therapists); 30 were student mental health workers; and 28 had no mental

health experience. The last-named group included 17 artists and 11 people with no experience in either art or the field of mental health" (Ulman & Levy, 1975, p. 395). The task for the judges involved viewing each transparency for 3 seconds and then entering either a P (patient) or N (normal) in the designated place on the data sheet. The judges were told that adult psychiatric patients, representing various clinical classifications and individuals with no known mental hospital admission were the painters, and they varied in intelligence. A practice set of nine slides was presented to familiarise the judges with the task. (Ulman & Levy, 1975, p. 395)

To evaluate the characteristics of the paintings, they "were divided into three categories according to the correctness with which they were judged: (1) Paintings to which a significant proportion of judges responded correctly beyond chance expectation....With a total of 84 judges, statistical standards demanded at least 55 correct judgments for a painting to be placed in this category. (2) Paintings to which a significant percentage of judges responded with the incorrect diagnosis....(3) Those to which the majority response was not significantly different from chance; the last-named were termed 'ambiguous'" (Ulman & Levy, 1975, p. 397). The results indicated that 21 out of the 48 paintings produced by normals were judged correctly, and 39 out of the 48 paintings produced by patients were correctly identified. (Ulman & Levy, 1975, p. 397) The 60 "correctly judged" paintings "were hung on a wall in two groups, patient and

normal, and each group was arranged in order of the frequency of correct versus incorrect judgments" (Ulman & Levy, 1975, p. 397). This format allowed the experimenters to describe, isolate, and observe the entire range of characteristics. Ulman and Levy (1975) were "impressed with the dramatic disorganization and unrealistic quality at one end of the series as contrasted with the opposite end where we find pictures that are well integrated and, usually, realistic in color, shape, and perspective. Some paintings obviously dictate a judgment of health; others, of illness" (Ulman & Levy, 1975, p. 397).

Another significant observation was the similarity that the paintings showed within each group. Paintings produced by the normal group were primarily landscapes. "The entire page is filled with solidly colored shapes, numerous colors are used, and colors are mixed or blended. Linear and atmospheric perspective are frequently evident" (Ulman & Levy, 1975, p. 398). It seemed as if the normal painters attempted, within the range of their ability, to represent the subject matter realistically. The small proportion of abstractions that they produced revealed "an organized use of the entire available surface" and usually represented real objects whose proportions and shape had been very carefully observed. (Ulman and Levy, 1975, p. 399) The paintings in the patient group tended "to be abstract, contain shapes which are symbolic, often labeled, usually unintegrated with each other and unrelated to the page as a whole" (Ulman & Levy, 1975, p. 399). Those few painters who did attempt to use perspective, did not succeed. "Graphic chaos

prevails" (Ulman & Levy, 1975, p. 399).

Ulman and Levy (1975) made a comparison between the patients' paintings and the work of professional artists, especially those representative of the schools of art such as cubism, expressionism, and surrealism. The characteristics found in patients' paintings are similar to the professional artists' work which may include abstractions and exaggerations of reality and, perhaps, at times are totally nonrepresentational. However, according to Ulman and Levy (1975), "the striking difference seems to lie in the implications of a graphic logic behind the products" (p. 400). The exaggerations, abstractions, and nonrepresentational content of the professional artists' work usually reflects a rather systematic and "well integrated formal structure." (Ulman & Levy, 1975, p. 400) As mentioned previously, and noted by Ulman and Levy, Reitman (1951) recognised and confirmed that the skilled artist provides the viewer with a reorganised interpretation of reality, while psychotic artists seem to provide a disorganised version. (p. 400)

Four questions were used to approach the findings in this study: "(1) How accurately do judges make the diagnosis? (2) Are there characteristics of judges which influence their diagnosis? (3) Are there characteristics of the painters other than mental health or illness which are related to the diagnosis? (4) Are some paintings easier to identify correctly than are others?" (Ulman & Levy, 1975, p. 395) Statistical analysis confirmed the hypothesis that the judges can accurately distinguish, to a significant degree, between psychotic paintings and normal paintings.

Surprisingly, the judges with extensive mental health experience were not significantly more accurate in their assessments than the judges with little or no experience. No effort was made to correlate the amount of art experience with the accuracy of judgment. "A cursory inspection of the judges' records makes it appear unlikely that experience in this area has any more influence on accuracy than has experience in the mental health field" (Ulman & Levy, 1975, p. 396). Thirty-six of the paintings were described as "difficult to judge," and again it was found that the professional background of the judge provided no additional assistance in labelling the painting. (Ulman & Levy, 1975, p. 396).

The art experience and the professional training of the judges do not appear to affect their responses to the paintings. However, the intelligence of the painters showed a strong correlation with the judgments. (Ulman & Levy, 1975, p. 396) There were indications that high intelligence, in conjunction with a painter's artistic talent, may complicate the diagnosis. For instance, one patient had an estimated high intelligence and had studied art; her painting was incorrectly judged as representing the work of a normal painter. (Ulman & Levy, 1975, p. 401) The artistic training and talent of the subjects did not produce significant findings in this study, but they are recognised as important and related variables. Another characteristic which was explored, to see if it in any way influenced the diagnosis, was the sex of the artist. The judges, however, diagnosed the work of female painters and male painters with

the same amount of accuracy. (Ulman & Levy, 1975, p. 397) It can be seen from these findings that intelligence and artistic talent or training should be controlled factors in the experimental design, but the sex of the subjects appears to have no effect on the judges' ability to diagnose the artwork.

This study provided some interesting insights into the judging process and indicated some related variables; these variables may influence the results of this type of investigation. The accuracy of judgment depends on controlling certain contaminating factors. For example, mentally retarded subjects with no psychiatric history were judged to be in the patient group of painters. Also, very intelligent patients tend to be inaccurately diagnosed as being in the normal group. Ulman and Levy (1975), then, have provided further guidelines in terms of the selection of judges and patients. It seems that judges can most successfully identify paintings if they have been produced by individuals with a dull average to bright average level of intelligence. (Ulman & Levy, 1975, p. 401) On the other hand, mental illness in graphic representations is no sooner or more accurately detected by individuals familiar with patient populations. In fact, Ulman and Levy (1975) concluded that some individuals with no knowledge of psychiatry or art are more accurate than others in their judgments. (p. 402)

As stated initially, the purpose of the Ulman and Levy (1975) study was to evaluate the validity of using paintings to identify various aspects of mental illness. These researchers were seriously concerned about the

accuracy of judgments made during the process of evaluation. Therefore, their experiment and results primarily addresssed the question of validity. Unfortunately, the reliability of the judges' rating of paintings received little attention. Interjudge-reliability was not assessed, but some effort was made to address the question of reliability over time.

Approximately a year after the Ulman and Levy (1975) study, six psychiatrists involved in the initial judging process were asked to re-assess the paintings. During the time period between assessing the paintings and re-assessing the paintings, the psychiatrists had the opportunity to do the following: (1) examine the artwork of several patients, (2) discuss some of the art products at conferences, and (3) participate in painting sessions where they discussed the psychological aspects of all the paintings produced, including their own. Ulman and Levy (1975) discovered that the experiences of the six doctors did not influence their ability to judge paintings. "Scores had changed a point or two, but to no significant extent, and the ranking of the six in their ability to judge accurately remained the same" (Ulman & Levy, 1975, p. 396).

Ulman and Levy (1975) focused their attention on the validity of judging paintings and offered the suggestion that the judging process was most efficient when the subjects range from dull average to bright average in intelligence. They concluded that individuals with psychiatric or art training were no better than others in judging the paintings. In addition, their study helped them formulate the conclusion that "research centered on <u>form</u> and its

correlation with personal characteristics may point the way toward greater reliability (Underlining mine.) in the use of paintings for diagnostic purposes" (p. 402). The validity and reliability of the judging process were examined in the Ulman and Levy (1975) study and this aspect of the evaluation deserves recognition. However, the attention given to validity still greatly outweighed the attention given to reliaiblity; reliability should have received a greater amount of consideration. Theoretically this claim is justified, but the practical aspect of re-assessment by the same judges presents a rather difficult obstacle, especially if there is a large number of judges or paintings. On the one hand, it may be said that a large number of subjects increases the validity of the study, but, on the other hand, this very factor makes it very difficult to re-assess the data and establish the reliability of the measuring instrument.

The work of Pereira (1972)[1] has been reviewed previously in reference to the pathology of attention and the theory of interference. In his earlier studies (1963, 1966, 1966a, 1967, 1968), Pereira presented the patient with standard material[2] but suggested no theme. Volmat (1955) and

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[1]Pereira's research was brought to my attention when he presented this summary of his work at the Seventh International Congress of Psychopathology of Expression (Boston, 1973).

[2]Standard materials for painting would include paper, paint, and brushes; these materials would be the same for all individuals involved in the painting task.

his collaborators in the 1950's had initiated the first extensive investigation of the subject's experimental productions using this technique. (Pereira, 1972, p. 104) Quantitative rating scales were developed to establish a scoring procedure for drawing and painting analysis, in Pereira's earlier studies. Pereira (1972) noted that the steps that he followed to develop the rating scales were "influenced by the notion of the coordinates of plastic representation (space, time, movement, and color), by the classical studies on psychopathological art, and mainly by Billig's descriptions of the degrees of regression in space and movement" (Pereira, 1972, p. 119). In spite of the fact that Pereira's rating scales incorporated certain aspects of Billig's regression hypothesis, he felt it necessary to state that Billig's "theoretical speculations" did not influence his theoretical or experimental approach. (Pereira, 1972, p. 119)

The quantitative rating scales (Pereira, 1963, 1966) evaluated the picture in terms of space, colour, and movement with a 5-point numerical value attached to each category. Ratings for the representations of space included the following:

	Score
Undefined (monochromatic blot)----------	0
Bidimensional (painting or drawing or organized element or elements without the following condition)----------	1
Transition by the use of a base-line or figure-background opposition----------	2
Tridimensional, with sketched perspective only (without the following condition)------	3
Perspective, with use of shade----------	4

(Pereira, 1972, p. 124) (Underlining mine.)

It is possible to detect the influence of Billig's classification system, in such concepts as undefined splotches, base line, and perspective with the use of shade or shadows.

The findings of Pereira's earlier studies (1963, 1966a, 1966b) revealed that "there is no simple style peculiar of schizophrenia, and that only six of the classical 'signs' allow for a reliable differential diagnosis" (Pereira, 1972, p. 104). The six "signs" considered to be significantly more evident in schizophrenic drawings, as opposed to normal drawings, were fragmentation, stereotypy, iteration, geometrism, symbolism, and framing; fragmentation was the most reliable diagnostic feature. (Pereira, 1972, p. 26) Pereira's (1972) doctoral dissertation extended his previous studies by further investigating the relationship between attention, major set, and fragmentation in the schizophrenic's graphic representations. An appropriate selection of graphic tasks introduced a problem for Pereira in testing the interference theory.[1] The solution should require the maintenance of a major set as "solution-

[1]A description of Pereira's interference theory may be found on pages 164-166.

irrelevant materials to function as distractors" and "the integration of visual materials" (Pereira, 1972, p. 61). Also, the tasks must be structured enough to make reliable rating feasible. At the same time verbal communication must be considered. The tasks must not be as complex as projective techniques, nor so simple that a discrimination process is impossible. The reason for this is that Pereira (1972) was essentially concerned with the process involved in graphic representation, as opposed to the content. (p. 61) The final selection of appropriate graphic tasks included completion drawings and puzzles.

A pilot study was carried out, and 14 nonparanoid chronic schizophrenics and 16 normal controls (all male) were matched for education, age, and socio-economic position. A preliminary form of the face puzzle,[1] found to be too difficult and frustrating for schizophrenics, and the Healy Pictorial Completion Test II[2] were the tasks given to all pilot subjects. In the pilot study (as well as Experimental Study II), the "subjects were presented with differently-shaped cuttings which followed the main outlines or included the eyes, ears, nose, hair pieces, etc. The origi nal drawings (three different perspectives of a man's face) were not shown and the subjects were only told that they would be able to reconstruct one face. They were also told that some of the pieces would have to be discarded"

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[1]For a more detailed description of these tests and scoring methods, the reader may consult Pereira (1972).

[2]For a more detailed description of these tests and the scoring methods, the reader may consult Pereira (1972).

(Periera, 1972, p. 140). When the Healy Pictorial Completion Test II (landscape with water) is presented to the subject it is an incomplete picture, and the task is to complete the picture by drawing the three missing elements (a house, a man, and a dog). These three elements "are reflected in the river, but are not represented in the landscape per se" (Pereira, 1972, p. 137). After the experimenter informs the subject of the three missing elements, he is asked "to draw them in so that when it is all finished, the picture makes sense" (Pereira, 1972, p. 137).

The face puzzle was used "to test the intrusion of task-irrelevant details and to pinpoint the locus of interference relative to the structure of the incomplete composition" (Pereira, 1972, p. 66). The results of the pilot study revealed that the normal controls demonstrated more integration[1] than the nonparanoid schizohrenics, and the controls did not show any indications of interference (displacements, additions, and "worsening corrections"). Pereira, 1972, p. 65) "Task-irrelevant details appeared predominately in the non-structured [sic] area of the patient's productions" (Pereira, 1972, p. 67). The fact that nonparanoid schizophrenics failed to correct their previous errors and that the normal controls did correct errors was discovered by judging the performance on the Healy Picture Completion Test II and the obvious use of their eraser.

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[1]Pereira (1972) measured integration and interference in the following way: "Absences of 'omissions' and 'improving corrections' are indices of integration; 'additions,' 'displacements,' and 'worsening corrections' indices of interference" (p. 65).

(Pereira, 1972, p. 67)

Pereira's dissertation (1972) included two experimental studies: Study I investigated the performance of paranoid and nonparanoid schizophrenics under two conditions, normal and impaired attention, while involved in a drawing task; Study II involved normal participants only and the results were compared with the performance of the schizophrenic group. As far as I know, this is the first attempt to alter the cognitive condition, attention, of normal subjects and compare their performance with schizophrenics. Normal participants are usually selected to provide a basis for evaluating the extent of the deviation found in the behaviour of the psychiatric group; they are not expected to "provide" a cognitive condition similar to that of the schizophrenic group.

In Experimental Study I, 14 nonparanoid schizophrenic patients and 14 paranoid patients were compared in their performance on the following four tests: Picture Completion I (window view)[1], Picture Completion II (landscape and water)[2], the face puzzle[3], and the Stroop Color-Word Test[4] (Stroop, 1935) to measure "the vulnerability of selective attention to interference" (Pereira, 1972, p. 68).

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[1]For a description of the Picture Completion Test I (window view), the reader may refer to page 173.

[2]For a description of the Picture Completion Test II (landscape and water), the reader may refer to page 239.

[3]For a more detailed description of this test and the scoring method, the reader may consult Pereira (1972).

[4]For a description of the Stroop Color-Word Test, the reader may refer to page 167.

For the face puzzle, the "subjects were presented with square pieces, cut from three different drawings of a man's face in three different perspectives, and mounted on cardboard" (Pereira, 1972, p. 140). Subjects are presented with the pieces and with a mounting of the three original drawings...of equal size. Patients are told which face they can reconstruct and that the other two cannot be reconstructed" (Pereira, 1972, p. 140). The version of the face puzzle used in the pilot study was found to be too difficult for the schizophrenic subjects as well as the normal controls. (Pereira, 1972, p. 140)

The independent variables for Experimental Study I were: (1) "interference proneness", (2) drug dosage-phenothiazine therapy, (3) length of time in the hospital, and (4) social competence-premorbid. The dependent variables were: "(1) addition of task-irrelevant details, (2) displacement of elements, (3) omission of task-relevant details in the three tasks, and (4) time necessary to complete the three tests" (Pereira, 1972, p. 82). Pereira (1972) devised elaborate criteria for the selection of patients; these criteria included age, sex education, chemotherapy experience, and the American Psychiatric Association classifications for the schizophrenic syndrome. (Pereira, 1972, pp. 72-73) The application of the test material allowed Pereira to apply several chi-square tests and canonical correlations with numerous tables illustrating the results. In terms of integration, the nonparanoid group revealed a significantly "lower ability to integrate the elements of the three tasks than the paranoid group"

(Pereira, 1972, p. 79). The interference performances of the paranoid and nonparanoid groups were very different in the three tasks in terms of task-irrelevant additions. (Pereira, 1972, p. 79) "All non-paranoid [sic] patients added irrelevant details in all tasks. Only six paranoid patients produced any such additions" with a significant difference at .05 level of confidence. (Pereira, 1972, p. 79) As predicted, the unstructured section of the Picture Completion I (window view) was the most frequent area for the inclusion of details irrelevant to the task; Wilcoxon matched-pairs, signed-ranks tests for both the paranoid and nonparanoid groups were significant at .01 level of confidence. (Pereira, 1972, p. 80) The two groups of schizophrenics, then, performed differently and their productions were also different. As hypothesized, "addition of solution-irrelevant details is significantly more frequent in the non-paranoid [sic] group, and the mean Stroop test score[1] of this group is close to double the mean Stroop test score of the paranoid group" (Pereira, 1972, p. 90).

The initial canonical correlation for the nonparanoid group indicated the following: "94% of the variance of irrelevant additions is accounted for by the correlation between the vulnerability for selective attention to interference and addition of solution-irrelevant elements" (Pereira, 1972, p. 90). This simple correlation was not

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[1]The Stroop test score indicates the response time of the subject; the measure of interference is provided "by the difference in the time it takes to read the sheet with words and the sheet with crosses" (Jensen, 1965, cited in Pereira, 1972, p. 147).

evident in the paranoid group of subjects. The canonical correlation indicated the following: "79% of the variance of irrelevant additions is accounted for by the relation of the drug dosage and the vulnerability of selective attention to interference to the number of additions of solution-irrelevant elements" (Pereira, 1972, p. 91). According to Pereira (1972), this statistical evidence indicates that the medication given to the subjects may account for a difference in task performance.

This particular portion of Pereira's work is very significant because he is the first researcher to actively explore the possible effects of drug dosage on the patient's painting behaviour. The interpretation of the influence of drug dosage on the findings is to some extent ambiguous due to the fact that it can occur in various ways. Drug therapy may affect production directly, and drug dosage is also to a great extent correlated with the disorganisation of the patient. "The more intense the symptomatology, the higher the level of dosage of phenothiazines the patient is likely to receive....This is particularly true of the paranoid patients whose symptomatology is often experienced as especially disturbed" by the staff at the hospital. (Pereira, 1972, p. 91) However ambiguous the interpretation of this variable may be, Pereira (1972) noted many high correlations related to drug dosage. (Pereira, 1972, p. 92) He noted that the vast majority of studies disregard the chemotherapy variable, and he noted the need for further discussion and research related to this specific experimental variable. He did not, however, offer any practical solutions to this

methodological problem.

Experimental Study II tested the following hypothesis: "Alterations of graphic representation similar to the ones seen in the productions of schizophrenic patients are primarily due to disturbances of attention, even in the absence of any given psychopathology" (Pereira, 1972, p. 93). Indeed, this is not a common approach to studying psychopathology, attempting to prove that schizophrenics do not differ from normals when placed under the same experimental conditions.

An experimental group of 11 subjects and a control group of 10 subjects, undergraduate and graduate students, were selected for this study. The control group was involved in two testing sessons; the control condition was a normal sleep cycle. The experimental group underwent a mild sleep deprivation condition and was tested twice. It was postulated "that mild sleep deprivation would disturb the subjects' patterns of attention as measured by the Stroop test" (Pereira, 1972, p. 93).

Pereira (1972) discussed the effects of sleep deprivation and provided statistical support for his findings. Sleep deprivation did increase the score on the Stroop test, "additions of solution-irrelevant details and omissions of solution-relevant details; and it produced worsening of previous solutions in the Healy Picture Completion II. In this study no relation of additions and omissions to the structural constraints was found" (Pereira, 1972, p. 101). The findings, then, from Experimental Study II supported the hypothesis that "alterations of attention do induce alter-

ations of graphic representation similar to the ones of schizophrenic patients" (Pereira, 1972, p. 102). The experiment, however, did not support the prediction that task-relevant omissions and irrelevant additions would be most likely to occur in the unstructured areas of the tests. (Pereira, 1972, p. 102)

According to Pereira (1972), one of the reasons for this approach to studying psychopathology and expression is to provide an alternative to psychoanalysis. (Pereira, 1972, p. 106) The schizophrenic's artwork indicates both a problem in representation and a deficit in psychological functioning. This cognitive theory of interference was formulated to explain fragmentation as the result of disturbances in selective attention and the failure to maintain a major set. These same alterations may occur in the graphic representations of normal subjects under sleep deprivation conditions. Pereira's (1972) work has provided a new framework of concepts. However, the small size of the subject groups indicates that there is a need for replication of his findings. Pereira (1972) also made some interesting suggestions for further applications of his theory. For example, young children lack the ability to concentrate on the task at hand, and perhaps this cognitive similarity is responsible for graphic characteristics which are similar to those of the schizophrenic artists (e.g., scribbling, the use of shapes, and placement of objects).[1]

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[1]Personal style describes the way a child draws the basic scribbles, designs, shapes, and pictorials which are universal. Other factors, such as eye attention and muscle

Like Pereira (1972), Wadlington and McWhinnie (1973) emphasised the need to move away from the tendency to theoretical speculation and approach art from a statistical standpoint. "We shall attempt to avoid the possible conflict of using an unacceptable or unverifiable psychological framework (i.e., Freud and psychoanalysis, Kris and ego psychology, Reitman and Arnheim and Gestalt psychology) to justify assumptions about psychotic art. We wish instead, to view art products simply as the tangible record of some particular set of behaviors undertaken by their respective creators. This scheme of organisation is, we believe, sufficiently general to be accepted by a wide range of investigators using diverse methods and theoretical bases" (Wadlington & McWhinnie, 1973, pp. 201-202). It is necessary to recognise this attitude and the new experimental directions related to it but, at the same time, the authors noted that the theoretical interpretations of Freud and Jung, for example, are not invalidated by statistics but that statistics merely "subject their hypotheses to the criteria of statistical proof" (Wadlington & McWhinnie, 1973, p. 202). Wadlington and McWhinnie (1973) clearly indicated that they intended to eliminate a number of criticisms of previous interpretations of art by relying on statistical evidence. (p. 202)

Wadlington and McWhinnie (1973) claimed to be inno-

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pressure as well as the child's attention span "determines whether his execution of a line formation is bold or subtle, simple or intricate, large or small" (Kellogg, 1970, p. 52).

vators in their operational procedure. (p. 202) They noted that the literature on psychotic art approaches the material from a philosophical and psychological perspective, but no previous author has followed one philosophical theory consistently. "The precise, logical formulations of aestheticians have been sacrificed for a body of largely interpretative statements which relate to the philosophy of aesthetics in only a secondary and inconsistent manner" (Wadlington & McWhinnie, 1973, p. 202). The authors selected Monroe Beardsley (Beardsley, 1958) as their aesthetic philosopher with the intention of using his writings as a consistent reference on which to base their assumptions. Wadlington and McWhinnie (1973) clearly stated the reasons for this selection and their intentions; they made the decision to employ "a particular scheme of organization only as a source of reference for a clear terminology" (Wadlington & McWhinnie, 1973, p. 202). There is no question that the primary purpose for this work was "to make descriptive statements about particular examples of psychotic art, and to suggest an efficient, meaningful manner in which this task can be carried out" (Wadlington & McWhinnie, 1973, p. 202). Consequently, Beardsley's differentiations and formulations related to psychotic art were employed as a reference for definitions and clarification of terms. According to Wadlington and McWhinnie (1973), a study of psychotic art has never before utilised or applied an operational procedure consistently. (p. 202)

The experimental purpose of this study was to apply the distinctions made by Beardsley to the formulation of a

rating scale. This scale could, of course, be used to evaluate all types of artwork, but it was specifically constructed to judge psychotic art. (Wadlington & McWhinnie, 1973, p. 203) Beardsley's "categories of critical description of form" were used in the 5-point scale; it consisted of 18 questions concerning the formal characteristics of the paintings. The four judges assigned the appropriate numerical value (0-5) to each question attached to the painting. The judges did not have any knowledge of the method, experimental group, or subject of the experiment; they also had no previous experience with psychotic act. Wadlington and McWhinnie (1973) also considered the artists' age, sex, clinical category, and length of hospitalzation; these four factors were correlated with the ratings for the paintings. Thirty-three paintings were collected by the art therapist for evaluation. (Wadlington & McWhinnie, 1973, p. 203)

Three methods of analysis were applied to the data. A variance analysis was used to evaluate the judges' pooled ratings on the 18 questions. The within-cells correlations for the 18 questons on each of the four factors was determined by a correlational analysis. The inter-judge reliability was tested by Hottling's T-Square Test. Wadlington and McWhinnie (1973) provided numerous tables to illustrate and describe their statistical findings.

The Wadlington and McWhinnie (1973) study reflected a new approach; the primary concern of the study was to evaluate the effectiveness and applicability of methodology, and the results were a secondary concern. Considering the

four factors correlated with the judges' ratings, sex was discovered not to be significantly correlated. Age factors, on the other hand, were shown to be significant; "the subjects in [the] older age groups consistently obtained higher ratings on several variables" (Wadlington & McWhinnie, 1973, p. 204). The data indicated that the following aesthetic variables increase with age: dominance of value, hue, chroma, and brightness. (Wadlington & McWhinnie, 1973, p. 204) The most significant finding related to the clinical category was that "members of the psychotic depressive group scored high ratings on hue dominance" (Wadlington & McWhinnie, 1973, p. 204). Also significant was the length of hospitalization; "the group which was institutionalized for the longest period of time was rated significantly higher on the hue dominance factor" (Wadlington & McWhinnie, 1973, p. 204). The rating scale and results focused on colour-related factors and not on structural components. However, another scale was developed to evaluate the form of psychotic paintings, and the authors intended to use it in future research. (Wadlington & McWhinnie, 1973, p. 204)

The conclusion of the Wadlington and McWhinnie (1973) study was that judges could be trained to evaluate formal elements of paintings and "that certain aesthetic factors are related to specific psychological categories of the artists" (p. 204). The authors admitted that it was not easy to extract specific conclusions from the diverse information accumulated. The suggestion for future research was to limit the rating scale to a minimum of factors (e.g., colour) as well as following new experimental procedures

(e.g., comparing obtained results with results of studies dealing with children's art); this might simplify the experimental task. Wadlington and McWhinnie (1973) attempted to cover too many variables, and they felt that the selection and training of judges presented so many potential problems that further investigations would require the use of laboratory computers to measure the variables. (p. 204) Furthermore, a consideration of the rating scale indicated several problems. "Both the form and length of the instrument were obstacles to the efficiency of the judges' ratings" (Wadlington & McWhinnie, 1973, p. 204). In addition, the operational procedure did not enhance the effectiveness of the terminology, but, instead, the judges and the experimenter reported "semantic difficulties." These criticisms led to the formulation of a <u>new</u> rating scale which encompassed only those factors related to hue, chroma, value, and colour tonality.[1] Applying a consistent operational procedure did not prove to be effective, so, therefore, Beardsley's descriptions were not employed exclusively. To formulate a new rating scale, the authors used information acquired from the administration of the previous rating scale. (Wadlington & McWhinnie, 1973, p. 204)

The Wadlington and McWhinnie (1973) study is not necessarily overwhelming in its procedures or findings. However, the emphasis placed on the process of defining and

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[1]For example, the 5-point rating scale included the following distinctions: (1) value--light to dark, (2) hue--red, yellow, green, blue, only black and white, (3) chroma--dull to bright, and (4) colour tonality--clashing to harmonious. (Wadlington & McWhinnie, 1973, p. 218)

developing an effective tool for measurement indicated that attitudes previously reserved for the measureable sciences are now being introduced into the field of psychopathology and creative expression. The hierarchy of concerns consists of developing experimental measuring and evaluating instruments and then significant results related to the application of these tools; this approach reflects the beginning of a science and the focus of the present research.

The seriousness of methodological problems, especially the lack of data concerning the acute schizophrenic patient prompted Langevin and Hutchins (1973) to conclude that the literature has not yet told us if there is any real distinction between the paintings of the "abnormal" and normal.[1] (p. 537) The Langevin and Huchins (1973) study is a replication, in part, of the Levy and Ulman (1967) study and also an extension of that study. (p. 538)

A group of 31 patients diagnosed as schizophrenic were compared with 19 college and art students. The patients' and students' intelligence test scores and previous art experience were recorded. Most of the schizophrenics had a history of prior hospital admissions (13 schizophrenics were presently having delusions, 8 were hallucinating, and 2 were experiencing both). Every effort was made to ensure that there were no patients with organic brain disease; this was considered to be a possible explanation for the mislabelling of the paintings in the Levy and

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[1]Langevin and Hutchins (1973) appear to have made this statement after considering only the Anastasi and Foley review of literature.

Ulman (1967) study (the paintings produced by the low IQ subjects were labelled as "abnormal"). It is possible that the low IQ subjects might have had an organic brain disease, and their paintings might have been interpreted as the disorganised paintings of the schizophrenic patients. (Langevin & Hutchins, 1973, p. 538) In addition, while Levy and Ulman (1967) collected only one painting from each subject, Langevin and Hutchins (1973) collected four paintings; the purpose was to evaluate "the consistency of judges' ratings from painting to painting with Ss" (Langevin & Hutchins, 1973, p. 538). The four paintings requested by the experimenters were: (1) a free-choice (2) human content, (3) squiggle, and "make it into some recognizable form," and (4) a painting to reflect how the subject felt on that day. The participants painted in groups of three to ten people and were given 1 to 2 hours to complete the painting task. (Langevin & Hutchins, 1973, p. 538)

The authors discussed the reasoning behind the four specific painting topics. A free-choice painting provided a task similar to that found in art therapy. The human content painting, not only focused on a topic related to the schizophrenic's problem with people and interaction, but the analysis of human content drawings has been well developed and documented with the Draw-A-Person Test. Therefore, it would be helpful to examine the possibility that human content drawings offer greater diagnostic assistance than other paintings. The third subject, the squiggle, "was expected to involve organizational ability, concentration, and problem solving in order to make an acceptable form from a ran-

dom line" (Langevin & Hutchins, 1973, p. 538). This task was expected to reflect additional deficits in schizophrenics, but, also, it involved artistic ability and intelligence. The final painting, which was to reflect how the subject was feeling, provided a general technique for eliciting negative affect from the schizophrenic group and positive affect from the student group. The experimental assumption was that "many formal characteristics of painting relate to affect, and for this painting, judges should have content as well as formal features to direct their judgments" (Langevin & Hutchins, 1973, p. 538). Each painting, then, was to provide the experimenter with specific information.

A series of behavioural measures and personality tests was given to each subject, in addition to the paintings. Langevin and Hutchins (1973) selected the Shipley Hartford Aptitude Test as a short form of intelligence test. Art experience was varied in two control groups; one group consisted of art students with extensive art experience and the other group consisted of education students with little art experience. A further measure was taken by asking all participants about previous art experience (other than the required school art classes). Ratings were assigned as follows: "(a) no experience other than the usual public and high school courses (1); (b) some experience other than (a) in the form of painting or sculpting as a hobby (2); (c) considerable interest in painting or sculpting as a hobby as well as some courses in art (2.5); (d) enrolled in a full time art course at college level (3)" (Langevin & Hutchins,

1973, p. 539). This rating scale is the most detailed measure of art experience in the related literature, and this is the first study to collect such extensive information about previous art experience.

Fourteen judges were asked to view 200 paintings in the form of transparencies. The judges comprised 11 occupational therapists, 1 psychiatrist, 1 nurse, and 1 psychologist; all were familiar with the artwork of schizophrenics. Three questions accompanied each transparency:

1. Was the painting done by schizophrenic or a normal person?

2. How confident are you of that decision?

1	2	3	4	5
very uncertain		midpoint		very certain

Record a number corresponding to your rating.

3. Briefly, why do you think the painting was done by a schizrophrenic (or normal) person?

Record your answer on tape; take as long as you wish. Change the slide as you are ready.

(Langevin & Hutchins, 1973, p. 539)

The judges were given no information about the subjects except that they were males and females between 18 and 30 years old. (Langevin & Hutchins, 1973, p. 539)

Langevin and Hutchins (1973) provided a thorough statistical analysis of the following: (a) agreement of the judges on schizophrenic versus normal painters, (b) confidence of judges in their ratings, (c) judges' ratings on

the four paintings of schizophrenics versus normals, (d) a within subjects comparison of the four paintings, (e) intelligence scores and art experience of schizophrenics and normals, (f) the relationship of intelligence and art experience to judges' correct categorization of paintings, (g) characteristics of all painters (schizophrenic and normal) believed to be schizophrenic by the judges, and (h) the relationship between hallucinations and the judges' identification of schizophrenics. (Langevin & Hutchins, 1973, pp. 541-542)

Langevin and Hutchins (1973) applied Light's (1971) G statistic to the nominal data. They explained that "the G statistic allows comparison of several raters' responses with a 'standard' and determines whether raters' agreement is significantly greater than chance. G is distributed as the normal variate and therefore may be read like a Z score" (Langevin & Hutchins, 1973, p. 539). The value of G for their data was found to be highly significant ($p<.001$), and, therefore, "agreement of the judges with a priori categorization was not random" (Langevin & Hutchins, 1973, p. 539).

In addition, the category assignments were evaluated, and the results were rather encouraging. The judges correctly assigned 35.92 paintings produced by normal subjects, while the researchers expected a mean of 25.93. For the patient group, the mean number of correct assignments was 91.69, while the expected mean was 81.70. "For 11 of the 13 judges, observed values were greater than expected values, indicating greater than chance correct assignments to normal and schizophrenic categories. Two judges produced

observed values approximately equal to expected values. The total mean percent correct assignments was 63.80 with an expected value of 53.81" (Langevin & Hutchins, 1973, p. 539). In terms of reliability and validity, it may be stated that the agreement between judges was more than random, but the number of accurate assignments beyond chance was small (9.99%). Langevin and Hutchins (1973) concluded that their results were "comparate to Levy and Ulman's (1967)" (p. 539).

Langevin and Hutchins (1973) also evaluated the judges' confidence in their ratings. There would not be a significant positive relationship between the degree of the judges' confidence in their ratings and the proportion of accurate assignments if the judges were guessing at random during the evaluation process. If, however, the judges were using a criteria which was "reliably identifiable from painting to painting", then the proportion of accurate assignments and the degree of the judges' confidence should reflect a positive relationship. The results of the Langevin and Hutchins (1973) study found the accuracy and confidence factors to be positively related.

A two way analysis of variance was used by Langevin and Hutchins (1973) to examine the proportion of accurate assignments at the 5 confidence intervals, 5 confidence rating points X 13 judges. The results for the ratings were $F=4.377$ $\underline{df}=4$, $\underline{p}<.01$. "The mean proportion correct increased across the ratings from 'very uncertain' (1) to 'very certain' (5). However, a Newman Keuls test (Winer, 1962, p. 80) showed that only the last rating (very certain)

was significantly different from the other four ratings. Nine of the 13 judges showed this latter pattern but only five showed a consistent increase in proportion correct as confidence increased across the five ratings" (Langevin & Hutchins, 1973, p. 540).

To explore the question, Is there any difference between the four types of paintings in terms of the difficulty in categorizing? The researchers employed a 13X4X3 analysis of variance which represented all of the judges, the four types of paintings, and the subjects (schizophrenics, art students, and education students). "The $\log_{10}$ transformation was used to reduce inhomogeneity of variance created by use of proportions and unequal Ns in the cells. In this analysis, it was also important to take into account the number of assignments to schizophrenic and normal categories by each judge, to estimate the number of correct assignments expected by chance. Therefore, the $\log_{10}$ (proportion correct observed minus proportion correct expected) was used in the analysis of variance.

Significant effects from the analysis were further examined by Newman Keuls tests" (Langevin & Hutchins, 1973, p. 540).

For the three groups of subjects, there was no significant difference ($F=1.63$, $df=2, 132$, $p>.05$), but the results did indicate a significant painting effect ($F=6.49$, $df=3, 132$, $p<.01$). The judges, according to a Newman Keuls test, correctly assigned the paintings in this order: (1) human content paintings, (2) free paintings, (3) the squiggle, and (4) feeling paintings. It was noted, however,

that "there is considerable overlap of the mean and the differences are not clear cut" (Langevin & Hutchins, 1973, p. 540). The education students produced human content paintings which received high scores and this factor attributed to the significant painting X group interaction. So, in spite of the fact that there were no significant differences in scores for the three groups of subjects, Langevin and Hutchins (1973) concluded that the human content paintings seemed to provide the most information about the subject. (p. 540)

An additional aspect of reliability was examined when the researchers compared the four types of paintings within subjects. The proportion of accurate assignments by the 13 judges for each subject's paintings were calculated. "The four scores for each S were intercorrelated and the values ranged from $\underline{r}$=.2673 for paintings 1 (free painting) and 3 (squiggle) to $\underline{r}$=.5424 for paintings 3 (squiggle) and 4 (how you feel)" (Langevin & Hutchins, 1973, p. 540). Given these results, the conclusion had to be as follows: "There is very low reliability between paintings in judging painters as schizophrenic or normal" (Langevin & Hutchins, 1973, p. 540).

Overall, the results indicated that in this study the judges differentiated the schizophrenic from the normal paintings correctly "on a greater than chance basis" (Langevin & Hutchins, 1973, p. 542). Unfortunately, the results further indicated that there "is considerable error

in their judgments, and their consistency from one S's painting to his other productions is low" (Langevin & Hutchins, 1973, p. 542). If one were to look at these results and those of Levy and Ulman (1967), where it was found that experience had little influence on the accuracy of judgments, the suggestion is that the task of judging paintings requires "refining" (Langevin & Hutchins, 1973, p. 542). The human content painting was most often judged correctly; perhaps several human content paintings would improve the success rate. (Langevin & Hutchins, 1973, p. 542) Furthermore, the findings pointed to the fact that judgments were influenced by the painter's art experience. (Langevin & Hutchins, 1973, p. 542) It is possible for judges to differentiate between schizophrenic and normal paintings; but the judging process has not been adequately developed and should not be considered an independent diagnostic tool. (Langevin & Hutchins, 1973, p. 542)

Generally, the relationship of art experience and intelligence to correct categorization was inconsistent. The authors carefully reviewed each of the four paintings and the relationship of intelligence and painting scores. In the end, Langevin and Hutchins (1973) found that, in general, the relationship of intelligence to the assignment of the subject to the schizophrenic category, as well as the correct assignment of the painters, did not support the findings of Levy and Ulman (1967). (pp. 542-543)

The Langevin and Hutchins (1973) study along with the Levy and Ulman (1967) study represent the most serious systematic attempts to evaluate the use of judges' ratings.

In the process, both studies have discovered the difficulties related to such an attempt. Levy and Ulman (1967) found intelligence to be a factor, but they also had to recognise the fact that the subjects with low intelligence might have been suffering from an organic brain disorder. Langevin and Hutchins (1973) replicated and extended the Levy and Ulman (1967) study and found intelligence not to be as much a factor as art experience. Langevin and Hutchins (1973) offered critical comments about their study and admitted that there were factors which may have confounded the judging process. For example, the condition of the patient was not assessed in their study; the patient may have been experiencing acute symptoms when one painting was produced and near discharge when the last painting was produced. They commented on their study by saying that the results were weaker than they had anticipated, but the judges, nevertheless, "were identifying paintings according to some criteria and perhaps an examination of these criteria or of formal aspects of painting, will serve to better evaluate the use of painting as a diagnostic aid" (p. 543).

In 1975, Langevin, Raine, Day, and Waxer recognised the long history of interest in the artwork of the abnormal, but, again, the obvious absence of experimental studies was mentioned. Specifically, the authors pointed out two factors which significantly influence the interpretation of paintings but which have usually been overlooked. First of all, the reader is rarely informed of the intelligence or art experience of the painters in the experimental group. It

is noted that in the two experimental studies available which evaluated judges' ratings of abnormal and normal paintings (i.e., Langevin & Hutchins, 1973; Levy & Ulman, 1967), art experience and intelligence biased the findings. (Langevin et al., 1975, p. 149) As one might expect, if the artist was experienced in art and more intelligent than the members of the normal control group, it was more likely that his painting would be rated as normal. (Langevin et al., 1975, p. 149) "It appears that art experience especially shows through in the overall organization and aesthetic quality of the picture" (Langevin et al., 1975, p. 149). So, this factor must be considered in studying and interpreting the artwork of any individual, but it must be considered very carefully when comparing groups of individuals. The second significant consideration to be made when study ing paintings is the reliability attached to the rating. "Often it is difficult to know from case reports to what degree the painting per se is a significant factor in the interpretation offered" (p. 151). From the experience of Langevin and his colleagues, "listening to what a psychotic person says while he is painting is as valuable, if not more valuable, than the painting he produces" (p. 151). If the experimenter attempts to examine the painting without having any knowledge of the artist, "considerations of color, form, organization, etc. are often unreliable" (Langevin et al., 1975, p. 151). Perhaps this problem is due to the fact that some descriptive terms, such as form, have more than one meaning, and all the judges may not apply the same definition during the evaluation process. Langevin et al., (1975)

claimed that inter-judge reliability ratings are not often reported, so the readers "do not know even if the raters within a single study were referring to the same formal features in their judgments" (p. 151).

Two studies were designed to investigate "the detailed surface characteristics" of paintings. The art experience of the painters was assessed by the following criteria: (1) no art experience other than in school, (2) some art experience in addition to school, and (3) a college level art course (involved in or completed). Intelligence scores were assessed by a series of behavioural measures and personality tests; the WAIS was too extensive, so the Shipley-Hartford Aptitude Test was used. (Langevin et al., 1975, p. 156)

The first study[1] involved 31 schizophrenics and 19 normals; each subject completed four paintings: (1) free-choice, (2) squiggle, (3) human content, and (4) an expression of how the subject was feeling. (Langevin et al., 1975, p. 153) Two judges with knowledge of art and experience as artists rated these paintings; they used 144 terms, each of which had a written definition and was also accompanied by a visual illustration. After a factor analysis, the findings indicated that "the patients produced paintings of lower aesthetic quality or technical excellence. The paintings

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[1]This study is an extension of the Langevin and Hutchins (1973) study; there is no indication that the patient and student groups are the same groups used in the previous study.

had less shape variation, detail, depth, tension, unity, dominance, craftsmanship, originality, and aesthetic quality than paintings of normal subjects. The free content and human content paintings were the most discriminating in the results" (Langevin et al., 1975, p. 156). Unfortunately, the schizophrenics in this study had a lower intelligence and less art experience than the other groups, thereby essentially negating the primary purpose of the study. But art experience and intelligence scores were covaried statistically over the scores for the paintings, and the authors claimed that "some differences between schizophrenic patients and control subjects may have been related to art experience and/or IQ differences" (Langevin et al., 1975, p. 156).

The second study was designed to deal with some of the problems discovered in the previous work. This time the subjects were matched for their art experience; all subjects had no art experience other than school art classes. The subject groups were very small, nine normals and nine patients. To obtain a more clearly defined patient group, the criterion established for patient selection stated that the individual must be delusional, hallucinating or both. Langevin et al. (1975) reasoned that these symptoms were "the clearest evidence of psychotic process" (p. 157). With this criterion, it was not necessary for the patient to be schizophrenic, but eight out of the nine subjects were schizophrenic and one was manic-depressive. Due to the fact that the free-choice and human content paintings had formal

features which were found to be the most useful in discriminating between the psychotic and control groups, the subjects were asked to paint only these suggested topics. The patients produced the paintings within 3 days following admission. All the patients were, consequently, on medication when the test was administered. In addition, the judges were more experienced than in the previous study. In the first study, the judges were art students; in the second study, they were art teachers and practising artists. Finally, the authors decreased the number of paintings to be judged, hoping to make comparisons easier, and the two types of paintings (free-choice and human content) were presented to the judges alternately. (Langevin et al., 1975, p. 157)

The results from the second study showed that "there were few differences between the groups on any variables," and "the results are inconsistent from one painting to the next even within the same category of painting, i.e. the same terms were not statistically significant for both free content or both human content paintings" (Langevin et al., 1975, p. 158). If the two studies are reviewed, they indicate that "art experience is a dominant factor in any judgments which may be made about paintings of the abnormal" (Langevin et al., 1975, p. 158). When the experience of the subjects was controlled and the selection of patients more clearly defined, the differences between the groups were few. "What differences did appear were inconsistent from painting to painting" (Langevin et al., 1975, p. 158). The authors concluded that the formal features of paintings by

the "average psychotic" have only an extremely limited diagnostic value. It is suggested that content analysis may prove to be more beneficial or, perhaps, the analysis of the paintings produced by psychotic artists with a great deal of training in art. (Langevin et al., 1975, p. 158)

Langevin et al.(1975) concluded that the reliability of judgments is an important point to be considered in any process involving the analysis of paintings "While judges may not mean the same thing when using a term, they may also disagree because their judgments are random sortings of paintings within a small range of variability on a given quality. In this report, judges agreed on a considerable number of terms for which results were nonetheless statistically nonsignificant. However, unreliability of judgments may have obscured significant group differences" (Langevin et al., 1975, p. 158). The authors presented the following recommendation for researchers interested in art therapy and abnormal painting: Intelligence, art experience, and reliability of judgments must be considered essential factors in an investigation and in the interpretation of results. (Langevin et al., 1975, p. 158)

Investigations have been previously reported on the characteristics of graphic representations associated with schizophrenia (e.g., Billig, 1970, 1971, 1973b; Fink, et al., 1973; Levy & Ulman, 1967). Mosher and Kwiatkowska (1971) selected formal elements and rated them for diagnostic and therapeutic use. Pereira (1972) developed rating scales to categorize patients' graphic representations into

a scheme to be used for diagnosis. Reiner, O'Reilly and Tellin (1975) added another technique to these studies; they developed a rating scale to recognise changes in the graphic expression of one psychiatric patient throughout the course of his treatment. Lehnsen (1972) previously discussed the correlation between the clinical course of a patient and his pictorial expression but did not attempt to apply any form of measurement to the graphic changes. The interest and emphasis in these articles was with the collection and analysis of a series of paintings by the same patient; the researchers focused on individual differences as opposed to group differences.

The Pictorial Regression Scale for Adults (PRSA) was designed by Reiner et al. (1975) "to measure 18 paired categories of assessment within the formal components of Content, Form, and Style, in order to determine the degree of regressive expression in pictures" (p. 165). The section of this scale related to form places it in two categories: regression (e.g., elementary shapes, unconnected parts, disproportionate space, strong line, two-dimensional space) and organisation (e.g., complex shapes, relatedness of parts, continuity of space, perspective, three-dimensional space). (Reiner et al., 1975, p. 166) This scale was used in conjunction with the art therapy program in a mental hospital. The authors selected an 18 year old male schizophrenic out of a group of patients and, within a 25 month period, his artwork was carefully evaluated as well as clinical details. Reiner, O'Reilly and Tellin acted as

judges, and their evaluations showed a high degree of consistency. However, as in the Foltin (1953) study, the evaluation results cannot be accepted without some criticism; the experimenters made the judgments themselves, instead of using external judges.

After the patient's pictures were observed, it was discovered "that during times of emotional and social adjustment, he retained his ability to incorporate the fantasies of his psychotic periods into his drawings" (Reiner et al., 1975, p. 165). The authors believed that the indication here was "that psychotic ideation may persist in pictorial expression indefinitely, after a patient has achieved a favorable emotional and social adjustment" (Reiner et al., 1975, p. 165). In addition, "those features that determine the style usually found in the pictures of an adjusted adult did not remain constant in the pictures of the patient studied, but could be profoundly altered by marked changes in his emotional state" (Reiner et al., 1975, p. 165). The tendency to continue to represent fantasies while in remission, supports the theory that structural components or formal features of paintings, as opposed to the content, are the more appropriate guidelines to use for analysis and insight into the changes occurring during the psychotic process and periods of remission.

The study by Reiner et al. (1975) did not attempt to provide group descriptions or classifications, but, instead, it attempted to inform the reader that a drawing may provide a signal to the therapist or physician. Distress, conflict,

or a fantasy may be recognised in the drawing, and, therefore, it may be considered a form of social communication. Reiner et al. (1975) made the analogy that a drawing is perhaps "comparable to emotional tones, timbres, and rhythms in the auditory realm" (p. 172). They followed one patient and applied statistical procedures to the graphic variations that he produced. A periodic analysis of one schizophrenic patient's pictures is, according to Reiner et al. (1975), an "under-utilized" approach to understanding the graphic reflection of this disorder. (p. 165) The authors did not provide detailed definitions of the structural components included in the rating scale (PRSA), but perhaps they felt it unnecessary due to the fact that they were the judges. There was, however, no indication that this was the reason for the lack of detailed definitions or that the lack of external judges was an attempt to improve the degree of consistency in judging the artwork. Considering the literature related to variability in performance on tests, perhaps following the artwork of one schizophrenic would produce more beneficial results, but using external judges would also increase the credibility of the evaluation process.

This study presented a possible solution to the problem of drug intake during the testing period. The amount of medication administered to the patient during the 25 months of study was essentially the same throughout; it would follow, then, that the changes in pictorial representation were not the result of the drug dosage. The control of this factor alone makes this experimental design worthy of serious consideration.

An interest in the progression of paintings by schizophrenics has also appeared elsewhere in the literature. For example, Billig's (1970, 1971) theory explored the process of ego disintegration and the related spatial structures in a patient's paintings. In 1972, Enachescu published an article on the art of schizophrenics.[1] The changes in the graphic representations of paraniod schizophrenics are discussed, and the reproduced paintings of five patients are reviewed. Enachescu (1972) wanted to demonstrate "the evolutionary process of mental deterioration" (National Institute of Mental Health, 1974, p. 115). He believed that the products of artistic creativity can be analysed from "dynamic-evolutive" and "structural-formal" perspectives. Enachescu's (1972) study of various clinical cases disclosed the following eight categories in schizophrenic creativity: "change of style, progressive stylization and ornamentation, progressive poverty of expression without degradation of the plastic expression toward scribbling, periodic stereotypical evaluation, uniform evolution, and the reestablishment of dynamic type" (National Institute of Mental Health, 1974, p. 115). Some of the previous findings associated with each category were mentioned (e.g. scribbling, Billig, 1970). However, this work is reviewed in an effort to provide a complete review of the literature, and a more detailed discussion of the categories is not possible with the information provided by the

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[1]This information was taken from a translated abstract in Schizophrenia Bulletin, Fall 1974, (No. 10), 115.

abstract.

After several years of working with various patients, Celentano (1977) concluded "that progression from a disorganized to an organized state of mind was reflected more regularly in the spontaneous art of schizophrenics than in that of patients in other diagnostic categories" (p. 68). He witnessed patients in a variety of clinical categories, and they painted in a disorganised fashion when severely disturbed. However, the schizophrenic patient, more often than other patients, produced paintings which "showed a consistent pattern of growth in their degree of organization," as he clinically improved. (Celentano, 1977, p. 68)

Celentano (1977) worked in a hospital where there were no long-term patients, so the possibility of a controlled study documenting these observations proved to be a 10 year task. He collected illustrative examples in chronological order from acutely disturbed schizophrenic patients. When he had obtained eight series of paintings, he felt that he had found support for his theory. Dan's artwork, a university student with schizophrenic symptoms, provided the illustrative example for the reader. Celentano (1977) felt that this patient's work showed the typical progression found in schizophrenic paintings. Several paintings were described in detail and indicated the following progression: (1) the initial agitated and entirely disorganised smears of colour (made 3 days after admission), (2) abstract forms well organised and hinting of symbolic meaning, (3) three-

dimensional objects which are recognisable but whose "relationship to each other seems arbitrary and their position in space is not clearly defined," and (4) a clearly recognisable content and an effort "to represent spatial relationships realistically" (Celentano, 1977, p. 71). In a landscape series produced by Dan just prior to his discharge, both spatial organisation and detail continued to approach realism. (Celentano, 1977, p. 71)

Other schizophrenic paintings were discussed by Celentano (1977), and he noted that the specific symptoms at the beginning of the treatment (e.g., withdrawal, agitation, or hostility) always produced chaotic paintings. Eventually progress became apparent in two ways:

> (1) Configurations began to be distinguishable but for a time they were not representational and their symbolic implications remained cryptic. Representation of recognizable objects then began, and movement continued in the direction of greater realism. (2) Design quality improved, but spatial organization at first remained two-dimensional and arbitrary. Eventually objects became three-dimensional and were brought into realistic relationship with each other. Space took on depth. Toward the last the compositions produced were at the same time relatively well organized and realistic. (Celentano, 1977, p. 72)

Celentano (1977) did not find this particular pattern of representation in the artwork of the nonschizophrenic patients that he evaluated.

Celentano (1977) claimed that, in spite of the small sample of patients, the assumption was confirmed: An orderly progression was observed in the paintings produced

by schizophrenics but not in the paintings produced by patients in other clinical categories. He admitted that his descriptive account was only an initial effort and looked to others to provide systematic support. Due to the clinical circumstances, it was impossible to employ external judges, but, again, it is necessary to note that the author observed the graphic changes in the series of schizophrenic paintings, rather than an external judge or panel of judges. It should also be noted that Celentano (1977) made no mention of the work of Billig (1970), but his description of the schizophrenic's graphic interpretation of space was the same as the graphic evidence outlined by Billig (1970).

Wadeson (1978), a research psychologist and psychiatric art therapist for the National Institute of Mental Health, published material to assist those interested in accumulating data related to psychiatric art; she outlined four approaches to methodology and described how art therapy data could contribute to research. The methods were (1) rating pictorial components of the subject's artwork to test predictive hypotheses, (2) a blind rating scale to judge pictorial components of a subject's artwork, (3) assigning specific art tasks designed for a particular purpose and studying the specific data related to the task, and (4) studying data that spontaneously presents itself. These approaches to research were not suggested as appropriate for any particular clinical group, but they represented an attempt to guide art therapists in their investigative efforts. It should be noted that there was an emphasis on

the use of a rating scale, and structured as well as unstructured tasks are suggested techniques for data collection.

Results of a different kind were reported by Cvetkovic (1979); he administered a test with six human figure drawings to 70 schizophrenics and 71 normals. "With the exception of a few schizophrenic patients, no significant differences for placement, miscellaneous modes of drawing, synthesis of a figure, omissions, transparencies, symmetry, and front and profile views were found between the schizophrenic and normal group" (Cvetkovic, 1979, p. 253). Ninety-two percent of the figures drawn by the schizophrenic and normal groups were situated in the center of the paper, symmetrical, and proportional. Only schizophrenic subjects with an organic disorder showed substantial deviations in their drawings. The indication from the findings was that the normal and schizophrenic subjects had no difficulty with the conception of space and that "the patterns of representation were almost identical for all groups" (Cvetkovic, 1979, p. 254).

Cvetkovic (1979) used these findings to come to the following conclusion: "If structural schematas [sic] of a human figure are acquired before the occurrence of any significant psychopathology, a basic spatial representation (reproduction of the simplest euclidian shapes) will not be significantly influenced and impaired by psychodynamic disorders at any later stage of life" (Cvetkovic, 1979, p. 254). It was suggested that support for this theory came from the finding that not one member of the schizophrenic

group, represented by a wide variation of disorders, "reduced his or her drawings to mere scribbles" (Cvetkovic, 1979, p. 254). If scribbles had been utilised by the subjects, it would have indicated an elementary stage of cognitive functioning, "where basic spatial schemes are still nonexistent, or only in the process of formulation (Arnheim, 1964; Jung, 1973; Kellogg, 1969; Morris, 1961, Piaget & Inhelder, 1967, 1973)" (Cvetkovic, 1979, p. 254). A detailed discussion of the cognitive aspects of these findings is not possible at this time, and the results from human figure drawings do not contribute directly to this review of literature. However, the theory that the representation of space is not altered by psychopathological processes is directly related to the present research.

Few systematic studies have concentrated on the recently admitted or acute schizophrenic and his art productions. A study by Russell-Lacy, Robinson, Benson, and Cranage (1979) focused on this group and investigated the validity of the painting assessment process used as a technique for differentiating diagnostic categories. In this study, it was hypothesized that an experimental schizophrenic group would produce paintings with formal features which have been reported to characterize schizophrenics (Anastasi & Foley, 1944), and these paintings would differ from the artwork of a control group consisting of hospitalized psychiatric patients with a nonschizophrenic diagnosis and another control group of normals. (Russell-Lacy et al., 1979, p. 195) Specific features hypothesized as illustrating this difference between groups were incorporated

into a questionnaire. An additional hypothesis stated "that there would be differences between the three groups in the amount of space covered by colours, the use of colour blending, and the variety of colour used" (Russell-Lacy et al., 1979, p. 196). It was believed that these factors were more measurable than those outlined in the questionnaire. For example, a template was used to quantify the amount of paper which was covered by paint. (Russell-Lacy et al., 1979, p. 196)

The schizophrenic group comprised all patients admitted who received a diagnosis of any form of schizophrenia; this same procedure was followed for the patient control group, but the diagnosis excluded any form of schizophrenia. The individuals with the following characteristics were excluded from these groups: (1) dull intelligence, (2) neurological damage, (3) previous psychiatric admissions, (4) art training, and (5) a resident of the geriatric unit (Russell-Lacy et al., 1979, p. 195) To be considered for participation in the normal group, an individual had to be free of any previous psychiatric consultation; the subjects were student nurses, occupational therapists, psychiatric nurses, typists, and community people utilising the sports facilities at the hospital. (Russell-Lacy et al., 1979, p. 195) Each subject painted one picture with standard art material in an empty room. The instructions specified that the subject was not to copy anything in view and to spend approximately 30 minutes painting.

Art students judged the 90 transparencies taken of

the paintings with no knowledge of the group represented; the transparencies were presented to the judges in random order. The 90 transparencies were divided into six sequences of 15 transparencies. Each sequence consisted of five slides from each of the three groups of subjects. Six groups of 10 judges represented the division for the 60 art students. Each group of judges viewed only one sequence of 15 transparencies. Finally, five test slides were presented to all the judges to enable the researchers to estimate the inter-judge reliability and to assess the agreement among the groups of judges. (Russell-Lacy et al., 1979, pp. 196-197)

The assessment of interjudge reliability was formulated by using the data from the sixty judgments for each questionnaire item and the five test transparencies. "For each factor on each slide the difference between the number of 'yes's' and 'no's' was calculated (the majority). The maximum possible size of a majority is 60; the minimum is 0. For a majority to be significant the probability of that majority occurring if the judges were rating randomly should be less than 5 percent ($P<0.05$)." (Russell-Lacy, et al., 1979, p. 197).

"A significant level was assigned to the majority verdict for each slide on each factor...and interjudge agreement depended on the number of slides found significant" (Russell-Lacy et al., 1979, p. 197). The results of the assessment of interjudge reliability may be summarised as follows:

Very Good Agreement	-"absence of a focal point (confusion)"
	-"unevenly distributed elements (imbalance)"
	-"at least one written or printed word present (script)"
	-"the main pictorial subject a house (primitivism)"
Good Agreement	-"absence of any clear horizon line in an outdoor picture (poor atmospheric perspective)"
Acceptable Agreement	-"imagery lacking relationship with other imagery (incoherence)"
	-"presence of three or more repetition of the size and shape of non-representational abstract forms (mannerisms)"
	-"any large area of over one-sixth of the picture totally covered by one colour only (monochromaticism)"
	-"at least four repetitions of the shape of any one representational pictorial detail regardless of colour or size (stereotype)"
	-"at least one image lacking characteristic detail (poor detail)"
	-"only two dimensions (primitivism)"
Poor Agreement	-"at least one superfluous image (over-elaboration)"
	-"childlike appearance (primitivism)"

It may be noted that the factors describing a rather clear structural element produced very good agreement between the judges, whereas the factors, such as "childlike appearance", which might require verbal interpretation produced poor agreement between the judges.

Russell-Lacy et al., (1979) also assessed the agreement between judgment groups; each group included 10 judges.

The highest score possible for each slide, on each questionnaire factor was 10 and the lowest 0, depending on the "number of affirmative judgements" (Russell-Lacy et al., 1979, p. 197). Using the test slides, the Friedman two-way analysis of variance was calculated for each questionnaire factor and all the questionnaire factors. "Since none of the tests on the individual factors nor the test using all the factors gave a significant result, the null hypothesis that the six groups of judges were drawn from the same population was not rejected" (Russell-Lacy et al., 1979, p. 197).

When schizophrenic paintings were compared with normal paintings, "the only factor found to reach significance in differentiating these two groups was the presence of mannerisms; that is to say the repetition of abstract forms was judged to be more frequently present in the schizophrenic pictures" (Russell-Lacy, 1979, p. 198). Schizophrenic paintings, as compared to normals, were also judged as having more overelaboration, imbalance, two-dimensions, and less colour, variety, detail, and paper covered by paint, but the difference between the two groups was not statistically significant. (Russell-Lacy, 1979. p. 198) The same results were found when the nonschizophrenic subjects were compared with the normals, except that there was no difference between the two groups in mannerisms and two-dimensions. (Russell-Lacy et al., 1979, p. 198)

Generally, this study revealed that psychiatric patients in an acute stage of illness produced paintings of lower quality (in terms of art) than the normal individuals,

and there was no significant difference between the paintings by the acute schizophrenics and the other acute psychiatric patients. These results, then, did not support the traditional view of schizophrenic art as representing a pathological process, where abnormalities in the art product are linked with thought disorder, autistic thinking, and regression (e.g., Bender, 1938; Mosse, 1940; Pickford, 1956; Prinzhorn, 1972; Sato, 1933). (Russell-Lacy et al., 1979, p. 199) There was no indication of more imbalance, stereotyping, primitivism, overelaboration, incoherence, use of script, or the overall impression of confusion in the schizophrenic paintings as compared to those of other acute patients. The similarity observed between the artwork of the two groups was explained as a reflection of "the subject's normal responses to the stress they were all experiencing" (Russell-Lacy et al., 1979. p. 199). The only evidence found to support the theory of a pathological process specific to schizophrenia was the characteristic of mannerisms (the repetition of abstract forms). Russell-Lacy et al., 1979, p. 199)

Russell-Lacy et al., (1979) predicted from these findings that "general medical patients in hospital...would produce pictures similar to those produced by schizophrenic patients" (Russell-Lacy et al., 1979, p. 199). In addition, they predicted that the more bizarre and distorted paintings of chronic schizophrenics, as described by Prinzhorn and others, "would be predictably produced by chronic general medically ill subjects enduring a similarly prolonged period

of stress" (Russell-Lacy et al., 1979. p. 199). When the paintings of the psychiatric group were compared with the normals, the patients tended to show less detail, more "uncovered space", and less variety in the use of colour. The researchers attributed this "to a lack of interest and enthusiasm for a novel challenging experience in people recently admitted to hospital and preoccupied with their own personal problems" (Russell-Lacy et al., 1979, p. 199). This is obviously a hypothesis which would be difficult to quantify, in terms of the magnitude of the normal person's personal problems and the psychiatric patient's problems; the assumption was that no normal subject could have problems as severe or stressful as an individual experiencing psychotic symptoms.

A further explanation of the differences between the normal and patient groups was the effect of medication on performance. The Russell-Lacy et al. (1979) study had no control over the treatment program of the patients, for obvious ethical reasons. They did, however, admit that "any real differences in drawing between diagnostic groups could possibly have been masked by the psychotropic effect of medication" (Russell-Lacy et al., 1979, p. 199). Schizophrenics and other psychiatric patients are prescribed different types of drugs, and this might have influenced the pictures produced by the groups. All the subjects in the patient groups were on medication while producing their artwork, and this, too, might account for the difference in performance. (Russell-Lacy et al., 1979, p. 199) The conclusion to this study emphasised the need to assess the

various factors related to this extraneous variable.

Russell-Lacy et al. (1979) mentioned the methodological problem of selecting a control group of normals. They indicated that the normal group may have included skilled artists or people interested in drawing. Therefore, the results may have been biased by the possibility of this group characteristic. (Russell-Lacy et al., 1979, p. 199) It is unusual for this particular aspect of the experimental design to be evaluated, but this is a very difficult experimental group to select and encourage to participate. I commend Russell-Lacy et al. (1979) for their thorough discussion of the methodological aspects of this study. The theory that stress is the factor responsible for various characteristics of paintings, casts considerable doubt on the feasibility of using paintings as a diagnostic tool to assist in classification.[1]

SUMMARY

The earlier investigations concerning the artwork of mental patients (e.g., the reviews and investigations of Anastasi & Foley, 1940, 1941a, 1941b) were primarily descriptive and interested in the dilemma of diagnosis. However, when art therapy was introduced into the psychiatric

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[1]This study focused on stress and the psychiatric experiences of the individual. A similar focus has been found in the recent literature on alcoholism, along with a new psychological and medical emphasis on anxiety related disorders.

hospital setting, the emphasis changed from the content of the painting to the style and structure of the painting. The experimental approach to the graphic representations of schizophrenics received a new direction and source of data.

This chapter has familiarised the reader with the chronological development of the postulates, approaches, methodological problems, and improvements directly related to this area of study. The details of the experimental designs have been reviewed because, at this point, the method of data collection is as important as the findings; this is due to the numerous and complicated variables involved in the recent collection of data and also to the diversity of results. The controversy surrounding the validity of applying experimental methodology to graphic representations still exists in the literature; for example, Russell-Lacy et al. (1979) questioned the validity of the diagnostic value of spontaneous drawings, while Gerevich, Ungvari, and Karczag (1979) defended the use of this diagnostic tool.

The reader has been provided with background information and a chronological review of the approaches to studying paintings and drawings produced by schizophrenic subjects. An informal empirical approach has been replaced most recently by attempts to apply formal experimental and evaluation standards; the evaluation process may involve judges and should include estimations of validity and reliability. Validity refers to the accuracy of the judges' estimates; reliability refers to the consistency with which two judges will reach the same judgment of the same painting

or the consistency with which the same judge will reach the same judgment of the same painting when assessing and reassessing it at two different times. Some attention has been given to the validity of the judging process involved in evaluating paintings, but the reliability aspect has received less attention and documentation. There are, however, practical reasons for the lack of data dealing with reliability. A separate reliability study may seem like a reasonable expectation when the researcher formulates the proposal. However, the nature of the experiments designed to evaluate paintings, using a panel of judges, makes the test for reliability very difficult.

The Langevin and Hutchins (1973) study along with the Levy and Ulman (1967) study represent the most serious systematic attempts to evaluate the use of judges' ratings; both studies discussed the difficulties surrounding the attempt to use judges' ratings. Several studies have been discussed in this section and the validity and reliability results emphasised whenever possible. The results of these studies vary and there is little doubt that problems surround the use of rating scales and judges, but it appears that until a new or more effective methodology is available, the use of judges and rating scales are the best approach to the evaluation of paintings. With this review of relevant literature, the reader is prepared and encouraged to evaluate the methodology and findings of the research effort outlined in the following pages.

CHAPTER II

INTRODUCTION TO THE EXPERIMENT

The Purpose of the Research

The primary purpose of this research was to experimentally test Billig's theory of spatial structures represented in the paintings of schizophrenic patients. The intention was to test this theory under controlled conditions and to compare the results with Billig's findings. Additional tests of perceptual constancy were included to provide a new source of information about the relationship between disturbances of ego boundaries, body image, the self, the perceptual constancies, and space perception, as described by Weckowicz and Sommer (1960). If Billig's findings are supported and extended, then the validity of this nonverbal technique for the evaluation of the condition of the ego is confirmed and will offer valuable information to the art therapist, psychologist, and psychiatrist treating the schizophrenic. Spatial structures in paintings may be used to formulate a nonverbal diagnostic tool.

Billig's Work and Experimental Procedures

Billig provided his reader with stimulating observations. It is my opinion that his research deserves further attention. It is necessary to either experimentally validate his findings and extend the application of this theory or to question and limit the possibilities that it presents for nonverbal communication with schizophrenics.

While reviewing the related literature by Billig (1966, 1970, 1971, 1973b), an experimentally oriented psychologist must become aware of the apparent lack of experimental procedures. Some of the methodological factors to be considered are as follows: (1) The paintings by the schizophrenics were produced spontaneously, without experimental controls. The art material varied from subject to subject. Billig's artists painted because they felt like it; therefore, the paintings represent a particular segment of the schizophrenic patient population. Also, Billig relied on psychiatrists and hospital staff members to collect and send him the requested artwork. This means that there was a lack of contact with the source of the data.[1] (2) No subject selection criteria were mentioned by Billig. The reader has no information as to whether or not the schizophrenic was suffering from an accessory disorder, had been exposed to electroshock therapy, had been hospitalized

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[1]The sources of this information are a conversation with Billig, footnotes in Billig's published articles, and contact with a psychiatrist familiar with Billig's work and who received a rather vague request for paintings.

for a given length of time, had participated in any form of art training, or any of a number of other possibly contaminating variables. (3) Billig did not mention whether he collected a sample of paintings from a segment of the normal population of the cultures included in his investigations. However, he did discuss the traditional art forms of the culture in general (Billig & Burton-Bradley, 1973).

Billig is a psychiatrist, and it is understandable that he would concentrate on the condition of an individual's ego and any changes which may occur in the condition of that ego. He certainly provided a stimulus for further research into this theory, and that alone should be recognised as an important contribution. Festinger, I believe, said that it is more important to be stimulating than right because in the scientific world no one is right for very long. However, statements such as, "the collected material is limited but of varied cultural background" tend to reinforce my concern about the accuracy of the data collected. It is my intention to consider Billig's findings but to place them within the framework of experimental procedures and attempt to discover some specific information.[1]

The Controversy Surrounding the Number of Paintings Necessary For Evaluation

Considering the fact that long-term hospitalization

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[1]In 1972, I corresponded with Billig and informed him of the ongoing research and the related hypotheses.

is now discouraged in the psychiatric setting, the patient's contact with the art therapy program may be limited in the future and an accumulation of the patient's artwork may not be possible. However, a controversy exists over how much artwork is required to indicate the nature of the pathology. Some investigations encourage the evaluation of a progression of paintings in order to understand the course of the schizophrenic illness (e.g., Arieti, 1974, pp. 359-362; Lehnsen, 1975, pp. 286-310), and this is the most common approach used to evaluate the artwork of patients. Billig (Note 1) agreed that this would be the best alternative, if it was possible to accumulate a series of paintings; if not, it should be possible to gain insight from one painting alone. Foltin (1953), also, claimed that "the mere analysis of a picture should tell us something about the patient" (p. 260). There is no question that a series of paintings would offer more insight into the schizophrenic patient's condition. The foundation of the controversy is that some believe that it is possible to gain insight with one or two paintings (e.g., Billig), and others claim that one painting will in no way contribute to the therapist's knowledge of the patient's disorder (e.g., Reitman, 1947, p. viii).

Betensky (1973) stated that one or two works of art may provide "a cue to an individual's visual pattern" (p. 121), even though several may provide a more complete representation of patterns; "in a serial study of a patient's art work [sic] a cue is soon observed which turns out to be a component of an ordered but hidden pattern of the patient's emotional relationships" (p. 121). A repeated line, a

colour, or pictorial space may represent cues to the patient's pattern of artistic expression. (Betensky, 1973, p. 121) Betensky (1973) recognised the significance of even one art product but admitted the additional benefit of several. "The visual expression as a whole...is also important, for a strengthening or a weakening in the structure of the art work [sic] may indicate a corresponding shift in a personality balance of its creator" (p. 121).

It should be possible to predict, then, that if a schizophrenic patient participates in a painting task only once, some evidence of characteristic spatial structures, as outlined by Billig (1970), should be detected. If this is possible, the art therapist and other psychiatric staff members will be able to use this nonverbal technique to better understand and assist the schizophrenic patient, especially the short-term or out-patient.

The Rationale for Group Selection

According to Billig (1970), the spatial structures which reflect various levels of ego deterioration are universal and have been discovered in schizophrenic populations of both Western and non-Western cultures (i.e., Japan, Near East and Hong Kong). This claim, along with Berry's (1966) comparison of the perceptual skills of the Canadian Eskimos and the Scots, provided the necessary stimulus to select the Alaskan Eskimos and the Scots as the two populations to be compared in the present study. In addition to Berry's (1966)

comparison of the Eskimo and the Scot, it seemed appropriate to include two cultures with significantly different cultural backgrounds in an attempt to validate the universal aspect of Billig's theory. As indicated by the detailed comparison of these two cultures (Chapter I), the most obvious difference is the relatively recent exposure of the Alaskan Eskimo to the Western culture. Therefore, the Scots and the Alaskan Eskimos were selected as representatives of a Western and a non-Western culture.

A Comment on the Eskimo People of Alaska

The Alaskan Eskimos, the Yup'ik and the Inupiat (see Figure 19), represent a people who have experienced and are still experiencing a cultural transition. While in Scotland and outlining the proposal for this research, I read Freuchen's (1961) book about the Eskimos of Greenland and their reaction to the white man. I must admit that when I initiated my research in Alaska, I expected to encounter hostility from the Eskimo people. My personal feelings were that the nonnative Alaskans were intruding on the native Alaskans and the old controversy of invasion versus innovation seemed very real. I feel very strongly about the significance of cultural heritage and the part that it plays in helping individuals understand their uniqueness. The Eskimos that I have met and the ones that remain friends feel that their villages are still in a state of transition

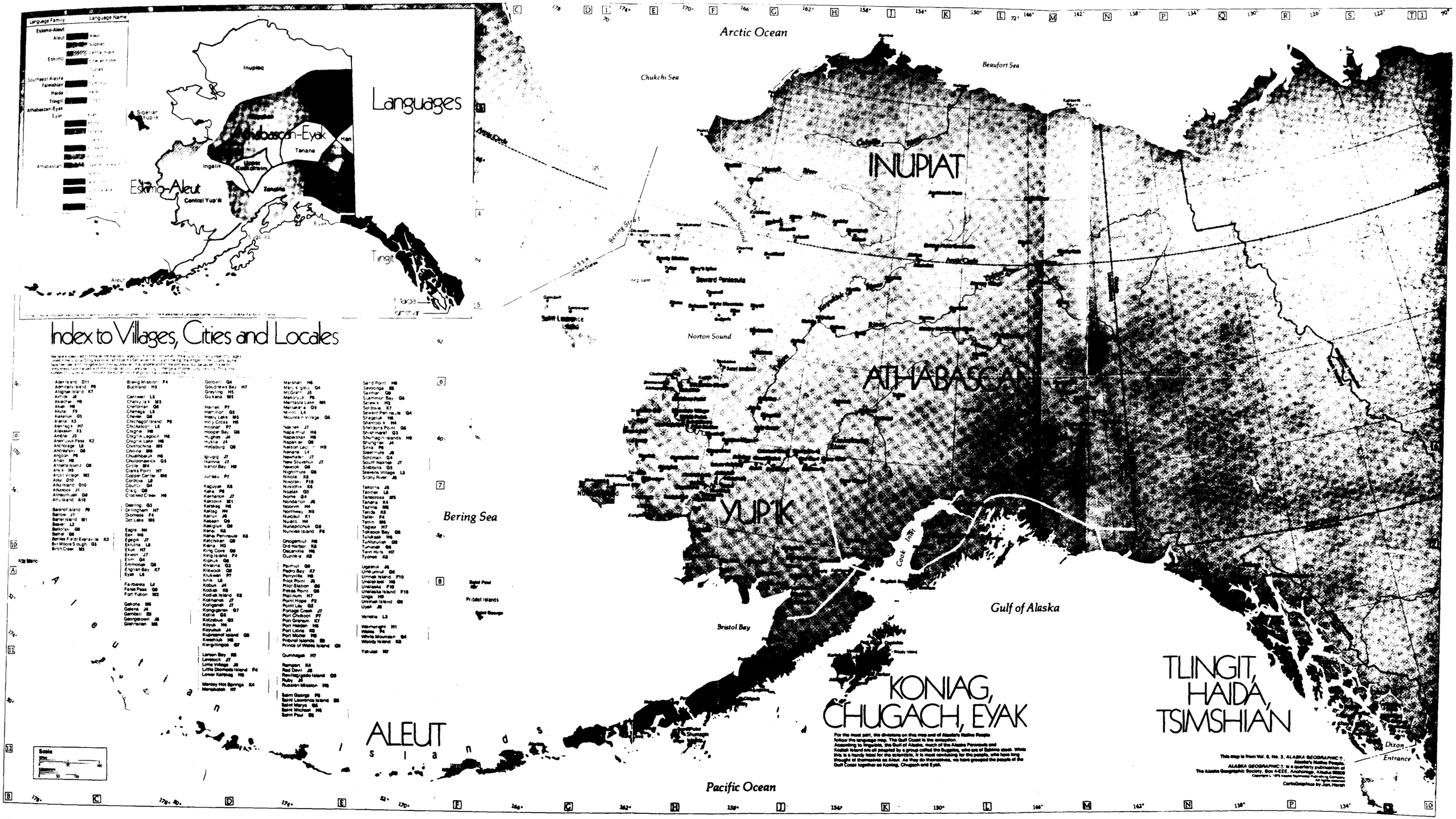

Figure 19. Map of Alaska (showing the location of the Inupiat and Yup'ik Eskimos).

and that there are problems related to this change; alcohol abuse represents one of them. Generally, they feel good about the changes occurring and the adoption of the white man's culture. They feel that it is time for their people to move away from the environmental hardships which have confronted them and accept ways which make their lives easier; for example, using a "snowmobile" instead of feeding and training several huskies for a dog sled team.

My experience of living in Alaska has changed my view of the situation. The period of transition is very difficult for any culture when introduced to a new culture. Emotional trauma is imposed when, for example, the young children are taken out of the village and educated elsewhere at a time when they would be learning their roles in village life. When they return, they do not find their place in the village, and the village people can not relate to the new ways that the young people have acquired. This educational process has been vastly improved in recent years; children often have their own schools in their village and teachers now encourage the Eskimo children to appreciate culture instead of punishing them for speaking their own language, as in the past. The shipment of alcoholic beverages and foods advertised on television is another example of the negative side of the acculturation process occurring in Alaska. As a nonnative Alaskan, it initially seemed to me that the Eskimo people should question the benefits of the new culture, but perhaps as a result of their nature, they seemed to only discuss the positive changes for them as individuals and families. It was difficult to understand

how easily these individuals concentrated on some of the ways of the white man and allowed their culture to be devoured by commercialism. Perhaps the reason for my lack of understanding is that I have never experienced the hardships that accompanied the rituals, customs, beliefs, and unique artwork of these people. This research offered me the opportunity to interact and become acquainted with several Eskimo people; to discuss what that experience has taught me about these people, and people in general, would require several hundred more pages. I should like to note, however, that I have an overwhelming respect and warm regard for the Eskimo people whom I met during my stay in Alaska.

Alaskan Eskimos are being assimilated into the nonnative society and adjusting to numerous changes in their life style. What happens, however, when one of these people requires psychiatric assistance? There has been only a recent attempt to formally teach nonnatives the languages of the Alaskan Eskimos, and it is unreasonable to expect the staff at a psychiatric hospital to speak these languages, as well as the languages of the other native Alaskans.[1] So, the disturbed individual often faces the problem of a sudden admission to a totally alien environment, where communication may be unattainable unless the patient has some knowledge of the English language (the older Eskimos would not). The task of diagnosis then becomes even more difficult, especially for the schizophrenic patient.

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[1]For more information about the linguistic classifications of native Alaskans, refer to the map of Alaska (see Figure 19) and also Oswalt's (1967) book about the Alaskan Eskimos.

The Importance of Nonverbal Testing Techniques

Dr. William Richards, a psychiatrist for the United States Department of Health (Alaska Native Services), has worked with native Alaskans for several years. He explained that the Eskimos express affect and associate differently from the white man; they also do not perceive "reality" in the same way as the white man. Dr. Richards questioned whether these differences should be labelled "disturbances." Many of the behaviours which would be considered normal for the nonnative Alaskan (e.g., expressing feelings directly and asking questions) are considered "disturbed" by the Eskimos. This psychiatrist once asked a group of Eskimos, "What is the 'craziest' thing you have ever done?" They all responded, "cry in front of another person" (Richards, Note 2). With this observation in mind, and the fact that there is no such thing as a culture-free test (Berry, 1966, p. 229) or psychotherapeutic techniques which are not culture-bound (Tayal, 1975, p. 289), the need for an alternative approach to understanding the mentally disturbed seemed apparent. If one were to spend some time with the Alaskan Eskimos and then review various clinical tests, it would be obvious that adjustments in content and administration are necessary.

The value of projective techniques as a diagnostic tool was confirmed by Dr. Richards. However, the benefit of these techniques was not in their detection of the stages of disintegration of the schizophrenic's ego, but the fact that

patients tended to "describe themselves very fully with little disguise or defensiveness when approached nonverbally" (Richards, Note 2). In addition, hearing problems are very frequent in Alaska (i.e., otitis media), so most Eskimos are better at performance skills, drawing a picture of a family for example, than they are at verbal skills, such as telling someone directly about their problems. Also, there are cultural taboos about direct verbal expression of problems; the person who directly states the problem is "dumb" or not tactful. There are culturally sanctioned procedures for presenting problems nonverbally, such as the "story knife technique" (Richards, Note 2). The Eskimo, then, for these reasons presents a valid reason for attempting to develop alternative techniques and procedures to be used in the psychiatric setting.

Before the final proposal was submitted for this research, it was necessary to travel to Alaska to investigate the feasibility of collecting data. Dr. Koutsky was at that time the superintendent of the Alaska Psychiatric Institute. He provided me with a paper, Alaskan Psychiatry[1], which he had prepared for an international symposium (Koutsky, 1971). In this paper, Dr. Koutsky described the private psychiatrists in the Anchorage area[2] as following the Freudian tradition. "Being derived from western

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[1]The only published material to discuss mental illness in the Eskimo populations is a descriptive case history account of three psychotic Eskimos (Teicher, 1954).

[2]In 1971, Anchorage represented 42 percent of the total population of the state.

European philosophy, however, does not make these analytic theories as easily applied to the native population" (Koutsky, 1971, p. 5). The Alaska Psychiatric Institute is a unique institution for a number of reasons, but especially because of "the quantity of cultural-anthropological aspects of mental illness found in its present patient population, which is apt to be comprised of 30-50 percent natives in its treatment programs" (Koutsky, 1971, pp. 9-10). Consequently, the people involved in the treatment programs at this institution "can not depend upon treatment approaches for its psychiatric treatment plan, but must include consideration for the tremendous variations in human behavior that are due to cultural patterns" (Koutsky, 1971, p. 10). Koutsky (1971) described the problems with treatment follow-up for the rural patients; the rate of readmission was approximately 60 percent due to the enormous distances of the villages from the psychiatric institute, along with the problem of a language barrier. (Koutsky, 1971, pp. 17-18). From this information, it seemed apparent that alternative forms of communication and diagnostic assistance would contribute to the treatment of the mentally ill Eskimo; this is especially true due to the cultural significance and pleasure derived from drawing and decorating.

Other investigators (e.g., Tayal, 1975) have pointed to the importance of art therapy with patients representing other cultures, "where verbalization of personal problems is (culturally) inhibiting and where psychiatric intervention is eschewed" (Tayal, 1975, p. 290). Mintz (1975) used human figure drawings with schizophrenic Navajo and Hopi American

Indians. It was believed that the results could be applied by other researchers in other cultures, "once the structural representations for the human figure are known for a specific culture" (p. 154). Furthermore, "structural elements (in contrast to content) are less open to short-term variability; therefore, a structural analysis of human figure drawings may prove to be a useful technique for assessing effectiveness of treatment...as well as a diagnostic instrument" (Mintz, 1975, pp. 154-155). Perez and Marcus-Ofseyer (1978) also support the value of art therapy when language is a barrier; they described how a patient's psychological condition was "mirrored" in her paintings when there was no other source of communication, due to the fact that she could not speak Spanish. These documented cases support the usefulness of painting when verbal communication is not possible. It is also important to note the effectiveness of evaluating the structural elements, as opposed to the content, of the drawings.

The Definition of Schizophrenia Used as a Criterion for Patient Selection

The Primary Definition

Before proceding with a discussion of the criteria for the selection of schizophrenic subjects, it is necessary to establish the definition of schizophrenia used for this research. The first consideration was to find a definition

which was incorporated into the diagnostic process of psychiatrists in Scotland and Alaska. After consulting with the superintendents from the institutions contacted for participation in this project, it was established that the psychiatrists in these hospitals relied on Bleuler's (1950) definition of the schizophrenic syndrome.

According to Bleuler (1950), the four fundamental symptoms of the schizophrenic disorder include "disturbances of association and affectivity, the predilection for fantasy as against reality, ambivalence, and the inclination to divorce oneself from reality (autism)" (p. 14). There was agreement among the psychiatrists that the first two symptoms, representing thought disorder and blunt affect, were the ones relied upon for diagnosis; however, there was an emphasis on the accessory symptoms, such as hallucinations and delusions (Bleuler, 1950, p. 95), for confirmation. Frequently, the fundamental symptoms are not "so markedly exhibited as to cause the patient to be hospitalized" (Bleuler, 1950, p. 94). The accessory symptoms, on the other hand, present themselves quite clearly and confirm the existence of the fundamental symptoms.

It should be noted, also, that thought disorder is not restricted to schizophrenia; other types of thought disorder occur in anxiety states, mania, and depression. (Wing, 1978, p. 12) Due to the fact that identifying the kind of thought disorder present is not always an easy task, the accessory symptoms are a means of confirming the specific nature of the schizophrenic disorder.

The Diagnostic Evaluation of Schizophrenia in the United Kingdom and the United States

Edwards (1972) published results from a questionnaire designed to evaluate the symptoms used in the United Kingdom and the United States to diagnose schizophrenia. The ten symptoms considered most often as indications of schizophrenia were reviewed, and formal thought disorder was the most frequent symptom indicated in both countries. The decision to define schizophrenia in terms of thought disorder and blunt affect was further reinforced by a later study (Gurland et al., 1974). The publication involved only the diagnosis of schizophrenia and was completed between 1965-1970. The authors discovered disagreements in diagnosis between New York and London (especially between schizophrenic and manic-depressive disorders), but concluded that "patients who showed symptomatology such as delusions of control, blunting of affect, or speech disorganization were usually agreed to be schizophrenic by psychiatrists in both countries" (Gurland et al., 1974, pp. 86, 88). Psychiatrists may vary from one another in their approaches to diagnosis; in addition each psychiatric hospital may employ a different set of criteria for diagnosis. For this reason, a cross-cultural approach to the study of schizophrenia demands a diagnostic investigation of its own. The diagnosis of the schizophrenic syndrome in the participating psychiatric institutions was consistently based on Bleuler's fundamental symptoms of thought disorder and blunt affect; often the diagnosis was confirmed by the use of the acces-

sory symptoms, if there was any question about the patient's illness.

Extensive steps were taken to ensure a consistent process of diagnosis among the psychiatric institutions involved; this was because of previous evaluations which noted the difference in the diagnostic practices in the United States and the United Kingdom (e.g., Simon, Fisher, Fleiss, Gurland, & Sharpe, 1971). Psychiatrists in the United Kingdom diagnosed manic-depressive psychosis, according to the Kramer (1961a, 1961b) study, almost 900 percent more often than the United States and 50 percent less often diagnosed an individual as suffering from schizophrenia. A more recent research project, designed to search for differences in diagnostic evaluations (Gurland et al., 1974), found that American psychiatrists (e.g., New York Psychiatric Institute) apply the schizophrenic classification to more people than the British participants (Maudsley Hospital, London). The authors offered their explanation for this difference in the psychiatric evaluation[1]. However, the overall opinion was that the psychiatrists in the United States have a tendency to diagnose a patient as schizophrenic, whereas the British psychiatrists have a tendency to diagnose the patient as suffering from a manic-depressive illness.

The significance of diagnosis has been emphasised for a long time in British psychiatry, and a renewed

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[1]The reasons for the differences have been explored (Gelfand & Kline, 1978; Hordern et al., 1968), but the concern at this time is with the actual consistency of psychiatric classification.

interest in psychiatric evaluations has occurred in the United States as well as the United Kingdom. (Hordern, Sandifer, Green, & Timbury, 1968)[1] "The phenomenon is probably related to a current tendency to exchange ideas across the Atlantic, and to the need for a common diagnostic code emphasized by cross-national epidemiological data, mental hospital population movement statistics, and studies of the efficacy of treatment" (Hordern et al., 1968, p. 935). This relatively recent cooperative effort may explain the positive reception that I received while trying to sort out the transatlantic comparison of diagnostic procedures.

The Secondary Definition

Some writers discourage divisions within the schizophrenic syndrome; they feel that divisions may enlighten us only in terms of artifical factors unrelated to the schizophrenic disorder (e.g., the prolonged hospitalization of the chronic patient). (Salzinger, 1971) However, most investigators have employed one of three classifications for this psychotic illness: (1) premorbid adjustment (process-reactive), (2) paranoid or nonparanoid, and (3) acute-chronic. (Salzinger, 1971) All of these classifications

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[1]Dr. Gerald Timbury was the superintendent at the Gartnavel Royal Hospital in Glasgow at the time of this research. He was also involved in the publication of another article which compared the psychiatric diagnosis of patients in London, Glasgow, and North Carolina (Sandifer, Hordern, Timbury, & Green, 1968).

have received attention and are well represented in the psychiatric literature.

The Process-Reactive Dichotomy

The value of the premorbid adjustment dimension, both conceptually and empirically, has been demonstrated, and it is considered a positive development in the unravelling of the complex nature of schizophrenia. (Broen, 1968; Higgins, 1969; Shakow, 1962, 1963) There are scales which have been developed to evaluate this dimension, such as the Elgin Prognostic Scale (Whittman, 1941), the Phillips Premorbid Adjustment Scale (Phillips, 1953), and the Ulman and Giovannoni Self-report Inventory (1964). Following the recommendations set forth by Higgins (1964, 1969)[1], the initial approach to classification for this research was the criteria established for the process-reactive dichotomy. The case history of the patient must be reviewed to acquire the information necessary for this classification. A descriptive list outlining the characteristics of these two forms of schizophrenia was considered (see Appendix II) an appropriate method by which to select the reactive and process schizophrenics. Unfortunately, in spite of my enthusiasm for this approach and the extensive review of case

[1]For additional information about this approach to the classification of schizophrenia, the reader is directed to Herron, 1961, 1962; Higgins, 1964, 1969; Lorr, Whittman, & Schanberger, 1951.

histories to become familiar with the technique of evaluation, one of the first psychiatrists contacted to participate in this research denied the existence of the process-reactive distinction; he also believed that only a psychia-trist was qualified to make diagnostic decisions of that nature. We did agree that a psychiatrist had to form the diagnostic opinion, and without his assistance it was not possible to pursue this dimension of the schizophrenic syndrome.

The Paranoid-Nonparanoid Dichotomy

The perceptual performance of the paranoid schizophrenic differs from the nonparanoid schizophrenic as discussed in Chapter I. In addition, there are differences between the paranoid and nonparanoid schizophrenic in attention and task performance (Pereira, 1972, p. 75). The intention of the present research was to compare the performance of schizophrenics in Scotland and Alaska as well as the performance of schizophrenics and alcoholics. To avoid further complexity of the experimental data related to group behaviour (e.g., perceptual performance, attention, and task performance), it was felt that a homogeneous group of schizophrenics should be selected. Therefore, the paranoid versus nonparanoid dichotomy of schizophrenia was not considered.

After a further evaluation of the difficulties surrounding diagnostic classification, it seemed necessary to prepare a set of criteria based on the acute-chronic dimension (see Appendix III). The definitions indicated on the form were an attempt not only to distinguish between the acute and chronic schizophrenic but also to identify the schizophrenic who remains chronic only as a result of poor family, social, medical, or financial support outside the hospital setting. The reasoning behind this approach was that the socially chronic patient may differ in various ways from the medically chronic schizophrenic. Two psychiatrists, experienced in the treatment of schizophrenics, were asked to review the form which described the acute, medically chronic, and socially chronic patient (see Appendix III); they considered this approach to the acute-chronic dimension an outstanding alternative to the traditional distinction. The psychiatrist responsible for each schizophrenic patient's treatment was asked to indicate on the form the category which best described his patient at the time of the experiment.

The advantage of using the acute-chronic classification was that the results could be directly compared with those of Weckowicz (e.g., 1957). In addition, I would be able to investigate the existence of spatial structures in the paintings of schizophrenic individuals in different stages of the illness. Also, the acute and chronic groups

would provide information and insight into perceptual differences (Jackson, 1960, p. 239; Silverman, 1964), which are among the ways in which the acute and chronic groups differ in performance. If the spatial structures in paintings are in any way correlated with perceptual ability, then the acute-chronic dichotomy would provide results to indicate this relationship.

Some of the Differences between the Acute and Chronic Schizophrenic

The general belief has been that schizophrenia is a progressive illness. The chronic schizophrenic is an individual "in whom the disease process is still active" (Weckowicz, 1960, p.525), but the patient has adapted to the disorder and, hence, seems less affected by it. (Weckowicz, 1960, p. 525) Sommer and Witney (1961) offered an excellent discussion of factors related to the process of becoming chronic. "Chronicity can be viewed as a sequence of connected events, each of which must occur before the patient becomes chronic. This suggests that chronicity can be reduced or eliminated if any link in the chain is broken" (Sommer & Witney, 1961, p. 111). The confusion and difficulties related to the term "chronic" are discussed by the authors, and an effort is made to distinguish between the social and medical chronic schizophrenic, even though these specific terms are not applied to the schizophrenic. "A chronic schizophrenic is a mentally ill person whose illness

and behavior have reached a stable level, while the chronic patient is a person unable to manage outside of an institution" (Sommer & Witney, 1960, p. 116). If an individual finds it difficult to maintain his independence or to survive outside of an institution, then he may, indeed, become a chronic patient. (Sommer & Witney, 1960, p. 117) It is not difficult to see, then, why a chronic schizophrenic patient population could represent various aspects of this illness and not represent a homogeneous group of individuals. The form developed for this research was formulated to reveal some interesting insights into this aspect of chronicity.

Remarkable differences have been indicated between acute and chronic schizophrenics, "even within the same diagnostic or premorbid adjustment category" (Silverman, Berg, & Kantor, 1966, p. 657). The following question was introduced by Silverman, Berg, and Kantor (1966): Are perceptual differences or characteristics unique to the various types of schizophrenia, or are the same perceptual differences found in nonschizophrenic individuals institutionalized for the same period of time? An analysis of the perceptual performance of 100 prison inmates indicated that short-term and long-term prisoners revealed perceptual differences which were significant, and the "differences in styles of perceptual and cognitive response within the two groups were comparable to those found within acute and chronic schizophrenic groups" (Silverman, Berg, & Kantor, 1966, p. 657). Institutionalization, then, was believed to

have an effect on perceptual responses. Johannsen and O'Connell (1965), on the other hand, claimed that their study suggested the following: "Perceptual deficits which increase with advancing chronicity are more likely to be a function of factors involved in the disorder itself rather than of environmental factors" (p. 246). Many researchers tend to avoid this controversial question, such as McGhie and Chapman (1961); they said that the "observations of a few early schizophrenic patients during psychotherapy endorsed the opinion that the fundamental disorder in schizophrenia was a cognitive one, most clearly evident in the fields of attention and perception, and that other aspects of the patient's symptomatology could be interpreted as his reactions to this basic disorder. It was also felt that a study of the early schizophrenic patient was much more rewarding in that the primary impairments were accessible to study, being unobscured by secondary reactions which occur in the later stages of the illness" (p. 103). The research represented by this paper is not designed specifically to investigate the controversy surrounding this acute-chronic dichotomy; however, an experiment involving perceptual tasks for the acute and chronic schizophrenic presented the opportunity to provide additional relevant information.

A Final Analysis of the Secondary Definition of Schizophrenia

The acute-chronic classification is established in

the related psychological research by employing one of two criteria, the total length of hospitalization or the length of time since the onset[1] of the schizophrenic disorder. (Cromwell, 1972) This data was carefully, and in many cases tediously, extracted from the case history files of all the schizophrenic subjects (see Appendix IV). When the data from this information was compared with the results of the acute-chronic classification form (see Appendix III), the results were less than satisfactory. There was no consistent agreement between the indicated classification and the onset of the illness, the total length of hospitalization, and, in some cases, my notes regarding the patient's condition. In spite of the agreement that this approach to classification was necessary and that the form seemed like a useful tool, there did not seem to be any agreement among psychiatrists as to what should be termed acute and what should be termed chronic.

Each psychiatrist may perhaps have a consistent approach to placing an individual in an acute or chronic category, but this research required a consistency of evaluation among psychiatrists and between countries. What the form did provide was insight into the difficulties related to this dichotomy, as well as the others mentioned. It also indicated that more research needs to be designed to inves-

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[1]The onset of a disorder is defined in the psychiatric literature as the date of the first admission to the hospital. This is a sufficient definition for empirical data but may not reflect the actual beginning of the course of the illness.

tigate this aspect of the psychiatric evaluation. The concern for most psychiatrists seems to be with the primary definition; the attitude being that the primary diagnosis is the most significant task because it determines the fundamental course of treatment.

The decision was made to utilise another approach to define the schizophrenic groups included in this research. After carefully reviewing the detailed analysis of the methodological problems associated with the acute-chronic differentiation as outlined by Strauss (1973), it would have to be said that the schizophrenics in this study were in the acute phase of the illness. The data collected in terms of admissions and the length of hospitalization clearly indicated that there were only a few chronic schizophrenic patients in the Scottish group; these subjects were excluded from the experiment. There was no real equivalent of the chronic patient in the Eskimo group, in terms of the length of time spent in the hospital.

Various time periods have been established as cut off dates for the acute-chronic dimension. For the patients in Pereira's (1972) study, for example, the period of hospitalization ranged from 6 months to a total of 6 years. (p. 73) An alternative to this criterion was used by Silverman (1964); an early-term schizophrenic was considered a patient that had been hospitalized for less than 3 years, and a long-term schizophrenic was a patient that had been in the hosital for more than 6 years. Sommer and Witney (1961), on the other hand, stated that "80 percent of the patients in public mental hospitals are considered chronic

by the criterion of having been hospitalized two years or more (Brown, 1959; Cross, 1954)" (p. 111). The data that was recorded for each schizophrenic tested (see Appendix IV) indicated that the patients involved in the present research should be classified as acute schizophrenics.

This new definition seemed to have some advantages in that the effects of chronicity and the dependence of some patients on medication would no longer be factors that might contaminate the results of the experimental tasks. In addition, the schizophrenic groups would more closely resemble the alcoholic groups tested because alcoholic patients do not generally remain in the hospital for long periods of time. Also, the acute schizophrenic subjects would allow the present research to focus on the diagnostic time period, admission, which requires further investigation in order to accurately differentiate between the schizophrenic and the alcoholic. The acute classification as outlined by Strauss (1973) was accepted as the most accurate description of the patients that participated in the present study, and the criteria left little room for personal impressions or individual interpretations of the secondary classification.

The following criteria, as outlined by Strauss (1973), represented the selection criteria for the schizophrenic groups in the present study: (a) a recent first admission, (b) a first admission with only a brief hospitalization at the time of the study, and (c) a multiple-admissions patient with a small total length of hospitalization. (p. 273) A schizophrenic individual interviewed for participation in this study, if a first admission patient,

was required to be in the hospital for approximately 1 week to 1 month. The multiple-admissions patient did not have more than 2 or 2½ years of total hospitalization.

It is necessary to review this process of definition, as painful as it may seem, because the difficulties surrounding the description of the schizophrenic patient are enormous and have a direct effect on the results of research. As mentioned previously, this inconsistency and lack of agreement about the symptoms and course of the schizophrenic syndrome may provide us with one reason for the vast variety of results obtained (e.g., Jackson, 1960) when the distortions in perception, as well as other schizophrenic deficits, have been measured. The three criteria outlined above describe the schizophrenic groups in this study, and all the subjects included in the evaluation of the data are ACUTE schizophrenics.

A Review of the Reasons for Testing an Alcoholic Group

An individual involved in research is usually concerned with definition and clarification and sometimes enjoys the process of unravelling the differences between those things which may seem the same. It was this orientation that prompted a further investigation into the apparent similarities between the thought process of schizo phrenics and alcoholics. Upon reviewing the clinial case files of the schizophrenic and alcoholic patients, it was

found that the confusion of symptoms upon admission was not the only similarity between the two clinical disorders, as outlined in the following pages. The question that prompted the inclusion of this group may be stated as follows: If schizophrenics and alcoholics are similar in some specific ways, as indicated by the difficulty in assessing the difference in the form of thought disorder upon admission to the hospital, then will these two clinical disorders present similar characteristics in terms of Billig's spatial structure theory? In order to verify Billig's theory of spatial structures in paintings and to further define and perhaps extend its application, it was necessary to establish whether or not the alcoholic could benefit from the potential of this diagnostic tool, or whether modifications in application and evaluation would be necessary or possible.

It may be said that individuals suffering from schizophrenia or alcoholism present some unique similarities, and this presents the possibility that there may be a similarity in spatial structures which might interfere with the application of Billig's theory, as it is stated at the present time. But, further investigation would help to clarify and possibly extend the application of the spatial structure theory and make it possible to incorporate it into the diagnosis and treatment of the alcoholic patient. The intention, then, was to prove that schizophrenics and alcoholics may be similar in some specific ways and to discover if these similarities extend to the spatial structures in paintings, as outlined by Billig (1970).

A review of the literature which discussed the alco-

holic or alcoholism quickly indicated that studies investigating traffic accidents and driving behaviour dominated the research efforts. Some studies limited the discussion to procedures employed to discover "the psychological changes contingent on experimentally induced alcoholic intoxication" (e.g., Jellinek & McFarland, 1940, p. 272). It is true that inducing intoxication eliminates numerous problems with the experimental subjects which would be encountered in an alcohol treatment unit; for example, the investigator would have control over the amount of alcohol ingested and the related behaviour. However, there appeared to be a need for additional investigations dealing with the hospitalized alcoholic and aspects of this disorder other than response time.

An exception to the gap in the literature was an article by Kalliopuska (1982). He pointed out the following fact: The study of the relationship between field-dependence and other personality characteristics has received almost no attention. The cognitive style of an individual is a significant factor, especially when considering the fact that alcoholics as well as schizophrenics have a global cognitive style (Kalliopuska, 1982). Comparing a group of alcoholic subjects with a group of schizophrenic subjects would contribute to this field of research. In addition, it would address Deregowski's (1982) suggestion: An appropriate method of cross-cultural research is to study a particular psychological process.

Schizophrenics have frequently been compared to a group of control subjects, but there may well be extraneous variables which affect the results and produce an inappro-

priate impression of the schizophrenic disorder. Gjerde (1983) provided an excellent example when he discussed the attentional dysfunction in schizophrenia and expressed the need for examining the direction of causality between arousal and cognitive processing. A group of alcoholic subjects would be "closer" to a schizophrenic group of subjects in terms of arousal because being institutionalised establishes a certain amount of anxiety in the subject. (Gjerde, 1983) The Gjerde (1983) research has been discussed in detail in the previous pages and it supports the rationale for a group of alcoholic subjects.

There were four initial reasons for extending this research to include an alcoholic group:

1. Thought Disorder

It was necessary to review carefully the case histories of the schizophrenic patients in order to extract relevant data and to assist in establishing a good rapport with the patient. The initial diagnosis at the time of admission was frequently changed from alcoholism to schizophrenia or schizophrenia to alcoholism (the first order was somewhat more frequent). A small number of files indicated that the patient was initially diagnosed as an alcoholic, and then at the next admission he was diagnosed as a schizophrenic and possibly as an alcoholic at the next admission, and so on. This difficulty in interpreting symptoms at the time of admission seemed to suggest some significant similarities between these two disorders.

After extensive interviews with various patients diagnosed as alcoholic and patients diagnosed as schizophrenic, a recognisable similarity did in fact seem to exist (even if this was not the symptom causing confusion on admission). A form of thought disorder could be detected in the conversations of the alcoholic and the schizophrenic; the form of the thought disorder was not, however, the same. The difference between the two forms of thought disorder is illustrated in Figure 20.

The alcoholic patient follows a line of reasoning with a logical sequence of explanations as to why he doesn't like his wife, but there is no closure to the thought process. He doesn't explain that his complaints are the reasons why he wants a divorce. The schizophrenic patient "handles a conversation" in a different way. The thought process includes a series of unrelated reasons and a conclusion is reached, but it is unrelated to the previously mentioned reasons.[1] However, the fact that the schizophrenic mentions specific reasons, even though they are unrelated, and that there is a closure to his thought process illustrates the difference between the two forms of thought disorder.[2] Alcoholics as well as schizophrenics experience

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[1]The illustration does not discuss a divorce because there are very few married schizophrenic patients.

[2]This observation was presented to Dr. J.B. Rae (T.D., M.B., Ch.B., D.P.M.). As a consultant psychiatrist and director of the Alcohol Unit at the Bangour Village Hospital, he confirmed this conclusion. For other publications related to the alcoholic, the reader is referred to Drewery and Rae (1969) as well as Rae and Forbes (1966).

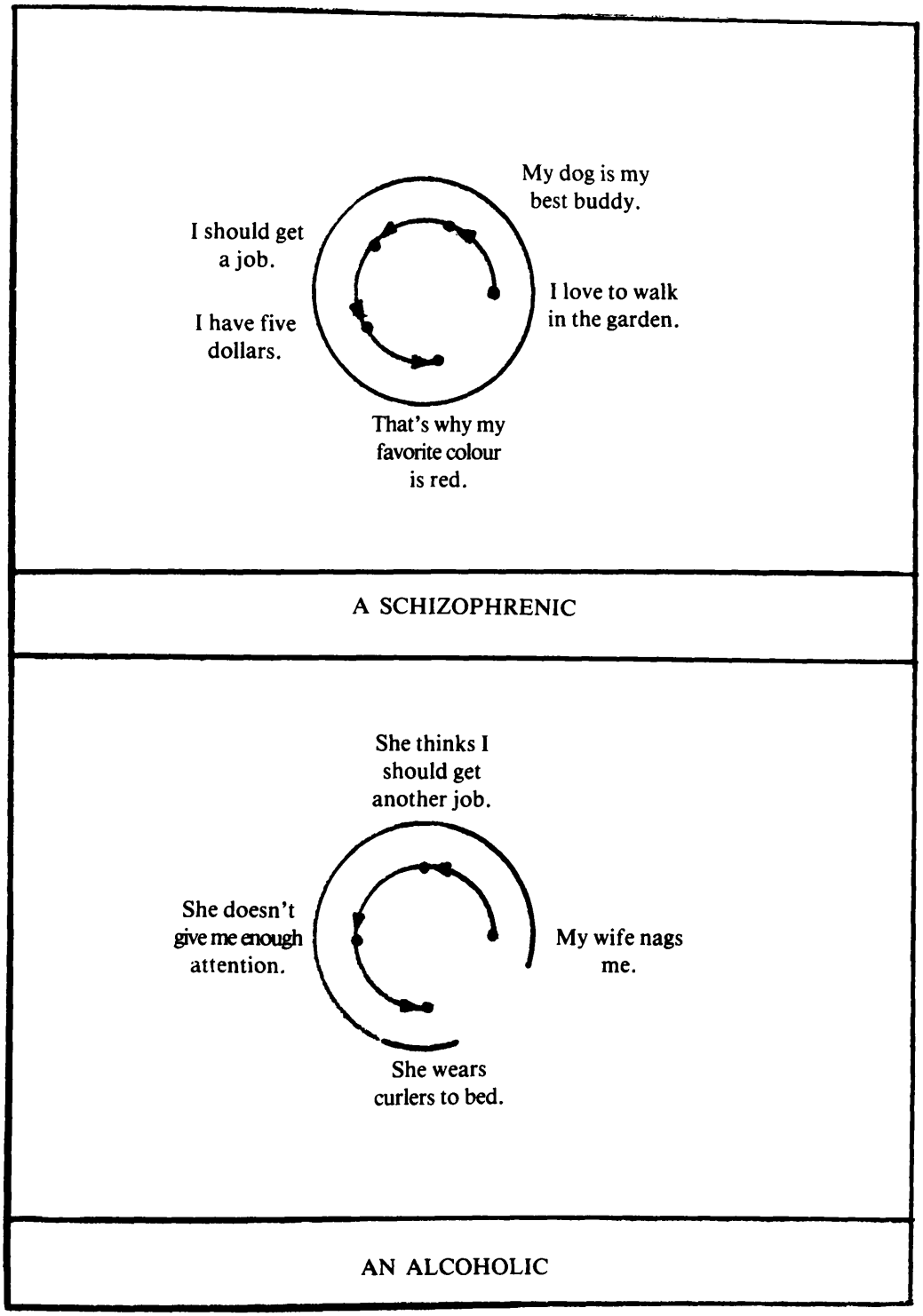

Figure 20. An example of the difference between schizophrenic thought disorder and alcoholic thought disorder. The circle represents the process of thinking, the dots indicate the reasons used in forming a conclusion, and the arrows indicate the direction of the process.

thought disorder, and a further consideration of this similarity seemed worthwhile.

2. Similarity between Cultures

Scotland and Alaska share a high incidence of alcoholism. In Northern Scotland, the incidence of alcoholism is four times as great as the rest of Scotland. (Warder & Ross, 1971, p. 112) Newspaper articles published in 1978 and 1981[1] described the alcohol abuse in Scotland. Regional differences in alcohol abuse are also evident in Alaska, a northern region of the United States with similar characteristics of isolation.

Blane, Overton, and Chafetz (1963) and Jellinek (1960) have demonstrated that the diagnosis of alcoholism is to some degree regulated by social and cultural factors, specifically the increase in prevalence and the variation of incidence between the regions of Scotland. According to 1961 statistics, alcoholics formed 31 percent of the admissions to mental hospitals in Scotland (Morrison, 1964, p. 111). Warder and Ross (1971) claimed that "there has been a real increase in the prevalence of alcoholism in Scotland over the last decade" and a "lack of activities alternative to drinking" may be a possible explanation for the high incidence in the rural regions. (p. 113) In addition, Scot-

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[1]Los Angeles Times (1978) and MacLeod (1981).

land's liquor industry may place a high significance on the sale and consumption of this product. Kessel and Walton (1965) asked this question, "Does not the liquor industry in Scotland provide a likely explanation for the high rate of alcoholism there?" (p. 72)

These suggested explanations for the high incidence of alcoholism could very easily be applied to the social factors which influence the drinking behaviour of the Alaskan Eskimos. There is certainly a lack of activity in the villages of Alaska, especially now that technology has replaced previous tasks necessary for survival. The Eskimo now fills his "snowmobile" with gas, instead of feeding and training several huskies for a dog sled team. Access to alcohol is easy for the Eskimo, in spite of the isolation in some cases, because of the economic profits received from the sale of liquor. It is transported by aeroplane and may have priority over the transportation of food. (Johnson, Note 4) Some villages are legally classified as "dry" (no alcohol to be sold or publicly consumed) in an effort to control the alcohol abuse, but this does not significantly hinder the rate of consumption. Lack of activity and easy access may offer explanations for the alcohol abuse among the Eskimos.[1] (Anchorage Daily News, 1966, p.41), and the problem has shown a definite increase in the last two decades. (Johnson, Note 4)

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[1]This problem is not limited to the Eskimos, but they are mentioned for the purpose of this discussion.

It is certainly not suggested that Scotland and Alaska alone share a problem of alcohol consumption. However, these similarities between the people of Scotland and the Eskimos of Alaska encourage further investigation into other possible similarities which may exist between these two cultures. This research may not offer any solutions to the social problems related to alcohol abuse, but if the number of alcoholics admitted to hospitals continues to increase in both cultures, then any steps to improve the treatment or provide insight into the problem should be taken.

3. Pilot Study

A pilot study included a group of 12 men (mean age=47.8, SD=12.87) selected from the alcoholism unit at the Bangour Village Hospital (mean length of hospital stay=91 days, SD=13.31), a group of 12 schizophrenics (6 females, 6 males)(mean age=33.1, SD=7.8, mean length of hospital stay=345.7 days, SD=202.28), and a group of 12 control subjects (6 females, 6 males)(mean age=29.8, SD=7.3). All of the subjects were asked to produce two paintings, a free-choice and a landscape or scene; in addition, they were asked to perform the distance constancy test. The results indicated that characteristics considered to be schizophrenic (such as transparency, base line, and geometric shapes) by Billig (1970) were present in the paintings of the alcoholic men as well as the schizophrenic subjects; the spatial structure characteristics described by

Billig (1970) were not, however, found in the paintings produced by the control group. Also, a one-tailed Mann-Whitney U Test was used to analyse the distance constancy data, and it indicated that there was no significant difference, at any of the intervals, between the alcoholic and schizophrenic subjects. There was, on the other hand, a significant difference in the one-yard estimations made by the schizophrenics and controls as well as the alcoholic and control subjects. The results did not provide sufficient evidence to reject the theory that schiozphrenics and alcoholics may be similar in their perceptual and painting performance.

To avoid the possibility of the results being contaminated by an age factor or the Korsakov's Syndrome[1] and to match the Scots sample with the Eskimo sample[2], it was decided to concentrate on younger men in the early phases of the illness. In addition, it has been established that alcoholism is a symptomatic psychosis which resembles schizophrenia, especially in the chronic phase of the illness. (Slater, Note 3) In the early phase, however, diagnosis is often difficult, and the present study should supply new information.

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[1]For a description of this form of chronic alcoholism, the reader is directed to Kessel and Walton, 1965, pp. 37-38.

[2]The Korsakov Psychosis is rare among the Eskimos because of the length of time necessary for this condition to develop and their relatively recent abuse of alcohol.

The decision was made to extend the subject groups to include an alcoholic group. The primary objective was to clarify the representation of specific spatial structures found in the paintings of schizophrenics and identify any possible evidence which might interfere with the application of Billig's theory. This theory, of course, would be applied by developing a nonverbal diagnostic tool to be used with schizophrenic patients. A question to be asked might be, If spatial structures characteristic of schizophrenics (i.e., Billig, 1970) are found in the artwork of patients suffering from alcoholism, do these spatial structures reflect ego disintegration? If the same spatial structures appear in the artwork of alcoholics and schizophrenics, do the spatial structures in the paintings produced by alcoholics follow the same sequence of deterioration that has been documented by Billig (1970)? There are several questions raised by the results of the pilot study.

4. Length of Treatment

Alcoholic and schizophrenic patients represent two groups of people with a low rate of success in terms of treatment. Patients diagnosed as alcoholic frequently use the hospital setting for temporary relief from social stress, as a source of food, or a place of sleep, rather than as a place to be treated for their problem with alcohol. I have direct experience with this attitude, and Warder and Ross (1971), also, indicated that this was a factor in the treatment of the alcoholic. Consequently, a brief

encounter with the patient is all that may occur and a non-threatening task, such as painting, may provide insight into the patient's condition. If the alcoholic patient could provide the therapist with some information related to the painting, then the use of this diagnostic aid would be beneficial.

It should also be noted that an attempt to investigate the cognitive dysfunction of the alcoholic patient was considered. The alcoholic with less cognitive dysfunction will regain adequate depth perception after a 4 week[1] interval from the time of admission, whereas the alcoholic with severe cognitive dysfunction will demonstrate no recovery of perceptual skills. This extension of the research, referred to as the 1-4 week interval of dysfunction, was very difficult to pursue and was finally abandoned. The alcoholic patients rarely remained in the hospital setting for the full 4 week period; if they did remain in the hospital, it was discovered that they had left the hospital for a brief time to return to their drinking pattern. Foltin (1953), also, discussed the problems related to seeing patients at various intervals of time. I continue to believe that this line of investigation is worthwhile but it is not within the scope of this research.

These are the four initial reasons why an extension to the original experimental groups was necessary and worth attention. Thought disorder is experienced by the alcoholic

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[1]Dr. Rae recommended that a 4 week interval would allow adequate time for the patient to "dry out."

as well as the schizophrenic, the prevalence of alcoholism in the two cultures makes the investigation of both warranted, the pilot study indicated no significant difference between the alcoholic and the schizophrenic groups, and the alcoholic and the schizophrenic often require repeated hospitalization and treatment. Any additional diagnostic tools which would assist in the treatment process deserve attention.

A female group of alcoholics was not considered for this research because men and women alcoholics do not represent a homogeneous group. Women alcoholics frequently have a secondary diagnosis of depression or other psychiatric difficulties (Winokur & Clayton, 1968, p. 885), such as retardation, suicidal thoughts, and delusions; these same complications are not found very often in the male alcoholic. (Winokur & Clayton, 1968, p. 889) Winokur and Clayton (1968) concluded that alcoholic women in particular suffer from an affective disorder as well as the alcoholic illness. (p. 891)

Results from a later clinical study of 259 alcoholics indicated that alcoholic individuals could be divided into three groups: "(a) primary alcoholics, (b) depression alcoholics, and (c) sociopathy-alcoholics. Males predominate in Groups a and c, females in Group b" (Winokur, Rimmer, & Reich, 1971, p. 571). Females seem to "differ in the way they express the disorder" (Winokur et al., 1971, p. 571). This is not to say that alcoholic men do not suffer from depression, but this secondary diagnosis is relatively frequent in women alcoholics.

Clinical evidence has suggested other rather major differences between the male and female alcoholic (e.g., Rathod & Thomson, 1971). One noted difference is the ratio of recorded cases of men and women alcoholics; for example, Alpert and Silvers (1970) reported five men to one woman and Victor and Hope (1953) reported four men to one woman. This is not necessarily an indication of a difference in incidence but rather the fact that men are more frequently in social positions where they cannot conceal the problem.

When all of these differences are considered, the conclusion must be that a female sample of alcoholics would not make a worthwhile contribution to the present study. For this reason, the decision was made to include only male alcoholics in this experimental group.

The reasons for selecting the Scottish and Eskimo schizophrenics as well as the Scottish and Eskimo alcoholics for the present investigation have been reviewed previously. They address the most frequent questions asked by individuals interested in this research project, "Why are you including Scots and Eskimos in your study?" and "How is schizophrenia and alcoholism similar?" Now that these questions have been answered for the reader, it is necessary to address the primary and secondary hypotheses formulated and tested by the present experiment.

SUMMARY

The primary purpose of the present research was to experimentally test Billig's theory; this theory stated that

there is a correlation between specific changes in the graphic representation of space and the disintegration of the schizophrenic's ego boundary. If the results of the present research support Billig's findings, then it would be possible to formulate a nonverbal diagnostic tool to be used in the treatment of schizophrenic patients.

The Scots and the Alaskan Eskimos were selected as representative of a Western and a non-Western culture. It was decided that these groups were appropriate for this particular research project for two primary reasons: (1) The spatial structure theory developed by Billig (1970) claimed that the spatial structures which reflect various levels of ego deterioration are universal and have been revealed in both Western and non-Western cultures. (2) Berry's comparison of the perceptual skills of the Canadian Eskimos and the Scots provided a valuable opportunity to test the universal aspect of Billig's theory without the concern for the possible variation in skills related to space perception. These two cultures seemed to offer the opportunity to test the universal aspect of Billig's theory. If the Scots and the Alaskan Eskimos possess similar skills related to space perception, then the universal aspect of Billig's theory could be tested without concern for possible cultural variations in perception. In addition, the constancy performance could be evaluated as well as the level of ego disintegration without concern for the cultural influences on perception.

The process of selecting the most accurate definition of schizophrenia was longer than one might imagine and

involved an extensive review of psychiatric literature as well as interviews with psychiatrists from two cultures. However, the effort involved was necessary in order to establish criteria for the selection of schizophrenic subjects. The primary definition of schizophrenia selected for the purpose of this research was taken from the work of Bleuler (1950). Schizophrenia shall be represented by the symptoms of thought disorder and blunt affect, and the accessory symptoms, such as hallucinations and delusions, will be used as a means of confirmation. The secondary definition of schizophrenia will follow the criteria established by Strauss (1973), and it will describe the acute versus the chronic schizophrenic. In terms of the secondary definition of the disorder, the Strauss (1973) criteria represent the most accurate method of matching the schizophrenic groups from Scotland and Alaska. The following criteria, as outlined by Strauss (1973), represented the selection criteria for the schizophrenic groups in the present study: (a) a recent first admission, (b) a first admission with only a brief hospitalization at the time of the study, and (c) a multiple-admissions patient with a small total length of hospitalization. (p. 273) A schizophrenic individual interviewed for participation in this study, if a first admission patient, was required to be in the hospital for approximately 1 week to 1 month. The multiple-admissions patient did not have more than 2-2½ years of total hospitalization.

There were numerous reasons for testing a group of

alcoholic subjects. Generally, there was a lack of information in the literature regarding the perceptual or psychological changes which accompany this disorder, and there was also a need to match schizophrenic subjects with other subjects in terms of arousal (Gjerde, 1983) and its relationship to perceptual performance. In addition, the alcoholic as well as the schizophrenic is described as having a global cognitive style (field-dependent); this fact would allow the researcher to follow Deregowski's suggestion. He encouraged researchers to investigate a particular psychological process when conducting cross-cultural research.

More specifically, there were four initial reasons for extending this research to include an alcoholic group. They have all been discussed previously, so it will be suffice to list them here: (1) Thought disorder is experienced by the alcoholic as well as the schizophrenic. (2) There is a high incidence of alcoholism in Alaska and Scotland and any steps to improve the treatment plan or provide insight into the problem should be taken. (3) The pilot study indicated no significant difference between the alcoholic and the schizophrenic groups but a significant difference between the control group and the alcoholic group and the control group and the schizophrenic group. (4) The alcoholic and the schizophrenic often require repeated hospitalization and treatment. These factors strongly suggest that a diagnostic tool developed to address the similarities and differences between these two disorders and appropriate treatment plans would be beneficial to the psychiatric staff

as well as the patient. The purpose of the present research is to explore the possibility of establishing a nonverbal diagnostic tool that could be applied universally to assist schizophrenic patients and, perhaps, alcoholic patients as well.

RESEARCH HYPOTHESES AND IMPLICATIONS[1]

Primary Hypothesis

There is a significant positive correlation between the amount of error made on a size constancy task and the ratings representing the disintegration of spatial structures in paintings.

Implications

a) Weckowicz proposed that there is a relationship between the disturbance of ego boundaries, breakdown of perceptual constancies, and, consequently, the deterioration of space percep-

[1]At this point, the reader may wish to review the experimental procedure for a specific description of the tasks described in these hypotheses.

ception. If this hypothesis is supported, and the acute schizophrenic subjects indicate a disturbance of perceptual constancy and a disintegration of the spatial structure in their paintings, then the Weckowicz theory is supported.

b) If this hypothesis is supported, then Billig's theory, which stated that spatial structures reflect ego disturbances, is also supported. However, Billig's theory must be extended to state that the artist may be structuring representational space to reflect his perception of space as well as the condition of his ego boundary.

Secondary Hypotheses

1. The early term or acute schizophrenic experiences a severe disturbance of the ego boundary and perceptual constancy, and, therefore, the acute schizophrenics will be significantly poorer than the control subjects in their performance of the distance constancy task and the unstructured painting task.

Implications

a) If the schizophrenic subjects perform significantly poorer than the control subjects on

the distance constancy test but are not significantly poorer in their painting performance, then the lack of ability to perceive depth has no influence on the spatial structures detected in the paintings of schizophrenics.

b) If the distance constancy scores of the schizophrenic subjects are not significantly poorer than the control subjects, but the ratings representing the spatial structures in the paintings are significantly higher than the control subjects, then there is no support for the correlation between the deterioration of space perception, perceptual constancies, the self, and body image of the schizophrenic, as outlined by Weckowicz and Sommer (1960). The spatial structures in the paintings of schizophrenics may, then, reflect only the condition of the schizophrenic's ego boundary, as outlined by Billig (1970).

c) If the acute schizophrenic subjects receive significantly higher ratings on the unstructured painting task, considered to be characteristic of the acute schizophrenic (Billig, 1970), than the control subjects, then Billig's spatial structure theory is supported.

2. There is a significant difference between the spatial structure ratings in the paintings of the Scottish schizophrenics and Eskimo schizophrenics.

Implication

a) If this hypothesis is supported, then the universal application of Billig's (1970) theory is not supported by the results of this experimental study.

3. The schizophrenic artist will show a greater ability to integrate space in his painting if he is asked to paint a specific subject. The schizophrenic subjects will receive a significantly lower rating on the structured painting task (specific subject) than on the unstructured painting task (free-choice).

4. The schizophrenic subjects will be significantly poorer than the alcoholic subjects in their performance on the perceptual constancy tests and the unstructured painting task.

Implications

a) If this hypothesis is supported, then the findings support the (obvious) view that in this respect the clinical conditions are not similar.

b) If this hypothesis is supported, then the spatial structures in the paintings produced by schizophrenic patients (Billig, 1970) are not found to the same extent in the paintings produced by alcoholic patients. Therefore, Billig's (1970) spatial structure theory may not be used to evaluate the paintings produced by alcoholics.

The Experimental Tasks Selected to Test the Hypotheses

The Perceptual Constancy Experiments

In order to conduct an experimental investigation of spatial structures in paintings and their possible relationship to perceptual constancy, two appropriate tests of constancy were selected, size and distance constancy. These tests are representative of constancy of perception and directly relate to depth perception.

Size constancy and distance constancy were included in the experimental design for two reasons: (1) The literature provides a significantly greater amount of data on size constancy experiments with schizophrenics than on distance constancy performance. The results of the size constancy experiment could, then, be compared with previous research, and the distance constancy data could provide additional information about the perceptual performance of the acute schizophrenic. Weckowicz investigated the size constancy

(1957b) and distance constancy (Weckowicz & Hall, 1960) performance of chronic schizophrenic patients. If both perceptual constancy tasks were included in the experimental procedure, then a more extensive examination and comparison of Weckowicz's research would be possible. (2) The Eskimo life style demands skill in the estimation of distance, often in a bleak environment. The distance constancy test, then, would provide a more direct measurement of this necessary environmental skill. The size constancy test would provide comparative data with a more extensive research base.

The Size Constancy Apparatus and Experimental Procedure

The size constancy apparatus used by Weckowicz (1957) consisted of a white box with a white screen placed behind it on a white table. Extending from the top of the white box was a black rod (.5cm in diameter) which was adjusted to various heights (0-20cm) from behind the white screen by moving a handle. Another white screen was placed in front of the white box and removed after the experimenter had adjusted the black rod to the standard height. Another white box was placed on another white table; both the table and the box were identical to the experimenter's apparatus. A chin rest was attached to the side of the table where the subject could rest his head at the time of testing.

The test was conducted in a well lit corridor where "all external light was carefully excluded. Care was taken

to maintain a standard arrangement of objects so that the cues would not change. The subject was seated behind the second table with his chin on the chin support, and his hand on the handle for adjusting the rod on top of the white box 44cm. in front of him" (Weckowicz, 1957, p. 478). The experimenter's table was placed at a distance of 7.5m from each subject and then 15m from each subject.

The subject was required "to adjust the black rod on top of the white box in front of him to the same size as the other black rod, which he saw at a distance. He was instructed to use both eyes, and not to use sighting. He was asked to use his first impression. When making a new adjustment, he was not allowed to go back to zero, but had to make it from the existing position" (Weckowicz, 1957, p. 478). These instructions were read to each subject in the Weckowicz (1957) study.

The experimenter sat in a chair behind the screen and showed the following sizes of the standard rod: 10, 15, 5, 11, 6, 18, 2, 14, 7, 20, 4, 17, 1, 13, 3, 19, 8, 16, 9, 12 cm from the 7.5m distance, and 7, 20, 2, 18, 6, 11, 5, 15, 10, 16, 9, 12, 8, 19, 3, 13, 1, 17, 4, 14 cm from the 15m distance. The white screen was placed in front of the white box while the size of the rod was being changed, preventing the subject from witnessing the movement of the black rod.

An assistant read and recorded the adjustments of the black rod made by the subject, who was not allowed to see the measurements made by the assistant. All the adjustments were recorded as an error in centimeters (to one deci-

mal point) from the standard rod size (a plus indicating greater and a minus smaller). The arithmetic sum of these errors was calculated, and the mean error became each subject's score.

"'Series effect' had to be taken into consideration in using a series of different sizes as stimuli. It was hoped that this tendency to regress to the mean size of the series would be counteracted by displaying alternately large and small sizes, which by introducing the contrast phenomenon would act in the opposite direction. The instruction to adjust the rod from the previous position instead of the zero position aimed at including the same amount of 'up' and 'down' movement in adjusting the rod in each series, as it is possible that upward movement may require more motivation than downward movement-an important consideration in dealing with schizophrenic patients" (Weckowicz, 1957, p. 479).

The Distance Constancy Apparatus and the Experimental Procedure

The apparatus for the Weckowicz and Hall (1960) distance constancy experiment was constructed and located outdoors, on an open, flat prairie.

> A small cart with a white triangular marker was moved by a series of strings and pulleys away or towards the subject. It was held on a straight path by a white nylon rope stretched from an iron peg 200 yards away. A red peg was used as the sta-

> tionary marker. The strings and pulleys were operated by an assistant who stood behind the subject. (Weckowicz & Hall, 1960, p. 273)

The subject was required to judge 1-yard intervals for 10 distances ranging from 11 yards to 20 yards. "In order to reduce the possibility that non-visual [sic] cues would be used by the subjects, the order of presentation of these distances was randomized" (Weckowicz & Hall, 1960, p. 273). The order of the 1-yard intervals was the same for each matched pair of subjects, one schizophrenic and one non-schizophrenic, but different for each pair of subjects. The instructions for each subject was as follows: "We are going to move the cart with the white triangle away from the red peg. Would you tell us to stop when the near side of the cart is one yard from the red peg?" (Weckowicz & Hall, 1960, p. 273) After the response, "Stop the cart", the subject was asked to turn his back, and the distance the cart had moved was measured; "the red peg was then removed and driven into the ground at the distance which was next in the order of presentation. This procedure was repeated ten times" (Weckowicz & Hall, 1960, p. 273).

The Modifications of the Perceptual Constancy Experiments

Every attempt was made to duplicate the apparatus used in the Weckowicz (1957) and Weckowicz and Hall (1960) studies. However, it was necessary to modify these experi-

ments in various ways.

The Size Constancy Experiment

All of the apparatus[1] for this experiment was constructed to duplicate the Weckowicz (1957) apparatus (see Figure 21). The apparatus would be required to travel extensively; so, an attempt was made to eliminate any unnecessary equipment. Consequently, only one screen was used to conceal the experimenter's adjustment of the black rod and to provide a white background for the subject viewing the black rod. The white screen could easily be moved from one position to the next by the experimenter. A chin rest was also eliminated from the design of the table. After consulting with a psychiatrist, it was determined that this device would be difficult for most schizophrenic patients to use, and certainly foreign (and perhaps intimidating) to the Eskimo schizophrenic.

A long corridor would not always be available in the hospitals participating in this study. Available spaces at the psychiatric hospitals included auditoriums (Gartnavel Royal Hospital, Alaska Psychiatric Hospital), a church corridor (Bangour Village Hospital), and a hospital corridor (Alaska Native Hospitals in Bethel and Anchorage). There was adequate lighting in all of the facilities, and all external light was excluded. An effort to remove all extra-

[1]The apparatus was constructed by the technicians for the psychology department of the University of Glasgow.

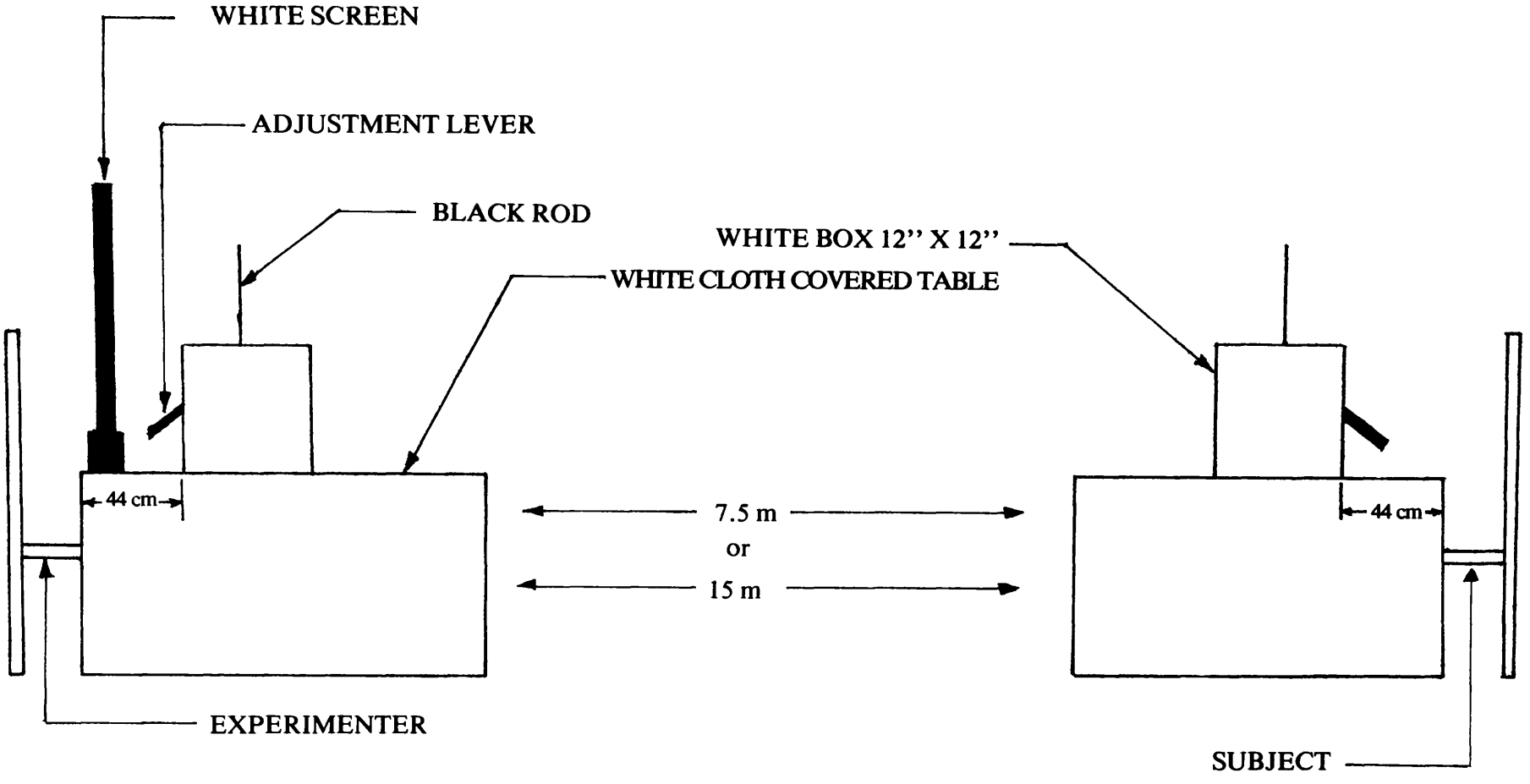

Figure 21. The apparatus for the size constancy test.

neous objects ensured that they would not act as possible cues.

The two distances (7.5m and 15m) were not presented to each subject in the same order as in the Weckowicz (1957) study. To attempt to control for a possible fatigue factor, the 15m distance was presented first to half of the subjects and second to the other half of the subjects in each experimental group; the assignment of the subjects was random.

The experimenter adjusted the black rod to a standard size, allowed the subject to adjust his/her black rod, and then walked over to the subject's table to measure the adjustment in centimeters; the experimenter then returned to the experimenter's table to record the data (see Appendix IV). The first adjustment of the black rod was not included in the experimental data but considered a trial adjustment. An assistant was not available for this study; so, all of the details of the procedure were performed by the experimenter.

These modifications (i.e., one screen instead of two, no chin rest, necessary alternatives to a corridor, a variation in the two distances, and the experimenter conducting the experiment as well as recording the data) are the only deviations from the Weckowicz (1957) study, except for the experimental groups investigated and the related hypotheses.

The Distance Constancy Experiment

It is not possible to conduct experiments out-of-

doors in Alaska, due to the severe climate in the winter and rain in the summer. The first modification, then, had to be to design the experiment so that it could be conducted in an auditorium or corridor. To conserve on the amount of equipment, the two white boxes (12 inches square) constructed for the size constancy test were also used for the distance constancy test. They were turned on their sides and three brass screw eyes were inserted in the two front corners of the boxes (see Figure 22). The boxes were placed on the same two tables which were covered with white cloth and situated so that there was a distance of 80 feet (not 200 feet) between them. It was necessary to place two white concrete blocks on top of the boxes to make it possible to operate the pulleys. A white nylon rope was threaded through the brass screw eyes so that the rope formed two separate pulleys, one controlling the red triangular marker[1] (representing the stationary red peg) and the other controlling the white triangular marker (see Figure 22).

An assistant was not available to operate the pulleys from behind the subject, so the experimenter stood at the opposite end of the apparatus and operated the pulleys from there. The order of presentation of the 1-yard intervals, ranging from 11 to 20 yards, was randomised; a subject from each of the six groups was assigned to each set of randomised distances. After the subject had completed the

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[1]According to Vernon (1962), "the simpler the actual shape which is viewed, the more likely it is to be perceived accurately. Thus, if we are shown geometrical shapes such as circles, squares, rectangles, and triangles, we perceive them readily because they are both simple and familiar" (p. 50).

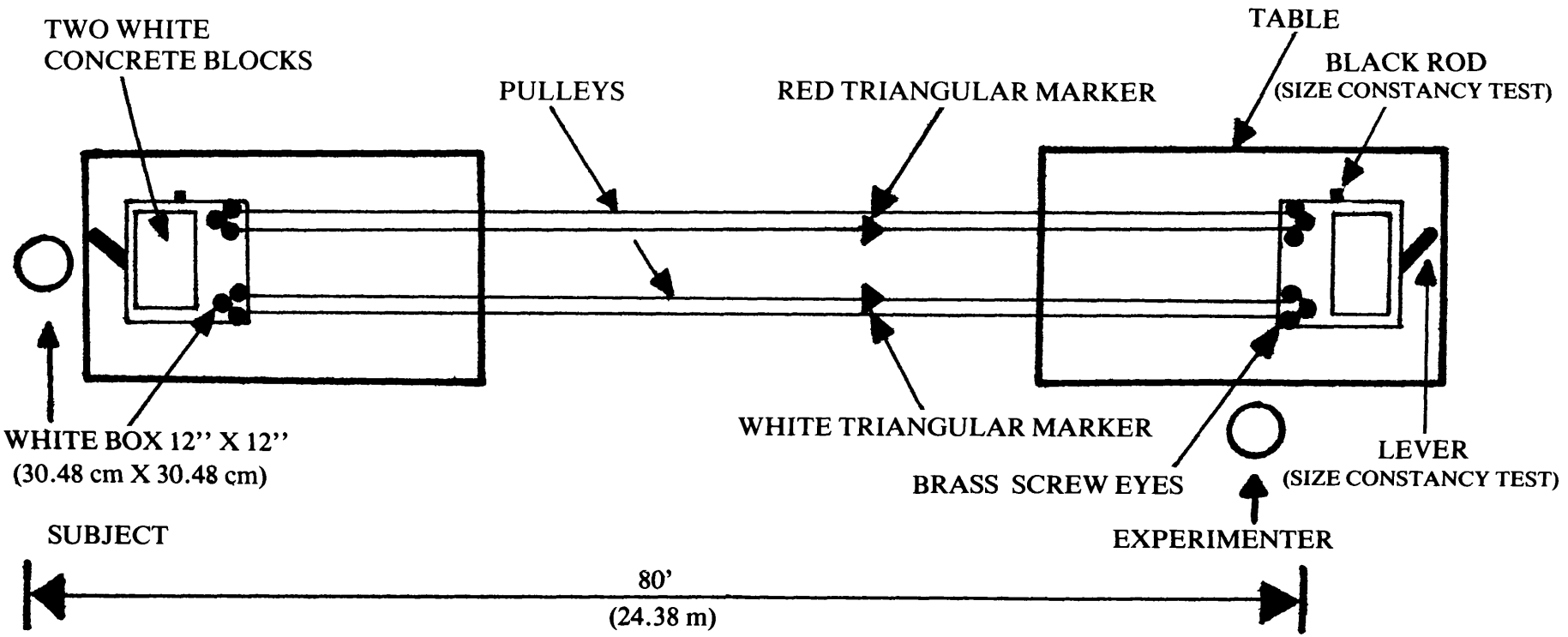

Figure 22 The apparatus for the distance constancy test (aerial view).

estimation of the 1-yard interval, the experimenter measured the distance that the white triangular marker had travelled, while the subject turned away from the apparatus. The first 1-yard adjustment was considered a trial adjustment to acquaint the subject with the apparatus; this adjustment was recorded but not included in the calculation of the subject's performance.

After the estimated distance had been recorded (see Appendix IV), the red and white triangular markers were moved to the next standard yard interval. The standard intervals were marked with material which camouflaged with the colour and appearance of the floor and were not visible to the subject. When the markers were moved to the next standard interval, they were carefully placed directly over the appropriate line on the floor.

The distance constancy experiment required more modification than the size constancy experiment. Transforming the apparatus so that the task could be performed indoors was the primary modification. It was not possible to include a cart in the apparatus if it was to travel from Scotland to Alaska, and possibly back again. The pulley device seemed quite adequate for the task required and made it possible for all of the apparatus to be packed in a large wooden box. And, finally, the red peg could not be used to mark the intervals but the notations on the floor provided a good alternative for recognising the standard yard intervals. Other than these modifications, the experiment remained the same as the Weckowicz and Hall (1960) experiment, with the exception of the groups tested and the hypotheses.

The Painting Task

Each subject was asked to produce two paintings, a free-choice and "a landscape or scene of some kind." The first painting was a free-choice, and the subject could use any of the acrylic colours placed before him on the painting table (red, blue, green, yellow, black, and white). The landscape or scene was to be produced only with black and white acrylic paints. An evaluation of the spatial structures in the painting was believed to be easier if the colours were limited to black and white. This restriction in the use of colour may also be interpreted as contributing structure to the painting task. It was anticipated that some of the schizophrenic patients might use an excessive amount of water (necessary to mix the acrylic paints), so the artist painted on the reverse side of a piece of plain wallpaper (18" x 21"). This material provided a good painting surface and resulted in a durable painting. In addition, each subject had access to two paint brushes, a small and a large camel's-hair brush. All of the painting material as well as the placement of the material on the painting table remained consistent from subject to subject.

During a conversation in 1973,[1] Billig commented on the restrictions placed on the schizophrenic subject's painting task. He said that if the subject of one of the paintings was to be suggested (structured task), the patient

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[1]The Seventh International Congress of Psychopathology of Expression in Boston, Massachusetts.

should be allowed to paint something else of his own choice first (unstructured task), such as splotches, before making any restrictions on the task. In this way, it would be easier for the artist to include splotches, for example, in the painting. Although the painting characteristics reflecting the disintegration of the ego should appear whether a subject, a landscape, is suggested or not, the schizophrenic subject who has first performed the structured task of drawing a landscape, may continue to do nothing but landscapes because he feels that that is what is expected of him. This mistaken view of what is required would be especially common among the Eskimos. My experience with the Eskimo people indicated that they were eager to please the person making the request for their participation. With this in mind and knowing that the schizophrenic might repeat a suggested subject matter in his painting, the order of the painting tasks remained the same for all subjects; the unstructured task preceded the structured task. Billig reinforced my thinking about the structured task, and he also stated that asking for a "landscape painting" was not an unfair restriction on his theory. One should find the characteristic spatial structures, at least to a certain extent, in the structured paintings, and the nature of this task might even make it easier to recognise the characteristic spatial structures.

The experimental procedure placed the painting tasks between the size constancy and distance constancy tasks. There were essentially two reasons for this placement: (1) It would provide the subject with a completely different

task and assist in extending the attention span of the subject. The experimental procedure could require 2 hours of the subject's time; this would depend on the subject's performance of the tasks. (2) A certain amount of time was necessary to rearrange the tables, boxes, and concrete blocks necessary to construct the constancy experiment which would be presented to the subject after the painting task. The subject was allowed to participate in the painting task for as long as 30 minutes. The manipulation of the constancy apparatus required approximately 15 minutes; in the remaining 15 minutes, the painting instructions were read to the subject and further rapport was established.

A Description of the Subject Groups

Scotland

The Scottish subjects live in various urban and rural areas, most of them in Glasgow, Edinburgh and surrounding rural areas. Gartnavel Royal Hospital in Glasgow and Bangour Village Hospital in Broxburn (near Edinburgh) provided the testing facilities and access to the schizophrenic and control subjects. The individuals in the control group have no prior psychiatric history and are employees (e.g., individuals working in the maintenance, laundry, domestic, and kitchen departments) of the hospital; all of the individuals in the control group volunteered their own time in order to participate in this study. All control subjects were asked to answer a series of questions,

prepared by Johns Hopkins University, to establish the individual's drinking pattern (see Appendix V).

The alcoholic subjects were selected from the admission unit of the alcohol treatment facility at Bangour Village Hospital in Broxburn. All alcoholic subjects were administered the Benton Visual Retention Test (Administration A)[1] as a measure of "organicity"; the purpose was to find out whether brain damage was present and possibly influencing the perceptual performance of the alcoholic. A score which is two points below the score expected for the age of the subject, raises the question of impairment in cognitive functions; a score of three suggests cognitive impairment, whereas a score of four points below the expected score strongly suggests cognitive impairment. Twenty-one of the alcoholic subjects received a score of less than two points below the expected score on the Benton Visual Retention Test, and the remainder of the alcoholic subjects received a score of two points below the expected score, not indicating impairment but raising the question.

Alaska

The Alaskan Eskimo schizophrenic group was selected and tested at the Alaska Psychiatric Institute in Anchorage.

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[1]There is a high correlation between the WAIS (Wechsler Adult Intelligence Scale) and the Benton Visual Retention Test; there is also the suggestion that the Benton is more sensitive as an indicator of brain damage than the WAIS and less prone to give "false positive" results. (Rae, Note 5)

This facility is the only psychiatric hospital in Alaska, and, therefore, the patients treated are from the cities and villages throughout the state. The patients are from as far away as Barrow in the north, Shishmaref in the west, and Bethel in the southwestern part of Alaska; they include both the Inupiat and Yup'ik Eskimos (see Figure 19).

A control group of hospital workers from the Alaska Native Medical Center in Anchorage and the Public Health Service Hospital in Bethel volunteered to participate in this study. Bethel, Alaska was primarily selected for two reasons: (1) It is the transportation and health center for southwestern Alaska; it is situated between the Kuskokwim Rivers and the lower Yukon. The inhabitants of 66 villages rely on Bethel for supplies, communication, and transportation to the other villages and cities in Alaska. (Anchorage Daily News, 1966, p. 5) In 1966, the population of Bethel was estimated to be 1600, and it was labelled a small village. However, the rapid development of the state has caused it to grow. According to the present population, Bethel could be referred to as a city, but in appearance it still resembles a rustic village. (2) The Public Health Service Hospital is the other reason for selecting Bethel. Not only would I have the opportunity to test Native Eskimos from various rural regions of Alaska, but the facilities at the hospital were large enough to accommodate the experimental apparatus. This was obviously a necessary requirement but not an easy one to fulfill because there is a limited number of large buildings in the rural regions of Alaska. If a village does have a large building, the chances are

very good that all of the space is utilised to the maximum and unavailable to visitors.

Because of the widespread use of alcohol in Alaska as well as Scotland, an attempt was made to select a control group free of alcohol abusers. For this reason, each control subject was asked to answer a series of 35 questions (see Appendix V), prepared by Johns Hopkins University, to establish whether or not the individual suffered from alcohol abuse. It was not necessary to ask the hospitalized subjects to answer these questions because alcohol abuse was recorded as part of the patient's history.

The Eskimo controls were also given the performance part of the Wechsler Adult Intelligence Scale. This test would hopefully provide some information about intelligence because the Alaskan educational structure and standards are more flexible than the Scottish educational system. Due to the cultural bias of clinical tests, such as the WAIS, it was believed that the primary function of the test would be to establish that the Eskimo subject could understand and follow instructions in the English language. All of the Eskimo control subjects scored in the average range of intelligence on the performance portion of the Wechsler Adult Intelligence Scale.

One of the major concerns that this research proposal raised was the question of communicating with the Eskimo people. Actually, this potential problem illustrated the difference between theory and application. Very often the researcher encounters unexpected problems when he/she attempts to prove or disprove a theory; in this case, the

reverse was true. Before leaving Scotland and travelling to Alaska, I had several preconceived notions derived from various sources of information. It was a relief to find that the Alaskan Eskimos were familiar with the Western culture and educational system, and consequently they had no difficulty understanding the experimental procedures.

The performance part of the WAIS indicated clearly that the Eskimo controls had no difficulty with the concept of one yard or three feet. There is no way that one could declare with ultimate certainty that the notion of one yard is equally well known to the Scots and the Eskimos. However, demonstrating the distance of one yard to the subjects and implementing an educational requirement represent an attempt to address a possible problem. This research offers no further evidence that would indicate whether the two groups were equally good at scaling, for example, or comprehension of the unit of measurement used.

If after living in Alaska, speaking with teachers in Scotland and Alaska about the various concepts of measurement, and testing some of the Eskimo subjects, I had felt that this aspect of the experimental procedure, or any aspect for that matter, required additional testing or attention, I would have pursued that area of evaluation. It is my impression that both groups, the Scots and the Eskimos, have a similar ability to comprehend and indicate a yard or three feet. The cognitive process which precedes this judgment may vary; therefore, the two groups may or may not be equally good at scaling, even if both groups were equal in the understanding of the basic unit of measurement.

These aspects of measurement and perception were not addressed, and the demonstration of a yard or the educational level achieved by the subject do not provide insight into these questions. The experimental procedures used were believed to be equivalent for the two groups; the empirical evidence confirmed this belief. However, this research offers no further insight into this question.

In Alaska, the alcoholic group was selected from the individuals admitted to the Comprehensive Alcoholism Services in Anchorage; this program was operated by the Salvation Army Organisation. The individuals to be tested were taken to another facility in Anchorage, the Alaska Native Medical Center, where there was a sufficient amount of space for the apparatus. All of the Eskimo alcoholics were administered the Benton Visual Retention Test (Administration A); only two of the alcoholics received scores of 2 points below the expected score, indicating that there might be a possibility of cognitive impairment, and 28 of the alcoholic subjects showed no sign of cognitive impairment.

A data sheet (see Appendix IV) was completed for all subjects. The information recorded for the control group varied slightly from the schizophrenic and alcoholic groups (e.g., the diagnostic information was replaced with the control subject's place of employment). Some of this data will be discussed in more detail when extraneous variables are examined.

The Control of Extraneous Variables

This experimental design required the control of numerous extraneous variables. For this reason, these experimental factors, which are usually reviewed in the outline of the experiment, will be discussed in detail at this time.

Subject Selection

Volunteers

Are Eskimos as ready to volunteer as are Scots? The empirical evidence, as reflected in the notes taken through out the collection of data, does not suggest that the Scots and the Eskimos differ in their willingness to volunteer. It is perhaps relevant to mention that the hospital administration in Scotland did not require the staff to volunteer but perhaps the simple fact that the request came from an administrator or department supervisor may have encouraged some individuals to participate in the experiment. In Alaska, the hospital administrators and supervisors may have also been responsible for the volunteers' decision to participate in the tests, and in addition, the Eskimos may have also felt that the request was a part of their "new" culture. Therefore, if the Eskimo approached for volunteering wanted to be a part of the "new" culture, then he should respond positively to the request for volunteers.

In other words, it appears that the effects of self-selection operated in a similar manner in both the Scottish and Eskimo groups. Both cultural groups were placed, unintentionally, in a parent-child relationship by the request to volunteer. This relationship was not designed to produce a high percentage of positive responses, but, rather, it was the most practical approach for the selection of volunteer groups and the one that respected hospital procedures.

In spite of the access to a volunteer population that the hospitals established, the control or nonhospitalized subjects presented one of the most difficult obstacles in the collection of data. Many volunteer subjects may have been encouraged to say "yes" while in the hospital setting, whereas they would have said "no" elsewhere. In practical terms, one can not stop individuals on the street and ask for their help, then transport them to the testing facility. Why some volunteers agreed to participate and others from the same department in the hospital said "no" is not a question that can be addressed by this research. The answer may be as simple as: Some people have more free time than others. The data related to the present research does not provide the numbers required to establish a comparison between the number of positive and negative responses for each culture. There may have been different self-selection effects operating in different degrees in each culture, but there is no way of accurately and honestly assessing this factor involved in the method of subject selection.

Urban-Rural Representation

The Scots sample included subjects from Glasgow, Edinburgh, and rural towns within approximately fifty miles. The Eskimo sample included subjects from Anchorage and other Alaskan cities as well as subjects from very remote vil lages. Rural subjects had either just arrived in Anchorage or Bethel for hospitalization or a visit. This aspect of the subject data was carefully recorded, and the two cultures were well matched in terms of urban-rural representation.

It is, however, necessary to consider the possible discrepancies between the two cultural groups as a result of "culturally mediated differences in experience" (Segall, Campbell, & Herskovits, 1966, p. 68). The study by Segall, Campbell, and Herskovits suggested that in addition to the possible differences between rural and urban inhabitants, there is a differential exposure factor which might affect or explain cultural differences in perception. In other words, the urban Scots may differ from the urban Eskimos as a result of "culturally medicated differences in experiences", and these differences may result in differences in perception. The perceptual test for the present research required an assessment of size and distance using abstract forms, a rod and a triangle; this aspect of the tests hope fully reduced cultural differences. In spite of the fact that the subjects were not required to judge, identify, or relate to specific objects, such as tea cup or mukluks, it is possible that one culture had more experience in judging distance than the other or one more experience in judging

the size of objects. The empirical evidence, notes taken during the collection of data, indicated that all of the subjects from the Eskimo groups and the Scottish groups stated that the distance constancy test was more difficult than the size constancy test. So, apart from the evaluation of perceptual performance, the two cultures responded in the same way to the experience of judging distance as opposed to size. It should be noted that these informal results surprised the researcher; the life experiences of the Eskimo, past and present, suggested that the Eskimos would find the distance constancy task familiar and easier than the size constancy task. The assumption that some people as well as possibly some cultures have more experience and, therefore, are more comfortable with a judgment of size as opposed to distance, is one reason why the experimental procedure for the present research included a size constancy test as well as a distance constancy test.

Attitude

There is another point that might be considered in terms of subject selection. The Eskimo subjects selected from the urban environment may represent individuals with a different frame of mind than the urban subjects from Scotland. The majority of Eskimos in urban Alaska have essentially stepped into the Western world from their Eskimo village, a decision which was probably their own.[1] They, in other words, may represent individuals that are motivated to make changes or experience a new culture. They may feel

[1]At this point in time, very few adult Eskimos have been born and raised in the urban environment.

more comfortable with the new culture than Eskimos still living in their village. So, the urban and rural Eskimo groups may represent not only the standard differences between urban and rural living but a difference in attitude. The urban Scot may have moved from a rural environment at some time, but he did not "move into" a new culture. Therefore, the reasons for a Scot to live in an urban area and say "yes" to a researcher's request may be different than the reasons for an Eskimo from an urban environment to participate in the same experiment.

There is not way to measure the effect that this aspect of subject selection had on the data, if it had any effect. The urban Eskimos may have taken the experiment more seriously because it represented participation in the "new" culture and, therefore, perhaps they made more of an effort in their perceptual performance. This question could be applied to all three urban Eskimo groups but, unfortunately, it is only possible to recognise the implications and to accept the fact that the urban-rural requirement for the present experiment was fulfilled. Considering the very difficult task of subject selection that was required by this research, it must be stated that the groups represent the best possible efforts to satisfy the criteria for subject selection.

Fatigue Factor

The experimental procedure required manipulation because it involved two constancy experiments and a painting task, possibly requiring 2 hours of the subject's time.

Each subject was randomly assigned to one of the two orders of presentation: size constancy--painting--distance constancy or distance constancy--painting--size constancy; half of the group received one sequence, and half of the group received the other sequence. The size constancy test required approximately 45 minutes and the distance constancy test approximately 20-30 minutes. The experimental tasks were not physically difficult but required an extended attention span and concentration.

Rapport

A special effort was made to establish a friendly and consistent rapport with the subjects. This particular control factor was very necessary for the schizophrenic patients in particular; it was necessary to relax the patients as much as possible and also to retain adequate attention throughout the series of tasks. The primary function of the rapport established in the experimental setting, then, was to elicit a rather lengthy span of attention.

Co-operation

Shakow (1946) presented the suggestion that several of the findings which significantly differentiated schizophrenic and control subjects could be attributed to the lack of interest and co-operation of the schizophrenic subjects

and not necessarily the variable that the experimenter is manipulating. For several years, he has considered the variable co-operativeness and has rated his subjects accordingly. Shakow (1963) believed that when the experimenter takes this factor into account, differences between schizophrenics and controls (normals) are frequently reduced or even eliminated. Winder (1960) further claimed that this relationship between co-operativeness and performance was only found with schizophrenic patients and not in others, such as patients suffering from organic disorders. Co-operation, then, may be a major factor to consider when evaluating a schizophrenic subject's performance.

To avoid the possible difficulties implied by Shakow's (1946) work, all the subjects in this study participated on a volunteer basis. All Eskimo schizophrenic subjects were required to sign a permission form which described the purpose of the research and the experimental tasks (see Appendix VI). Only <u>one</u> individual, out of the numerous people approached to particiapte in this study, refused to cooperate. No rewards were offered to the subjects, so any decision to participate indicated an adequate amount of motivation. However, it has also been suggested that when the individuals with inadequate motivation are not incorporated into the study, there is a sample bias. (Salzinger, 1971, p. 611)[1]. Nevertheless, the other alternative is unreliability of results; this presents the re-

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[1]Salzinger (1971) provided a good review of methodological problems in studying schizophrenic patients. Also, Cancro (1970) provided an excellent review of the various treatments and research efforts related to the schizophrenic syndrome.

searcher with a methodological dilemma. Fortunately, this aspect of methodology did not present a problem for this particular study; all of the subjects indicated an interest in the experimental tasks. The unusual appearance of the apparatus seemed to stimulate and maintain the interest of each subject.

Intelligence

The level of an individual's intelligence is noted differently in Scotland than it is in the United States (see Table II).

Table II

A Comparison of the Notation of Intelligence in Scotland and the United States

Scotland		United States	
Grade I	Superior	120+	Superior
Grade II	Above Average	110-119	Bright Normal
Grade III	Average	90-109	Normal-Average
Grade IV	Below Average	80-89	Dull Normal
Grade V	Mentally Defective	70-79	Borderline Retardation

All subjects were required to have a notation of intelli-

gence between the dotted lines indicated in the table.[1] With the exception of one Scottish schizophrenic subject, who indicated a slightly above average intelligence, this variable requirement was fulfilled. There were 17 subjects noted as being in the Grade IV (80-89) level of intelligence; however, they were within the upper limits of the classification.

Formal Education

The secondary grades or age 15, the time when many young people leave school in Scotland, seemed an appropriate requirement for the level of education achieved. The age of the individual when formal education was discontinued seemed to be a more reliable measure of educational experience than the grade system used in the United States because of the different educational systems represented. Table III indicates the means and standard deviations for the ages of the various subject groups on leaving school. The mean age of the individuals in the Eskimo group and the Scottish group reflects the educational system in each culture; age 15 is the educational requirement for the Scottish child, and age 16 is the legal educational requirement in the United States.

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[1]Ulman and Levy (1975), in their attempt to provide guidelines for the selection of judges and patients involved in painting tasks, concluded that judges can most successfully distinguish paintings by individuals with an intelligence designated as within the dull average to bright average range. (p. 401)

Table III

Mean and Standard Deviation of Ages of Subject Groups When Formal Education Was Discontinued

Subject group	Mean age	SD
Scottish controls	15.54	1.28
Scottish schizophrenics	15.19	1.57
Scottish alcoholics	14.93	.82
Eskimo controls	16.04	3.03
Eskimo schizophrenics	16.57	2.15
Eskimo alcoholics	14.07	2.34

A possible explanation for the difference in the standard deviation might be that some Eskimo children adhere more closely to the demands and tasks of their culture and prefer to leave school for the nonacademic events of the village; other Eskimo children (or perhaps their relatives) more closely adhere to the white man's educational aspirations and interests in career opportunities, and they remain in school for a longer period of time. Consequently, the standard deviation of ages may reflect a range of cultural preferences, more than anything else.

Snellen Notation

To ensure that the spatial structures in the subjects' paintings and the results of the perceptual constancy

tests are not affected by poor visual acuity, each individual participating in the experiment was required to have visual acuity of 20/20 or 6/6m (corrected or uncorrected) to qualify as a subject. Individuals with glasses were required to wear them throughout the experimental procedure.

Electroconvulsive Shock Therapy

Templer, Ruff, and Armstrong (1973) published an article discussing electroconvulsive therapy and brain damage. They concluded that "the ECT patient's Bender-Gestalt performance was significantly inferior to that of the control group. It was not certain why such significance was obtained upon a test of perceptual-motor functioning but not upon tests of memory and general intelligence....The ECT patient's inferior Bender-Gestalt performance does suggest that ECT causes permanent brain damage" (Templer et al., 1973, p. 443). This information was not available when this research was initiated, but there was some uncertainty about the effects of electroconvulsive therapy. As a precaution, it was required that the schizophrenic subjects not have had ECT within the previous 6 months. This problem did not arise with the subjects from the Alaska Psychiatric Institute because shock therapy was not used as a form of treatment.

When an investigator attempts to unravel a certain aspect of the schizophrenic syndrome, it is realistic to assume that the schizophrenic individuals will be taking medicine prescribed by the psychiatrist. In the strict laboratory sense, it would be advisable to eliminate this variable which might confound the research results. (Salzinger, 1971, p. 612)

However, when the investigator enters a psychiatric hospital, it is soon apparent that to request that schizophrenic patients be taken off their medication or that it be administered after the testing procedures is completely unreasonable. An obvious question is, Does an investigator discontinue his attempt to understand this disorder because of this methodological obstacle or does he attempt to modify the variable and persist in the investigation of the schizophrenic syndrome?

There are essentially four possibilities available to the researcher interested in understanding this syndrome. The methodological choices are as follows: (1) Test the patient without a consideration of his current drug status and note that the effects of drugs on performance is still under consideration. (2) Test only the patients who are not receiving drugs at the time of testing[1]. (3) Test the pa-

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[1]This is, in most hospitals, a very small or nonexistent group and consists of patients who may not show overt psychotic symptoms; these patients would not adequately represent the schizophrenic population.

tient only after a "drying-out" period (when all drugs have been eliminated from the schizophrenic's body) (Chapman, 1963, p. 540). (4) Test only schizophrenic patients who are taking a specific drug. Pereira (1972), for example, selected only schizophrenic patients on phenothiazine regimes, thereby controlling the drug variable. The difficulty with this approach to evaluating the effects of medication is that it has been reported that "schizophrenics who profit from phenothiazine therapy appear to differ in their thought disorder from patients who do not" (Chapman, 1963, p. 542). These choices indicate the problems introduced by this drug factor.

The approaches to this problem have varied in the research literature. Some investigators (e.g., Ebner & Ritzler, 1969, p. 201) merely stated that the patients in the study were receiving medication at the time, and others (e.g., Salzinger, 1971) indicated that it is necessary to deal only with subjects who are not influenced by the drugs. A third approach (e.g., Johannsen et al., 1964) was to compare schizophrenic groups by equating them on several factors, including "the relative potency of tranquillizing medication" (p. 564). More recently there has been an effort to discover the therapeutic effect of lithium carbonate on a chronic schizophrenic female. The usefulness of art therapy as a method of studying this effect on the patient's affective symptoms and distinguishing between affective disorder and thought disorder was pointed out by Perez and Marcus-Ofseyer (1978). Cvetkovic's (1979) study, the representation of space in drawings of the human figure,

on the other hand, noted that the patients were medicated and that no effort was made to account for or eliminate this factor. His reasoning was that previous studies by Datson (1959) and Koh and Kayton (1974) claimed "a minimal effect of phenothiazines on memory and general performance, and it was expected that other commonly used drugs in a psychiatric setting would not significantly impair the performance" (Cvetkovic, 1979, p. 251). These studies indicate the various attitudes related to the control of this extraneous variable.

Medication, as it affects the experimental investigation of the schizophrenic syndrome, is a controversial subject, to say the least, and one which will undoubtedly receive further attention in research. For the art therapist, there is a recent interest in understanding the effects of drugs through the use of painting and drawing. However, it is not within the focus of this study to concentrate on the specific effects of medication prescribed for schizophrenic patients. All of the schizophrenic subjects in this study were taking a minimum amount of medication at the time of testing. The name of the drug(s) and dosage were recorded as well as the date on which it was administered for the first time. A consultation with the attending psychiatrist offered an opportunity to learn about the nature of the drug and the strength of the medication (see Appendix IV, Subject Data). An effort was made not to test patients who had just recently received medication because there have been reported cases of temporary effects, such as blurred vision or nausea, soon after the medication

had been administered. The procedure adopted seemed to be the only feasible one, especially due to the cross-cultural nature of this study and the pharmaceutical variations between the two countries.

Changes Associated with Withdrawal

As Adams (1953) indicated in his classical paper, "The Effect of Alcohol on the Nervous System", there are extensive changes associated with the withdrawal of alcohol. Within the first 14 days of withdrawal, the alcoholic will experience the tremulous state, the tremulous-hallucinatory state, the seizures, and the delirium tremens. The alcoholic subjects selected for the present research will be tested within 14 days after admission (p. 300). The reader may then ask the following questions: (1) Do these changes occur at approximately the same time in the Scottish and Eskimo populations? (2) How do these changes related to withdrawal (e.g., hallucinations, D.T.s) affect perception?

These questions are certainly interesting to explore, but the present research attempted to screen out all those alcoholic patients with obvious withdrawal symptoms. Given this screening attempt, it was not within the scope of this thesis to assess the variations that may occur in the process of withdrawal. Unfortunately, neither the literature reviewed nor the information acquired from attending physicians offered any enlightening information for the researcher or reader. Therefore, the first question

is not relevant to the present research due to the screening of the alcoholic patient, and the second question was not under investigation and the answers can not be extracted from the data. It must be emphasised that it would not have been possible to test alcoholics showing marked withdrawal effects. This, in fact, is one of the reasons for following the criteria for the selection of alcoholic patients; alcoholic patients experiencing withdrawal symptoms were not asked to participate in the perceptual tasks.

Art Training

The art experience of the subject must be noted when the study involves artwork. Various art instructors have confirmed the fact that an individual with advanced training will structure space differently than one whose only contact with art was in the elementary and secondary schools.

Hammer (1958) discussed the effect of art training on projective techniques. An investigation revealed, "that there was no difference between students with or without art training (or art interest) in the degree of accuracy with which they were psychologically diagnosed on the basis of their projective drawings" (Hammer, 1958, p. 53). At the same time, Hammer (1958) considered the possible effect of elementary and secondary school art instruction on drawings used as personality indicators. He concluded that there was very little contamination of the projective drawing interpretation. Dennis (1960), on the other hand, had the fol-

lowing to say about his observations: They "suggest that group differences in drawings are much more closely related to differences in artistic experience and decorative skills than to differences in personality" (p. 218). The opinions of these authors provide evidence for both sides of the art training versus no art training argument.

Considering the possible influence of formal art training on the artwork of an individual and the advice of art instructors, there was an attempt to control this variable. Each subject was questioned during the painting task about his art experience and background; this information was noted on the subject's data sheet (see Appendix IV). However, this particular factor did not prove to be difficult to control because all of the individuals that were asked to participate in the study had no formal art experience beyond the secondary level of education, and three Eskimo subjects had no formal art experience. There is still the possibility that the subject may demonstrate drawing skills and untrained artistic potential; this is especially true of the Eskimo subjects because of the emphasis on ornamentation and drawing in their culture.

The extraneous variables in this study were numerous and demanded a great deal of attention. However, the quality of subject selection provided justification for the efforts made to control the possible contaminating factors. Medication, as a variable, appeared to be the most difficult to control and perhaps the one which requires the most attention in future research. Perhaps, if psychiatrists and art therapists continue to collaborate, the efforts to dis-

cover the effects of various forms of medication will provide insight and assistance with this methodological obstacle. The experience of confronting these variables has provided me with a new appreciation for some of the previous investigations and has, also, made me a more critical appraiser of experimental work conducted with schizophrenic and alcoholic subjects.

SUMMARY

The primary hypothesis and secondary hypotheses as well as their implications have been stated; the experimental tasks selected to test these hypotheses have been described. Due to the nature of the present experiment (e.g., the mobility factor), it was necessary to make certain modifications of the perceptual constancy apparatus and the procedures required to conduct the size constancy and distance constancy experiments. Figures 21 and 22 should assist the reader in understanding the modifications and procedures described. A detailed description of the painting task is provided as well as the reasoning behind the specific requests and requirements.

A description of the subject groups from Scotland and Alaska is considered an essential part of this chapter because this research project attempted to improve upon past research efforts in this area of study; one of the obstacles facing the reader upon reviewing research is a lack of clear and careful descriptions of the subjects involved in the

experiment. For this reason, as well as the attempt to respect the obvious research standards, a detailed description of the subjects has been included as well as the reasons behind the selection process.

Extraneous variables surrounding this experimental procedure were numerous and presented some interesting obstacles. The variables discussed include the following: subject selection, fatigue, rapport, co-operation, level of intelligence, formal education, visual acuity, electroconvulsive shock therapy, medication, changes associated with withdrawal, and art training. The amount of effort and time required to maintain high standards of subject selection might explain why there is little discussion of extraneous variables in previously published research. However, the quality of subject selection provided justification for the efforts made to control the possible contaminating factors related to the present research.

This introduction to the experiment has concentrated on problems which stimulated the present study and were encountered in it, such as Billig's lack of concern for control variables, the definition of schizophrenia, the appropriate secondary classification, the modification of the apparatus, and the control of extraneous variables. It is essential to evaluate the obstacles associated with the experimental definitions, designs, and subjects to fully understand the implications and, hopefully, the progress indicated by the present experiment and the results. Every obstacle represented a learning process and together they represented many facets of a particular goal, a valid experiment.

Chapter III

THE EXPERIMENTAL STUDY

METHOD

Subject Groups

The six subject groups that participated in this study are outlined in Table IV. All consecutive psychiatric admissions diagnosed as schizophrenic or alcoholic, who agreed to participate in the experiment, and who satisfied the criteria for patient selection were included in the hospitalized experimental groups. All schizophrenic subjects, with the exception of two Eskimo schizophrenics[1], were multiple-admission patients. A detailed description of the Scottish and Alaskan subject groups was provided in the previous chapter.

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[1]These two patients were tested 120 and 235 days after they were admitted to the hospital, and confirmation of the initial diagnosis was obtained prior to testing.

Table IV

A Descriptive Summary of the Six Subject Groups

Group	Sex		Age		Total number of days in hospital		Number of days between last admission and testing date	
	N	M/F	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Scottish controls	50	25/25	28.58	8.30	.00	.00	.00	.00
Scottish schizophrenics	50	25/25	31.18	9.38	372.66	225.82	41.25	38.89
Scottish alcoholics	30	30/0	36.14	8.15	17.20	16.26	8.00	3.25
Eskimo controls	50	25/25	31.82	9.58	.00	.00	.00	.00
Eskimo schizophrenics	44	25/19	28.32	5.14	188.39	146.24	15.42	13.58
Eskimo alcoholics	30	30/0	35.29	8.83	6.00	4.72	5.96	2.60

Criteria for the Selection of Subjects

Schizophrenics

The case history and current clinical evaluation of each schizophrenic patient was carefully reviewed prior to the testing procedure. All subjects meeting the following criteria were asked to volunteer their skills for the experiment.

Diagnosis

a) Primary Definition of Schizophrenia

The primary definition of schizophrenia shall be represented by the symptoms of thought disorder and blunt affect and the accessory symptoms, such as hallucinations and delusions (Bleuler, 1950, p. 95) will be relied upon for confirmation by the consulting psychiatrist.

b) Secondary Definition of Schizophrenia

The secondary definition of schizophrenia will follow the criteria established by Strauss (1973) to describe the acute or early-term versus the chronic schizophrenic.

For the purposes of this research, schizophrenia will not be defined according to the Diagnostic and Statistical Manual of Mental Disorder II of the American Psychiatric Association, due to the cross-cultural nature of the study.

The definition established for this research more closely resembles the description provided by the Manual of International Statistical Classification of Diseases (World Health Organization, 1977). Strauss (1973) provided the most accurate method of matching the schizophrenic groups from Scotland and Alaska, in terms of the secondary definition of the disorder.

A singular diagnosis of schizophrenia will be required. If a contaminating secondary diagnosis is noted in the potential subject's psychiatric file, such as epilepsy,[1] alcoholism, brain damage, or mental retardation, the patient will not be asked to participate in the study. All patients will be required to be well-oriented at the time of testing and indicate no hallucinatory activity.

Age

Patients between the age of 20 and 50 will be included in the study, avoiding the extreme limits of age and, consequently, childhood schizophrenia and the possible effects of geriatric conditions.

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[1]This contaminating disorder requires careful consideration according to Slater and Beard (1963) because "there is not one of the cardinal symptoms of schizophrenia which has not been exhibited at some time by epileptic patients" (Pond, 1957, pp. 110-111, cited in Slater & Beard, 1963).

Sex

The male and female subjects should represent equal proportions of the patient group.

Intelligence

In Scotland, the subject should have a Grade III or Grade IV level of intelligence, and in Alaska, the subject should have an IQ within the 80-109 range.

Formal Education

The subject should have achieved a level of education equivalent to the secondary grades or reached 15 years of age before terminating his/her formal education.

Urban and Rural Inhabitants

In an effort to select a representative sample of subjects from Scotland and Alaska, there should be rural as well as urban inhabitants included in the experimental group. This sample dichotomy is primarily suggested because of the influence of westernisation on perceptual skills, and urban samples may be considered more westernised than rural samples. (Berry, 1966, p. 227) In spite of the fact that the selection of subjects is primarily determined by the availability of appropriate people, in this study there shall be the same proportions of urban and rural inhabitants

in each group.

Visual Acuity

The subject shall have a visual acuity of 20/20, corrected or uncorrected. If it is necessary for the subject to wear glasses or contact lenses to correct their visual acuity, these shall be worn at the time of testing.

Duration of Hospital Residence

a) First-admission Patient

A first-admission patient shall be required to be admitted to the hospital for 1 week to 1 month, depending on the patient's level of adjustment to the hospital and medication.[1]

b) Multiple-admission Patient

A multiple-admission patient should not exceed 2½ years of total length of time in a psychiatric hospital.

The total duration of hospital residence shall be computed by noting the date of admissions and discharges of

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[1]The diagnostic procedure associated with this disease entity has been recently revised. The new criteria in the DSMIII, initiated by most psychiatrists in the United States by July 1981, indicates that a first-admission patient is not to be classified as schizophrenic prior to a 6 month length of hospitalization. The disorder of the patient within the first 6 months of treatment is now referred to as schizophreniform. This revision in nomenclature does not significantly effect this research because only two subjects were first admissions and only one patient had a duration of hospital residence of less than 6 months (3.97 months).

the patient, as indicated in the clinical case history, and calculating the total number of days that the patient received treatment.

Electroconvulsive Shock Therapy

All subjects shall be free of ECT at the time of testing and for a minimum of at least a 6 month period prior to testing.

Medication

It will be necessary for all schizophrenic patients to be taking some form of medication. The initiation date of all medication administered to the patient and the dosage prescribed by the attending psychiatrist shall be noted. If the patient has received a new medication within the last three days or an additional dosage of continued medication, he shall not be tested until a later date.[1] The condition of the patient in reference to the administration of medication shall be reviewed with the nurse in charge of the psychiatric ward.

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[1]There is no psychological research literature which directly addresses the possible effects of medication on perception. However, two psychiatrists were consulted about the various side effects of medication; they stated that some patients require a few days to become physiologically adjusted to the medication. Therefore, the notation of the initiation and dosage of medication was a precautionary measure.

Previous Training in Art

The subject shall have no formal art training or experience beyond the secondary level of education.

Co-operation

All subjects in this study shall be informed of the required tasks and time necessary for the experimental procedure. Only the subjects who volunteer to participate shall be included in the experimental group.

Alcoholics

Diagnosis

The diagnosis of the alcoholic patient shall indicate an addiction to alcohol; it shall clearly state that the patient has been unsuccessful in attempting to refrain from drinking. There may be an indication that the individual has gone without alcohol for a short period of time, or a relatively long period of time, but he inevitably reverted to a previous drinking pattern. In addition, the diagnosis will state that the patient "suffers from withdrawal symptoms--short-lived (though often serious) physical or mental ill-effects which supervene when drinking is temporarily halted for a few days or even hours" (Kessel & Walton, 1965, p. 17).

The alcoholic shall not be confused with a social drinker or excessive drinker but may be described as a chronic alcoholic. "Most alcoholics proceed to a stage where their brains or their bodies have been so harmed by alcohol that the effects persist even when they are not drinking. This stage may be reached by some excessive drinkers who had not manifested addiction. It is called chronic alcoholism. The term should only be applied when the body has been physically damaged by alcohol" (Kessel & Walton, 1965, p. 17).

The dependency factor will be an important criteria in establishing the diagnosis. Alcoholic patients addicted to alcohol may be considered dependent upon that substance. "They may not...require it constantly, nor does the need necessarily betoken physical dependence. It may be a psychological dependence, so that the alcoholic may rely on alcohol continuously or from time to time, to free him from unbearable tensions. With its aid he can face his problems, his family and himself. He is dependent upon alcohol to function efficiently as a social being. It is the irony of this which makes alcoholism into a problem, for the very stuff on which he relies in order to function has the inexorable physiological effect of impairing function" (Kessel & Walton, 1965, p. 18). Therefore, the patient's diagnosis shall indicate that treatment is required; the purpose of this treatment will be to help the individual to live without being dependent on alcohol.

With this information, it is possible to understand the World Health Organization definition of the alcoholic as

well as the criteria utilised to select the alcoholic subjects for the present study: The patient diagnosed as alcoholic shall indicate a pathological dependency on ethanol (Section 303.2 in the Diagnostic and Statistical Manual of Mental Disorder of the American Psychiatric Association) that has resulted in a significant disturbance of mental and physical health, interpersonal relations, as well as economic and social functioning; the individual, as a result, requires treatment. (World Health Organization, 1952, cited in Warder & Ross, 1971, p. 110). The alcoholic requires help from his family and others associated with him, but the word 'treatment' in the above definition refers to "something only doctors can give" (Kessel & Walton, 1965, p. 18).

Alcoholic subjects suffering from any symptoms of alcohol withdrawal (e.g., delirium tremens) were not included in the testing procedure because of the question of the possible affect on perception. Individuals vary as to the pattern of symptoms associated with withdrawal, but the individuals tested were observed after admission and tested when the attending physician confirmed that there were no symptoms associated with withdrawal. It would not be possible to test an individual in a tremulous-hallucinatory state, and no alcoholic patient performed the experimental tasks while hallucinating. Therefore, this criterion for the selection of alcoholic subjects attempts to screen out all those with obvious withdrawal symptoms.

Sex

All alcoholic subjects shall be men; there will be no women included in this experimental group.

Duration of Hospital Residence

a) First-admission Patient

The alcoholic patient shall participate in the experimental tasks within the first 14 days of hospitalization.

b) Multiple-admission Patient

The alcoholic patient shall have a clinical record indicating less than 1 year of total hospitalization and a recent admission of less than 14 days.[1] The testing date shall be adjusted if the alcoholic patient is experiencing hallucinatory activity; no alcoholic patient shall perform the experimental tasks while hallucinating.

Benton Visual Retention Test

All alcoholic subjects shall be required to respond

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[1]The multiple-admissions criterion of 1 year was established because alcoholic patients in the early phases of the disease generally tend to leave hospital within a brief period of time; to have more than 1 year of total hospitalization may indicate a chronic stage of the illness with additional physiological dysfunctions. This view was formed after reviewing numerous case histories, and it was confirmed by Dr. Rae, previously mentioned as the psychiatrist in charge of the alcoholic unit at Bangour Village Hospital, Broxburn.

to the Benton Visual Retention Test (Administration A). If there is an indication of organic brain damage, the alcoholic subject shall not be asked to participate in the experiment.

With the exception of the above selection criteria, the alcoholic subjects will be selected according to the same criteria established for the schizophrenic subjects.

Controls

Definition

The control subject shall be an individual with no psychiatric history.

Johns Hopkins Questionnaire

All control subjects shall complete the Johns Hopkins Questionnaire (see Appendix V).

Wechsler Adult Intelligence Scale

All Eskimo control subjects shall complete the performance section of the WAIS; this task will establish their ability to follow instructions and understand the English language.

With the exception of the above selection criteria, the control subjects will be selected according to the same criteria established for the schizophrenic subjects.

The selection of subject groups is especially important when interpreting the results of a study which includes psychiatric groups and groups from different cultures. Experimental differences unrelated to the dependent variables under investigation may be detected if an unsystematic selection of subjects has occurred. The selection criteria established for the three subject groups in this study provided a very thorough and efficient selection method.

Experimental Procedure

After consulting the clinical case history of a patient and the current clinical notes (or interviewing a prospective control subject), each individual was informed of the nature of the experiment and asked if he would like to volunteer as a participant. The visual performance required for the perceptual constancy tasks allowed the experimenter to emphasise the physiological nature of the tests, thus reducing the anxiety sometimes associated with psychological evaluation.

The participant was escorted to the testing room or corridor and asked to recite the letters on the Snellen Eye Chart. This task tended to reduce anxiety because most

individuals are familiar with the procedures designed to examine visual acuity, and it also reinforced the physiological orientation of the experiment.

If the hospitalized individual passed the eye examination (20/20 corrected or uncorrected), he was randomly assigned to Procedure I or II; one half of the schizophrenic group and one half of the alcoholic group was assigned to each procedure. The nonhospitalized individuals were assigned to Procedure III and formed the control group. It should be emphasised, at this point, that the initial outline for the experimental procedure included a control group for the size constancy test, as well as the distance constancy test and painting task. However, when the subjects were added to the experimental plan, it was immediately apparent that it would not be possible to have a control group for the size constancy test. Unfortunately, it was not possible to engage a volunteer group of nonhospitalized individuals for the length of time required for the size constancy test. Procedure III required approximately 1 hour and Procedures I and II required approximately 2 to $2\frac{1}{2}$ hours. A serious attempt was made to encourage nonhospitalized individuals to participate in all three tasks, but the time frame was not conducive to full participation. Hospitalized individuals seemed thankful for the diversion from the ward activities, but control subjects rarely have more than an hour to contribute to research. This aspect of the experimental procedure was disappointing, but also provided insight into the difference between theory and application

in the field of clinial research. Nevertheless, the lack of a control group for the size constancy test must be criticised, just as previous studies (e.g., Foltin, 1953) were criticised for a lack of a control group.

Procedure I	Procedure II	Procedure III
Size Constancy	Distance Constancy	Distance Constancy
Painting Tasks	Painting Tasks	Paintings Tasks
Distance Constancy	Size Constancy	

A detailed description of the constancy experiments as well as the apparatus and procedure for these experiments have been included in the previous chapter (pp. 334-337) because they are modifications of the Weckowicz experiments (Weckowicz, 1957b; Weckowicz & Hall, 1960). The painting tasks also required a preliminary discussion and, therefore, a detailed description of the tasks and procedure may be found in the previous chapter (pp. 338-340).

After each subject completed the assigned experimental procedure, the primary purpose of the study was explained, and questions regarding the purpose of the experiment or the procedure were answered. The subject's performance was also reviewed, if he was interested, as well as the contribution the research would make to nonverbal communication with patients, especially Eskimo schizophrenics.

Apparatus

Modification of the Weckowicz Size Constancy Apparatus.

Instructions

The subject was seated at the table (see Figure 21) and the following instructions read:

> You are to "adjust the black rod on top of the white box in front of [you] to the same size as the other black rod, which [you see] at a distance." (Demonstrate.) Both eyes should be used, no sighting will be allowed. Adjust the size of your black rod according to your first impression[1] of the size of the other black rod. When making a new adjustment, you should not go back to zero but adjust the black rod from the present position of the black rod. (Demonstrate.) (Weckowicz, 1957b, p. 478) If you are comfortable, we are ready to begin.

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[1]First impressions, according to Vernon (1962) facilitate a high degree of size constancy and a closer approximation to the real size of objects, whereas deliberation over the judgments produces decreased size constancy and a closer approximation to the size of the retinal projection. (p. 70)

Independent Variable

The perceptual size constancy test presented a stimulus variable to be purposely manipulated by the experimenter. The experimenter's random adjustment of the black rod (0-20cm) on top of the white box represented the independent variable in this experiment.

Dependent Variable

The subject's adjustment of the black rod on top of his white box was calculated in terms of a plus or minus deviation from the standard rod adjustment. All the adjustments made by the subject were recorded in centimeters (one decimal decimal point) as an adjustment error, either plus or minus the standard rod size shown to the subject by the experimenter. The arithmetric sum of these errors was calculated, and the mean error represented the subject's score.

Painting Tasks

Apparatus

Paper, Brushes, and Acrylic Paints.

Instructions

The subject was asked to be seated at a table located in the testing area but with his back to the apparatus. He was, then, introduced to the art material and the instructions were as follows:

> I would like you to paint anything that you want, and you may use any of the colours that you see before you. You will have approximately 15 minutes to finish your picture.

When the first painting was completed, it was removed, and a new sheet of paper was placed in front of the subject. The following instructions were read to the subject:

> This time, I would like you to paint a landscape or scene of some kind, using only the black and white paints. You will again have approximately 15 minutes to complete your picture.

The suggested time allowed for the painting tasks seemed to reduce the anxiety[1] provoked by the request to paint. Yet,

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[1]The suggested time for the painting tasks indicated to the subject that he was not expected to produce a masterpiece.

it allowed an adequate length of time for the subjects to complete the task, and the experimenter to perform the tasks associated with altering the apparatus for the following constancy experiment. The mean time for the two painting tasks to be completed for all subject groups was 15 minutes; this was, also, an adequate amount of time for adjusting the apparatus.

Independent Variable

Purposeful manipulation is not incorporated into the painting task in strict experimental terms. However, the request for an unstructured and structured painting may be considered a manipulation of the stimuli. The sheet of paper placed in front of the subject, as well as the various colours of acrylic paint, represented stimulus variables initiated to produce a response from the subject.

Dependent Variable

The subject's unstructured and structured paintings may be considered the dependent variable for this portion of the experiment.

Distance Constancy Test

Apparatus

Modification of the Weckowicz Distance Constancy Apparatus.

Instructions

The subject was asked to stand in the designated position (see Figure 22) and the following instructions were read:

> There are two triangles before you, a red one on the left and a white one on the right. I am going to stand at the other table and move the white triangle away from the red triangle. Would you tell me when the white triangle is 1 yard or 3 feet behind the red triangle? (Demonstrate.) Please say, "Stop," when you feel that the 1 yard distance has been reached and then turn away from the triangles. (Demonstrate.) If you are ready, we will begin.

The subject was asked to turn away from the experiment so that he would not see the measurement of the adjusted distance or the adjustment of the red and white triangular markers.

Independent Variable

The perceptual distance constancy test presented a stimulus variable to be purposely manipulated by the experimenter. The two triangular markers placed at 10 randomly selected

1-yard intervals (11-20 yards) represented the independent variable.

Dependent Variable

After the subject indicated that the two triangular markers represented a 1-yard interval, the distance that the white marker had travelled away from the red marker was measured in inches. This measurement was recorded and converted into the number of yards represented by the adjustment.

The Evaluation of the Paintings

After reviewing previous attempts to formulate a reliable judging process (i.e., Langevin & Hutchins, 1973; Russell-Lacy et al., 1979; Ulman & Levy, 1975), the reader may not be convinced that the evaluation of paintings should include judges. It may, however, be helpful to view the judging process as one might view the developmental process; the next stage might be seen as an attempt to overcome some obstacles, while perhaps encountering new ones. The judging process used to evaluate paintings presents some challenges in terms of the validity and reliability of the measurement, but, in spite of the flaws illuminated by previous researchers, it is necessary to keep in mind that one of the intentions of the present study was to attempt to control the variables that were found to affect the reliability of previous attempts to evaluate paintings.

The present study selected the theory of one individual and the specific characteristics of structure that form the basis of this theory. These formal characteristics are limited in number and specific enough to allow for the effective training of judges, using visual aids. In other words, instead of asking a judge to evaluate "color brightness consistency" (i.e., Langevin, Raine, Day, & Waxer, 1975, p. 155), the judge was asked, after reviewing visual examples, to evaluate "transparency". This approach to the judging process improves validity and reliability; the process of evaluation used in the present study takes the position of the judges into consideration. If the judging task is too complex and requires a rather difficult interpretation, then the judge may treat the task as well as the paintings inappropriately. In addition, the number of subjects was substantially increased and specific subject criteria helped to establish homogeneous groups of subjects. The present study, therefore, should be viewed in conjunction with previous studies and also as a revision of previous attempts to evaluate paintings. It is important to look at the present study as an effort to improve the methods of acquiring accurate information; this is the reason why the review of literature is presented in chronological order.

It should also be stated that in spite of the obstacles presented by the judging process, it is the most appropriate method of measurement that could have been selected for the present study. The question of reliability over time was seriously considered and would have added

valuable information to the results of this study. However, considering the nature of the experiment, the task of re-evaluation or a separate reliability study was quite impracticable.

The Judges

The primary goal of the selection process for the judges was to find art teachers and artists familiar with artwork produced by elementary school children as well as high school students. This team would be familiar with the technical aspects of painting (i.e., spatial structures) as well as the evaluation of the art product. They would, in addition, be familiar with the primary and secondary levels of art education; this would be consistent with the levels of art education represented in the artwork produced by the subject groups.

Four judges were selected to evaluate the paintings produced by the subjects: (1) a high school teacher and professional artist (oil painting), (2) a high school teacher and professional artist (pen and ink drawings), (3) a school teacher with 25 years of experience in teaching art to elementary school children, and (4) a counsellor for emotionally disturbed girls (ages 12-18), with an art degree in painting and sculpture.

Another goal of the selection process for the judges was cultural representation. It would have been more appropriate to include two Scottish judges and two Alaskan

Eskimo judges or, perhaps, a different variation of art teachers and artists from several cultural backgrounds. A team of judges representing more than one culture would not present a problem if the researcher were living in a metropolitan area: such a location would provide access to travelers from all over the world. If, in fact, the judging portion of this research had taken place while the researcher lived in Anchorage, Alaska, there would have been an excellent opportunity to select a team of judges with a variety of art training, experiences, and cultural backgrounds.

However, due to the location in which the judging process occurred (i.e., Bennington, Vermont), it was not possible to find judges with a variety of cultural backgrounds. The judges selected for the present task of evaluating the spatial structures, therefore, raised the question of cross-cultural judgments and the possibility that the same instructions for the judges from Vermont might have yielded different results had the judges been selected from a different culture or a variety of cultures.

With this in mind, it should be stated that the team of judges selected for this research project fulfilled the primary goal in terms of their knowledge and experience with painting but did not fulfill the secondary goal of cultural representation. The reader should be aware of the fact that the results of the spatial structure rating scale represent a team of judges from one culture evaluating the artwork produced by people from two unfamiliar cultures. In terms of future application, the spatial structure rating scale

would probably be utilised by one member of a hospital staff (art therapist) or by a team of individuals (art therapist, psychologist, psychiatrist) with a similar cultural background and applied to the artwork of individuals from more than one culture. Therefore, the judging process may not have been ideal in terms of experimental design, but it may reflect the actual application process that one would find in most hospital settings.

Each judge was provided with a small notebook (5" x 8") indicating the rating scale (see Table V) to be used in the evaluation process. The intention was to use the numbering system as an ordinal scale; the assumption was that the [0] rating would be considered appropriate for only a very limited number of paintings, and the remaining numbers would consequently represent a process of spatial structure disintegration. A definition of each spatial structure and a photographic example of each spatial structure, as outlined by Billig (1970), were included in the notebook (see Appendix VII). The rating system also indicated two additional ratings (see Table V), and these ratings were also defined and a photographic example accompanied the definition (see Appendix VII). All notebooks were distributed at least two weeks prior to the evaluation session, and the judges were asked to become familiar with the rating system before the actual evaluation session. The judges were instructed to bring the notebook with them for the evaluation, and it was possible to remove the notecards with the photographs and definitions of the spatial structures. The notecards would then be placed in front of the judges for

reference purposes, if necessary, throughout the presentation of transparencies.

The Evaluation Session

The judges were seated on both sides of a long table. The transparencies were projected onto a screen at one end of the table; the experimenter was situated at the opposite end of the table and controlled the speed of presentation. Each judge arranged the rating cards or notecards, with definitions and photographic examples, along the top of the rating sheets (see Appendix VIII).

The following instructions were read aloud by the experimenter, while the judges read their own typed copy:

> Will you please review the information sent to you prior to this rating session. As you review, I will show transparencies of the paintings which accompany the definitions of spatial structures. Please use your notebook to follow the rating scale.
>
> As indicated in the rater's notebook and on the scoring sheets, the paintings are to be given a score of [0-6], depending on the spatial structure represented. You will be asked to circle the most appropriate score[1] for each painting. The scoring information is repeated on each of the six scoring sheets, and you will be allowed to have your notecards in front of you at all times. In addition, the scoring information may be repeated prior to each scoring session. The transparencies will be

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[1] "Since the cathexis is not evenly withdrawn...different stages of regression in the concept of reality and its spatial structures may be manifested in the same graphic" (Billig & Burton-Bradley, 1973b, p. 317).

presented in groups of 20 and there will be three sessions of 200-200-108 transparencies. There will be no time limit for your evaluation of each painting. When you have finished scoring the painting, direct your attention toward the projector; when all of the judges have indicated that the painting has been scored, the next painting will be presented.

The paintings have been randomly arranged and represent three groups of people from two cultures. May I remind you that you are to evaluate ONLY the spatial structures outlined in your notebook and reviewed at this presentation. Factors such as artistic ability[1] and indications of culture or content should not enter into your evaluations. Due to the number of transparencies to be presented, there will be rest intervals between the three evaluation sessions. I must ask you to avoid any discussion of the paintings, until the scoring process is completed.

Are there any questions?[2]

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[1]Cressen (1975) evaluated the influence of art quality on the judges' ratings of figure drawings. Judges trained in art, as well as untrained judges, tended to judge the low quality drawings as produced by a patient. The rating task for the present study is not the same as the one reported by Cressen (1975). However, the aesthetic quality of the artwork must not be considered as an aspect of the evaluation.

[2]In spite of the fact that the word "score" was used throughout these instructions, it should be recognised that the word "rating" would have been more appropriate for a numbering system representing an ordinal scale. However, the judges seemed to be more comfortable with the word "score" than the word "rating", and the question and answer period prior to the evaluation process as well as the 10 trial transparencies offered a good opportunity to clarify the task of the judges.

Table V

The Rating Scale for the Spatial Structures in the Paintings

Rating	Description of the Spatial Structure
0	none of the following
1	average-good representation of space
2	emptying space-shadowy figures-elongation
3	cosmic destruction-perseveration
4	"x-ray pictures"-mixing of planes
5	base line with vertical direction-geometric designs
6	multidirectional space

Note. The first two ratings were not included in Billig's (1970) outline of spatial structures. They were included in this rating scale to avoid a forced-choice evaluation and to provide an appropriate description of the paintings produced by the control subjects. For a detailed definition of each spatial structure, the reader may refer to Appendix VII.

After the judges' questions were answered, the 10 trial transparencies (i.e., new examples of the spatial structures) were projected onto the screen for evaluation. This preliminary evaluation provided an opportunity to acquaint the judges with the rating procedure and the task of evaluation. The evaluation session took place in a darkened room; the only light source was the light necessary to project the transparencies. The projector was situated in such a way that the projected light also allowed the judges to see their rating cards and rating sheets. The light, however, was not bright and the long table at which the judges were seated was very wide; therefore, when the judges turned their heads toward the projector to indicate that they were ready for the next transparency, their facial features were not visible and it was necessary to anticipate the movement

of their entire head in order to proceed to the next transparency (as indicated in the directions). This physical arrangement of the judges was the only practical approach to evaluating the large number of transparencies.

Fortunately, the darkened room and obscured figures of the judges decreased the possibility of any involuntary nonverbal communication. The speed at which the transparencies were presented did not allow any time for anything but a rather direct view-rate-turn head toward the projector-approach; in order words, the judges' task kept them very busy. Also, the rating scale itself was not conducive to establishing nonverbal communication. The rating scale was more extensive than a yes/no response task and, therefore, the judges were less likely to involuntarily shake their heads in a certain way. During the question and answer period which followed the reading of the instructions, a judge asked if they could refer to the rating cards at any time. In response to this, it was strongly suggested that they review their cards visually but make a special effort not to point to a particular card during the evaluation of a particular painting; the reason given for this request was that it might interfer with the evaluation process. At the same time it was stated that it was not necessary to "cover" ratings during the evaluation because the dim light and the width of the table made it impossible to see the ratings of other judges and the spaces between the judges' chairs were very substantial. In addition, each judge remained in a separate room during the rest intervals and was asked to close their eyes and relax in a comfortable chair. So, all

of these factors made involuntary nonverbal communication very difficult, if not impossible.

SUMMARY

The purpose of the previous chapter was to acquaint the reader with the background information related to the experimental study. The present experiment involved several hypotheses, modifications, subject groups, and extraneous variables; a separate chapter was required to prepare the reader for the experiment as well as the discussion of the results. In addition, it was thought that it would be helpful to the reader if the basic components of the experiment were presented without several paragraphs of explanation and discussion; it seemed important to provide the reader with details and information related to the experiment and also provide a format that would allow for efficient reference and review of the present experiment. Chapter II primarily represents the cognitive process involved in making various decisions related to the present experiment, and Chapter III represents the final decisions made in reference to the present experiment.

In an effort to focus on the evaluation of data, the process involved in the evaluation of the paintings was described. The rationale behind the use of judges, the four judges selected, the actual evaluation session as well as the rating scale developed to evaluate the spatial structures in the paintings were all included in the description

of the experimental method. The information provided in Chapter II and this portion of Chapter III places the reader in a good position to review the results of the experiment.

RESULTS

Assessment of Interrater Reliability

Cramer's Coefficient of Association (Hays, 1963, p. 606) was used to assess the degree of association among the judges' ratings. The statistical formula provides an indication of the strength of this association by a number ranging from 0, indicating complete independence, to 1, indicating complete dependence. Ten paintings were randomly selected for analysis and the 6' indicated an association of .525; an association of .4-.7 would indicate a moderate correlation or a substantial relationship. (Williams, 1979, p. 128) Therefore, the ratings of the four judges may be considered moderately correlated. To evaluate further the relationship among the ratings of the judges, an intraclass correlation was computed (Guilford, 1973, p. 263); the analysis required 20 randomly selected paintings. The results indicated an r_{cc} of .49, which confirmed that there was a moderate correlation among the four judges' ratings.

An Assessment of the Ratings for the Paintings

According to Billig's (1970) theory, the acute schizophrenic patient should receive spatial structure ratings which indicate an advanced stage of ego disintegration. The rating system designed for the present study places this stage at the end of the rating scale, indicating a complete disintegration of spatial structure [6], and this stage should represent the highest percentage[1] of ratings for the schizophrenic groups. As Table VI indicates, the spatial structures receiving the highest percentage of ratings for the Scottish and Eskimo schizophrenic groups are [2], [4], and [5], with the exception of [1] which does not represent one of Billig's spatial structures (see Figures 8 and 9).

If Billig's theory is to be supported, the schizophrenic groups should be assigned a higher percentage of the ratings designated as [4], [5], and [6] than the control groups. The Scottish schizophrenic subjects did receive a higher percentage of the ratings [4] and [5] than the Scottish control group, but the Eskimo schizophrenic subjects did not receive a higher percentage of the [4] and [5] ratings than the Eskimo control group (see Table VI). The Eskimo schizophrenic group did receive a higher percentage of the rating designated as [6], multidirectional space, when compared to the Eskimo control group. An initial in

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[1]The percentage results are included to assist individuals unfamiliar with the statistical analysis of data.

Table VI

The Percentage of Spatial Structure Ratings for the Unstructured Painting Task

Group	Ratings N	0 f[a]	0 %	1 f	1 %	2 f	2 %	3 f	3 %	4 f	4 %	5 f	5 %	6 f	6 %
Scottish controls	200	3	1.50	165	82.50	12	6.00	2	1.00	10	5.00	6	3.00	2	1.00
Scottish schizophrenics	200	4	2.00	144	72.00	11	5.50	4	2.00	13	6.50	16	8.00	3	4.00
Scottish alcoholics	120	0	.00	96	80.00	8	6.67	0	.00	6	5.00	7	5.83	3	2.50
Eskimo controls	200	1	.50	162	81.00	15	7.50	0	.00	12	6.00	9	4.50	1	.50
Eskimo schizophrenics	176	2	1.14	148	84.09	8	4.55	3	1.70	6	3.41	7	3.98	2	1.14
Eskimo alcoholics	120	3	2.50	84	70.00	6	5.00	3	2.50	6	5.00	8	6.67	10	8.33

[a] f=frequency

spection of Table VI, then, indicates essentially two findings: (1) When the [4] and [5] ratings are considered, the Scottish schizophrenic subjects and Scottish control subjects appear to support Billig's (1970) theory, but the Eskimo schizophrenic and Eskimo control subjects do not support this theory. (2) A higher percentage of paintings received a rating of [6], multidirectional space, in both schizophrenic groups when compared to the control groups. These findings appear to support Billig's (1970) theory that a schizophrenic patient in an acute phase of the illness will produce a painting with multidirectional space.

However, on a closer inspection of Table VI, it is also apparent that the four judges indicated that the greatest percentage of paintings in all six subject groups reflected an average to good representation of space. The rating of [6] was applied to a certain percentage of paintings in all of the subject groups; one would predict from Billig's (1970) theory that this spatial structure rating would be confined to the schizophrenic groups. In fact, the highest percentage of ratings indicating the multidirectional space characteristic was assigned to the paintings of the Eskimo alcoholics. It is not appropriate to statistically compare the Scottish schizophrenics and the Eskimo alcoholics, but it may be noted that these two groups received the highest percentage of ratings associated with the spatial structure hypothesized as characteristic of the paintings of the acute schizophrenic, multidirectional space.

Therefore, this initial assessment of the paintings, using percentages, indicated that the Scottish schizo-

phrenics and Eskimo schizophrenics did not perform the painting task with the same results. And the spatial structure described as characteristic of the acute schizophrenic may be detected in the paintings of control and alcoholic subjects; the paintings of the Eskimo alcoholic subjects received the highest percentage of ratings indicating multi directional space. These initial findings suggested that the universal aspect of Billig's (1970) theory as well as the specific diagnostic value of its application receive further evaluation.

RESEARCH HYPOTHESES

Primary Hypothesis

There is a significant positive correlation between the amount of error made on a size constancy task and the ratings representing the disintegration of spatial structures in paintings.

Implications

a) Weckowicz proposed a relationship between the disturbance of ego boundaries, breakdown of perceptual constancies, and, consequently, the deterioration of space perception.

If this hypothesis is supported, and the acute schizophrenic subjects indicate a disturbance of perceptual constancy and a disintegration of the spatial structure in their paintings, then the Weckowicz theory is supported.

b) If this hypothesis is supported, then Billig's theory, which stated that spatial structures reflect ego disturbances, is also supported. However, Billig's theory must be extended to state that the artist may be structuring representational space to reflect his perception of space as well as the condition of his ego boundary.

Results

Scottish schizophrenics
research hypothesis-rejected

Eskimo schizophrenics
research hypothesis-rejected

Scottish alcoholics
research hypothesis-rejected

Eskimo alcoholics
research hypothesis-rejected

The size constancy test involved 20 estimations of the size of a standard black rod for a 7.5m distance and 15m distance, and the distance constancy test involved only 10 estimations of a 1-yard distance, so the size constancy test was considered to be the more appropriate test to use for the comparison of perceptual constancy and painting per-

formance. The 7.5m distance was randomly selected as the distance to be represented in this measure of relationship. A plus or minus deviation from the standard rod adjustment was calculated in centimeters for each of the subjects' 20 adjustments (see Size Constancy Apparatus and Experimental Procedure, p. 330). Each deviation value ($\underline{x}$) was squared and the sum of the $\underline{x}^2$ divided by the total $\underline{N}$ (formula: $\underline{V} = \frac{\Sigma x^2}{N}$) (Spence et al., 1968, p. 49). The resulting value is designated the variance score for the subject. The variance scores for the schizophrenic and alcoholic subjects may be found in Tables VII and VIII. This measure of variability was selected to interpret the size constancy performance of the schizophrenic subjects because it seemed to best represent the extent of the subjects' performance variability, and the variance data could be translated into mean square in calculating the analysis of variance for between and within group variability; this allowed for the duplication of the statistical procedure utilised by Weckowicz (1957).

A 5x6 chi-square contingency table was constructed to estimate the relationship between the frequency of the ratings for the unstructured paintings and the variance scores for the size constancy test. The spatial structure ratings were divided into the following categories: [0+1], [2], [3], [4], [5+6], and the variance scores were represented by six equal intervals, including .00-1.49, 1.50-2.49, 2.50-3.49, 3.50-4.49, 4.50-5.49, and $\geq$ 5.50cm. Due to the frequency of ratings and variance scores, it was necessary to apply the correction for continuity. There-

Table VII

Variance Scores for the Scottish Schizophrenic and Scottish Alcoholic Groups

Scottish schizophrenics				Scottish alcoholics	
7.5m		15m		7.5m	15m
1.75	1.68	1.38	2.07	1.67	1.88
6.99	2.15	9.05	2.63	1.21	2.15
.86	2.06	2.04	2.70	1.94	1.07
.70	3.62	8.43	11.29	1.54	3.84
1.09	25.82	1.49	28.14	.59	.45
1.23	14.34	.80	13.01	1.74	3.48
1.98	2.01	6.99	1.44	2.75	1.75
.97	.93	1.55	1.19	2.44	3.06
3.33	2.48	5.36	1.53	8.70	2.43
7.00	1.13	2.03	5.91	1.20	2.61
.30	.38	.48	1.60	1.03	1.40
.91	25.77	1.19	29.28	1.04	1.36
2.66	1.68	1.11	2.07	5.65	7.24
2.11	2.15	1.48	2.63	.34	.78
3.06	2.06	1.34	2.70	.68	2.42
1.40	3.62	1.99	11.29	.67	1.55
1.65	25.82	2.15	28.14	2.94	5.68
5.77	14.34	7.23	13.01	5.74	4.00
15.65	2.01	19.35	1.44	1.81	3.86
7.83	.93	2.67	1.19	.83	.85
3.30	2.48	4.28	1.53	8.21	17.38
1.60	1.13	3.37	5.91	2.33	2.30
1.76	.38	2.94	1.60	1.05	.98
23.06	2.35	19.74	5.38	.92	1.85
2.92	1.76	3.79	1.62	2.53	4.33
1.96	2.44	1.52	3.18	1.09	1.07
3.81	.78	5.26	1.32	1.06	3.16
15.04	1.26	10.21	1.51	1.61	1.36
1.76	1.23	.89	2.32	2.82	3.86
2.11	3.63	3.73	2.36	1.25	1.38
25.77	1.96	29.28	1.52		

Note. Variance score = $\frac{\Sigma x^2}{N}$ (Spence et al., 1968, p. 49)

Table VIII

Variance Scores for the Eskimo Schizophrenic and Eskimo Alcoholic Groups

Eskimo schizophrenics		Eskimo alcoholics	
7.5m	15m	7.5m	15m
6.32	2.26	2.25	.88
1.24	1.89	.69	1.59
1.24	2.05	1.05	1.87
3.09	4.23	4.81	3.21
1.57	4.61	1.28	2.41
2.56	6.51	3.22	1.98
8.11	5.70	1.28	2.54
1.56	2.04	.64	1.18
.77	1.37	1.82	4.73
1.15	1.19	1.27	2.59
1.84	3.03	.71	.75
5.94	9.93	3.45	4.28
.57	1.60	7.91	5.39
1.77	10.04	1.61	4.06
1.40	2.01	2.37	1.70
5.92	1.88	3.70	3.92
2.90	6.13	.55	2.53
.40	1.45	3.16	2.78
1.39	1.42	2.25	2.13
1.81	1.74	.68	1.36
.65	3.51	1.60	2.17
3.79	3.50	1.39	1.86
2.07	2.50	2.26	2.32
2.51	2.77	13.50	9.96
3.44	1.79	23.20	23.24
1.81	2.90	4.20	5.01
2.08	2.60	1.92	3.47
2.18	2.42	.31	1.08
3.89	2.05	.49	2.52
1.18	1.44	.52	1.26
1.16	1.20		
4.67	3.66		
.87	1.28		
2.98	1.43		
2.13	2.09		
1.58	2.42		
1.56	1.46		
3.26	1.86		
1.57	2.43		
4.91	4.94		
4.36	2.79		
3.85	4.28		
3.25	1.85		
1.59	2.41		

Note. Variance score = $\frac{\Sigma x^2}{N}$ (Spence et al., 1968, p.49)

fore, the rating scale was condensed to form an abbreviated scale, [0+1] and [2-6]. The last three intervals representing the variance scores were also combined, forming a 2x4 contingency table.

The frequency distribution and results of the estimations of the relationship between the ratings for the unstructured paintings and the variance scores for the size constancy test can be seen in Tables IX and X. The calculations indicate that the chi-square for the Eskimo alcoholics is significant beyond the .05 level of significance with a phi coefficient of .27. It should be noted that the

Table IX

The Frequency Distribution of the Ratings for the Unstructured Painting Task and the Variance Scores

Scottish Schizophrenics and Scottish Alcoholics

Scottish schizophrenics			Scottish alcoholics		
Variance scores cm	Ratings (N=200) [0+1]	[2-6]	Variance scores cm	Ratings (N=120) [0+1]	[2-6]
.00-1.49	44	12	.00-1.49	44	12
1.50-2.49	53	19	1.50-2.49	27	5
2.50-3.49	15	5	2.50-3.49	11	5
≥3.50	36	16	≥3.50	14	2
χ^2=1.240	ϕ=.079	p>.05	χ^2=2.283	ϕ=.138	p>.05

Table X

The Frequency Distribution of the Ratings for the Unstructured Painting Task and the Variance Scores

Eskimo Schizophrenics and Eskimo Alcoholics

Eskimo schizophrenics			Eskimo alcoholics		
Variance scores cm	Ratings (N=176) [0+1]	[2-6]	Variance scores cm	Ratings (N=120) [0+1]	[2-6]
.00-1.49	38	10	.00-1.49	37	15
1.50-2.49	48	8	1.50-2.49	29	3
2.50-3.49	30	2	2.50-3.49	7	5
≥3.50	34	6	≥3.50	14	10
χ^2=3.261 ϕ=.136 p=>.05			χ^2=8.940 ϕ=.273 p<.05		

phi coefficient for the Eskimo alcoholic group is three times the standard error, indicating that the relationship is significant but the significance level is not high (Garrett, 1966, p. 391). The two schizophrenic groups and the Scottish alcoholic group, on the other hand, indicate that there is an independent relationship between the spatial structure ratings [0+1 and 2-6] and the variance scores.

In spite of the evidence which indicates that the relationship between these two experimental variables is significant for the Eskimo alcoholic group, these results do

not support the research hypothesis because the frequency distribution is not consistent with the appropriate spatial structures and variance intervals. In other words, the dependent relationship which was established by this data consists of low ratings for the paintings [0+1] and small variance scores (less than 2.49) (see Tables IX and X). For the hypothesis to be supported, it would be necessary for the frequency of ratings to be concentrated at the other end of the rating scale and in an interval representing a greater variance in perceptual constancy.

Secondary Hypotheses

1. The early term or acute schizophrenic experiences a severe disturbance of the ego boundary and perceptual constancy, and, therefore, the acute schizophrenics will be significantly poorer than the control subjects in their performance of the distance constancy and unstructured painting task.

Results

Scottish schizophrenics-Scottish controls
research hypothesis-accepted

Eskimo schizophrenics-Eskimo controls
research hypothesis-rejected

While calculating the data from the distance constancy test it was clear that working with means presented a distorted picture of the results. That is, while calculating a mean from plus and minus data, the minus signs may cancel out the plus signs; for example, if a subject underestimated a yard by 1 foot and then overestimated a yard by 1 foot and 2 inches, the impression given by the statistics would be that the mean variance was 2 inches. With the schizophrenic subjects the extent of variability was so great, as reported in previous literature, that calculating the mean adjustment and using an analysis of variance would be misleading and a misuse of statistics. This variability of performance was not a factor when evaluating the performance of one subject but also when evaluating the performance of subject groups. The median is the most appropriate measure of central tendency "when there are extreme scores which would markedly affect the mean. Extreme scores do not disturb the median" (Garrett, 1966, p. 38). Therefore, the median was selected as the most appropriate method of evaluating the data.

It is suggested that if an analysis of variance were applied, a difference between the schizophrenic and control subjects might have been found, but the performance of the schizophrenic subjects would have seemed less variable than the control subjects; a combination of underestimations and overestimations create a smaller mean than a consistent underestimation or overestimation which may be small but results in a larger mean.

The analysis of variance is very appropriate for "introducing statistical controls over individual subjects as a course of variability" (Lewis & Burke, 1949, p.440), but when schizophrenic subjects represent one of the subject groups it is necessary to address the variability of each subject's performance as well as the variability between subjects. Analysis of variance addresses the variance between groups and within groups but not the variance within the individual's performance. In addition, analysis of variance was not used because of the nonhomoscedastic and nonparametric nature of the data. The chi-square procedures do not allow for control of the variability between individual subjects and the analysis of variance procedures do allow for this variability. There is also a problem with carrying out multiple chi-square tests on the same data. For every 100 chi-square, one must expect by chance that 5 will indicate significance at the 5% level. In this process some true differences will appear, but there is no way to separate the true from the change differences. So, the analysis of variance and the chi-square procedures present a difficult choice of statistical tools, but the variability of performance on the part of the schizophrenic subjects in the present experiment pointed the deciding arrow in the direction of the chi-square procedures.

Weckowicz and Hall (1960) reasoned that nonparametric statistical procedures should be used to analyse the distance constancy data due to "the obvious lack of homogeneity of variance" (p. 273). Therefore, the Mann-Whitney $\underline{U}$ Test was selected to test the difference between

the 1-yard estimations of their two groups, and the same method of analysis was repeated in the present study in order to be consistent with the intentions of duplication. The results of the Mann-Whitney U Tests (Siegel, 1956, pp. 120-123) for the group comparisons may be found in Table XI. At this point, it is important to recognise the fact that this study addresses cross-cultural similarities and differences as well as the similarities and differences between psychiatric disorders. Billig's theory of spatial structure disintegration and its universal application prompted the cross-cultural comparisons of the subject groups; the psychiatric disorders represented by the subject groups were compared for the reasons outlined previously (pp.309-325).

To analyse the ratings for the unstructured and structured paintings, which represent an ordinal scale, the Median Test (Siegel, 1956, pp. 111-112) was considered the most appropriate statistical method. The items in the contingency tables may not be considered independent, however, because each painting in each cell is represented four times, as the ratings for the four judges. Therefore, the Median Test was amended to accommodate this factor; separate chi-square values were calculated for each of the four judges and then combined by using the $\sqrt{(\chi^2)}$ Method. (Everitt, 1977) Table XII indicates the results of this statistical analysis for all group comparisons.

The results of the Mann-Whitney U Tests (see Table XI) and the $\sqrt{(\chi^2)}$ Method (see Table XII) which are relevant for this hypothesis are summarised in Table XIII. The Scottish schizophrenic group is significantly poorer than

Table XI

Estimations of the 1-Yard Intervals for the Distance Constancy Test

Yards	Medians in feet		U	p	Yards	Medians in feet		U	p	Yards	Medians in feet		U	p
	Scottish[a] schizophrenics	Scottish controls				Eskimo schizophrenics	Eskimo controls				Scottish schizophrenics	Eskimo schizophrenics		
11	4.95	3.79	738.5	<.001	11	4.89	3.93	821.5	<.05	11	4.95	4.89	1194.5	>.05
12	4.85	3.54	776.5	<.001	12	4.33	3.99	899.0	>.05	12	4.85	4.33	1275.0	>.05
13	4.77	3.58	868.5	<.01	13	4.70	3.97	967.5	>.05	13	4.77	4.70	1175.0	>.05
14	4.58	3.81	898.5	<.01	14	4.62	3.60	747.0	<.01	14	4.58	4.62	1090.5	>.05
15	4.62	3.58	917.0	<.05	15	4.70	3.62	749.0	<.01	15	4.62	4.70	1093.0	>.05
16	4.81	3.70	922.5	<.05	16	4.00	3.95	1008.5	>.05	16	4.81	4.00	1280.5	>.05
17	5.10	3.60	691.5	<.001	17	4.85	3.50	733.5	<.01	17	5.10	4.85	1165.5	>.05
18	5.08	3.43	888.0	<.01	18	4.58	3.66	796.5	<.05	18	5.08	4.58	1132.0	>.05
19	4.72	3.66	814.5	<.01	19	4.50	3.66	1001.5	>.05	19	4.72	4.50	1330.0	<.05
20	4.91	3.45	826.5	<.01	20	4.04	3.54	947.5	>.05	20	4.91	4.04	1320.0	<.05
	Scottish alcoholics	Scottish controls				Eskimo alcoholics	Eskimo controls				Scottish alcoholics	Eskimo alcoholics		
11	3.77	3.79	778.5	>.05	11	3.91	3.93	762.0	>.05	11	3.77	3.91	397.0	>.05
12	3.79	3.54	776.0	>.05	12	3.77	3.99	793.5	>.05	12	3.79	3.77	451.0	>.05
13	3.35	3.58	818.5	>.05	13	3.66	3.97	807.0	>.05	13	3.35	3.66	381.5	>.05
14	3.02	3.81	827.5	>.05	14	3.81	3.60	622.5	>.05	14	3.02	3.81	345.0	>.05
15	3.89	3.58	722.5	>.05	15	3.62	3.62	646.0	>.05	15	3.89	3.62	413.5	>.05
16	3.50	3.70	761.5	>.05	16	3.85	3.95	783.6	>.05	16	3.50	3.85	430.0	>.05
17	3.77	3.60	746.0	>.05	17	3.52	3.50	616.0	>.05	17	3.77	3.52	395.0	>.05
18	3.29	3.43	768.5	>.05	18	3.97	3.66	616.5	>.05	18	3.29	3.97	343.0	>.05
19	3.41	3.66	788.0	>.05	19	3.93	3.66	714.0	>.05	19	3.41	3.93	392.0	>.05
20	3.58	3.45	715.5	>.05	20	3.66	3.54	755.0	>.05	20	3.58	3.66	466.5	>.05
	Scottish schizophrenics	Scottish alcoholics				Eskimo schizophrenics	Eskimo alcoholics				Scottish controls	Eskimo controls		
11	4.95	3.77	1047.5	<.01	11	4.89	3.91	741.0	>.05	11	3.79	3.93	1005.5	>.05
12	4.85	3.79	999.5	<.01	12	4.33	3.77	783.5	>.05	12	3.54	3.99	1121.0	>.05
13	4.77	3.35	976.0	<.01	13	4.70	3.66	746.5	>.05	13	3.58	3.97	1090.0	>.05
14	4.58	3.02	965.5	<.05	14	4.62	3.81	698.5	>.05	14	3.81	3.60	1186.0	>.05
15	4.62	3.89	925.0	<.05	15	4.70	3.62	740.0	>.05	15	3.58	3.62	1204.0	>.05
16	4.81	3.50	946.0	<.05	16	4.00	3.85	702.0	>.05	16	3.70	3.95	1131.0	>.05
17	5.10	3.77	936.5	<.05	17	4.85	3.52	743.5	>.05	17	3.60	3.50	1264.0	>.05
18	5.08	3.29	975.5	<.05	18	4.58	3.97	695.5	>.05	18	3.43	3.66	1105.5	>.05
19	4.72	3.41	1013.5	<.01	19	4.50	3.93	662.5	>.05	19	3.66	3.66	1123.5	>.05
20	4.91	3.58	960.5	<.05	20	4.04	3.66	726.5	>.05	20	3.45	3.54	1172.5	>.05

[a]Where a significant difference exists between the two groups, the name of the group with the longer estimations of distance is underlined.

the Scottish control group in their perceptual constancy performance and, in addition, received higher [2-6] spatial structure ratings on the unstructured painting task. However, the Eskimo schizophrenic group was not consistent in their perceptual constancy performance. The results indicate that the Eskimo schizophrenic subjects were not significantly different from the Eskimo control subjects at 5 out of the 10 distances. These inconsistent results did not provide unambiguous evidence of a significant difference in perceptual constancy performance.

Table XII

The Difference in Frequency Between the [0+1] and [2-6] Spatial Structure Ratings for the Scottish and Eskimo Groups

Subject groups[a]	Unstructured task		Structured task	
	z	p	z	p
Scottish controls-Scottish schizophrenics	1.99	.0233*	2.51	.0060**
Scottish controls-Scottish alcoholics	.90	.1841	.91	.1814
Scottish controls-Eskimo controls	1.53	.0630	1.79	.0367*
Scottish schizophrenics-Scottish controls	1.99	.0233*	2.51	.0060**
Scottish schizophrenics-Scottish alcoholics	1.28	.1003	2.76	.0029**
Scottish schizophrenics-Eskimo schizophrenics	2.40	.0082**	2.07	.0192*
Scottish alcoholics-Scottish controls	.90	.1841	.91	.1814
Scottish alcoholics-Scottish schizophrenics	1.28	.1003	2.76	.0029**
Scottish alcoholics-Eskimo alcoholics	.87	.1922	.54	.2946
Eskimo controls-Eskimo schizophrenics	.75	.2266	1.59	.0559
Eskimo controls-Eskimo alcoholics	2.05	.0202*	1.06	.1446
Eskimo controls-Scottish controls	1.53	.0630	1.79	.0367*
Eskimo schizophrenics-Eskimo controls	.75	.2266	1.59	.0559
Eskimo schizophrenics-Eskimo alcoholics	2.30	.0107*	.65	.2578
Eskimo schizophrenics-Scottish schizophrenics	2.40	.0082**	2.07	.0192*
Eskimo alcoholics-Eskimo controls	2.05	.0202*	1.06	.1446
Eskimo alcoholics-Eskimo schizophrenics	2.30	.0107*	.65	.2578
Eskimo alcoholics-Scottish alcoholics	.87	.1922	.54	.2946

[a]Where a significant difference exists between the two groups, the name of the group showing the higher proportion of [2-6] ratings is underlined (see Appendix IX for the frequency tables and χ^2 values).

*$p<.05$.
**$p<.01$.
***$p<.001$.

Table XIII

A Summary of the Results for the Distance Constancy Test and the Unstructured Painting Task for the Control and Schizophrenic Subjects

Group comparisons[a]	Distance Constancy	Unstructured painting task
	p	p
Scottish controls Scottish Schizophrenics	significant	<.05
Eskimo controls Eskimo schizophrenics	inconsistent	>.05

[a]The group underlined demonstrated poorer distance constancy and received a higher proportion of spatial structure ratings exceeding the median [2-6].

Implications

a) If the schizophrenic subjects perform significantly poorer than the control subjects on the distance constancy test but are not significantly poorer in their painting performance, then the lack of ability to perceive depth has no influence on the spatial structures detected in the paintings of schizophrenics.

Scottish controls-Scottish schizophrenics
research hypothesis-rejected

Eskimo controls-Eskimo schizophrenics
research hypothesis-rejected

When the performance of the Scottish control group was compared with the performance of the Scottish schizophrenic group, the results were the same for the distance constancy test and painting task (see Table XIII). For the Scottish schizophrenic subjects, these results indicated a possible relationship between poor distance constancy and the spatial structure in a painting. The evidence, however, was not as unambiguous when the distance constancy performance of the Eskimo schizophrenic group is considered; therefore, there may be various interpretations of these results and a need for further investigation. It may be stated, however, that the Eskimo schizophrenic subjects did not appear to be consistently different from the Eskimo control subjects in their 1-yard estimations or significantly different in their painting performance. The Scottish schizophrenic subjects, on the other hand, appeared to be significantly poorer in their distance constancy and painting performance than the Scottish control subjects.

b) If the distance constancy scores of the schizophrenic subjects are not significantly poorer than the control subjects, but the ratings representing the spatial structures in the paint-

ings are significantly higher than the control subjects, then there is no support for the correlation between the deterioration of space perception, perceptual constancies, the self, and body image of the schizophrenic, as outlined by Weckowicz and Sommer (1960). The spatial structures in the paintings of schizophrenics may, then, reflect only the condition of the schizophrenic's ego boundary, as outlined by Billig (1970).

Results

Scottish controls-Scottish schizophrenics
research hypothesis-rejected

Eskimo controls-Eskimo schizophrenics
research hypothesis-rejected

The Scottish schizophrenic and control subjects were significantly different in their perceptual performance and also in their painting performance. These findings support the theory that there is a correlation between the perception, the self, and the body image of the schizophrenic (i.e., Weckowicz & Sommer, 1960). The Eskimo schizophrenic subjects were not consistently different from the Eskimo control group in their performance of the distance constancy task, and the performance of these two groups on the unstructured painting task was not significantly different (see Table XIII). The Scottish groups, then, provided some

support for the statement that there may well be a correlation between the disturbance of space perception, perceptual constancies, the self, and the body image of the schizophrenic. (Weckowicz & Sommer, 1960)

c) If the acute schizophrenic subjects receive significantly higher ratings on the unstructured painting task, considered to be characteristic of the acute schizophrenic (Billig, 1970), than the control subjects, then Billig's spatial structure theory is supported.

Results

Scottish controls-Scottish schizophrenics
research hypothesis-accepted

Eskimo controls-Eskimo schizophrenics
research hypothesis-rejected

The $\sqrt{(\chi^2)}$ Method of analysis for the chi-square values estimated from the ratings of the four judges (see Appendix IX for the complete tables and Table XIII for a summary of the results) indicated that the performance of the Scottish schizophrenic subjects supported Billig's (1970) theory that ego disintegration is reflected in the

spatial structures found in the paintings by schizophrenic patients. However, it is necessary to reject the research hypothesis when the painting performance of the Eskimo schizophrenic group is compared to the Eskimo control groups.

Table VI, which indicates the percentage of ratings according to the level of spatial disintegration, may provide further insight into this apparent difference between the performance of the Scottish schizophrenics and Eskimo schizophrenics. The percentage of ratings representing "x-ray pictures [4], base line with vertical direction [5], and multidirectional space [6] was higher for the Scottish schizophrenic than the Eskimo schizophrenic; there were approximately twice as many [4] and [5] spatial structure ratings for the Scottish schizophrenics' unstructured paintings. Multidirectional space [6] was detected more than three times more often in the Scottish schizophrenics' paintings than in the Eskimo schizophrenics' paintings. According to Billig (1970), one should expect that the schizophrenic subjects would receive the highest percentage or frequency of [4], [5], and [6] ratings, and when the spatial structures designated as [2-6] were considered there was some support for this theory. The Scottish schizophrenic subjects received a higher percentage of [4] and [5] ratings than the other groups, but the Eskimo alcoholic subjects received the highest percentage of ratings representing multidirectional space [6] (see Table VI). All of these percentages, however, were overshadowed by the very high percentage of average-good representation of space [1] ratings, and this factor did not support Billig's (1970)

theory. If only the [4] and [5] ratings were considered, these ratings (see Table VI), as well as the chi-square values (see Tables XII and XIII), would indicate that the Scottish schizophrenic subjects support Billig's (1970) theory of spatial structure disintegration to some extent, but the Eskimo schizophrenic subjects do not appear to support the theory in any way.

2. There is a significant difference between the spatial structure ratings in the paintings of the Scottish schizophrenics and Eskimo schizophrenics.

Implication

a) If this hypothesis is supported, then the universal application of Billig's (1970) theory is not supported by the results of this experimental study.

Results

Scottish schizophrenics-Eskimo schizophrenics research hypothesis-accepted

The frequency of spatial structure ratings for the unstructured and structured paintings and the chi-square values for the four judges may be found in Appendix IX, Tables XLI and L; the results of the $\sqrt{}$ (χ^2 Method are shown

Table XIV

The Difference between the Spatial Structure Ratings for the Scottish and Eskimo Schizophrenic Subjects

Groups	Unstructured paintings		Structured paintings	
	z	p	z	p
Scottish schizophrenics Eskimo schizophrenics	2.40	<.01	2.07	<.05

in Table XIV. There was a significant difference between the spatial structure ratings for the Scottish and Eskimo schizophrenic subjects and this applied to the structured as well as the unstructured painting task. The Scottish schizophrenic subjects received a higher frequency of [2-6] ratings than the Eskimo schizophrenic subjects; this finding was consistent when the ratings of all four judges were reviewed (see Appendix IX, Tables XLI and L). These findings do not support the universal aspect of Billig's (1970) theory, which stated that specific spatial structures in paintings indicate specific levels of ego disintegration in

all schizophrenic patients, in spite of varied cultural backgrounds.

3. The schizophrenic artist will show a greater ability to integrate space in his painting if he is asked to paint a specific subject. The schizophrenic subjects will receive a significantly lower rating on the structured painting task (specific subject) than on the unstructured painting task (free-choice).

Results

Scottish schizophrenics
research hypothesis-rejected

Eskimo schizophrenics
research hypothesis-rejected

Table XV

The Difference between the Spatial Structure Ratings for the Unstructured and Structured Painting Tasks for the Control and Schizophrenic Groups

Group	z	p
Scottish controls	1.58	>.05
Scottish schizophrenics	1.86	<.05
Eskimo controls	2.03	<.05
Eskimo schizophrenics	.98	>.05

The ratings for the unstructured and structured paintings produced by the Scottish schizophrenic and Eskimo control subjects were significantly different (see Table XV). It was predicted that the schizophrenic subjects would receive a significantly lower rating on the structured painting task because of previous evidence indicating that the performance of the schizophrenic improves when his behaviour is guided or provided with a certain degree of structure (e.g., Messner, 1951). The results did indicate that there was a significant difference in the judges' ratings for the unstructured and structured paintings (i.e., Scottish schizophrenics), however, the results did not support the research hypothesis.

For this secondary hypothesis to be accepted, it would have been necessary for the unstructured paintings to receive more [2-6] ratings than the structured paintings. As the frequency and χ^2 tables for the unstructured and structured paintings indicate (see Appendix IX, Tables XXXII, XXXV), the frequency data and proportion of [2-6] ratings recorded reveal that two judges gave the structured paintings a higher proportion of [2-6] ratings than the unstructured paintings. Therefore, the results were in the opposite direction than predicted and the research hypothesis for the Scottish schizophrenics must be rejected.

It is interesting to note that the painting performance of the Scottish control subjects resembled the performance of the Scottish schizophrenic subjects. There was not a significant difference between the ratings for the unstructured and structured paintings (see Table XV and

Appendix IX, Table XXXI), however, the $\underline{z}$ score was very close to being significant ($\underline{z}$=1.58 and 1.65 is necessary for significance). In addition, the direction of significance would be the same for the Scottish control and Scottish schizophrenic subjects. The frequency of ratings above the median [2-6] was higher for the structured paintings than the unstructured paintings; in other words, the frequency of paintings showing noticeable deterioration of spatial structures was greater among the structured than the unstructured paintings.

The ratings indicated (see Table XV and Appendix IX, Table XXXV) that there was no significant difference between the spatial structures in the unstructured (free-choice) and structured (specific subject) paintings produced by the Eskimo schizophrenic subjects, but in spite of this non-significant trend it should be noted that the Eskimo schizophrenics received a higher proportion of [2-6] ratings on the structured task than on the unstructured task (see Appendix IX, Table XXXV). On the other hand, the painting performance of the Eskimo control subjects was consistent with the research hypothesis. There was a significant difference in the spatial structure ratings for the unstructured and structured paintings, and the significance was in the predicted direction. The structured paintings produced by the Eskimo control subjects received significantly lower ratings than the unstructured paintings; there were more [2-6] ratings for the unstructured paintings than the struc-

tured paintings (see Appendix IX, Table XXXIV).[1] These results, then, may be summarised in three ways: (1) The painting performance of the Scottish schizophrenic subjects was completely contrary to the results predicted by this research hypothesis; the structured painting task produced a higher proportion of [2-6] ratings, indicating greater deterioration of spatial structures. (2) The Eskimo schizophrenic subjects did not perform the painting tasks with the same results as the Scottish schizophrenic subjects. (3) The only group that supported this research hypothesis was the Eskimo control subjects.

To further investigate the possibility of a significant difference between the spatial structure ratings found in the unstructured and structured paintings, the Median Test and $\sqrt{(\chi^2)}$ Method were applied to the ratings for the control and schizophrenic subjects from both cultures, and the comparison was extended to include a cross-cultural analysis of these groups (see Table XVI and Appendix IX, Tables XXXVII, XLIII, XXXIX, XLI [unstructured] and XLVI, LII, XLVIII, L [structured]). As indicated in Table XVI, there was a significant difference in spatial structure ratings for the Scottish controls and Scottish schizophrenics when the task was structured as well as when it was unstructured. There was no significant difference in the spatial structure ratings for the paintings of the Eskimo controls and Eskimo schizophrenics; this was true for the unstructured as well as the structured painting task. As previously mentioned,

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[1]Each subject was questioned as to whether the assignment of colours (black and white versus the primary colours) influenced his artwork in any way, and the response was consistently, "No."

the Eskimo control subjects received lower ratings on the structured task and, in spite of the nonsignificant trend indicated by the spatial structure ratings (unstructured and structured) for the Scottish control group, there was a tendency for the Scottish control subjects to receive higher ratings on the structured task. Therefore, the condition of the painting task affected the behaviour of the Scottish and Eskimo controls differently, and this difference is reflected in the results (see Table XVI). When the Scottish and Eskimo schizophrenic groups were compared, there was a significant difference between the spatial structure ratings for the two groups, unstructured (<.01) and structured (<.05). Therefore, the results represented in Table XVI suggest that the painting condition (unstructured or structured) only affected the results when the performance of the Scottish and Eskimo control groups was compared.

Table XVI

A Comparison of the Spatial Structure Ratings for the Control and Schizophrenic Groups

Unstructured painting task		
Group	z	p
Scottish controls-Scottish schizophrenics	1.99	<.05
Eskimo controls-Eskimo schizophrenics	.75	>.05
Scottish controls-Eskimo controls	1.53	>.05
Scottish schizophrenics-Eskimo schizophrenics	2.40	<.01
Structured painting task		
Group	z	p
Scottish controls-Scottish schizophrenics	2.51	<.01
Eskimo controls-Eskimo schizophrenics	1.59	>.05
Scottish controls-Eskimo controls	1.79	<.05
Scottish schizophrenics-Eskimo schizophrenics	2.07	<.05

4. The schizophrenic subjects will be significantly poorer than the alcoholic subjects in their performance on the perceptual constancy tests and the unstructured painting task.

Implications

a) If this hypothesis is supported, then the findings support the (obvious) view that in this respect the clinical conditions are not similar.

b) If this hypothesis is supported, then the spatial structures in the paintings produced by schizophrenic patients (Billig, 1970) are not found to the same extent in the paintings produced by alcoholic patients. Therefore, Billig's (1970) spatial structure theory may not be used to evaluate the paintings produced by alcoholics.

Results

Scottish schizophrenics-Scottish alcoholics
research hypothesis-rejected

Eskimo schizophrenics-Eskimo alcoholics
research hypothesis-rejected

Table XVII summarises the relevant results outlined in Tables XI and XXVIII and provides the results of the

Median Test and $\sqrt{}$ (χ^2) Method applied to the spatial structure ratings (see Table XII). According to the results presented in Table XVII, it is necessary to reject the research hypothesis for the Scottish schizophrenics and Scottish alcoholics as well as the Eskimo schizophrenics and Eskimo alcoholics.

Table XVII

The Perceptual Constancy and Painting Performance of the Schizophrenic and Alcoholic Groups

Group[a]	Size constancy 7.5m	Size constancy 15m	Distance constancy	Unstructured painting task
Scottish schizophrenics Scottish alcoholics	$p<.05$	$p<.05$	significant	$p>.05$
Eskimo schizophrenics Eskimo alcoholics	$p>.05$	$p>.05$	nonsignificant	$p<.05$

[a]Where a significant difference is indicated, the group underlined demonstrated poorer size constancy, demonstrated poorer distance constancy , or received the higher proportion of ratings exceeding the median [2-6] (unstructured painting task).

The Scottish groups were significantly different in their performance of the perceptual constancy tasks but not significantly different in their performance of the painting task, whereas the Eskimo groups were not significantly different in their performance of the perceptual tasks but were significantly different in their painting performance (see Table XVII). The perceptual constancy and spatial structure requirements of the research hypothesis could not be satisfied, and, therefore, the research hypothesis must be rejected. These results certainly do not support a univer-

sal theory of perceptual or painting performance or the theory that there is a positive correlation between perceptual performance, as indicated by perceptual constancy tests, and painting performance, as indicated by spatial structures in paintings.

A Summary of the Painting Performance for All the Subject Groups on the Unstructured and Structured Painting Tasks

Within Culture

Scottish Groups

The z values represented in Table XVIII and obtained by the $\sqrt{(\chi^2)}$ Method provide a summary of results for all six subject groups in terms of the difference in painting performance for the unstructured and structured painting tasks. Spatial structure ratings for the two painting tasks were not significantly different for the Scottish controls and alcoholics, but as mentioned previously, the ratings were significantly different (not in the expected direction) for the schizophrenic group. When the painting performance of the Scottish groups was compared (see Table XIX), there was no significant difference between the ratings for the control and alcoholic subjects for either of the two painting tasks. The control subjects and schizophrenic subjects were significantly different in their painting performance for the unstructured ($p<.05$) and structured ($p<.01$) painting

task. The only inconsistent group comparison was provided by the schizophrenic and alcoholic subjects; there appeared to be no significant difference in the spatial structure ratings for the two groups when a free-choice painting was requested, but there was a significant difference ($p<.01$) when a specific subject was suggested for the painting. The reason that the significance level for this group comparison was not the same for the two painting tasks was that the Scottish schizophrenic subjects received a higher frequency of [2-6] spatial structure ratings on the structured task than on the unstructured task (see Appendix IX, Table XXXII), thereby increasing the extent of the difference between the ratings for the two groups. This factor appeared to be the explanation for a lack of consistent painting performance for all three Scottish group comparisons on the unstructured and structured painting tasks.

Table XVIII

Differences between Spatial Structure Ratings for the Unstructured and Structured Painting Tasks

Group	z	p
Scottish controls	1.58	>.05
Scottish schizophrenics	1.86	<.05
Scottish alcoholics	.30	>.05
Eskimo controls	2.03	<.05
Eskimo schizophrenics	.98	>.05
Eskimo alcoholics	1.29	>.05

Table XIX

Differences between Spatial Structure Ratings for the Scottish Groups

Unstructured painting task		
Groups[a]	z	p
Controls-schizophrenics	1.99	<.05
Controls-alcoholics	.90	>.05
Schizophrenics-alcoholics	1.28	>.05
Structured painting task		
Groups	z	p
Controls-schizophrenics	2.51	<.01
Controls-alcoholics	.91	>.05
Schizophrenics-alcoholics	2.76	<.01

[a]Where a significant difference exists between the two groups, the name of the group showing the higher proportion of ratings exceeding the median [2-6] (which indicates a greater disintegration of spatial structure) is underlined.

Table XX

Differences between Spatial Structure Ratings for the Eskimo Groups

Unstructured painting task		
Groups[a]	z	p
Controls-schizophrenics	.75	>.05
Controls-alcoholics	2.05	<.05
Schizophrenics-alcoholics	2.30	<.05
Structured painting task		
Groups	z	p
Controls-schizophrenics	1.59	>.05
Controls-alcoholics	1.06	>.05
Schizophrenics-alcoholics	.65	>.05

[a]Where a significant difference exists between the two groups, the name of the group showing the higher proportion of ratings exceeding the median [2-6] (which indicates a greater disintegration of spatial structure) is underlined.

Eskimo Groups

There was no significant difference in spatial structure ratings for either the Eskimo schizophrenic or the Eskimo alcoholic group (see Table XVIII), but, as mentioned previously, the Eskimo control subjects received significantly higher spatial structure ratings for the unstructured

painting task than the structured painting task ($p<.05$). This was the only group out of the six subject groups that supported the research hypothesis (#3).

No significant difference was found between the spatial structure ratings for the Eskimo control and Eskimo schizophrenic groups for either the unstructured or structured painting task; the painting performance for these two groups did not seem to differ when the painting condition was varied. The same was not true, according to these results (see Table XX), for the controls and alcoholics or the schizophrenics and alcoholics; these groups were significantly different in their unstructured painting performance ($p<.05$ and $p<.05$) (see Table XX) but not significantly different in their structured painting performance.

The proportion of ratings referred to as [2-6] was calculated by adding the frequency of these ratings by the four judges and then dividing this arithmetic sum by the total N (see Appendix IX, Tables XLIV and LIII); it can be seen that the proportion of [2-6] ratings for the control and alcoholic groups was .185 and .275, respectively, for the unstructured painting task and .125 and .192, respectively, for the structured painting task. In other words, the alcoholic subjects were significantly different than the control subjects when the task was unstructured because they received a higher proportion of [2-6] ratings than the Eskimo control subjects. The proportion of [2-6] ratings for the structured task were .125 (controls) and .192 (alcoholics) and, consequently, the comparison did not indicate a significant difference between spatial structure ratings.

The same evidence may be used to explain the difference in significance levels for the Eskimo schizophrenics and Eskimo alcoholics. The proportion of [2-6] ratings for the schizophrenic group was .205 and for the alcoholic subjects it was .192, whereas the spatial structure ratings for the unstructured paintings indicated a proportion of .150 (schizophrenics) and .275 (alcoholics) for the [2-6] ratings (see Appendix IX, Tables XLV and LIV.). Again, the Eskimo alcoholic subjects received a significantly higher proportion of ratings than the schizophrenics for the unstructured painting task.

When the painting task was structured, there was not a significant difference in painting performance when the three Eskimo groups were compared; the difference in spatial structure ratings seemed to be evident only when the task was unstructured (controls-alcoholics and schizophrenics-alcoholics)[1]. The reverse was indicated by the results for the Scottish subjects; the painting performance of the compared groups was consistent (i.e., significant or non-significant) for the unstructured and structured tasks (controls-schizophrenics and controls-alcoholics) or the structured task revealed a significant difference (schizophrenics-alcoholics) (see Table XIX and Appendix IX, Tables XXXVII, XXXVIII, XL, XLVI, XLVII, XLIX). The consistent evidence was provided by the control-schizophrenic

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[1]Where a significant difference is indicated between the two groups, the group underlined received the higher proportion of ratings exceeding the median [2-6].

groups from both cultures. In other words, there was a significant difference between spatial structure ratings for the Scottish schizophrenic and control subjects when the unstructured and structured paintings were evaluated; the Eskimo schizophrenic and control subjects performed with different but consistent results for the two painting tasks, no significant difference in spatial structure ratings. And finally, it appears from these results that a group may reveal no significant difference between spatial structure ratings for the unstructured and structured painting task (e.g., Table XVIII, Eskimo schizophrenics--Eskimo alcoholics), but when a specific task (unstructured or structured) for the group is compared with another group, the results for the two groups compared may not be the same for the two painting conditions (see Table XX, Eskimo schizophrenics-Eskimo alcoholics and compare the results for the unstructured and structured tasks). These findings indicate that group comparisons may reveal different results than the results presented when the spatial structure ratings for the unstructured and structured tasks are compared for individual groups.

Between Cultures

Upon reviewing Table XXI, it is apparent that the findings are consistent (i.e., significant or non-significant) for both painting tasks, with the exception of

the Scottish and Eskimo control groups, as discussed previously. These findings are inconsistent with the prediction that the structured painting task would decrease the significance of the difference between the subject groups, specifically the control and schizophrenic groups (see Hypothesis #3). It was, in fact, the structured painting condition that indicated a significant difference in spatial structure ratings for the control groups, not the unstructured painting condition (see Table XXI). The nature of the task (i.e., structured or unstructured) did not seem to influence the results for the Scottish and Eskimo schizophrenics. When the Scottish alcoholic group was compared with the Eskimo alcoholic group, there was no significant difference in the spatial structure ratings for the unstructured or structured painting tasks. On the other hand, when the Eskimo alcoholic subjects were compared with Eskimo control subjects (see Table XX), there was a significant difference in painting performance for the unstructured task but not for the structured painting task. The results for the Eskimo alcoholic subjects are consistent with the hypothesis (#3) which states that the artist will receive a significantly lower rating for the structured painting task than the unstructured painting task (free-choice). Therefore, the painting performance of the Eskimo alcoholic did, in fact, resemble the painting performance predicted for the schizophrenic subjects.

It should be noted that in spite of an apparent lack of significant difference in the spatial structure ratings

Table XXI

Differences Between Spatial Structure Ratings for the Scottish and Eskimo Subject Groups

Unstructured painting task		
Groups	z	p
Scottish controls-Eskimo controls	1.53	>.05
Scottish schizophrenics-Eskimo schizophrenics	2.40	<.01
Scottish alcoholics-Eskimo alcoholics	.87	>.05

Structured painting task		
Groups	z	p
Scottish controls-Eskimo controls	1.79	<.05
Scottish schizophrenics-Eskimo schizophrenics	2.07	<.05
Scottish alcoholics-Eskimo alcoholics	.54	>.05

for the unstructured and structured tasks for an individual subject group (see Table XVIII, Eskimo schizophrenics or Eskimo alcoholics), when subject groups within a culture (see Tables XIX and XX, schizophrenics-alcoholics) or between cultures (see Table XXI, Scottish controls-Eskimo controls) were compared, the nature of the painting condition (i.e., unstructured or structured) may have revealed a significant difference in the spatial structures found in the paintings produced.

SUMMARY

An assessment of interrater reliability was used to assess the degress of association among the judges' ratings, and the results indicated that the judges' ratings were moderately correlated. To evaluate further the relationship

among the ratings of the judges, an intraclass correlation was computed, and the results indicated a moderate correlation among the four judges' ratings.

Considering the fact that the purpose of the present research was to develop a nonverbal diagnostic tool, using the identification and documentation of spatial structures in paintings and the changes in these spatial structures during the course of the illness, the assessment of the ratings for the paintings represented an important part of the evaluation of the results. The percentage of ratings for each spatial structure found in the unstructured paintings is shown in Table VI. An initial inspection of this table indicated essentially two findings: (1) When the [4] and [5] ratings were considered, the Scottish schizophrenic subjects and Scottish control subjects appear to support Billig's (1970) theory, but the Eskimo schizophrenic and Eskimo control subjects do not support this theory. (2) A higher percentage of paintings received a rating of [6], multidirectional space, in both schizophrenic groups when compared to the control groups. Billig's theory appeared to be supported by the evidence collected from the Scottish schizophrenic and control groups; schizophrenic patients in the acute phase of the illness produced a painting with multidirectional space.

This initial assessment of the paintings indicated some important points: (1) The Scottish and Eskimo schizophrenics did not perform the painting task with the same results when compared to a control group from the same culture. (2) The spatial structure described as charac-

teristic of the acute schizophrenic may be detected to some extent in the paintings of control and alcoholic subjects. These initial findings suggested that the universal aspect of Billig's theory as well as the specific diagnostic value of its application requires further evaluation.

The results of the experiment required that the primary hypothesis be rejected for the Scottish and Eskimo schizophrenic and the Scottish and Eskimo alcoholic groups. [There is a significant positive correlation between the amount of error made on a size constancy task and the ratings representing the disintegration of spatial structures in paintings.] The only group to demonstrate a significant relationship between the amount of error made on the size constancy task and ratings representing the disintegration of spatial structures in paintings was the Eskimo alcoholic group. However, these results did not support the research hypothesis because the frequency distribution was not consistent with the appropriate spatial structures and variance intervals. The dependent relationship established by the present data consists of low ratings for the paintings [0=1] and small variance scores (less than 2.49) (see Tables IX and X); for the hypothesis to be supported, the frequency of ratings should be concentrated at the other end of the rating scale and in an interval representing a greater variance in perceptual constancy.

Two of the secondary hypotheses were accepted. Hypothesis #1: The Scottish schizophrenics were significantly poorer than the Scottish controls in their performance of the distance constancy and unstructured painting

task; the data did not indicate the same results for the Eskimo schizophrenic and Eskimo controls subjects. Hypothesis #2: There was a significant difference between the spatial structure ratings in the paintings of the Scottish schizophrenic and Eskimo schizophrenics. These findings did not support the universal aspect of Billig's theory. Implications for all of the secondary hypotheses were stated and the findings discussed.

The painting performance for all the subject groups on the unstructured and structured paintings tasks was discussed, both within the culture and between cultures (see Tables XIX, XX, and XXI). Spatial structure ratings for the two paintings tasks were not significantly different for the Scottish controls and alcoholics, but the ratings were significantly different (not in the expected direction) for the schizophrenic group. The control subjects and schizophrenic subjects were significantly different in their painting performance for the unstructured and structured painting task. When the Scottish schizophrenic and alcoholic subjects were compared, there appeared to be no significant difference in the spatial structure ratings for the two groups when a free-choice painting was requested, but there was a significant difference when a specific subject was suggested for the painting (see Table XIX). When the Eskimo schizophrenic and alcoholic groups were compared, there was no significant difference in spatial structure ratings when the task was structured (i.e., a landscape or scene), but there was a significant difference when a free-choice was requested (see Table XX). The Eskimo control

subjects received significantly higher spatial structure ratings for the unstructured painting task than the structured painting task (see Table XVIII); this was the only group comparison that supported the research hypothesis (#3). No significant difference was found between the spatial structure ratings for the Eskimo control and Eskimo schizophrenic groups for either the unstructured or structured painting task (see Table XX); the painting performance for these two groups did not seem to differ when the painting condition was varied. The same was not true, according to these results, for the controls and alcoholics or the schizophrenics and alcoholics; these groups were significantly different in their unstructured painting performance ($p<.05$ and $p<.05$) but not significaintly different in their structured painting performance (see Table XX). It should be noted that there was not a significant difference in painting performance when the three Eskimo groups were compared if the painting task was structured; the difference in spatial structure ratings seemed to be evident only when the task was unstructured (see Table XX). The reverse was indicated by the results of the Scottish subjects; the painting performance of the compared groups was consistent (i.e., significant or nonsignificant) for the unstructured and structured tasks (controls-schizophrenics and controls-alcoholics) or the structured task revealed a significant difference (schizophrenics-alcoholics)(see Table XIX).

Table XXI summarises the differences between spatial structure ratings when the two cultures were compared. The schizophrenic subjects were significantly different when the

task was unstructured and structured, whereas the alcoholic subjects were not significantly different in their performance of the unstructured or structured task. It was only the control subjects from the two cultures that demonstrated a difference in their painting performance on the unstructured task. The structured painting task resulted in a significant difference between the two groups in spatial structure ratings, whereas the unstructured painting task did not result in a significant difference in spatial structure ratings. The nature of the painting task seemed to significantly affect the results only when the painting performance of the Scottish and Eskimo control groups was compared.

DISCUSSION

The research hypotheses address various aspects of perceptual constancy and spatial structures represented in paintings. Therefore, it may be advantageous to discuss the results of the experiment as they relate to a specific hypothesis. A general discussion of the experimental methodology and results will follow the independent discussions, and it will provide the reader with additional findings that may contribute to future related investigations.

Primary Hypothesis

There is a significant positive correlation between the amount of error made on a size constancy task and the ratings representing the disintegration of spatial structures in paintings.

Implications

a) Weckowicz proposed a relationship between the disturbance of ego boundaries, breakdown of perceptual constancies, and, consequently, the deterioration of space perception. If this hypothesis is supported, and the acute schizophrenic subjects indicate a disturbance of perceptual constancy and a disintegration of the spatial structure in their paintings, then the Weckowicz theory is supported.

b) If this hypothesis is supported, then Billig's theory, which stated that spatial structures reflect ego disturbances, is also supported. However, Billig's theory must be extended to state that the artist may be structuring representational space to reflect his perception of space as well as the condition of his ego boundary.

There was a positive correlation between the amount

of error made on a size constancy task and the ratings representing the spatial structures in the paintings for only one subject group, the Eskimo alcoholic subjects. In addition, as implication a) states, the relationship between these two variables must indicate a disturbance of perceptual constancy and a disintegration of the spatial structure in paintings. An analysis of the data indicated that the positive relationship involved low variance scores (the highest frequency in the 1.49-2.49 interval for the schizophrenic subjects and the .00-1.49 interval for the alcoholic subjects, see Tables IX and X) and low spatial structure ratings (the highest frequency represented by the [0+1] ratings for all four subject groups, see Tables IX and X). For the results to support the research hypothesis, the chi-square contingency table should have revealed that the frequency distribution encompassed high variance scores (>2.50) and high spatial structure ratings [2-6]. However, the Eskimo alcoholic subjects, the only group that indicated a relationship between these two variables, showed good perceptual constancy and good spatial structure representation. These results indicated that there was no relationship between poor size constancy and the spatial structures represented in the paintings of Scottish and Eskimo schizophrenic or Scottish and Eskimo alcoholics.

Hamilton (1963) found evidence that acute and chronic nonparanoid schizophrenic subjects (men) showed an impairment in size estimation and supported the previous findings of Lovinger (1956) and Weckowicz (1957). The findings represented in Tables IX and X, however, more closely

resemble the results of the Kopfstein and Neale (1971) study, in which no significant difference in size estimation was found between the three experimental groups (acute schizophrenics. chronic schizophrenics, and nonschizophrenic psychiatric patients). The acute schizophrenics and alcoholics (nonschizophrenic group) in the present study were similar in the frequency distribution of low variance scores[1] (see Tables IX and X, .00-1.49cm row), and the Scottish schizophrenic and alcoholic subjects indicated the same relationship between the two variables ($p>.05$ for both groups). The possible explanations for this support of the Kopfstein and Neale (1971) study and lack of support for the previous studies are too numerous to discuss. However, the modification and clarification of diagnostic techniques as well as experimental procedures may account for the varied results.

The spatial structures that are characteristic of the advanced stages of ego disintegration (Billig, 1970), did not represent the highest frequency of ratings (see Table VI). The ratings representing a base line with vertical direction and geometric designs [5] and multidirectional space [6] were recognised in the paintings of the schizophrenics and the alcoholics, as indicated in Table VI, but the frequency with which they appeared does not contribute to a positive correlation between high spatial structure ratings and indications of high performance variability.

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[1]The formula for the variance score may be found on page 400 and the variance scores for the subjects in Tables VII and VIII.

A possible explanation for the findings may be that the attempt to introduce Billig's (1970) theory to experimental control did not encourage the use of these spatial structures to the same extent that they would be used in spontaneous art activity. Billig's (1970) theory of spatial structure regression relied upon the spontaneously produced paintings of schizophrenic patients for support, just as the free association technique in psychoanalysis relies on spontaneity. Celentano (1977) concluded that the schizophrenic's artwork reflected a progression from a disorganised to an organised cognitive condition as the patient's condition improved, but he, also, formulated his conclusion after observing spontaneously created artwork. On the other hand, Cvetkovic (1979) studied and statistically evaluated the spatial representation in human figure drawings (a structured task) by normal and schizophrenic subjects, and he found that the schizophrenic subjects had no difficulty with the conception of space and "that the patterns of representation were almost identical for all groups" (p. 254). Therefore, in spite of the attempt to approximate spontaneous art activity by including a free-choice painting in the experimental procedure, perhaps the experimental setting was not conducive to eliciting the spatial structures characteristic of acute schizophrenic patients (i.e.,Billig, 1970). These results offer serious doubt as to whether the spatial structures in the paintings of schizophrenic patients, collected in a controlled setting, may be used effectively to establish a projective

technique[1], which would offer valuable information about the condition of the schizophrenic's ego boundary.

Secondary Hypotheses

1. The early term or acute schizophrenic experiences a severe disturbance of the ego boundary and perceptual constancy, and, therefore, the acute schizophrenics will be significantly poorer than the control subjects in their performance of the distance constancy and unstructured painting task.

The performance of the Scottish schizophrenic and Scottish control groups on the distance constancy and unstructured painting task provided statistical support for this hypothesis. An analysis of the data indicated that the Eskimo schizophrenic group did not perform significantly different from the Eskimo control group on the distance constancy task (see Table XI). The research hypothesis is not accepted for the Eskimo schizophrenic and control groups

[1]This form of psychological assessment traditionally relies on ambiguous stimuli, and the material presented to the individual for interpretation is not produced spontaneously. The stimuli are structured and unfamiliar to the individual, but the response of the individual is spontaneous.

because the spatial structure ratings for the Eskimo schizophrenic and control groups were not significantly different (see Table XIII). These findings indicated that the Eskimo schizophrenic group was not consistently different from the Eskimo control group in the estimation of the 1-yard distances, and, therefore, these subjects did not provide unambiguous statistical evidence necessary for supporting this hypothesis.

A comparison of the Scottish schizophrenic and Scottish control groups provided support for the findings of Weckowicz, Sommer, and Hall (1958) and Weckowicz and Hall (1960); distance contancy is poorer in schizophrenics than in normals, and poor distance constancy is a perceptual disturbance specifically related to the schizophrenic illness. On the other hand, the inconsistent differences between the Eskimo schizophrenic and Eskimo control subjects provided support for the findings of Nelson and Caldwell (1962); they found no indication of a lack of depth perception in acute schizophrenics. It is necessary to note that there was no evidence in the perceptual constancy literature to either support or explain inconsistent results.

In addition, the Eskimo schizophrenic and control subjects showed no significant difference in the spatial structures represented in the unstructured paintings; this was not the case with the Scottish schizophrenics and controls (see Tables XIX and XX). The first impression might be that the Eskimo control subjects employed spatial structures which resembled their traditional art (e.g., "x-ray

pictures" or mixing of planes) and for this reason their painting performance appeared to be characteristic of schizophrenic art. The Eskimo control subjects did employ spatial structures representative of the [4] rating (twice as many times as the Eskimo schizophrenic subjects), but the Scottish control subjects also employed this spatial structure, as frequently as the Eskimo control and schizophrenic subjects (see Table VI). Therefore. this particular spatial structure did not appear to have been the deciding factor in establishing a lack of significant difference between Eskimo schizophrenic and control subjects.

The frequency and percentage of the [4], [5], and [6] ratings for the schizophrenic and control groups provided some insight into the reason why there was a significant difference in ratings for the Scottish schizophrenic and control groups and no significant difference for the Eskimo schizophrenic and control groups (see Table VI). The three ratings that represent the last stages of spatial structure disintegration (i.e., [4], [5], and [6]) received 18.50 percent of the total ratings for the Scottish schizophrenic subjects, whereas the Scottish control, Eskimo control, and Eskimo schizophrenic subjects received 9.50 percent, 11.00 percent, and 8.53 percent, respectively. These initial results, then, show some support or Billig's (1970) theory; schizophrenic patients employ "x-ray" pictures and mixing of planes, base line with vertical direction, and multidirectional space more frequently than nonschizophrenic subjects. If only the Scottish schizophrenic and control

subjects are considered and only the [2-6] ratings evaluated, then there is support for Billig's (1970) theory.

Generally, the frequency of the [0+1] ratings, as opposed to the [2-6] ratings, provided a more obvious explanation for the different results obtained when the Scottish schizophrenic and control subjects were compared, and also the Eskimo schizophrenics and controls. Again, the Eskimo schizophrenic and control groups did not support Billig's (1970) theory, even when the analysis of the data was restricted to the [2-6] ratings. Therefore, an interpretation of the results may be that the Eskimo schizophrenic subjects did not represent space graphically in the same way that the Scottish schizophrenic subjects represented space, and they did not appear to rely on the spatial structures outlined by Billig (1970) to the same extent as the Scottish schizophrenic subjects. The traditional art of the Eskimos incorporated various spatial structures considered to represent a disintegration of the ego boundary (Billig, 1970), but the characteristics of the early Eskimo art, and to some extent the contemporary work of the professional Eskimo artists, did not appear to be a strong influence on the spatial structures employed in the graphic representations of the schizophrenic or control subjects.

A possible explanation could be that the westernisation process has affected the artwork of the Eskimo people. The school systems in Alaska include art in the curriculum, and the Eskimo children perhaps respond to the art instruction more easily than the other courses, such as math and English. Consequently, the Eskimo child that has

been taught the importance of art by his ancestors, as a form of expression and communication, selects the "new" forms of art expression as the focus for his attention, and the westernised concepts of space are accepted and practised. An effort to employ the "new" art forms may be even more crucial when a nonnative investigator requests a graphic representation from an Eskimo subject. As mentioned previously, the Eskimo people involved in this study were extremely accommodating and made every effort to provide the experimenter with their best performance, which for some Eskimo subjects may have been analogous with the westernised concept of representation. If the Eskimo subjects (controls, schizophrenics, and alcoholics) were alone, with other Eskimo friends, or with ancestors, then they would, perhaps, incorporate spatial structures into their artwork that would resemble their traditional art. The extraneous variables of Caucasian expectation and the reaction to a controlled environment were not anticipated but must be considered as possible explanations for the findings.

There was a significant difference in the distance constancy (see Table XI) and painting performance of the Scottish schizophrenic and the Scottish control groups (see Table XIX). This finding lends support to the Weckowicz and Sommer (1960) theory; there is a positive correlation between the disturbances of space perception, perceptual constancy, the self, and the body image of the schizophrenic. If one applies Weckowicz and Sommer's (1960) theory, then the condition of the schizophrenic's self-boundary is significantly different than the normal subject's self-boundary,

and this difference can be detected in the spatial structures of paintings (Billig, 1970). The Eskimo schizophrenic and Eskimo control groups did not, however, provide support for either the Weckowicz and Sommer (1960) theory or the Billig (1970) theory (see Table XI and Table XX).

Generally, the results indicated that the Scottish groups, schizophrenic and control subjects, supported the secondary hypothesis (#1), and the Eskimo groups, schizophrenic and control subjects, did not support the hypothesis. Thus, there is strong evidence that there are cultural differences in perceptual and painting performance; these cultural differences must be recognised.

Implications

a) If the schizophrenic subjects perform significantly poorer than the control subjects on the distance constancy test but are not significantly poorer in their painting performance, then the lack of ability to perceive depth has no influence on the spatial structures detected in the paintings of schizophrenics.

There was no clear statistical evidence to support this research hypothesis. Table XIII indicates that the Scottish schizophrenic group was significantly poorer than

the Scottish control subjects on the distance constancy test, and they were, also, significantly different in their painting performance on the unstructured task. The results did not support the hypothesis but did imply that poor depth perception may influence the spatial structures detected in the paintings of Scottish schizophrenic patients; this indicated a relationship between the Weckowicz and Sommer (1960) and Billig (1970) findings. The Scottish schizophrenic patient may structure his graphic representation of space to comply with his visual impressions of space. The Eskimo schizophrenic subjects did not present any evidence of the same relationship between the distance constancy test and the painting performance. The performance of the Eskimo schizophrenic and Eskimo control groups indicated that there was no unambiguous evidence of a significant difference in perceptual performance, and there was no significant difference between the painting performance of the two groups. These findings may also indicate that these two tasks are related or require similar skills for the Eskimo schizophrenic and control subjects. The Scottish schizophrenic and the Eskimo schizophrenic obviously require a different interpretation of the results.

b) If the distance constancy scores of the schizophrenic subjects are not significantly poorer than the control subjects, but the ratings representing the spatial structures in the paintings are significantly higher than the control

subjects, then there is no support for the correlation between the deterioration of space perception, perceptual constancies, the self, and body image of the schizophrenic, as outlined by Weckowicz and Sommer (1960). The spatial structures in the paintings of schizophrenics may, then, reflect only the condition of the schizophrenic's ego boundary, as outlined by Billig (1970).

When the 1-yard estimations of the Eskimo schizophrenic and Eskimo control groups were compared, the results were internally inconsistent. The distance constancy results (see Table XI) as well as the lack of significant difference between the spatial structure ratings for the Eskimo schizophrenic and Eskimo control subjects (see Table XX) provided no clear statistical evidence to support the theory that there is a relationship between perceptual constancy and spatial structures in the paintings of schizophrenic patients. The disintegrated spatial structures, as outlined by Billig (1970), did not appear to be characteristic of the Eskimo schizophrenic and there did not appear to be a consistent disturbance of perceptual constancy, space perception, and, consequently, body image in the Eskimo schizophrenic subjects, as would be expected from the work of Weckowicz and Sommer (1960).

The results for the distance constancy test were internally inconsistent (see Table XI) when the Eskimo schizophrenic subjects were compared with the Eskimo control subjects but not when the Scottish schizophrenic subjects

were compared with the Scottish control subjects. This difference in performance may indicate that the Eskimo schizophrenic subjects demonstrate more performance variability than the Scottish schizophrenic subjects. This aspect of the results requires further investigation, but, for now, it should be recognised that the performance of the Scottish and Eskimo schizophrenic subjects cannot be interpreted in the same way.

c) If the acute schizophrenic subjects receive significantly higher ratings on the unstructured painting task, considered to be characteristic of the acute schizophrenic (Billig, 1970), than the control subjects, then Billig's spatial structure theory is supported.

In spite of the fact that the statistical analysis of the data indicated that the Scottish schizophrenic and Scottish control groups were significantly different in their performance of the unstructured painting task, and the hypothesis was accepted for these groups, it should be recognised that these findings did not fully support Billig's (1970) theory. As indicated in Table VI, the percentage of spatial structure ratings which represent the condition of the acute schizophrenic's ego (i.e., Billig's theory) was not as high as one would expect it to be for a homogeneous group of acute schizophrenic subjects. However, there may be a significant difference between the spatial

structure ratings (see Table XIII), indicating that the higher ratings (i.e., more disintegrated spatial structures) were more frequently detected in the artwork of the schizophrenic subjects than in the paintings of the control subjects.

Billig's (1970) theory claimed that a schizophrenic in an acute phase of the illness would experience an extensive disintegration of his ego boundary and this disintegration would be detected in the paintings by spatial structures characteristic of such a deterioration, specifically multidirectional space or, perhaps, base line with vertical direction or geometric designs. These results, then, provided support for Billig's (1970) theory and, yet, revealed that the spatial structures found in schizophrenic paintings may not conform to the characteristics outlined by Billig (e.g., 1970), at least to the same extent that his theory and related research indicated. The spatial structures in the artwork of the schizophrenics may be significantly different from the spatial structures in the artwork of the control group, but the percentage of spatial structures claimed to be characteristic of the acute phase of the schizophrenic illness was not high enough to add strong support to Billig's (1970) theory.

In addition, when the Eskimo schizophenic and Eskimo control groups were compared, their performance provided no indication that the Eskimo schizophrenics incorporated spatial structures in their paintings which were different from the Eskimo control subjects. The indication was that the acute Eskimo schizophrenic did not structure graphic space

in such a way that it reflected a deterioration of his ego boundary. The explanation mentioned previously may also be applied to these findings. It appears that the Eskimo schizophrenic has adopted the Western man's approach to perspective, and perhaps because this adoption is relatively recent, the Eskimo's tendency to comply with the "new" culture is still very strong. Therefore, the Eskimo subject, control or schizophrenic, may make more of an effort to accommodate the guidelines established for drawing than a subject from another culture (i.e., a culture that does not place the same emphasis on art for communication or a culture in which the people do not experience the need to accommodate a "new" culture).

2. There is a significant difference between the spatial structure ratings in the paintings of the Scottish schizophrenics and Eskimo schizophrenics.

Implication

a) If this hypothesis is supported, then the universal application of Billig's (1970) theory is not supported by the results of this experimental study.

As indicated in Table XVI, there was a significant difference between the spatial structure ratings for the Eskimo schizophrenic group and the Scottish schizophrenic group (see Appendix IX, Tables XLI and L). The universal aspect of Billig's spatial structure theory stated that the cultural variations in graphic representation "dissolve" under the influence of psychopathology, and there should be consistent evidence of specific spatial structures (Billig, 1970). If Billig's (1970) spatial structure theory is to be considered for universal application, it should describe the graphic representations of both the Scottish and Eskimo schizophrenic subjects; there should be no significant difference in the spatial structure ratings for these two schizophrenic groups from different cultures.

Billig and Burton-Bradley (1973b) claimed that their findings supported the universal hypothesis.

> Spontaneous graphics obtained from psychotic patients who live in areas of comparatively marked cultural isolation, such as New Guinea, show regressive patterns not unlike those of Western civilization. The content of the drawings is culturally influenced as long as the patient remains relatively well integrated. Enculturation, which has a strong impact on the individual and his society, resists the psychotic personality disintegration to [a] considerable degree. But as the psychotic process advances, a regression to universal factors of the spatial structure can be seen and cultural differences recede. (p. 328)

The impact of the Eskimo or Scottish culture on the individual would, then, be expected to lose its significance when the psychotic process intervened, and the schizophrenic from

Scotland or Alaska (Eskimo) should produce similar graphic representations.

There are two keywords in the above defense of the universal hypothesis, spontaneous and isolation, and these words may provide some insight into the lack of support for Billig's (1970) theory. First of all, the experimental procedure did not allow for the collection of spontaneous graphic material, but to the contrary, the task was requested and, therefore, controlled. It is possible that the spatial structures outlined by Billig (1970) become strongly evident only when the painting is spontaneously produced. The psychoanalytically oriented therapist, as well as professional artists, would perhaps agree that creativity should not be expected to comply with external controls. If this explanation is accepted, then these results appear to support the theory that psychotic artwork must be spontaneous. Wittels (1975), for example, stated that drawings must be spontaneous if the schizophrenic's ego is to be examined, encouraged to reestablish normal perception, and to cope with the trauma associated with the illness. (pp. 217-218) Spontaneity, then, appears to be essential if the therapist is to assist the patient but a hindrance for the experimenter interested in testing hypotheses related to psychotic art. In addition, the Eskimo people are no longer considered to be isolated. The effects of westernisation may explain why the characteristics of traditional Eskimo artwork are no longer as evident in the artwork of the Eskimo as one might expect (see Table VI) and why the difference between the Eskimo's artwork and the artwork of

other Western cultures, such as the Scottish culture, is not as great as one would predict (see Appendix IX, Tables XXXIX and XLVIII). Berry (1966), when evaluating the performance of the Canadian Eskimos, stated that contact with the Western culture, especially with movies, television, and magazines, tended to alter "traditional perceptual characteristics" (p. 225). He claimed that the spatial skills of the Eskimos had been improved as a result of the westernisation. This statement may be amended by saying that the Eskimos in Alaska have learned to draw objects according to what they can actually perceive. The Eskimo artist no longer provides the viewer with additional information or a story about the subject matter. The impact of the schools and television, in some villages, have without a doubt changed the Alaskan Eskimo's perceptual characteristics. Alaskan Eskimos have been exposed to Western man for numerous years, but the extent of the influence appears to have expanded in recent years. In other words, the acculturation process in its recent intensity is reasonably new to the Alaskan Eskimo people. The question may be asked, If a culture has recently become absorbed in an acculturation process (in this case the alteration of the structural aspects of graphic representation),[1] will the paintings of the schizophrenic artist still indicate a regression to universal spatial structures or will there be a stronger tendency to maintain the graphic characteristics that have been

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[1]For example, the multiple base lines have become single base lines, and the multiple perspective has become a single perspective.

recently acquired? Perhaps, the Eskimo schizophrenic was not significantly different from the Eskimo control group because the impact of the Western culture is still new and overwhelming, and the Alaskan Eskimo is making an extraordinary attempt to conform to the "new" culture. The Eskimo schizophrenic may attempt to maintain his contact with reality by focusing on an aspect of the "new" culture which is meaningful to him, graphic representation.

3. The schizophrenic artist will show a greater ability to integrate space in his painting if he is asked to paint a specific subject. The schizophrenic subjects will receive a significantly lower rating on the structured painting task (specific subject) than on the unstructured painting task (free-choice).

The experimental findings clearly established the fact that the schizophrenic subjects performed no better on the structured task than on the unstructured painting task (see Table XV); this was in spite of the fact that there had been numerous indications that the results would confirm the research hypothesis. Schizophrenic patients, for example, often appear to improve and adequately function in a hospital setting (structured environment), whereas a return to the community (unstructured environment) frequently indicates that the patient is not able to cope out-

side the hospital setting. Eskimo schizophrenic patients, for example, return to their villages and frequently fail to continue the prescribed medication for the relief of psychotic symptoms; they are either too far away from an outpatient facility or fail to establish contact with an available clinic. The Eskimo schizophrenic, in particular, may find the prescribed medication to be an alien requirement, which has no meaning in his world or the world of those responsible for him. The indication from these examples is that the individual suffering from the schizophrenic disorder should benefit from a structured condition.

Messner (1951), also, agreed that there is therapeutic value associated with a guided or structured creative program, combining the benefits of spontaneous, uncontrolled expression and technical creations. The patient is encouraged to select a realistic stimulus and to find his own unique way of expressing it in graphic form. The purpose of this approach is to interest the patient in reality again and to encourage him to eventually relinquish his fantasy world. Messner (1951) believed that having the patient choose his own subject and his own modifications of the actual object would in itself prove to be a therapeutic tool. (p. 235) Structure of the creative situation is provided by this technique, but the artist still maintains a feeling of choice and control within the framework of the task. In this way, the patient's self-confidence may be restored.

The structured painting task in this experimental procedure established the same approach to painting as described by Messner (1951); it provided structure (a land-

scape or scene) but allowed the patient to select, modify, and express his interpretation of the subject. The importance of this technique is enhanced when the patient is from a unique culture, such as the Eskimo. This task should have provided the patient with a framework and a feeling of choice, control, confidence, and, perhaps, an interest in reality. The structured painting task should have elicited a more representative expression of the objective world, but the results indicated that this approach to creative activity elicited more disintegrated [2-6] spatial structure ratings than the unstructured painting task for the Scottish control, Scottish schizophrenic, and Eskimo schizophrenic subjects (see Appendix IX, Tables XXXI, XXXII, and XXXV). An example of the similarity between an Eskimo schizophrenic's unstructured and structured paintings can be seen by comparing Figures 23 and 24. The structured painting condition produced an observable effect on the representation of space but not one that could be differentiated by using the spatial structure rating scale. There were also cases where the structured condition did have a noticeable effect on the spatial structures in the painting (e.g., Figures 25 and 26). However, there were not enough cases of this kind to significantly influence the experimental results for the Scottish control, Scottish schizophrenic, or Eskimo schizophrenic groups.

Further evidence that the deficits which appear in the schizophrenic's performance "improve when the tasks are simple, when the backgrounds are underarousing, or when the stimuli are unambiguous" was offered by Holzman (1970, p.

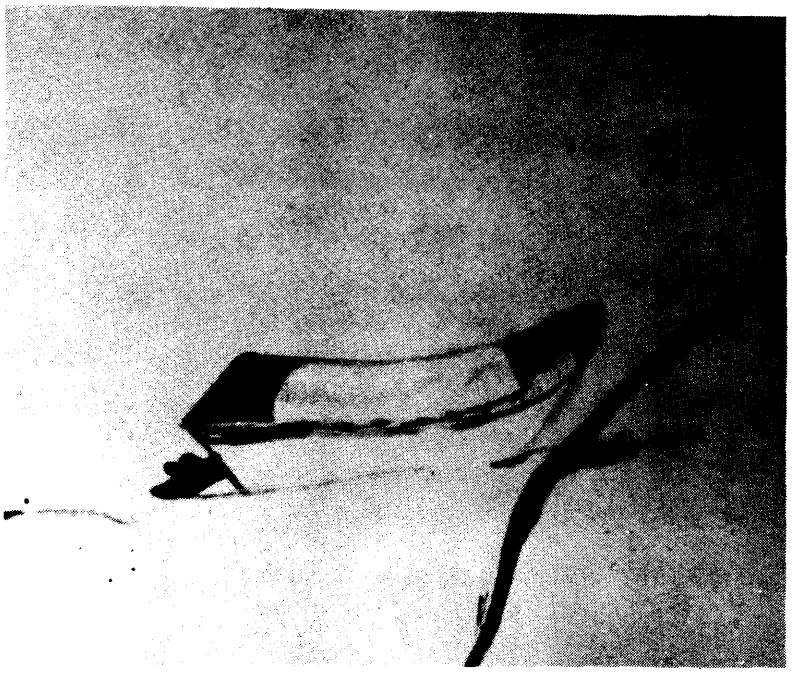

Figure 23. An example of an Eskimo schizophrenic's unstructured painting.

Figure 24. An example of an Eskimo schizophrenic's structured painting.

Figure 25. An example of a Scottish schizophrenic's unstructured painting.

Figure 26. An example of a Scottish schizophrenic's structured painting.

223). When the performance of schizophrenics was compared to normals on certain tasks, such as sensory isolation experiments, they revealed little deterioration in their responses (Cohen, Rosenbaum, Dobie, & Gottlieb, 1959, cited in Holzman, 1970, p. 223). The explanation for this lack of decrement was that the schizophrenic patient was able to deal adequately with a simple, structured situation. However, "in complex situations it is as if this schizophrenic patient has too much to deal with, too much to react to, but not because he cannot handle complexity--for complex thoughts and convoluted inferences are not at all atypical--but because reaction to the input is in some way impaired and thus response is put awry" (Holzman, 1970, p. 223). Information such as this, perhaps, encouraged Pereira (1972) to formulate the following prediction about drawing completion tasks: The "areas lacking structure are more vulnerable to the intrusion of task-irrelevant details" (p. 65). Pereira (1972) suggested that the schizophrenic's tendency to rely on structure may indicate "a broad behavioral trace"[1] (p. 92).

There appear to be two primary approaches to the question of the relative effectiveness of unstructured versus structured creative activity. Psychoanalytically oriented art therapists generally insist that free expression be the approach to therapy, just as free association is

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[1]Pereira (1972) suggested that drawing performance and language are two forms of expression which appear to depend on structure, even when they are altered by a disorder such as schizophrenia; he suggested that, perhaps, some indication of dependence on structure may be found consistently in other forms of behaviour. (p. 92)

used as a foundation for psychoanalysis. Billig (1970), a psychiatrist, collected only artwork which had been spontaneously produced by schizophrenics. The supporters of the structured activity contend that the spontaneous approach often increases anxiety and stress (e.g., Honig, 1977, p. 100) and discourages self-esteem (Honig, 1977, p. 110), whereas a structured therapeutic painting activity may help the schizophrenic to "resolve contradictions in his self concept" (Gruba & Johnson, 1974, p. 254) and establish stronger self-boundaries. It would appear, then, that the spontaneous graphic productions of schizophrenic patients may assist the psychoanalytically oriented therapist in interpreting the schizophrenic's ego condition and in understanding the illness. The structured painting activity, on the other hand, assists the schizophrenic patient by enhancing his self-concept and helping him to cope, organise, and reduce the confusing, disorganised, and disturbing nature of his psychosis. In spite of the fact that the painting procedure in this experiment included an unstructured task, this task was not unstructured in the same way as a spontaneous painting. Perhaps, one painting must be spontaneously produced and the other structured (specific subject) in order to produce significantly different spatial structure ratings. Of course, this experimental design would be extremely difficult, if not impossible, to execute.

The spatial structures present in traditional Eskimo art (i.e., multiple base lines and multiple perspective) encourage one to expect that an Eskimo control group would receive higher (more disintegrated) spatial structure

ratings than a Scottish control group for the structured task. This expectation, however, was not supported by the data (see Appendix IX, Tables XXXI and XXXIV); the Scottish control group received a higher proportion of the disintegrated spatial structure ratings [2-6] than the Eskimo control group. A possible explanation might be that the Eskimo control subjects made an effort to provide the experimenter with material which would indicate that they are a part of the "new" culture. Artwork is an essential part of the traditional Eskimo culture; for this reason, it seems reasonable that adapting one's art to conform to the Western standards might represent an acculturation effort. Also, the Eskimo people involved in this study were relatively young; they were educated by Caucasian teachers, interested in exposing the Eskimo children to technique, perspective, design, and so on. Drawing and other various forms of art might conceivably be one of the most interesting subjects for the Eskimo child because it represents a well accepted form of Eskimo communication. Therefore, the Eskimo control group may have provided the experimenter with carefully selected spatial structures, whereas the Scottish control group, in general, may have been more intimidated by the painting task. Frequently, the Scottish subjects commented that they "never did well with painting in school." Often the Scottish subjects entertained the attitude that painting was for children and not adults. When a painting was requested of the Eskimo subjects, perhaps, the control subjects approached the task with less anxiety and with the intention of performing "correctly", whereas the Scottish

control subjects considered the task childish and were anxious about their performance.

The Scottish control group demonstrated a tendency to produce abstract and nonrepresentational art forms when a free-choice painting was requested; this was not true for the Eskimo control or schizophrenic subjects. The Eskimo subjects relied on structural elements for a representation of reality, perhaps because of the strong traditional tendency to use art forms to illustrate stories or the relatively recent influence of the Caucasian art teachers. It may be that the Eskimo schizophrenic subjects relied on representational structure in the same way that schizophrenic subjects rely on the base line (Billig, 1970); they employed it as a last attempt to organise reality rela tions.

The Eskimo schizophrenic's tendency to avoid abstract forms and rely on a realistic representation of space for the unstructured painting task may have made the rating task easier for the judges. It is possible, then, that the difference in object orientation between the Eskimo and Scottish groups did affect the efficiency of the rating process. When the judges were questioned in reference to this factor, there was unanimous agreement that the abstract paintings did require more of an evaluation effort, but the four judges did not feel that the final rating was influenced by the variation in effort required.

When the control and schizophrenic groups were compared (see Table XVI), the only group comparison that did

not reveal the same results (significant or nonsignificant) for both painting conditions was the Scottish control and Eskimo control groups. In other words, when the task was unstructured, the difference in spatial structure ratings for these groups was nonsignificant, but when the task was structured, the ratings were significantly different ($p<.05$). All of the other group comparisons in Table XVI reveal the same results (significant or nonsignificant) for both painting tasks. Perhaps, the tendency toward representational art also affected the spatial structure ratings for these two groups (i.e., Scottish and Eskimo controls). Three of the four judges gave a higher proportion of the [2-6] ratings to the Scottish control subjects than to the Eskimo control subjects. The Scottish control subjects may have had a greater tendency to represent their landscape or scene (structured painting) by using forms which were more abstract than the ones used by the Eskimo controls and, therefore, the task of judging spatial structures may have been hindered to a certain extent. This distinction may not have been so easily recognised in the unstructured paintings because there was no request for structure. The Eskimo control subjects may have found it easier to utilise their representational orientation to this art form than the Scottish control subjects. It is suggested, then, that the painting condition may influence the painting performance of the subjects. In the present study, however, the expected

difference[1] in performance between the unstructured and structured task is significant only for the Eskimo control group (see Table XVIII).

4. The schizophrenic subjects will be significantly poorer than the alcoholic subjects in their performance on the perceptual constancy tests and the unstructured painting task.

Implications

a) If this hypothesis is supported, then the findings support the view that the clinical conditions are not similar.

b) If this hypothesis is supported, then the spatial structures in the paintings produced by schizophrenic patients (Billig, 1970) are not found to the same extent in the paintings produced by alcoholic patients. Therefore, Billig's (1970) spatial structure theory may not be used to evaluate the paintings produced by alcoholics.

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[1]It was predicted that the spatial structures in the unstructured paintings would receive a higher proportion of ratings exceeding the median [2-6] than the structured paintings (see Hypothesis #3).

The Scottish schizophrenic and alcoholic subjects were significantly different in their performance of the perceptual constancy tasks, whereas the Eskimo schizophrenic and alcoholic subjects showed no significant difference in their performance of the size and distance constancy tasks (see Tables XI and XXVI). The unstructured painting task, on the other hand, revealed a significant difference in spatial structure ratings when the Eskimo schizophrenic and alcoholic groups were compared but no significant difference for the Scottish schizophrenic and alcoholic groups. These findings indicated that the Scottish schizophrenic and alcoholic subjects did not represent similar clinical conditions in terms of perceptual constancy; the Eskimo schizophrenic and alcoholic subjects, on the other hand, may have represented related clinical conditions in terms of perceptual constancy but not in terms of the spatial structures found in paintings. There did not appear to be a positive relationship between the perceptual ability of the schizophrenic and alcoholic groups and their graphic representation of space (unstructured task). In addition, the results for the Scottish schizophrenic and alcoholic subjects and the Eskimo schizophrenic and alcoholic subjects were directly opposite from each other (see Table XVII); the Scottish and Eskimo groups did not appear to be similar in perceptual constancy or painting performance. An additional difference between the two cultures may be summarised by Table XXV. This table reveals that the mean variance of each score for the Scottish alcoholic group was lower than the Scottish schizophrenic group; the mean variance of each

score for the Eskimo alcoholic group, on the other hand, was higher than the Eskimo schizophrenic group. These two sources of evidence establish a difference between the Scottish and Eskimo cultures. There was a significant difference between the Scottish schizophrenic and alcoholic groups in the estimates of population variance ratios[1] but no significant difference for the Eskimo groups. Also, the mean variance for each score revealed that the Scottish schizophrenics performed with a higher variance than the alcoholics, and the Eskimo schizophrenics performed with a lower mean variance than the alcoholics. The reader will find a more comprehensive discussion of these results in the following pages; the present research findings will be informally compared with the findings of Weckowicz (1957) and Weckowicz and Hall (1960).

The results of the unstructured painting task for the Scottish schizophrenic and alcoholic groups were consistent with the results of the pilot study, which examined the similarities between the Scottish schizophrenic and alcoholic subjects, as well as Scottish controls. The subjects in the pilot study as well as the subjects involved in the experiment were tested soon after admission to the hospital, and it is possible that some patients were experiencing hallucinatory activity. It may be remembered from the review of literature that alcoholic hallucinosis

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[1]The difference between estimates of population variance for two independent samples is tested by forming the following ratio: $F=\frac{S_1^2}{S_2^2}$. If the ratio equals 1.00, it completely satisfies the null hypothesis; as the ratio moves away from 1.00, the differences between the two samples are greater. (Guilford, 1973, p. 168)

and schizophrenia are two clinical conditions which are frequently compared (e.g., Alpert & Silvers, 1970; Freed, 1975; Schuckit & Winokur, 1971; Surawica, 1980). If painting similarities are to be examined, perhaps it is best to examine the Scottish alcoholic when there is a possibility of hallucinatory activity. However, if the purpose of an investigation is to seek a method of clinical distinction between these two disorders, then perhaps the alcoholic subject should be tested after the attending physician has confirmed that hallucinatory activity is not present. There are two difficulties with this procedure: (1) The need for diagnostic clarification is at the time of admission to the hospital. (2) The alcoholic patient does not usually remain in the hospital for a long period of time.

A further examination of the statistical results for the painting tasks revealed an additional distinction between the Scottish and Eskimo subjects. The spatial structure ratings for the Scottish schizophrenic group were not significantly different from the Scottish alcoholic group for the unstructured task but significantly different for the structured painting task, whereas the reverse was true for the Eskimo schizophrenic and alcoholic groups (see Tables XIX and XX). Also, the Eskimo alcoholic group appeared to employ more spatial structures in their paintings that have been considered characteristic of the schizophrenics (i.e., ratings [2-6]) than the schizophrenic group (see Appendix IX, Table XLV). These findings, along with the lack of significant difference between the ratings for the Scottish schizophrenics and Scottish alcoholics,

showed that the graphic representations of these groups strongly supported the initial findings of the Scottish pilot study. However, it also appears from these findings that there must be a recognised difference in the relationship between the two groups in each culture (i.e., the schizophrenic and alcoholic groups from Scotland and the schizophrenic and alcoholic Eskimos from Alaska). The Eskimo schizophrenics and alcoholics were not similar in painting performance, but the performance of the alcoholic group resembled the predicted performance of the schizophrenic group. An explanation for these findings was not indicated in the related literature, but the results for the painting tasks supported the view that these two clinical conditions have yet to be understood or unravelled. Perhaps, the Eskimo people can contribute to further investigations into the similarities between schizophrenia and alcoholism.

There was no significant difference between the Scottish and Eskimo alcoholic groups in their painting performance but a significant difference between schizophrenic groups for the structured and unstructured task (see Table XXI). When the nonsignificant difference between the groups was examined more closely, it was apparent that there was a tendency for the Scottish alcoholics to receive a lower proportion of [2-6] ratings than the Eskimo alcoholic subjects, and there was a tendency for the Eskimo schizophrenic subjects to receive a lower proportion of [2-6] ratings than the Scottish schizophrenic subjects (see Appendix IX, Tables XLI and XLII). It can be said that the Eskimo alcoholic

group responded to the variation in painting condition in the same way that the schizophrenic groups were expected to respond (see Hypothesis #3). When the performances of Eskimo control and alcoholic groups were compared on the unstructured painting task there was a significant difference in spatial structure ratings ($p<.05$), but this difference appeared to dissolve when the painting task was structured (see Table XX). The proportion of [2-6] ratings was higher for the Eskimo alcoholic than for the Eskimo control group when the ratings for unstructured and structured paintings were reviewed; however, the proportion was higher for the unstructured painting task and this contributed to the significant difference between the performances of the two groups (see Appendix IX, Tables XLIV and LIII). Therefore, the painting performance of the Eskimo alcoholic group resembled the painting performance which was expected for the schizophrenic groups.

Alcoholics, as well as schizophrenics, experience a deterioration of behaviour outside the hospital and represent a high percentage of readmissions to the hospital. There could be a physiological as well as a psychological explanation for this dependency on a structured hospital environment, but it is interesting that in this experimental procedure there seemed to be a trend for the Eskimo and Scottish alcoholics to receive lower ratings on the structured painting task than on the unstructured task, even though there was no significant difference between the spatial structure ratings for the two tasks for either group

(see Appendix IX, Tables XXXIII and XXXVI). It is possible that the alcoholic subjects from both cultures were field--dependent and environmental cues were sought after and used as aids for behavioural responses. The structured task provided an unambiguous environmental cue to behaviour, and, thus, the alcoholics' response did not indicate the extent of deterioration that might be recognised on a task which provided no appropriate environmental cues. This response behaviour was recognised when the Scottish alcoholics were tested on the distance constancy task, but the environmental cues that they selected were inappropriate (e.g., a subject watched and counted the stones in a wall, while he judged the 1-yard distances). Therefore, the response was usually influenced by inappropriate cues.

It must be noted, however, that the Eskimo alcoholics may be different from the Scottish alcoholics, and, therefore, explanations based on pre-existing information may be totally inadequate. For example, during the present research it was observed that some Eskimo alcoholics entered the hospital after a heavy bout of drinking, and, then, within a very short period of time, they left the hospital to return to seasonal fishing or hunting. It appeared as if the Eskimo alcoholic had the ability to cope with the physiological and psychological symptoms associated with alcoholism, in order to respond to cultural demands. Perhaps the Eskimo people still perceive survival as a personal or family challenge which involves contact with nature and its seasonal demands, whereas the more westernised

cultures allow people to perceive employment as a source of survival but one which is not so immediate or fleeting. If the Scottish alcoholic loses a job, he may assume that he can obtain another job somewhere else or receive help from an outside source, whereas the Eskimo alcoholic, living in the village, knows very well that the environment is still in control of his subsistence. The unknown factors may be numerous and may include the following: (1) The Eskimo alcoholic may be unique because of his genetic heritage, (2) the process of acculturation, (3) a field-dependent factor, or (4) his particular response to the experimental setting. What the results did indicate was that the Eskimo alcoholics responded to the perceptual tasks, size and distance constancy, in such a way that their behaviour was not significantly different from the Eskimo schizophrenic subjects. Also, the Eskimo alcoholics' paintings represented more characteristics associated with the artwork of schizophrenics (Billig, 1970) than the Eskimo schizophrenic group (see Table XVII and Appendix IX, Table XLV).

There are two points of information to be drawn from these findings: (1) Billig's (1970) spatial structure theory must state that it is possible for other clinical groups to produce spatial structures previously considered to be specifically characteristic of schizophrenic patients. (2) The schizophrenic and alcoholic groups did not support the theory that there is a relationship between perceptual constancy, the condition of the ego (Weckowicz & Sommer, 1960), and, consequently, spatial structure ratings (Billig, 1970). Neither the Scottish schizophrenic and alcoholic

groups nor the Eskimo schizophrenic and alcoholic groups supported this theory (see Table XVII).

The findings from the present research support the indication that these two clinical groups resemble each other and that there are cross-cultural similarities between schizophrenic and alcoholic patients. However, there also appear to be definite cross-cultural differences between these disease entities (e.g., the Scottish schizophrenic and alcoholic subjects were significantly different in their perceptual performance, but the Eskimo schizophrenic and alcoholic subjects were not significantly different). Previous research which has proposed general theories with regard to the schizophrenic individual's performance or the alcoholic's performance should be prudently considered and further evaluated. It may be beneficial to investigate the Eskimo and Scottish alcoholics in terms of possible personality subtypes (e.g., Eshbaugh, Hoyt, & Tosi, 1978) to obtain further insight into the possible similarities and differences between these individuals.

The Present Research Results Are Informally Compared to the Findings of Weckowicz (1957) and Weckowicz and Hall (1960)

The perceptual constancy experiments for the present research were designed to duplicate the size constancy study by Weckowicz (1957) and the distance constancy study by Weckowicz and Hall (1960). It was necessary to modify the experimental apparatus because of the location of the test-

ing and the travelling required to collect the data. However, the apparatus designed for this research proved to be reasonably mobile as well as efficient in data collection, considering the perceptual nature of the tasks. There will be no formal (i.e., statistical) comparisons between the performance of the subjects in the Weckowicz (1957) and Weckowicz and Hall (1960) studies because the subjects are unmatched, but, perhaps, it would be beneficial to discuss the results on an informal basis.

Size Constancy Test

Weckowicz (1957) claimed that chronic schizophrenic patients would show impaired size constancy of perception when compared with nonschizophrenic mental patients and normal controls. (p. 477) If this hypothesis was to be confirmed, as well as the fact that the schizophrenic's judgment of size is determined by the size of the retinal image to a greater degree than the judgment of nonschizophrenics and normals, it was necessary for the experimental results in the Weckowicz (1957) study to show the following: (1) Schizophrenics underestimate the sizes of the standard black rod in comparison with the control group and the nonschizophrenic group. (2) The underestimation is not as great at the shorter distance (7.5m) as it is at the longer distance (15m). An analysis of the data revealed the results indicated in Table XXIII. The same statistical techniques applied to the Weckowicz (1957) data were followed in the

analysis of the size constancy data for the present experimental study, and the initial findings are summarised in Table XXII.

As indicated in Table XXIII, the mean error of the chronic schizophrenics in the Weckowicz (1957) study showed an underestimation of the standard stimulus, and the mean error for the acute schizophrenics in this study showed an overestimation of the standard stimulus. The variance of the error scores for the chronic schizophrenics was similar to the Eskimo schizophrenics and the Scottish alcoholics at the shorter distance (7.5m) and the longer distance (15m). The nonschizophrenics and the Eskimo alcoholics demonstrated a similar variance in size estimations. However, the Scottish schizophrenics demonstrated the greatest variance in their estimation of the size of the standard stimulus. The mean error for the Scottish alcoholics and the nonschizophrenic revealed an overestimation at the 7.5m distance and an underestimation of the standard stimulus at the 15m distance. On the other hand, the Eskimo alcoholic and the normal subjects showed an overestimation of the standard stimulus at the 7.5m and 15m distances. This informal analysis of the data indicated that the acute Scottish schizophrenics and acute Eskimo schizophrenics performed the size constancy task with a mean error similar to the normal subjects in the Weckowicz (1957) study. However, the variance in the estimation of the size of the standard stimulus of the Eskimo schizophrenics may be informally compared to the chronic schizophrenics, and the variance of the Scottish schizophrenics appeared to be greater than any other experimental group.

Table XXII

An Analysis of the Size Constancy Data for the Schizophrenic and Alcoholic Groups

Diagnosis	Average error		Standard deviation		Variance	
	Distance		Distance		Distance	
	7.5m	15m	7.5m	15m	7.5m	15m
Scottish schizophrenics	+.32	+.10	1.8213	2.2932	3.3145	5.2771
Eskimo schizophrenics	+.39	+.12	1.3103	1.5728	1.7011	2.4792
Scottish alcoholics	+.47	-.20	1.2644	1.5357	1.6034	2.3385
Eskimo alcoholics	+.60	+.47	1.0000	1.2302	.9918	1.5163

Table XXIII

Weckowicz's Analysis of the Size Constancy Data

Diagnosis	Average error		Standard deviation		Variance	
	7.5m	15m	7.5m	15m	7.5m	15m
Schizophrenics	-.69	-.86	1.1096	1.6906	1.2312	2.8581
Normals	+.07	+.32	1.0453	1.3225	1.0926	1.7490
Nonschizophrenics	+.02	-.06	.7900	1.0600	.6241	1.2360

Note. From "Size Constancy in Schizophrenic Patients" by T.E. Weckowicz, Journal of Mental Science, 1957b, 103, 475-486.

Table XXIV

The Influence of the Distance Change on the Size Estimations

Diagnosis	r	p
Scottish schizophrenics	+.93	<.01
Eskimo schizophrenics	+.86	<.01
Scottish alcoholics	+.89	<.01
Eskimo alcoholics	+.81	<.01

Weckowicz Results

Diagnosis	r	p
Schizophrenics	+.42	<.05
Normals	+.74	<.01
Nonschizophrenics	+.64	<.01

Note. (Bottom Table.) From "Size Constancy in Schizophrenic Patients" by T.E. Weckowicz, Journal of Mental Science, 1957b, 103, 475-486.

The Pearson Product-Moment Correlation Coefficient was applied to the data to establish whether the estimations of the size of the standard stimulus were influenced by the change in location of the stimulus from 7.5m to 15m or 15m to 7.5m. The results shown in Table XXIV indicate that the subjects who tended to overestimate at the 7.5m distance also tended to overestimate the size of the standard stimulus at the 15m distance; the subjects who tended to underestimate the size of the standard stimulus at the 7.5m distance also tended to underestimate the size at the 15m distance. These results were consistent with the Weckowicz (1957) findings, except the level of significance for the

present study was $p<.01$ for all of the subject groups, and the schizophrenic group in the Weckowicz (1957) study reached a $p<.05$ level of significance (see Table XXIV).

The fact that schizophrenic subjects show greater variability or heterogeneity of scores on psychological tests has been reported repeatedly (e.g., McGhie, Chapman, & Lawson, 1965). Weckowicz (1957) reported that "the performance of schizophrenics is significantly more variable than that of the normals [7.5m, $p<.01$ and 15m, $p<.05$] and nonschizophrenics [7.5m, $p<.01$ and 15m, $p<.05$]. There is no significant difference between the latter two groups" (p. 481). Also, Shakow (1963) reported that schizophrenics frequently show greater interindividual variability than control subjects in any behavioural experiment. In fact, the schizophrenic subjects in the present experiment did reveal variability in their size constancy performance; for this reason, it was more appropriate to evaluate the variance of the schizophrenic's response to the standard stimulus than the mean estimation of performance.

In the present study, the results showed that the mean variance of each score at the 7.5m distance was not significantly different from the mean variance of each score at the 15m distance. This lack of statistical significance applies to the four experimental groups (see Table XXV, top). As indicated in Table XXII, the Scottish and Eskimo schizophrenics as well as the Eskimo alcoholics tended to overestimate the size of the standard stimulus to a greater degree at the 7.5m distance than at the 15m distance. Also, the Scottish alcoholics overestimated the stimulus size at

the 7.5m distance to a greater extent than they underestimated the size of the stimulus at the 15m distance; this was the only group that indicated both an overestimation (7.5m) and an underestimation (15m) of the stimulus size. When the groups were compared, the performance of the Scottish schizophrenic group was significantly more variable than the performance of the Eskimo schizophrenics and Scottish alcoholics, but the results were the same for the 7.5m and 15m distance ($p<.05$) (see Table XXVI, top). Weckowicz (1957), on the other hand, found the 15m distance to be more of a discriminating distance than the 7.5m distance; the underestimation or overestimation of the stimulus occurred to a greater degree at the 15m distance than at the 7.5m distance. In the Weckowicz (1957) study, the schizophrenic group was significantly more variable than the normal and nonschizophrenic groups; the level of significance for the 7.5m distance was .01 and .05 for the 15m distance (see Table XXVI, bottom). Schizophrenics tended to underestimate the size of the standard stimulus in the Weckowicz (1957) study to a greater degree at the 15m distance, and the normals tended to overestimate the stimulus to a greater degree at the same distance (see Table XXII). When Weckowicz (1957) compared the nonschizophrenics and the normal group, the variability of performance for the two groups was not significantly different (see Table XXVI, bottom). The Scottish alcoholic group was the only group that indicated results which were similar to Weckowicz's (1957) results (see Tables XXII and XXIII); there was a tendency for Weckowicz's nonschizophrenic group to overestimate the

Table XXV

The Mean Variance of Each Individual Score[a] for the Size Constancy Test

Diagnosis	Distance 7.5m	Distance 15m	t[b]
Scottish schizophrenics	4.4465	5.0768	.49
Eskimo schizophrenics	2.5662	3.0304	1.20
Scottish alcoholics	2.2463	2.9843	1.07
Eskimo alcoholcs	3.1364	3.4922	.31

Weckowicz Results

Diagnosis	Distance 7.5m	Distance 15m	
Schizophrenics	5.0656	3.8625	....
Normals	1.2039	1.7383	....
Nonschizophrenics	1.2043	1.6607	....

Note. From "Size Constancy in Schizophrenic Patients" by T.E. Weckowicz, Journal of Mental Science, 1957b, 103, 475-486.

[a]Each subject's score represented the mean adjustment of the black rod to the 20 standard stimuli presented. The mean variance was the average variance of the 20 adjustments for each subject in each group (see page 400 and Tables VII and VIII).

[b]All *t* values were nonsignificant; Weckowicz did not include *t* values in his publication.

Table XXVI

The Estimates of Population Variance Ratios for the Schizophrenic and Alcoholic Groups

Groups[a]	Distance 7.5m		Distance 15m	
	F	p	F	p
Scottish schizophrenics / Eskimo schizophrenics	1.7327	<.05	1.6733	<.05
Scottish schizophrenics / Scottish alcoholics	1.9795	<.05	1.7749	<.05
Eskimo schizophrenics / Eskimo alcoholics	1.2222	>.05	1.1524	>.05
Scottish alcoholics / Eskimo alcoholcs	1.3963	>.05	1.1702	>.05

Weckowicz Results

	F	p	F	p
Schizophrenics / Normals	4.2076	<.01	2.2219	<.05
Schizophrenics / Nonschizophrenics	4.2062	<.01	2.3258	<.05
Nonschizophrenics / Normals	1.0003	>.05	1.0467	>.05

Note. From "Size Constancy in Schizophrenic Patients" by T.E. Weckowicz, Journal of Mental Science, 1957b, 103, 475-486.

[a]Where a significant difference exists between the two groups, the name of the group underlined indicates the direction of significance.

stimulus size at the 7.5m distance and underestimate it at the 15m distance. However, the Scottish alcoholic group tended to overestimate to a greater extent at the 7.5m distance than underestimate at the 15m distance, whereas the nonschizophrenics in the Weckowicz (1957) study tended to underestimate to a greater degree at the 15m distance than overestimate at the 7.5m distance (see Tables XXII and XXIII). It may be stated, then, that the results from the present study were not consistent with the Weckowicz (1957) study when the estimation of the stimulus size for the 7.5m and 15m distances were compared. In the present study, the 7.5m distance appeared to be the discriminating distance.

The Scottish schizophrenics were significantly more variable than the Eskimo schizophrenics and Scottish alcoholics in their performance of the size constancy task (see Tables VII, VIII, and XXVI); The Eskimo schizophrenics were significantly less variable in their size constancy performance than the Scottish schizophrenics. When the performance of the Eskimo schizophrenic group was compared with the Eskimo alcoholic group, it was not significantly more variable. There was no significant difference between the variability of the Scottish alcoholic and the Eskimo alcoholic groups, but a significant difference in variability between the Scottish alcoholic and Scottish schizophrenic groups. Schizophrenic variability, then, may be significantly different when the subjects are from different cultures (e.g., Scottish schizophrenics and Eskimo schizophrenics), and the results may vary when the variability of performance of two different clinical groups from

the same culture is compared with the variability of performance of the same clinical groups from another culture (e.g., Scottish schizophrenic-Scottish alcoholic versus Eskimo schizophrenic-Eskimo alcoholic).

Distance Constancy Test

Nonparametric statistical methods were applied in the analysis of the distance constancy data for two reasons: (1) Weckowicz and Hall (1960) claimed that this statistical procedure was necessary due to the "lack of homogeneity of variance" in schizophrenic groups (p. 273). (2) One of the purposes of the present research was to compare the results of the Weckowicz and Hall (1960) study with the present results, and this required a duplication of statistical analysis (see Table XXVII).

To investigate whether or not poor distance constancy was associated with the schizophrenic process specifically or with mental illness and hospitalization, Weckowicz and Hall (1960) compared the subjective 1-yard estimations of 20 chronic schizophrenics and 19 nonschizophrenic subjects. The differences between the two groups in their estimations were tested by the Mann-Whitney U Test. The results of the Weckowicz and Hall (1960) study are summarised in Table XXVII.

The results of the distance constancy task performed by the Scottish and Eskimo groups are summarised in Table XI and may be informally compared to the results of Weckowicz and Hall (1960). As in the Weckowicz and Hall (1960)

study (see Table XXVII), the median estimations of the schizophrenic subjects were longer than the other experimental groups. Chronic schizophrenics tested by Weckowicz and Hall (1960) indicated longer median estimations for the 10 distances than the Scottish and Eskimo schizophrenics. In the previous findings, the median estimations of the schizophrenic patients increased in length as the 1-yard intervals increased in distance. As indicated in Table XI, the Scottish and Eskimo schizophrenics were relatively consistent in their performance, according to the median estimations, at all 10 distances. In contrast, the Weckowicz and Hall (1960) findings indicated that there was a consistent increase in the median estimation for the schizophrenic and nonschizophrenic groups, with the medians of the schizophrenic group increasing more rapidly (see Table XXVII). As Table XI indicates (e.g., Scottish controls Eskimo controls and Scottish alcoholics-Eskimo alcoholics), this gradual but consistent increase in the median estimation of the 1-yard interval did not occur with the nonschizophrenic groups in the present study.

The results of the previous study, according to Weckowicz and Hall (1960), indicated "that in schizophrenic patients judgments of one-yard intervals [sic] in depth are determined to a greater extent by the visual angles than the same judgments in the non-schizophrenic [sic] patients" (p. 274). The conclusion that chronic schizophrenic patients are poorer than nonschizophrenic patients in distance constancy was established by these findings. (Weckowicz &

Hall, 1960, p. 274) The median estimations of the acute schizophrenic patients in the present study, on the other hand, indicated that the median distance estimated was longer than the alcoholic and control groups but, also, as constant as these groups. Therefore, the visual angle did not appear to determine the perception of depth for the

Table XXVII

Estimations of the 1-Yard Intervals for the Weckowicz and Hall Distance Constancy Test

Distances in yards	Medians in feet			
	Schizophrenics	Nonschizophrenics	U	p
11	7.1	5.2	124	<.05
12	7.5	5.1	101	<.01
13	7.9	5.2	126.5	<.05
14	7.7	5.6	105	<.01
15	8.5	5.5	93.5	<.01
16	8.9	5.4	77.5	<.001
17	8.0	5.7	128.5	<.05
18	8.3	5.7	125	<.05
19	8.2	5.7	107	.01
20	9.7	5.7	81	<.001

*One-tail test.

Note. From "Distance Constancy in Schizophrenic and Non-schizophrenic [sic] Mental Patients" by T.E. Weckowicz and R. Hall, Journal of Clinical Psychology, 1960, 16, 272-276.

acute schizophrenics in this study, as it did for the chronic schizophrenics in the Weckowicz and Hall (1960) study. (p. 274)

The differences between the experimental groups in the estimation of the 1-yard distance, using the Mann-Whitney U Test, may be described in three ways: (1) significant, (2) nonsignificant, or (3) inconsistent (see Tables XI, XXVIII, XXIX).

Schizophrenics

The Scottish schizophrenics that participated in the present study were significantly different from Scottish controls and alcoholics in all of the estimations of the 1-yard distance; their distance judgments were longer than the controls or alcoholics. The Eskimo schizophrenics, on the other hand, were not significantly different from the Eskimo alcoholics in their 1-yard estimations, and they were inconsistent in the level of significance established when their 1-yard judgments were compared to the Eskimo control group (see Table XI).

Alcoholics

The Scottish alcoholics were not significantly different from the Scottish controls in their 1-yard judgments, but they were significantly different from the Scottish schizophrenics in their estimations (see Table XI). When the performance of the Eskimo alcoholic group was compared

to the schizophrenic and control groups, there was no significant difference in estimation at the 10 intervals. Whereas, the 1-yard estimations of the Scottish alcoholics were significantly shorter than the Scottish schizophrenics; the Eskimo alcoholics' perceptual performance on the distance constancy task was not significantly different from the other two experimental groups from the same culture (see Table XI).

Table XXVIII

A Comparison of the Distance Constancy Performance of the Scottish Groups

Groups	Results
Scottish controls-Scottish schizophrenics	significant
Scottish controls-Scottish alcoholics	nonsignificant
Scottish schizophrenics-Scottish alcoholics	significant

Table XXIX

A Comparison of the Distance Constancy Performance of the Eskimo Groups

Groups	Results
Eskimo controls-Eskimo schizophrenics	inconsistent
Eskimo controls-Eskimo alcoholics	nonsignificant
Eskimo schizophrenics-Eskimo alcoholics	nonsignificant

Controls

The Scottish controls did not respond to the 1-yard estimation task in the same way as the Scottish schizophrenics; the 1-yard estimations of the schizophrenic sub-

jects were significantly longer than the estimations of the control subjects (see Table XI). However, there was not a significant difference in the distance judgments of the Scottish control group and Scottish alcoholic group. Control subjects from the Eskimo culture indicated no significant difference in their performance when compared to the Eskimo alcoholic group. When the perceptual performance of the Eskimo schizophrenics was compared to the Eskimo control group, the results revealed inconsistent levels of significance for the 10 distances. Thus, the Scottish and Eskimo control subjects performed the distance constancy task with no significant differences (see Table XI), but when the performance of the control group in each culture was compared to the schizophrenic group in the same culture, there was not the same degree of consistency in performance. The Eskimo controls and Eskimo schizophrenics were not consistent in establishing a significant difference in their estimation of the 1-yard distance, only 5 out of the 10 distances indicated a significant difference in performance. Therefore, when the distance constancy performance of the two groups was compared, the test results indicated a lack of internal consistency (see Table XI).

Between Cultures

Schizophrenics

When the distance constancy performance of the

Scottish schizophrenics and Eskimo schizophrenics was compared, the results did not provide unambiguous evidence (see Table XI and XXX). The results of the Mann-Whitney U Test indicated that 2 of the 10 estimations were significantly different (see Table XI). Therefore, it must be stated that the results revealed inconsistent levels of significance for the 10 distances.

Alcoholics

When the 1-yard estimations of the Scottish alcoholic group were compared to the estimations of the Eskimo alcoholic group, the results indicated no significant difference in perceptual performance for all 10 distances (see Table XI and XXX). The alcoholic groups from these two cultures, then, presented clear and consistent evidence; this distance constancy task indicated no significant differences between these two groups (see Tables XI and XXX).

Controls

The Scottish control group and the Eskimo control group showed no significant difference in their performance of the distance constancy task; the evidence was consistent for all of the 1-yard estimations (see Tables XI and XXX). These results indicated that the Scottish and Eskimo control subjects were not different in their perceptual performance.

In summary, it may be stated that a comparison of the distance constancy performance of the Scottish and

Eskimo groups indicated that the control subjects and alcoholic subjects perform with no significant difference. The performance of the schizophrenic subjects from the two cultures, on the other hand, did not make it possible to construct a clear statement of evidence. However, a close examination of the results of the 10 distances revealed a strong tendency for the schizophrenic groups to be similar in perceptual performance; there were 8 out of 10 distances which indicated no significant difference between the two schizophrenic groups (see Table XI). Generally, the results from the distance constancy test revealed that the subjects from these two cultures were not significantly different in their perceptual ability.

Table XXX

A Comparison of the Distance Constancy Performance of the Scottish and Eskimo Groups

Groups	Results
Scottish controls-Eskimo controls	nonsignificant
Scottish schizophrenics-Eskimo schizophrenics	inconsistent
Scottish alcoholics-Eskimo alcoholics	nonsignificant

These experimental findings present an opportunity to informally compare the perceptual performance of acute schizophrenics with previous research, which involved chronic schizophrenics and used essentially the same experimental apparatus and procedures. (Weckowicz, 1957; Weckowicz & Hall, 1960) Informally (i.e., without the aide of statistics), the results of the present study indicated that the

Scottish schizophrenics subjects appeared to resemble the chronic schizophrenic subjects in the Weckowicz and Hall (1960) study when compared to Scottish controls and, also Scottish alcoholics; the same similarity in performance was not detected when the Eskimo schizophrenic subjects were compared to the Eskimo controls and alcoholics. Therefore, the results of the present research should encourage future researchers to consider cultural variations in perceptual performance.

SUMMARY

The results related to the primary hypothesis indicated that there was a positive correlation between the amount of error made on a size constancy task and the ratings representing the spatial structures in the paintings for the Eskimo alcoholic subjects, but no such relationship was found in any of the other groups. However, the relationship shown between perceptual constancy and spatial structures by the Eskimo alcoholics was not the expected relationship; they showed good perceptual constancy and good spatial structure representation.

In an effort to explain these results, it was suggested that the attempt to introduce Billig's theory to experimental control did not encourage the use of the spatial structures outlined by Billig (1970) to the same extent that they would be used in spontaneous art activity. In spite of the attempt to approximate spontaneous art activity by including a free-choice painting in the experimental pro-

cedure, it must be suggested that the experimental setting was not conducive to eliciting the spatial structures outlined by Billig (1970). The question is raised as to whether it is possible to experimentally test a theory that is formulated on the basis of spontaneous painting activity.

Most of the discussion with regard to the Secondary Hypotheses #1, #2, and #3 focused on the advantages and disadvantages of unstructured versus structured art activity and also spontaneous art activity versus art activity which is placed within an experimental procedure. The findings related to Secondary Hypothesis #4 suggested the following points: (1) Billig's spatial structure theory must state that it is possible for nonschizophrenics to produce spatial structures previously considered to be specifically characteristic of schizophrenics. (2) The schizophrenic and alcoholic groups did not support the theory that there is a relationship between perceptual constancy, the condition of the ego (Weckowicz & Sommer, 1960), and, consequently, spatial structure ratings (Billig, 1970). Neither the Scottish schizophrenic and alcoholic groups nor the Eskimo schizophrenic and alcoholic groups supported this theory (see Table XVII).

These findings support the indication that these two clinical groups resemble each other or that there are cross-cultural similarities between schizophrenic and alcoholic patients. There also appear to be definite cross-cultural differences between these disease entities; for example, the Scottish schizophrenic and alcoholic subjects were significantly different in their perceptual performance but the

Eskimo schizophrenic and alcoholic subjects were not significantly different. The reader is encouraged to carefully review previous research related to the schizophrenic individual's performance or the alcoholic's performance, and it is suggested that further research designed to investigate the similarities and differences between these two disease entities may be beneficial in the treatment of schizophrenic and alcoholic patients.

This experiment provided an opportunity to discuss the perceptual performance of schizophrenic subjects documented by previous researchers which involved essentially the same experimental apparatus and procedures (i.e., Weckowicz, 1957; Weckowicz & Hall, 1960). It is very tempting to statistically compare the results of these previous studies with the results of the present research, but it is not possible because of the lack of similarity between the subjects and experimental controls. However, it is possible to informally compare the results, as long as the reader remains aware of this fact. Unlike the results of the Scottish schizophrenic and Scottish control comparison, which informally resembled the Weckowicz and Hall (1960) findings, the Eskimo schizophrenic and control comparison indicated internally inconsistent levels of significance. The overall indication from these findings must be that the Eskimo schizophrenic group did not provide the same consistent levels of significance as did the Scottish schizophrenic group. Also, the perceptual constancy performance of the Scottish schizophrenic subjects appeared to resemble the findings from previous constancy experiments (e.g.,

Weckowicz & Hall, 1960), but the perceptual performance of the Eskimo schizophrenic group did not (see Tables XI, XXVIII and XXIX) appear to resemble any of the previous research findings related to perceptual constancy performance. Therefore, the results of the present research should encourage future researchers to consider cultural variations in perceptual performance.

GENERAL DISCUSSION

The methodological and experimental designs necessary for clinical research, especially when the patient groups include schizophrenic and alcoholic subjects, present some rather challenging and innovative approaches to the process of investigation. McGhie and Chapman (1961), 20 years ago, attempted to initiate methodological procedures which could allow for a more efficient and accurate collection of clinical data. For example, their solution to the problems associated with the selection of schizophrenic patients and diagnostic difficulties was to test all psychiatric patients as they were admitted to the psychiatric facility. To insure that the patient was in fact suffering from schizophrenia, McGhie and Chapman (1961) confined their investigation to patients exhibiting symptoms over a long period of time, so that the course of the disease would leave no doubt about the diagnosis. Their efforts were directed toward the "established schizophrenic patients" (p. 114). The remaining patients that were not

diagnosed as schizophrenic, then functioned as the control group in the study. However, even this attempt to ensure accurate selection of patients presented difficulties; for example, the evidence of the primary schizophrenic disorder in chronic patients may be obscured by such factors as deterioration and secondary reactions. (McGhie & Chapman, 1961, p. 114) The methodological dilemmas associated with clinical research often provide the investigator with a challenging puzzle; an attempt must be made to unravel unambiguous evidence to support the research hypothesis, and this must be done without applying so many experimental controls that the unravalled information is of little use. The subjects should not have to comply with so many criteria that the process of random selection is seriously affected. At this time. it will be beneficial to review methodological aspects of the present research effort that may contribute to future experimental designs for clinical research with schizophrenic and alcoholic patients.

Anxiety

In the acute stages of the schizophrenic illness, the individual experiences intense anxiety; the anxiety is caused by unfamiliar aspects of the psychotic disorganisation, perceptual changes, and the loss of stability (of a familiar and reliable world). "In this profoundly frightening condition, the individual is still trying to regain

control of the object world and is sensitively attuned and responsive to perceptual input, which must be immediately evaluated in terms of its aversive or nonthreatening qualities" (Ebner & Ritzler, 1969, p. 205). Anxiety, then, has been acknowledged as a very real extraneous experimental variable for the schizophrenic subject, and anxiety related factors have been discussed as "correlates of perceptual change" (Ittelson & Kutash, 1961, Chaps. 7, 8, and 9). In addition, normal control subjects frequently feel intimidated by the words "psychological evaluation." For these reasons, the subjects in the present study were told that the required task would "examine your eyes or tell me how you see things." The assumption associated with this explanation was that the tests were not psychological but physiological in nature; this assumption made it possible for the experiment to represent a nonthreatening situation for all subjects.

Many schizophrenic subjects were encouraged to participate in the experiment because they had experienced changes in their visual perception, often reporting blurry vision, difficulty focusing, or impaired depth perception. (Freeman & Chapman, 1973, pp. 51-52) Schizophrenic patients interviewed for participation often described their perceptual problems as a need for glasses, and if they already had glasses, then, they claimed that they needed new glasses because the old ones were not functioning properly. This reaction to perceptual disturbances has been documented in the literature which described the subjective changes asso-

ciated with perceptual disturbances (Freedman, 1974, p. 334) and descriptive accounts of the schizophrenic illness (Ward, 1946). Consequently, most schizophrenic patients involved in the present study were eager to co-operate and discuss their visual problems. Fortunately, the nature of the present research allowed the investigator to actively reduce the anxiety usually associated with any type of psychological investigation. Also, as mentioned in previous investigations (e.g., Hozier, 1959), the possibility of a subject having a negative attitude, where the subject might intentionally misdescribe his perceptions, was not a factor in this experiment; it was not necessary to reject any subject due to a lack of co-operation.

The experimental procedure for the present research incorporated a visual acuity test, the Snellen Notation, into the process of subject selection. This evaluation of acuity allowed the experimenter to screen subjects and exclude the ones with less than 20/20 vision (controls[1] as well as patients), and it reinforced the experimental emphasis on visual acuity. It also presented the subject with a familiar and simple task to perform, thus reducing anxiety. None of the schizophrenic subjects selected for participation complained of blurred vision during the visual acuity test.

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[1]Control subjects are not always tested for visual acuity (e.g., Raush, 1952) but, instead, asked to evaluate their own perceptual accuracy.

As might be expected by investigators familiar with clinical research, an experimental design which complies with the characteristics of one clinical condition may not accommodate another clinical condition. Such is the case when schizophrenic and alcoholic subjects are included in the same experimental investigation. Specifically, to reduce the anxiety associated with testing for the schizophrenic and control subjects, may not create optimal response conditions for the alcoholic subjects. Alcoholics appear to function more efficiently and in a reasonable manner when under stress. (Rae, Note 5) Evidence of this ability to perform adequately under stress was seen during the experiment; Scottish and Eskimo alcoholics commented on the difficulty of the distance constancy test, but their performance, according to the Mann-Whitnev U Test (see Table XI), was not significantly different than the corresponding control group. When the individual performance of alcoholic subjects was examined, the task perceived as more difficult was the one that indicated better performance. Therefore, efforts to reduce anxiety for the schizophrenic and control groups may have, in fact, provided the alcoholic subjects with less of an overall stimulus for their optimal performance. It is not certain whether or not this unexpected extraneous variable significantly affected the performance of the alcoholic subjects. Therefore, an additional experiment should be designed to test the alcoholic's perceptual constancy performance under conditions of stress and under conditions of no stress.

The Experiment and the Pathology of Attention

It has been reported that perceptual disturbances associated with schizophrenia may be explained by the following: (1) a failure to selectively attend[1] to environmental stimuli (McGhie & Chapman, 1961), (2) an inability to maintain a major set for a response to a specific stimulus when competing stimuli are present in the individual or in his environment (Shakow, 1962)[2], (3) an inability in the individual to shift his attention from one source of sensory input to another source (Mettler, 1955), (4) a defective filtering mechanism which does not allow the schizophrenic to eliminate irrelevant information or efficiently process incoming information (Payne, 1960, 1961, 1963, cited in McGhie et al., 1965, p. 383), or (5) an arousal disorder which disturbs cognitive processing (Gjerde, 1983). In addition, Schneider (1978) speculated about the problems encountered when schizophrenic subjects participate in cognitive experiments. "The cognitive disorder he seeks to measure interferes with its own measurement" (Schneider, 1978, p. 483). Schizophrenics may be especially susceptible to various types of distraction that do not affect other

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[1]A deficit in focusing attention may not be universal, but it is important in understanding some patients. (Freedman & Chapman, 1973)

[2]Pereira (1972) also explained the graphic representations of the schizophrenic as a failure of selective attention and an inability to maintain a major set.

experimental subjects, such as the equipment, the testing room, or the subject's own thoughts. Schneider (1978) did not discourage the participation of schizophrenic subjects in psychological experiments but did encourage the researcher to develop new models and theories to explain cognitive dysfunctions in schizophrenia, such as Kahneman's (1973) "allocation policy" (Schneider, 1978, p. 48). Schneider (1978) concluded that (1) there may be more than one difficulty with attention for the schizophrenic, (2) the attentional deficit may vary from schizophrenic to schizophrenic, (3) there may be more than one type of attention dysfunction, or (4) each schizophrenic may have his own predispositions regarding appropriate stimuli when performing an experimental task. The variability of performance among schizophrenic subjects may be more fully understood if these possibilities of pathology are considered. However, it also makes it imperative to carefully consider various details of the experimental design and procedure, and, yet, it is still impossible to account for all of the possible effects of the attentional deficits.

The nature of the present investigation, as well as the apparatus and procedure, contributed to the task of maintaining the subject's attention, without placing the subject in a state of arousal, (Gjerde, 1983). In other words, the nature of the tests and responses were kept simple and as undemanding as possible, hopefully reducing the possible state of arousal. (Gjerde, 1983) The schizophrenic subjects, in general, were interested in a test designed to understand visual changes. According to Bleuler

(1924), if the schizophrenic subject is interested or involved in an "affect-toned activity," then attention appears to be normal. Perhaps, the purpose of the experiment enhanced the level of attention because it did represent an effort to understand a very real perceptual dysfunction, which may have been a source of anxiety for the individual. In addition, Ornitz (1969) described the "subject option": the possibility that the schizophrenic subject does not understand the instructions or actively attend to the experimental procedures in the same way as control subjects or as the experimenter intended. (p. 265) There is no method of measuring this uncontrolled variable. However, empirical evidence indicated that the schizophrenic subjects did appear to completely understand the standard instructions, as reported by Chapman and McGhie (1962). The response behaviour is so specific that any indication of "subject option" or misunderstanding would have been detected.

The apparatus for the present study looked rather unusual, with strings and white boxes and black rods. In general, the subjects were intrigued by the "machinery" and curious as to its purpose. Also, the experimental procedure allowed for a diversity of activity, especially necessary for the schizophrenic subjects. Previous research findings suggested that the schizophrenic's perception of time is significantly different than normal subjects or nonschizophrenic patients. (e.g., Densen, 1977, p. 436) An unexpected aspect of the experimental procedure, also, assisted in maintaining the interest of the schizophrenic subjects

and sustaining their attention; this was the experimenter's task of briskly walking between the two white boxes during the size constancy experiment to measure and record the data. The size constancy test required more extensive involvement and sustained attention on the part of the subject than the other segments of the experimental procedure. However, most of the subjects were concerned about the amount of work being done by the experimenter and this (i.e., numerous measurements and the amount of walking) seemed to draw their attention away from the repetitious nature of their task.

The movement required of the experimenter to measure and record the data during the size constancy test and the movement of the triangular markers for the distance constancy test indicated that moving stimuli tended to hold the attention of the schizophrenic and alcoholic subjects. However, further discussion of the movement factor may be beneficial. McGhie and Chapman (1961) provided subjective accounts of two patients and their experiences with movement. One patient said, "'Everything is all right if I stop, but if I start moving again I lose control'" (p. 107). A unique method for estimating size constancy was described by Gregory and Ross (1964, Part I), where the normal observer was put into motion on a swing in a cueless condition (darkness). The authors discovered that visual size constancy was better when the observer was in a forward movement of the swing, as opposed to a backward movement. Further experiments involving this size constancy technique examined the various factors involved in size constancy

during movement, such as the use of both eyes instead of one eye. (Gregory & Ross, 1964, Part II) When schizophrenic subjects have been shown a human figure, they have failed to indicate that the arms and leg are capable of moving or that the arms and legs had joints and were attached to the body. (Hozier, 1959, p. 192) Psychoanalytic ego psychology and knowledge pertaining to the development of the bodily self tell us

> that movement is of importance for differentiating the body from the world. Freud (1953) stressed the importance of movement in differentiating between stimuli which come from within the body and stimuli which come from without. Schilder (1953) feels that actions are of such importance in differentiating the me from the not me, that he states that if action were not possible that the body and the world would be one. In line with Des Laurier's theoretical postulates, it is hypothesized that in schizophrenics there is a breakdown of the delineation of the body from the world. That the schizophrenics did not clearly and significantly indicate the potentialities for movement is taken as support for this theoretical postulate.
> (Hozier, 1959, p. 193)

It is suggested that a schizophrenic patient may subjectively experience the movement of objects, people, or himself differently than a nonschizophrenic individual. And movement does appear to have an influence on perceptual tasks, such as size constancy, even for normal subjects. (Gregory & Ross, 1964)

If an accurate perception of movement is required to differentiate between internal and external stimuli (Freud,

1953), the self from the nonself (Schilder, 1953), and to establish a boundary between the body and the outer world (Des Lauriers), then the misperception of movement may offer an explanation as to why these distinctions between the self and the outer world disintegrate for the individual suffering from schizophrenia; it may explain why the schizophrenic's ego boundary disintegrates. The experimental procedure for this study indicated that the attention of the schizophrenic subjects was sustained by the movement of the experimenter during the size constancy test and the movement of the triangular markers during the distance constancy test. However, in addition to the attention variable, the experimenter noted: (1) When the subject was asked to indicate which constancy test was more difficult, all indicated the distance constancy test (in spite of the fact that the test was much shorter than the size constancy test). (2) There were a greater number of distinctly different approaches employed in handling the dependent variable for the distance constancy test than the other two dependent variables. It may be that the performance of the schizophrenic subject on the distance constancy test was significantly influenced by the amount of movement required of the apparatus to measure the perceptual constancy of the individual. Therefore, movement may have contributed to the control of the attentional deficit variable, but, at the same time, it introduced an unexpected extraneous variable.

Extensive measures were employed to ensure that

there were no distracting stimuli, such as sound,[1] unusual objects, the presence of other people, and so on. According to Chapman and McGhie (1962), in their investigation of the effects of distracting stimuli on attentive behaviour, consistency of performance in the schizophrenic group was most obvious when the subject did not have to contend with a distracting stimulus; it is essential that the task presented to the schizophrenic subject be confined to one sensory channel. Chapman and McGhie (1962) discovered that under these conditions the schizophrenic subjects performed adequately; it was only when the schizophrenic was required to be selective, especially if the information was in competing channels of sensory data, that he showed the characteristic deterioration in task performance. (p. 498) The schizophrenic subjects in the present experiment, then, should not have shown a deterioration in performance as a result of distracting stimuli or multiple sensory channels. The experiment was conducted in a room with no apparent distracting stimuli, and the task included one sensory channel. A specific response was requested after the subject observed the unambiguous, simple form used for the stimulus object (i.e., a rod for the size constancy test and a triangle for the distance constancy test). The nature of the experiment seemed to encourage subjects to co-operate, and it allowed the experimenter to manipulate and control the effects of attentional and arousal deficits, which may influence experimental results.

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[1]According to Chapman and McGhie (1962), auditory input appears to be predominant in disrupting the schizophrenic's attention (p. 498)

In spite of the attempt to manipulate and minimise the attention and arousal variables, the 1-yard estimations of the Scottish schizophrenic subjects were significantly different from the Scottish control group for the distance constancy task. The indication is that either the attention and arousal variables were not adequately controlled or the performance of the acute schizophrenic subject was not significantly altered when these variables were controlled. If the latter was the case, these findings did not support previous research findings which concluded that attention and arousal deficits significantly affect schizophrenic perceptual performance (e.g., Chapman & McGhie, 1962; Gjerde, 1983; McGhie & Chapman, 1961). Freedman and Chapman (1973) claimed that their findings were inconsistent with the McGhie and Chapman (1961) study; this study reported only three patients with the attentional disorder described by McGhie and Chapman (1961), and half of the subjects made no mention of a problem with attention. It is possible that the inconsistent findings reflect modifications and improvements in clinical research.

The level of significance for the Eskimo schizophrenic subjects was not significantly different from the control subjects for all of the 1-yard estimations. Five distances revealed a significant difference between the two groups and five distances revealed no significant difference in the 1-yard estimations. A possible explanation might be that the various experimental factors manipulated to de-

crease or eliminate the effects of attentional or arousal deficits were adequate for the Scottish schizophrenic and control groups but not adequate for the Eskimo groups. The Eskimo subjects may have more frequently relied on their auditory skills than the Scottish subjects, and the Eskimo controls may have detected and relied on extraneous information, (e.g., the sound of the string being pulled through the brass screw eyes) as a source of perceptual information. Consequently, the diverted attention of the Eskimo control subjects may have been responsible for the lack of consistent performance because extraneous cues are not reliable sources of information. Also, the Eskimo subjects revealed a need to accommodate the "ways" of the "new" culture, and this may have resulted in a higher level of arousal than that experienced by the Scottish subjects. It may be suggested, then, that the Eskimo control group indicated field-dependent behaviour, and this could explain why the distance constancy performance of the Eskimo schizophrenic and con trol subjects did not indicate unambiguous evidence of a significant difference in perceptual performance, as indicated by the Scottish groups.

Field-Dependence and the Perceptual Performance of Schizophrenics and Alcoholics

Empirical evidence from the present research supports the observation that the schizophrenic and alcoholic subjects with field-dependent cognitive style appear to rely on peripheral cues as well as extraneous aspects of the

apparatus and experimental situation in their visual assessment of the stimulus object. The observation of the schizophrenic and alcoholic subjects' perceptual response to the distance constancy test indicated unequivocally that there was a tendency for the schizophrenic and alcoholic subjects to search for peripheral information to assist them in their response; the same tendency toward field-dependence was also noted when the Eskimo control subjects performed the task. The distance constancy test provided more empirical evidence of the cognitive style associated with field-dependence for two reasons: (1) The schizophrenic and alcoholic subjects commented that this task was more difficult than the size constancy test, and for this reason, there was more anxiety associated with the response. (2) The design of the apparatus may have offered more opportunities to recognise peripheral cues (e.g., the motion of the string). It is also submitted that the alcoholic subjects tended to experience more difficulty in selecting appropriate visual cues and disregarding inappropriate perceptual information than the schizophrenic subjects, although there was no statistical evidence offered at this time to support this observation. An explanation may be that visual hallucinations predominate in delirium tremens and motion is a common component (Heaton, 1968, p. 187), as compared to the predominately auditory and tactile hallucinatory experiences of the schizophrenic, in which motion is not a common component. Consequently, the distance constancy test, which involved motion, may have disturbed the alcoholic subject more than

the schizophrenic subject. This may explain why the distance constancy task created a heightened sense of anxiety for the alcoholic[1] and encouraged the alcoholic to consider inappropriate visual cues to accomplish the task. These findings support the conclusion of Sigman and Olfman (1977), and others such as Berry (1976b); it is not only necessary to consider the effects of "visual contexts" on perception but also the cognitive style of the subject. When field-dependent subjects participate in a perceptual task, the following question may be submitted: Does the data indicate poor perceptual performance or inappropriate cue selection and, consequently, inaccurate perceptual judgments? Would you, then, explain the nonsignificant difference in distance constancy performance for the alcoholic and control subjects (see Table XI, $p>.05$) as an improvement in the alcoholic's performance due to the stressful condition?

A variability of perceptual performance may represent inconsistent attempts on the part of the field-dependent subject to select the appropriate cues necessary for the perceptual process. If the Eskimo schizophrenic and alcoholic groups are similar in the degree of field-dependence and the Scottish schizophrenic and alcoholic

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[1]An overt indication of the anxiety associated with the distance constancy task was the consistent tendency for the alcoholic subjects to volunteer a self-evaluation of their performance and, then, request the experimenter's evaluation. This verbal request for confirmation that the alcoholic had engaged in an appropriate response was not evident when the schizophrenic subjects performed the same task.

groups represent different degrees of field-dependence, demonstrating a variation on the continuum of field-dependence to field-independence (Donovan et al., 1975, p. 358), then this might explain why the population variance ratios for the Eskimo schizophrenic and alcoholic groups (see Table XXVI) and the Mann-Whitney U Test (see Table XI) did not establish a significant difference between these Eskimo groups. This might also explain why the performance of the Scottish schizophrenic and alcoholic groups did establish a significant difference. Also, it is possible that the field-dependence--field-independence continuum describes the alcoholic subject's response behaviour as well as the schizophrenic subject's perceptual performance.

This field-dependence--field-independence continuum may provide an explanation for cross-cultural variations. Psychological differentiation, as manifested in a particular cognitive style (i.e., field-dependence/fieldindependence), may be influenced by "the encouragement of responsibility and self-assertion and by parental stimulation of the child's curiosity and interests, and is characterized by an 'analytic' approach to perceptual field" (field-independence) or "a stress on conformity, from arbitary or impulsive discipline, and from the use of irrational threats to control aggression, and is characterized by a 'global' approach to a perceptual field" (field-dependence) (Berry, 1976a, p. 127). From a behavioural standpoint, Berry (1976b) suggested that "nomadic, loose cultural groups" (p. xii) may be seen as field-independent in their cognitive style, whereas "sedentary, tight cultural groups" (p. xii)

tend to be field-dependent. Characteristics represented at the field-independent end of the cognitive style dimension include, for example, "skills in cognitive analysis and structuring and limited social sensitivity" (Berry, 1976b, p. xii) and the characteristics at the other end include, for example, "social skills and limited analytical and structuring skills" (Berry, 1976b, p. xii). Berry (1976b) claimed that each cognitive "mode is adaptive to the ecological setting in which it is predominant" (p. xii). He strongly suggested that the cognitive style of people is culturally determined as a result of cultural variations, such as parenting attitudes[1]. (Berry, 1976,a,b). It has been established that perceptual performance is influenced by the cognitive style of the subject (Berry, 1976b) as well as cultural differences "due to a complex interaction of cultural, environmental, and hereditary factors" (Winter, 1967, p. 56). Certainly, the two cultures represented in this study are recognised as different in ways too numerous to discuss within the context of this study. It may be said, however, that one would expect variations in cognitive style between the Scottish and Eskimo groups.

The primary point to consider, at this time, is that the experimental evidence (Donovan et al., 1975) and empirical observations point to the fact that field-dependence and field-independence may represent a continuum; there may be

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[1]In Japan, for example, the children are considered to be the center of the family, and in America, the parents are often considered to be the center of the family. (Woodley, 1982, p. 34)

variations in the extent that the cognitive style is incorporated into the perceptual process. Variations may occur within the same clinical category, between cultures, or according to the context of the visual task. Perceptual performance appears to be strongly influenced by the cognitive style of the subject; if the individual is suffering from a clinical disorder, such as schizophrenia or alcoholism, this cognitive style may be affected or may be a factor in the etiology of the disease.

In addition, field-dependence and field-independence are correlated with cultural characteristics. Therefore, it seems reasonable to assume that this perceptual variable is responsible, at least in part, for the group similarities and inconsistent findings and, perhaps, the variability of performance of schizophrenic subjects. There is one fact that may be stated with certainty: If the perceptual performance of the experimental subjects is to be examined, then the cognitive style of the subjects must be considered, especially if the subjects are selected from different cultures or cultural backgrounds. This fact strongly supports Deregowski's (1982) theoretical position regarding cross-cultural research. Field-dependence and field-independence should be evaluated, and the experimental groups should be matched according to this variable; then, it could be established with greater certainty whether the clinical categories, such as schizophrenia and alcoholism, are similar in other ways. It is not within the scope of the present study to evaluate this variable further, but it would be extremely beneficial to pursue this area of research.

The Spatial Structure Rating Scale and the Judges

Psychiatric artwork offers unique challenges with regard to experimental design and methodology, and the studies which have preceded this study have provided valuable insight and information related to various aspects of clinical research. The related literature represents a process of methodological modifications. For example, Anastasi and Foley (1944) discussed the experimental groups in general terms (e.g., the "abnormal" subjects); they did not differentiate schizophrenics from other psychiatric classifications. At present, the selection of patient groups is of the utmost concern, and the process of definition and selection is carried out as prudently as possible, with an emphasis on accurate diagnosis and matched experimental groups. The study of psychopathology and graphic expression is in the process of establishing itself as a science, and part of the process entails a discovery of the most appropriate tools for investigation as well as the specific types of information which are conducive to experimental investigation. The present research may be considered an exploratory investigation designed to contribute to this developmental process.

Pereira's (1972) quantitative rating scale was used to evaluate the paranoid and nonparanoid patients' picture and puzzle performance, according to characteristics of space, movement, colour, and representation. In contrast to the rating scale designed for the present study, Pereira (1972) attempted to provide a broad base of information by investigating more than one aspect of the graphic representation. This approach to pictorial analysis may provide a quantity of information, but the experience of training judges to use the spatial structure rating scale indicated that it is not reasonable to expect judges to effectively apply elaborate classifications to art productions. Wadlington and McWhinnie's (1973) suggestion should be acknowledged; the rating scale should be limited to a minimum of factors. (p. 204)

The spatial structure rating scale used in the present experiment provided an opportunity to become familiar with the selection and training of judges. It may be suggested that interrater reliability tends to be jeopardised to a greater extent as the number of judges increases, the more extensive the rating scale, and the greater the number of variables to be evaluated. Wadlington and McWhinnie (1973) devised a rating scale for colour-related factors which focused on too many variables; these variables "were obstacles to the efficiency of the judges' rating" (Wadlington & McWhinnie, 1973, p. 104). Consequently, the authors claimed that it was very difficult to extract speci-

fic conclusions from the diverse information accumulated. In addition, variables to be evaluated must be carefully defined, so that ideally all the judges will effectively evaluate the artwork. It is unreasonable to assume that a large number of judges can be adequately trained if the information is extensive or requires a rather complex process of evaluation. This, perhaps, explains the tendency to use several judges only when the rating task demands a distinction between the artwork of patients and nonpatients (e.g., Ulman & Levy, 1975).

Therefore, it is suggested that judges participate in the rating process if the effectiveness of the rating scale is the primary focus of the investigation; if the scale is to be used by individuals (e.g., art therapists) as a method of evaluation, then the judges must be considered essential. However, if the intention of the rating scale is to acquire a quantity of information related to various graphic features, then the suggestion offered by Wadlington and McWhinnie (1973) should be followed; the evaluation process should be performed by laboratory computers.

The Rating Instrument

The spatial structures rating scale provided the judges with an appropriate quantity of information. It required review prior to the rating session because the evaluation involved definitions and terms unfamiliar to the judges. In spite of efforts to limit the rating scale and

provide the judges with adequate preparation for the task, the interrater reliability was not high, although certainly within the range of respectability. The most consistent spatial structure categories of agreement included cosmic destruction, geometric designs, and "x-ray pictures". It is understandable that these categories would be easily and consistently recognised by the judges because there is an unambiguous indication of their presence. Examples of total agreement among the four judges' ratings is seen in Figures 27 and 28; the paintings were rated as representing a [3] and a [4], respectively, on the rating scale. Total disagreement among the judges' ratings is represented by Figures 29 and 30; these paintings were rated as [1], [2], [4], [6], and [0], [1], [2], [4], respectively. Figures 31 and 32 are examples of inconsistent rating[1] among the judges; the spatial structure ratings included [1], [1], [4], and [4] for both paintings. The four judges indicated that 1.28 percent (the mean percentage of the four judges) of the paintings required a notation of [0]; this rating indicated that none of the categories adequately described the representation of space (see Table VI). Thus, the indication is that the categories in the rating scale provide appropriate levels of distinction for the evaluation of spatial structures.

The efficacy of this rating instrument for judging spatial structures represented in paintings encourages fur-

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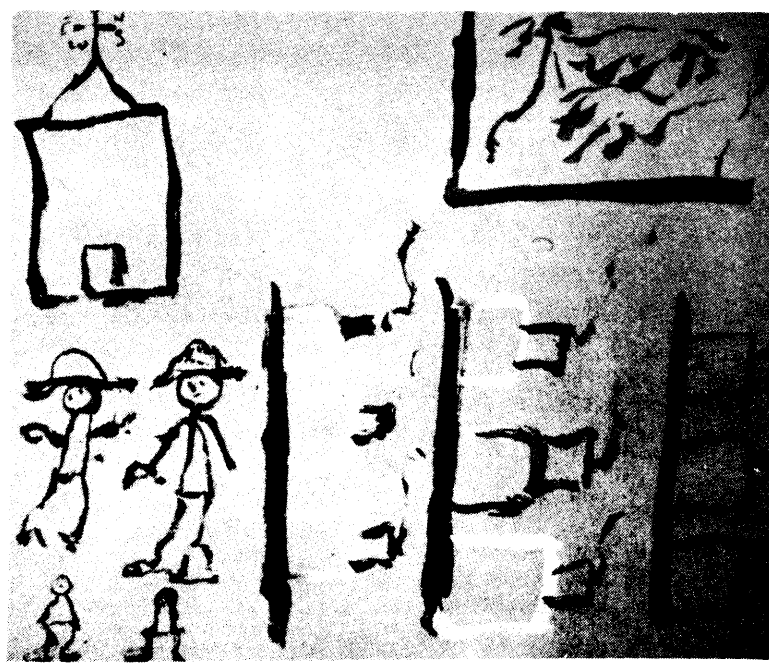
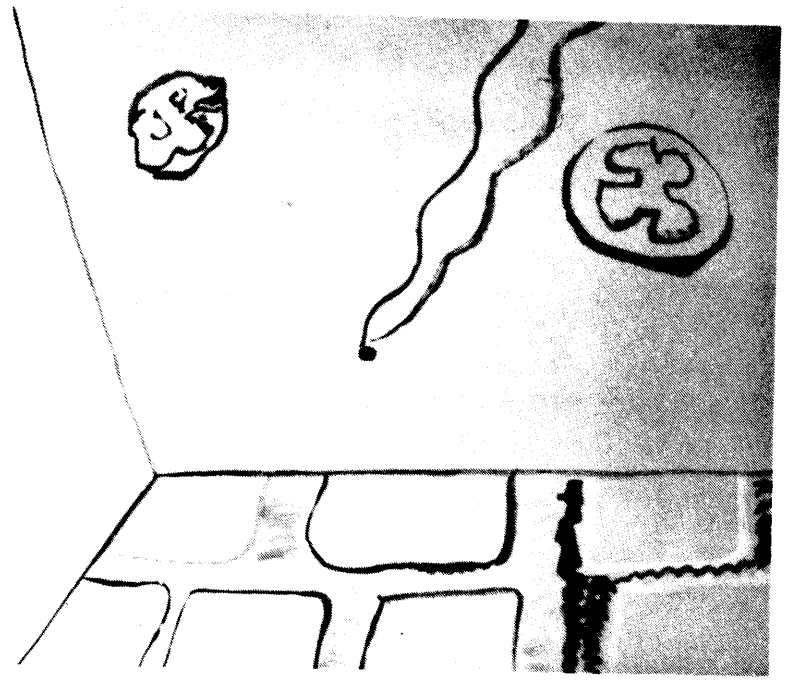
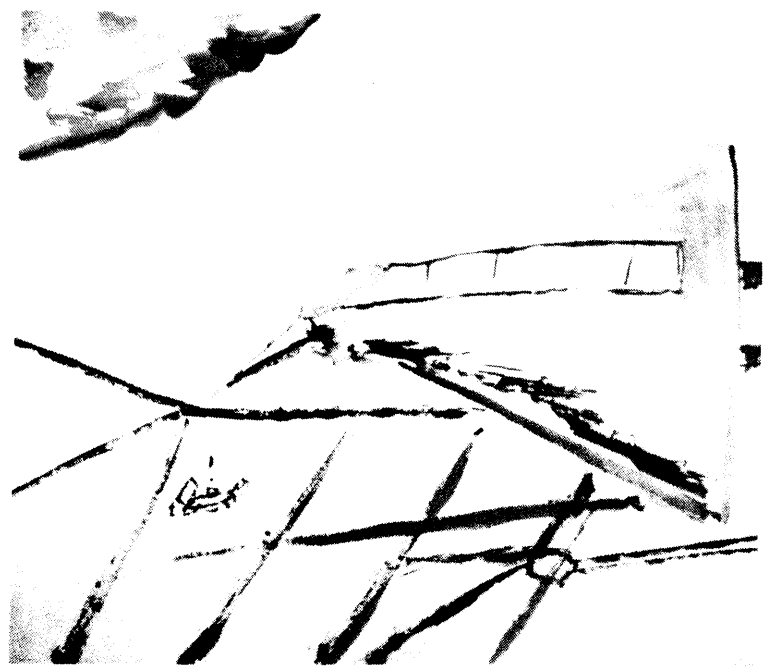
[1]Inconsistent rating: More than one spatial structure rating was represented but not four different ratings.



Figures 27 and 28. Examples of total agreement among the four judges' spatial structure ratings.





Figures 31 and 32. Examples of inconsistency among the four judges' spatial structure ratings.

ther application of the instrument. It is suggested that the spatial structure rating scale be used to record and evaluate the graphic changes in one patient's artwork throughout the course of his treatment. This approach was recommended earlier by Reiner et al. (1975), and it was the reason for the development of the Pictorial Regression Scale for Adults.

The Application of the Spatial Structure Rating Scale

The judges found the mixing of planes category difficult to apply to the paintings. The question presented by this spatial structure was, Should the painting be considered an average representation of space (i.e., [1]), created by an individual lacking in drawing ability, or should it be placed in the category which specifically refers to a mixing of planes (i.e., [4])? Base lines were also mentioned as sometimes difficult to evaluate according to the rating scale because it was often difficult to discern whether the objects placed upon the base line were related or unrelated objects, due to the lack of familiarity with cultural objects. It is apparent, then, that some of the spatial structure categories (i.e., [2-6]) present evaluation dilemmas because they also appear to some extent in the paintings of normal, untrained artists. If the rating scale was applied to the paintings of one individual over a period of time, the graphic changes that occurred in the

series of paintings would be recognised as part of the process of ego disintegration or reintegration; it would be possible to isolate the changes in spatial structure and avoid confusing them with the individual's drawing ability.

It should also be noted that the judges actively involved in their own painting or art projects found it more difficult to isolate[1] the spatial structures in the paintings than the two judges involved in art education and art programs. The present research was not intended to offer insight into the rating accuracy of professional artists versus individuals with no art training, such as the Ulman and Levy (1975) study. However, the comments from the judges established the fact that the individual accustomed to instructing others, evaluating the paintings of students, and participating in the creative process, may find it more difficult to evaluate the artwork of others on the basis of a limited criterion. In addition, the two professional artists admitted that "attaching" numbers to a painting was an uncomfortable task and discussed their attitudes about creativity. They found it difficult to understand why art should be statistically evaluated. This attitude was mentioned previously and reflects the artist's version of the art versus science controversy; the other side of the argument contends that science should not take creativity seriously, as a measurable source of information. There was, however, total agreement among the judges that the task

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[1]They tended to appreciate all aspects of the painting, such as design, colour, and meaning.

of evaluation proved to be an interesting experience and there was no difficulty maintaining attention, in spite of the quantity of material.

Two of the judges commented on the fact that some information from the artist would have assisted them in their rating task. This factor is especially significant when aspects of an unfamiliar culture are illustrated in the painting. For example, an Eskimo subject painted a small house on pilings. It appeared to be an "x-ray picture", but it accurately portrayed the appearance of the Eskimo houses in some of the remote villages.[1] Langevin et al. (1975) learned from their experience that listening to the patient talk while painting provided more valuable information than the painting itself, and an evaluation of the formal aesthetic qualities, such as colour, may be unreliable. (p. 151) The results of the present research tended to support the findings of Langevin et al. (1975). The subject's explanation of the artwork would have offered, at times, valuable information about the structural components of the painting. A blind systematic study of the spatial structures in the paintings of schizophrenics may, therefore have the disadvantage of misinterpretation; a blind systematic content analysis would offer the same disadvantage. The empirical evidence suggested that the patient's interpretation and discussion of the painting must be considered an integral part of the evaluation process. To extract the artist from

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[1]The houses are built to adapt to seasonal flooding.

this process increases the possibility of inaccurate evaluation.

The primary purpose of the present research was to investigate the spatial structure theory (Billig, 1970) and assess its potential for accurately indicating the condition of the ego boundary; the goal was to formulate a nonverbal diagnostic tool. The evidence did not support the speculation that one painting could provide an adequate basis for evaluation. The suggestion, therefore, is to apply the spatial structure rating scale to the artwork of a single patient throughout the course of his treatment and include the patient's dialogue in the evaluation process. The results of this study, as well as the empirical evidence provided by the subjects and judges, indicated that a painting in which the spatial structures are to be used as a diagnostic aid should not be isolated from other paintings; it should be viewed in conjunction with a series of paintings by the same patient.

SUMMARY

The purpose of the present study was to develop a nonverbal diagnostic tool, using the spatial structures in paintings (i.e., Billig, 1970). There were two major reasons why this research effort focused on a nonverbal approach to diagnosis and treatment: (1) There was a large population of people in Scotland and Alaska that were unfamiliar with the English language. Most individuals involved

in the treatment of psychiatric patients in Scotland and Alaska used English as their first language; it was apparent upon visiting psychiatric hospitals in Scotland and Alaska that an effective nonverbal diagnostic tool would assist in the treatment of psychiatric patients. (2) Schizophrenic individuals, by the very nature of their disorder, find verbal communication difficult. Therefore, a nonverbal tool which could be developed and experimentally tested would assist in the treatment of schizophrenic patients, especially if the psychiatric staff and patients did not share a common language. The spatial structures in paintings recorded by Billig (1970) provided a possible foundation for developing a nonverbal diagnostic tool. Some of the major findings and insights gained in the process of experimentally testing such a tool were discussed.

A very significant point in terms of methodology and experimental design was made by the results of the present experiment. The treatment of a specific extraneous variable may not have the same impact on the subjects if they are from two different clinical groups. It may be suggested from the present data that alcoholic subjects performed adequately under stress. Scottish and Eskimo alcoholics commented on the difficulty of the distance constancy test, but their performance, according to the Mann-Whitney U Test (see Table XI), was not significantly different from the corresponding control group. When the individual performance of alcoholic subjects was examined, the task perceived as more difficult was the one that indicated better performance. Efforts to reduce anxiety for the schizophrenic and control

groups (i.e., emphasising visual acuity as opposed to psychological testing) may have provided the alcoholic subjects with less of an overall stimulus for their optimal performance.

Perceptual disturbances associated with schizophrenia have been explained by various theories which have described attentional and arousal deficits (e.g., Gjerde, 1983; McGhie & Chapman, 1961; Shakow, 1962). The present research design and procedure were carefully considered with these theories in mind; it was necessary to maintain the subject's attention over a relatively long time but also avoid arousal. The nature of the experiment (i.e., visual acuity) as well as the experimental procedure encouraged the subjects to co-operate, and it allowed the experimenter to manipulate and control the effects of attentional and arousal deficits, which might have influenced experimental results.

Empirical evidence indicated that various experimental factors manipulated for the purpose of decreasing or eliminating the effects of any possible attentional deficit were adequate for the Scottish schizophrenic and control groups but not adequate for the Eskimo groups. The Eskimo subjects may have relied on their auditory skills more often than the Scottish subjects, and the Eskimo controls may have detected and relied on extraneous information (e.g., the sound of the string being pulled through the brass screw eyes) as a source of perceptual information. These observations were discussed in terms of the results, and it was suggested that the Eskimo control group indicated

field-dependent behaviour. This observation could explain why the distance constancy performance of the Eskimo schizophrenic and control subjects did not indicate unambiguous evidence of a significant difference in perceptual performance, as indicated by the performance of the Scottish groups.

The experimental evidence (i.e., Donovan et al., 1975) and empirical observations point to the fact that field-dependence and field-independence may represent a continuum; there may be variations in the extent that the cognitive style is incorporated into the perceptual process. Variations may occur within the same clinical category, between cultures, or according to the context of the visual task. Perceptual performance appeared to be strongly influenced by the cognitive style of the subject. When an individual is suffering from a clinical disorder, such as schizophrenia or alcoholism, his cognitive style may be affected, or the cognitive style of the individual may be related to the etiology of the disease. It has been suggested that perceptual research, clinical or cross-cultural, should consider the field-dependence and field-independence variable and should match the experimental groups according to this variable.

Developing an effective spatial structure rating scale was, of course, the primary stimulus for the present research. The final recommendations made on the basis of the present research were as follows: (1) It was suggested that judges participate in the rating process if the effectiveness of the rating scale was the primary focus of the

investigation; if the scale was to be used by individuals (e.g., art therapists) as a method of evaluation, then the judges must be considered essential. The evaluation of paintings would, however, be performed more efficiently by laboratory computers if the intention of the rating scale was to acquire a quantity of information related to various graphic features. (2) The spatial structures rating scale should be further investigated and applied to the artwork of a single patient throughout the course of his treatment, and the patient's dialogue should be included in the evaluation process. A patient's painting should not be evaluated unless it is viewed in conjunction with a series of paintings produced during the treatment process.

CHAPTER IV

CONCLUSIONS AND FUTURE RESEARCH

Billig's Spatial Structure Theory

The experimental evidence provided by the present research did not support Billig's (1970) spatial structure theory. Spatial structures as outlined by Billig (1970) were present in the paintings of all the Scottish and Eskimo subject groups (see Table VI). The spatial structures which have been described as characateristic of the acute schizophrenic and the level of ego disintegration associated with this phase of the illness did not occur as frequently as one would predict for the Scottish or Eskimo groups. Although, the Scottish schizophrenics did receive the highest percentage of [4], [5], and [6] ratings (see Table VI). In addition, the highest percentage of unstructured paintings produced by the six subject groups reflected an average-good representation of space. The universal aspect of Billig's theory was placed in question when the spatial structure ratings for the Scottish and Eskimo schizophrenic subjects indicated that there was a significant difference between the painting performance of these two groups for the structured as well as the unstructured task (see Table XIV).

Therefore, the conclusion established by the results of the present study was as follows: When the painting condition, extraneous variables, and patient selection were controlled there was no support for Billig's (1970) spatial structure theory.

These negative results did not, as in some cases, leave the researcher little advanced. The results of the present study: (1) provided statistical data to assist in the evaluation of Billig's (1970) spatial structure theory, (2) clarified the benefits of spontaneous and guided painting activity, and (3) suggested guidelines for the application of a diagnostic aid to psychiatric evaluation. The findings revealed two interesting facts, firstly, all of Billig's (1970) spatial structures were evident to some extent in the paintings of acute schizophrenics, but they were also present in the graphic representations of alcoholic patients. Therefore, it is possible for other clinical groups to produce spatial structures previously considered to be characteristic of schizophrenic artists. For example, the Eskimo alcoholics received the highest percentage of multidirectional space ratings, which was predicted for the acute schizophrenic subjects (see Table VI). Also, the claim that the spatial structures in schizophrenic paintings (see Figures 8 and 9) are universal was not supported by the data. Secondly, experimental control may alter performance, in this case painting performance. Multidirectional space may, in fact, be a consistent indicator of ego disintegration when the painting is spontaneously produced. It may not be possible to test this theory experimentally and find

the same results as one would find in a series of spontaneously produced paintings by a single schizophrenic artist. In addition, when one isolated painting was presented for evaluation, some of the spatial structures described by Billig (1970) created a rating dilemma. For example, the judges found the mixing of planes category difficult to apply to the paintings because it is a common component of the artwork of untrained artists. And thirdly, the spatial structure rating scale was indicated as an effective tool for evaluation. Also, the application of this diagnostic tool is now further defined as an aid to individual evaluation, as opposed to blind systematic group evaluation. The results, then, did not indicate the weakness of measurement or the vulnerability of the research hypotheses but, rather, contributed to the understanding of a diagnostic tool and the methodological boundaries surrounding its investigation and application.

The Content and Structural Analysis of a Personal Projective Painting

A patient's spontaneously produced painting may represent a personal projective technique; the stimulus material having been developed by the patient. The individually created projective material would not fulfill all of the primary and secondary criteria associated with projective techniques; it would not provide the individual with an

unstructured situation with a multitude of possible responses or a lack of awareness as to the purpose of the test or stimulus ambiguity. On the other hand, the projective painting may indicate a sensitivity to unconscious aspects of the individual's personality and may elicit a profusion of response data directly related to the patient. The therapist may find the content of the patient's graphic projections more helpful than other forms of nonverbal projective techniques in understanding the specific problems of the disturbed individual.

Billig's (1970) spatial structure theory is an important contribution to the psychiatric alternatives available for art therapists. He offered a structural analysis of the patient's paintings and a new stimulus for the objective evaluation of the schizophrenic's graphic representations. Art therapists may not wish to focus on a Freudian interpretation of a patient's artwork, and, yet, the patient would benefit from a psychiatrist and art therapist establishing some form of communication. Billig's (1970) theory provided an opportunity for the psychiatric staff to evaluate a possible source of information from two perspectives and an incentive to discuss their interpretations. The function of art therapy in the psychiatric setting would be enhanced if the psychiatrist analysed the content of the patient's personal projective painting and the art therapist provided the structural analysis.

The interpretation of the patient's spontaneous productions may assist the consulting psychiatrist and art therapist and, hopefully, affect the course of treatment. However, if the schizophrenic experiences difficulty with the flooding of sensory stimuli, then providing him with a structured painting assignment or guided art activity may be of benefit to him. It may be appropriate to contemplate a statement by Hall (1966); he made this statement while reporting the results of his research on the use of space by the Japanese. The study illustrated the Japanese habit "of leading the individual to a spot where he can discover something for himself" (Hall, 1966, p. 154).

The present experiment, in itself, may be seen as a structured situation; it involved three precise tasks and specific behaviours. The schizophrenic patients were guided through the required activities and appeared to respond positively to the constancy tests as well as the painting tasks. The verbal interaction which was necessary for a description of the subject's paintings provided some unexpected empirical evidence. When the schizophrenic patient was called upon to describe the contents of his graphic expression, there appeared to be a shift in control. The patient assumed the role of the "informer" and the experimenter the role of the "uninformed." The control subjects also revealed a change in their level of confidence but not to the same extent as the schizophrenic and alcoholic sub-

jects, perhaps because of the strength of their ego boundaries and self-esteem. This control factor may have been more obvious due to the fact that the investigator was essentially uninformed about various aspects of both cultures, which obviously cast the patient in the role of the expert. When this exchange occurred, the quiet schizophrenic patient, even the reserved Eskimo subjects, offered a lengthy description of the painted objects and often continued on to discuss other cultural characteristics or personal experiences. Schizophrenic patients, on occasion, requested to see the experimenter again; they wanted to repeat the painting portion of the procedure. It is reasonable to suggest that this exchange of roles provided a nonthreatening situation and offered the schizophrenic patient a sense of self-esteem and confidence. The psychoanalytic techniques employed by psychiatrists are based on similar role reversal procedures; the patient becomes the sender of the verbal message and the therapist assumes the role of the listener. However, when the tangible artwork of the patient is placed between the inquirer and the artist, it provides an effective method of guided painting activity and a stimulus for a meaningful dialogue.

The empirical evidence suggested that the schizophrenic's spontaneous productions may benefit and interest the psychiatrist and art therapist in their evaluations and interpretations. The structured painting condition (suggested subject), on the other hand, may not be helpful as a diagnostic indicator but may provide a meaningful stimulus for verbal interaction, not necessarily associated with the

unconscious part of the self. The structured or guided process may be more beneficial for the patient's sense of self and, consequently, may contribute to the strengthening of the ego boundaries.

THE CONTRIBUTION OF THIS RESEARCH

Methodology

It is submitted that the primary contribution of this research is methodological, since most of the research efforts required an emphasis on methodology and design, with the benefit of some interesting experimental results. A review of the related literature and the experiences associated with the collection of data for this study, encouraged this researcher to support the opinion of previous researchers (e.g., Wadlington & McWhinnie, 1973). If researchers are interested in the artwork of psychiatric patients, then their primary concern should be methodology, and their secondary concern, at this point in time, should be the experimental results. Perhaps there are areas of psychopathology and expression which are not conducive to experimental investigation; perhaps Billig's (1970) spatial structure theory is an example. However, art therapists must have access to theories and tools of evaluation which have been carefully examined and experimentally tested. Until accurate data is accumulated and statistically evaluated, the art therapist has no basis for establishing the

authenticity and significance of his field and no way of extending the potential of this nonverbal form of expression.

The Application of the Spatial Structure Rating Scale

If the results of studies evaluating the creative activity of psychiatric patients are to be incorporated into art therapy programs, then it is of paramount importance that the process associated with accurate evaluation of the patient's graphic form of creativity be similar to the process which would occur in the art therapy program. A specific example of co-ordinating research efforts with the practical application of the results would be the development and application of an effective rating scale. Previous studies have been primarily oriented toward the psychiatrist (e.g., Billig, 1970) or the individual trained in art (e.g., Reiner et al., 1975). In order for the field of art therapy to develop, it appears that it is necessary for experimental investigators to direct their efforts toward the practical application and evaluation of materials utilised by the art therapist. Art therapists must be informed as to the extraneous variables which may influence their evaluation of the patient's painting activity (e.g., the level of the patient's intelligence) (Ulman & Levy, 1975, p. 40). The present research was designed to investigate the possibility of constructing a nonverbal diagnostic tool based on the spatial structure theory of Billig (1970). This theory appear-

ed in the psychiatric art literature and could be easily recognised as a valuable tool for the art therapist. However, it seemed reasonable to expect that this theory be evaluated before art therapists were encouraged to incorporate it into their programs. Therefore, an experiment was designed to test, extend, and to further understand the nature of this potential tool.

The suggestion offered, at the conclusion of the present study, was that the spatial structure rating scale be applied to the paintings of one patient during the course of his treatment. The graphic alterations of an individual's creative attempts should be considered in relationship to each other and not isolated for evaluation. The concern in the past has been with the content of the patient's graphic expressions and the symbolism attached to the objects represented. At the present time, researchers are concerned with the form of the artistic expression and the possibilities of objectivity and measurement. Ulman and Levy (1975) stated that their study suggested the following: "research centered on form and its correlation with personal characteristics may point the way toward greater reliability in the use of paintings for diagnostic purposes" (p. 402). The empirical evidence from the present research suggested the following: (1) Structural analysis, as well as content analysis, benefits from the patient's verbal contributions, and (2) both forms of evaluation would contribute to the treatment and self-esteem of the patient. A painting appears to be an effective method for the patient to establish his own projective material (content), and a

suggested subject (structure) assists in strengthening the patient's sense of self and, consequently, the condition of his ego boundary, which is considered to be the initial stage in facilitating a reality relationship with objects in the environment.

Cultural Differences

Anthropology and cross-cultural psychology are often considered close relatives because they concentrate on the similarities and differences between various cultures and countries. However, the psychological approach to behaviour and mental disorders as well as the psychiatric literature does not, for the most part, consider cultural variations. If one were to read an article about schizophrenic behaviour, for example, there would probably not be an attempt to discuss specific cultural groups,[1] but, rather, the research findings would refer to specific classifications of schizophrenia or schizophrenia in general terms. Due to the fact that individuals suffering from a mental disturbance present the psychologist and psychiatrist with a complex and difficult task, and the therapists are usually overloaded with

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[1]Opler (1957) should be recognised as an exception to this statement; he provided an account of the variation in the schizophrenic illness between the Irish and the Italians. Schizophrenia was described as not one disease but several, and this disorder "varies particularly with the cultural background of the individual" (Opler, 1957, p. 103).

cases, the tendency may be to treat the disorder without recognising any variations other than the classifications of schizophrenia (e.g., hebephrenia or paranoid versus nonparanoid).

A significant contribution of this dissertation is a renewed recognition that cultural variations are reflected in subject performance and experimental data. The performance of the Scottish schizophrenic and control subjects, for example, did support the secondary hypothesis (#1), but the Eskimo schizophrenic and control subjects did not support the hypothesis. The performance of the Scottish subjects provided results which resembled previously published findings, but the performance of the Eskimo subjects did not resemble previously reported results. The present study also provided experimental evidence which indicated that there may be differences between patients from different cultures suffering from the same mental disorder (e.g., see Table XXVI, Scottish schizophrenics-Eskimo schizophrenics).

When the painting performance of the groups from the two cultures was compared, the results indicated that there was a significant difference between the schizophrenic subjects when the task was unstructured and structured; there was also a significant difference between the control subjects when the painting task was structured (see Table XXI). Results such as these and those outlined and discussed in the previous chapter must lead to the conclusion that cultural differences should be more closely examined. The Eskimo people may be in the process of assimilating a new

culture and moving away from their traditions, but they have provided a very strong and valuable reminder of an obvious fact that we sometimes fail to acknowledge. People are different and culture often enhances individuality; people from different cultures should not be expected to be the same, especially when trauma magnifies their individual conflicts.

In the final evaluation, a dissertation should contribute a new or improved methodology, evidence, or analysis (Davis & Parker, 1979, p. 44). This dissertation has attempted to improve the methodology of previous contributions to the psychiatric art literature, but it should be recognised that this research effort was part of a process. An attempt has been made to experimentally investigate psychopathology and expression, without destroying the nature of creativity or the creative process. The statistical evidence represented by the present study was, at various points, new, unexpected, and complex; this may explain the researcher's sustained interest in the collection and evaluation of the data. A discussion of the research findings, at times, had the benefit of related literature, while at other times only carefully thoughtout assumptions and empirical impressions could offer a possible explanation for the results. Festinger, the psychologist known for the cognitive dissonance theory, claimed that it is not as important to be right as it is to be stimulating. The assumption associated with this statement is that in the scientific world no one is right for very long. It was important that this study accurately accumulate data, provide substantial

evidence and attempt a reasonable analysis of the data, but this study has also suggested numerous directions for future research.

FUTURE RESEARCH

As indicated by the extensive review of related literature, there were several areas of knowledge which were brought together to attempt an understanding of the relationship between perceptual constancy and the graphic representation of space. The results of the present study suggests several directions for future research; some suggestions for future research are new and others represent the basis for renewed investigation or interest. It is not possible to mention all of the questions stimulated by the present study; therefore, only the most outstanding proposals will be discussed.

Spatial Behaviour

"Man's sense of space is closely related to his sense of self, which is in an intimate transaction with his environment" (Hall, 1965, p. 63). Hall (1966) described schizophrenics in the following way:

> Although man is a self-domesticated animal, the domestication process is only partial. We see this in certain types of schizophrenics who apparently experience something very similar to the flight reaction. When approached too closely, these schizophrenics panic in much the same way as an animal recently locked up in a zoo. In describing their feelings, such patients refer to anything that happens within their 'flight distance' as taking place literally inside themselves. That is, the boundaries of the self extend beyond the body. These experiences recorded by therapists working with schizophrenics indicate that the realization of the self as we know it is intimately associated with the process of making boundaries explicit. This same relationship between boundaries and self can also be observed in cross-cultural contexts...." (pp. 11-12)

Gibson (1950) stated "that seeing is almost inseparable from acting. Spatial behaviour is intimately connected with spatial perception" (p. 223).

In an attempt to learn more about the relationship between spatial behaviour and communication there has been an effort to investigate the following: (1) personal space[1] and the effect of distance on the interactions of schizophrenic patients (Sommer, 1959), (2) proximetric space[2] (Hall, 1963), (3) "variation in the boundaries of personal space zones of individuals from different sub-

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[1]Personal space: "An area with invisible boundaries surrounding a person's body into which intruders may not come" (Sommer, 1969, p. 26). The difference between territoriality and personal space is that a territory is primarily a fixed location and personal space accompanies the individual at all times.

[2]Proxemics: "The study of how man unconsciously structures microspace-the distance between men in the conduct of daily transactions, the organization of space in his houses and buildings, and ultimately the layout of his towns" (Hall, 1963, p. 1003).

cultures" (Little, 1965, p. 247), (4) body-buffer zone (Horowitz, Duff, & Stratton, 1964), (5) human spatial behaviour (Horowitz, 1965), (6) the effect of immediate stimuli in the schizophrenic patient's temporal and spatial environment (Salzinger, 1971), (7) the effect of the distance between psychiatrist and patient on the patient's behaviour during the initial interview (e.g., Lassen, 1973), and (8) the difference between the spatial behaviour of the schizophrenic and nonschizophrenic patients at the beginning of an interaction (Rierdan & Weiner, 1977). The overall intention of studies such as these was to discover if the schizophrenic's communication difficulties are indicated by the way he positions himself in space. Patients with a diagnosis of schizophrenia, a psychiatric group known for interpersonal avoidance and withdrawal, tend "to place greater distances around themselves than non-schizophrenic" [sic] patients (Horowitz, 1968, p. 26). Hall (1966) pointed to the fact that "with decreasing interpersonal distance, the amount of sensory input increases as the organism picks up more cues" (Evans & Howard, 1973, p. 334) and, for this reason, an individual experiencing a flooding of sensory stimuli would tend to increase interpersonal distance thereby decreasing the amount of sensory input. Other researchers, however, have concluded that personal space is in no way correlated with the patient's mental health (e.g., Dosey & Meisels, 1969).

Horowitz (1968) suggested that this form of extreme withdrawal would be especially true of acute schizophrenic patients recently admitted to the hospital, as opposed to

schizophrenic patients "who had undergone relative reintegration by the end of their inpatient stay" (p. 26). Regressed patients can be motivated to move from their chair or personal space by mere propinquity (Sommer, 1969, p. 36). Considering the difficulty that nurses and other hospital staff members have in obtaining a response of any kind from such patients, it is significant that "an emotion sufficient to generate flight can be produced simply by sitting alongside them" (Sommer, 1969, p. 36). The schizophrenic individual is "fearful of being hurt in social intercourse" (Sommer, 1969, p. 69), and he, consequently, withdraws from other people.

Studies have also indicated that schizophrenics not only establish too great a distance between themselves and others, but at times they come too close to other people. (Sommer, 1959) The schizophrenic's behaviour "violates the personal space of others who become offended by his excessive closeness" (Sommer, 1969, p. 70). A personal experience may illustrate this behavioural tendency. While testing patients at a psychiatric hospital, a rather large Eskimo schizophrenic and I approached the elevator at the same time, and we entered the elevator together as the door opened. He subsequently spotted a scarf that I was wearing and walked over to take a closer look at it; he examined the pattern by holding it in his hands and proceded to pull the scarf up to his eye level, pulling me closer as well, until his head was touching mine. A person unfamiliar with schizophrenic individuals would have been offended by this extreme form of interaction. Sommer (1969) speculated on

whether the schizophrenic's spatial behaviour is related to the "lack of a stable self-image and clear self-boundaries" (p. 70). An individual that is not sure of who he is "may not be clear as to where he ends and the next person begins" (Sommer, 1969, p. 70).

Horowitz, Duff, and Stratton (1964) formulated a hypothesis from their observations; it stated that "each human being has, a part of his body-image constellation, an internal projection of the space immediately around him" called the body-buffer zone. (p. 656) "The size, shape, and penetrability of this buffer zone probably depend on immediate interpersonal events, current ego and drive states, and the individual's psychologic and cultural history" (p. 656). According to Horowitz (1968), some schizophrenic patients clearly demonstrate unusual spatial behaviour; these patients are usually in the regressive period of the illness. As the patient improves, greater physical closeness is recognised and the patient tends to rely more on "advanced cognitive defenses and relinquish motor defenses" (Horowitz, 1968, p. 34). Both "motoric and perceptual withdrawal processes" are evident in regressive states resulting in "alterations in spatial behavior, interpersonal distances and body behavior" (Horowitz, 1968, p. 35). In other words, as the regression period of the acute stage of schizophrenia loses its intensity, "physical distancing maneuvers were to some extent replaced by internal psychological means of withdrawal such as selectivity or blunting of perceptions, ignoring persons or events by refusal to recognize or respond" (Horowitz, 1968, p. 33). The physical

forms of withdrawal (e.g., increasing interpersonal distance) were still employed at certain times when "the inner psychological operations were inadequate to prevent the development of negative affects. The overall trend during the patient's reintegration was to substitute psychic for physical defensive maneuvers" (Horowitz, 1968, p. 33). Spatial behaviour, therefore, can not be considered in isolation from manifestations of other behaviours; it is closely related, for example, to body image, interpersonal communication, and regression of mental functioning. (Horowitz, 1968, p. 34) It is of paramount importance to recognise this relationship because it reinforces the "necessity of following a given process within a given patient across many modalities of expression. What is expressed as spatial behavior at one time may be expressed as altered perceptual or cognitive behavior at another time" (Horowitz, 1968, p. 34).

The present research supports the view that spatial structure in paintings is a valid indication of the condition of an individual's ego boundaries. It has also been recommended that observing the artwork of one patient over a period of time provides a more accurate assessment of the condition of the schizophrenic individual's ego. Therefore, it is suggested that modalities of expression which may be related, such as the spatial structure in paintings and the spatial behaviour of one individual, warrant further investigation. For example, if there is a relationship between spatial behaviour and space perception, and if interpersonal distance is greatest in the acute phase of schizophrenia and

personal space is interpreted as a "boundary-regulation process" (Altman, 1975, p. 86)(a form of protection for the schizohprenic's ego), then the schizophrenic requiring the greatest amount of space should be the one with the weakest and most disintegrated ego boundaries. There may be, then, a correlation between the personal space or body-buffer zone of the schizophrenic and the spatial structures represented in his graphic art productions. Clinical recovery elicits improved space perception, spatial structure, and interpersonal distance. Perhaps spatial behaviour is a means of observing and measuring physical withdrawal and spatial structures a means of recognising psychological or cognitive withdrawal. When more than one modality of expression is investigated, perhaps it will be possible to yield more information about regressive states. One modality may aid the therapist in understanding a patient at one point and another modality at another point in the regressive process. Also, patients may offer different forms of information at different intervals during the course of treatment, or individuals of a particular cultural background may engage in one modality as opposed to another. Access to more than one source of clinical data can do nothing but improve the resources available to the therapist; a good example would be the contribution of the spatial structure rating scale to the evaluation of the schizophrenic's ego condition.

Horowitz et al. (1964), as well as Hall (1966), provided an indication of the possible cross-cultural significance of spatial behaviour. The shape, size, and penetrability of the body-buffer zone may be affected by cultural

background (Horowitz et al., 1964, p. 656) and "proxemic patterns" (Hall, 1966, p. 163) vary from culture to culture. If these patterns are examined "it is possible to reveal hidden cultural frame that determine the structure of a given people's perceptual world" because if the world is perceived differently then definitions may vary as to what constitutes interpersonal distance and other spatial conditions. (Hall, 1966, pp. 163-164) "Significant evidence that people brought up in different cultures live in different perceptual worlds is to be found in their manner of orienting themselves in space, how they get around and move from one place to the next" (Hall, 1966, p. 70). A further explanation as to why the performance of the Eskimo subjects in the present study did not duplicate the performance of previous schizophrenic subjects may be found by investigating spatial behaviour and the cultural determinants. For example, the Eskimo families prefer to have no walls in their house. When new conventional housing was constructed in some of the Eskimo villages in Alaska, the walls were often removed; these physical boundaries were not required as a method of organising space or establishing privacy. Perhaps the artwork of the Eskimo people has been affected by education and, consequently, the traditional uniqueness has tended to dissolve. The spatial behaviour of a people with a cultural history such as the Eskimos, however, may offer an opportunity to understand the regressive state of the schizophrenic from this culture. Perhaps, it would be beneficial to design a study that would investigate the body-buffer zone of the Eskimo schizophrenic patient and

compare proximetric space with the spontaneous graphic structuring of space.

In addition, the Scots might be compared to the Eskimos because they live in conventional houses with walls as boundaries and areas of private space. According to Hall (1966), "the English...lacking rooms of their own since childhood, never developed the practice of using space as a refuge from others. They have in effect internalized a set of barriers, which they erect and which others are supposed to recognize" (p. 140). It would be interesting to explore the following question: Would individuals from different cultures with different spatial requirements have the same body-image-boundary concepts? Do these cultural attitudes toward spatial boundaries have an effect on the process of ego boundary disintegration in the schizophrenics from these two very different cultures?

Field-Dependence

Just as Berry's work (e.g., 1976b) focused on the structural properties of a person's psychological constitution, as opposed to the content properties, the objective of the present research was to concentrate on the structural analysis of paintings, as opposed to the content analysis. This investigative emphasis warrants further attention, especially if the perceptual abilities of individuals from different clinical groups and different cultures are examined. The present research was not designed to investigate

the Alaskan Eskimo people but, rather, to understand a particular psychological process (i.e., the stages of ego disintegration) and the possible related implications (i.e., perception) as a means of developing an effective nonverbal diagnostic tool. Future research efforts would benefit from reviewing the theoretical approach to cross-cultural research outlined by Deregowski (1982) and take note of the various aspects of cross-cultural research which require prudence.

It has been suggested that cognitive style, specifically field-dependence and field-independence, may offer new insights. For example, the spatial behaviour of patients and individuals working with patients may be the result of their cognitive style. Pollack and Kiev (1963), also, reported the influence of cognitive style on the spatial behaviour of physicians. Another study indicated that the alcoholic's "inconsistency of interpersonal perceptions" may be explained in terms of his cognitive style (Fehr, 1972). Fehr (1972) pointed out that his conclusion was restricted to field-dependent alcoholics; field-independent alcoholics were not significantly different in their performance from field-independent controls. (p. 4209-B) Therefore, individuals suffering from alcoholism may not always be field-dependent in their cognitive style of perception. The hypothetical field-dependent--field-independent continuum (Donovan, Hague, & O'Leary, 1975) may offer a more accurate description of this clinical group and explain the sugges-

tion of possible subtypes among alcoholic patients (Sherfey, 1955).[1]

In 1982, Kalliopuska reviewed significant contributions to the field of cognitive research, as it related to field-dependence; he urged the reader to continue to focus on the influence of cognitive style on behaviour. Kalliopuska stated that "field-dependence is a central characteristic of alcoholics' personality constellation" but "it is not sufficient in differentiating alcoholics from other psychiatric patients" (Kalliopuska, 1982, p. 965). The research related to perceptual differentiation, according to Kalliopuska (1982), has "remained somewhat undeveloped" due to the fact that "field-dependence might be related to a weak identity and disturbances of body image" (p. 965).(Underlining mine.) This concept would of course require the researcher to engage in longitudinal studies. Kalliopuska (1982) outlined the need for further study of the relationship between field-dependence, locus of control, and low self-esteem. It is interesting to note the discussion of a weak ego and its relationship to body-image disturbances in this 1982 study of alcoholics and then connect the information with earlier studies of body-image disturbance in schizophrenia (e.g., Fisher & Cleveland, 1958; Fisher & Seidner, 1963; Holtzman, Thorpe, Swartz & Herron, 1961; Shukla, 1971), as well as the more recent studies (e.g., Grand, 1982; Spear & Hymowitz, 1982).

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[1]Sherfey (1955) suggested that "alcoholism is not a single entity or disease, but a symptom associated with several disorders" (p. 42).

The personality characteristics of drug users and alcoholics may well be similar; there appears to be core personality characteristics, such as field-dependence, low self-esteem, and oral fixation, which are shared by both drug users and alcoholics. "Perceptual style is followed by the lack of differentiation of self-concept through which a strong susceptibility to external stimuli is created" (Kalliopuska, 1982, p. 965). The reader may feel a certain familiarity with this information due to the review of literature and focus on Weckowicz and his work, which played a strong role in the formulation of the hypotheses for the present research. Kalliopuska (1982) not only emphasised the influence of cognitive style on behaviour but also described the possible reasons for the style; these reasons were based on experiences in stages of early childhood development. The work of Kalliopuska (1982) will definitely play a major role in developing future hypotheses.

Not only is it possible that the cognitive style of a specific clinical group may vary, but it may be suggested that the cognitive style of a single individual may be inconsistent or change over a period of time. If, as according to Berry (1976b), cognitive style is influenced by the structure of the cultural group, loose versus tight, as well as parental orientation, then perhaps it is possible for a person to adapt a different cognitive style if his people are in the process of assimilating a new culture. For example, if an Alaskan Eskimo man of 50 was tested 25 years ago for field-dependence and tested again this year, would his cognitive orientation toward perceptual differentiation be

the same? Does the number of years in which the individual has been exposed to a particular perceptual orientation affect the possibility of change? In addition, do the influences of childhood on cognitive style, as mentioned by Kalliopuska (1982), remain with the individual throughout his life or, as he matures and the gap between childhood and adulthood increases, do other factors influence and perhaps alter his perceptual orientation? Is it possible for the extent of perceptual differentiation to vary, placing the individual at different points on the continuum at different points in his life? There appear to be numerous unanswered possibilities to explore in reference to the nature of an individual's cognitive style and its influence on his perceptual orientation.

The cognitive style of perceptual differentiation, as reflected by field-dependence and field-independence, is submitted as a possible explanation for cultural variation in perceptual and painting performance. It is, in addition, suggested as a possible reason for the inconsistent findings and variability of performance within clinical groups. The findings of previous studies which concluded that a particular clinical group, for example alcoholics, was field-dependent may have been the result of the population sampled. The directions for research in reference to perceptual differentiation are too numerous to discuss at this time. However, an attempt should be made to clarify the variability aspect of perceptual performance. For this reason, it is suggested that the experimental subjects be matched according to their cognitive style of perception.

Stress

Contact with schizophrenic and alcoholic patients, as well as individuals experienced in treating these patients, contributed new insight into related aspects of these mental disorders. One of the factors which seemed to affect the functioning of the alcoholic subjects was stress or anxiety. As mentioned previously, the performance of the alcoholic subjects in this study may have been affected by the amount of stress associated with the distance constancy task. Similarly, Russell-Lacy et al. (1979) predicted that medically ill patients experiencing a similar amount of stress as schizophrenic patients would also produce distorted and bizarre paintings. (p. 199) Therefore, stress may be considered a variable which influences the performance of schizophrenic and alcoholic patients.

Dosey and Meisels (1969) attempted to extend the findings associated with two of the factors influencing personal space: (1) the personality characteristics of the subject and (2) the psychological environment ("feeling state"). (p. 93) "The perception of threatening elements in interpersonal situations, whether originating predominantly from environmental or intrapsychic sources, is seen to call forth measures for self-protection" (p. 93). Personal space, then, may be viewed in terms of a body-buffer zone (Horowitz et al., 1964), which may provide protection for one's body or one's self-esteem. (Dosey & Meisels, 1969, p. 93) From this it seemed apparent to the authors

that "environmental or internal threats to self-esteem should produce greater spatial distances" (Dosey & Meisels, 1969, p. 93).

According to Dosey and Meisels (1969), Leipold (1963), and Little (1966) there is a "tendency for spatial distances to increase under conditions of stress in the sense of reproof by others" (Dosey & Meisels, 1969, p. 93). Stress in university students was created by peer ratings of sexual and social competence; it was thought that these ratings would threaten the subjects' body image and self-esteem. (Dosey & Meisels, 1969) Fisher and Cleveland (1958), as well as Horowitz (1966), suggested that the body-image-boundary variable of the Rorschach might be associated with personal space. An individual that does not have a strong body-image boundary is believed to "create exterior conditions which will artificially provide a substitute boundary" (Fisher & Cleveland, 1958, p. 355). "Such a perception of one's body boundary as lacking definite structure and substance...or as weak and permeable...should result in greater use of personal space" (Dosey & Meisels, 1969, pp. 93-94). It was, consequently, predicted that if personal space is used to protect the person from threats in his environment, then the person would use a greater amount of personal space when in a stressful condition. (p. 94) Weaknesses in personality may then be "supplemented by spatial usage" and it follows that individuals with a high degree of anxiety or stress would require more personal space. (Dosey & Meisels, 1969, p. 94) However, test results for the student subjects did not support the prediction that

there are relationships between personality variables and personal space. (Dosey & Meisels, 1969, p. 97)

Schizophrenic and alcoholic patients, on the other hand, may provide the researcher with support for the prediction that relationships exist between personality variables and personal space. Individuals with disturbed body-image boundaries (e.g., Weckowicz & Sommer, 1960), spatial behaviour (e.g., Sommer, 1969), and interpersonal distances (e.g., Horowitz, 1968) appear to support the indication of a relationship between stress and these internal and external consequences. Wallis (1972), for example, examined the various types of stresses and the fact that stress can be used as a predictor variable in the diagnosis of schizophrenia. It may be possible that the type of stress or stresses (e.g., physical, marital, or military service) encountered by the schizophrenic influences his spatial behaviour and, consequently, his space perception. In addition, the fact that various types of stress may influence the schizophrenic's behaviour in different ways may offer some insight into the variability of perceptual performance between and within schizophrenic subjects. If stress takes on a new form for the patient, perhaps it influences his spatial behaviour; physical stress may not produce the same amount of withdrawal and spatial distancing as marital or family stress. The sources of stress may be the same for the alcoholic individual as for the schizophrenic patient, but the stress may be handled or approached differently.

In 1981, four articles were published which discussed the definition of schizophrenia and the causal rela-

tionship between stress and schizophrenia (i.e., Day, 1981; Dohrenwend & Egri, 1981; Spring, 1981; Wolfe, 1981). Day (1981), for example, concluded that stress does play a significant role in the onset of an acute schizophrenic episode, but there are still gaps that fail to indicate whether there is a direct or necessary association between stress and schizophrenia.

In 1982, Williams, Calhoun, and Ackoff maintained that alcoholism is a learned behaviour and the purpose for it is to cope with stress, which results from interactions with the environment. The authors hypothesised that alcohol consumption produces immediate effects which are rewarding to the individual. A questionnaire designed to elicit information about stress and coping was completed by 69 controls and 65 alcoholics. "Alcoholics reported significantly more frequent, more intense, or more prolonged instances of stress. Alcoholics preferred destructive coping strategies, such as aggression or consumption, while nonalcoholics preferred constructive strategies, such as self-distraction" (Williams et al., 1982, p. 509). This study supported the previous statements regarding the importance of considering stress and coping strategies as significant aspects of a disease, such as alcoholism or schizophrenia.

The definition of stress has hindered research efforts because the concept was believed to be far too global for experimentation purposes. Very recent research (e.g., Garmezy & Rutter, 1983), however, has taken advantage of the recent psychological and physiological research

related to environmental stimuli described as stressful. Garmezy and Rutter (1983) have edited a new book, Stress, Coping, and Development in Children; this book represents a new focus in research. It is reasonable to assume that when stress in childhood is better documented and understood, the information will contribute to our understanding of adult behaviours and the dysfunctional aspects of adult behaviours.

Stress may be considered a significant variable which may influence the behavioural and perceptual performance of the schizophrenic and alcoholic patient. How does the spatial behaviour of the alcoholic differ from the schizophrenic's spatial behaviour? Will a comparison of spatial behaviour between clinical groups provide additional information about the patient's interpretation of space and possibly his psychological condition? If a child experiences a high degree of stress or continual stress during his childhood, does this affect the possibility of that person experiencing schizophrenia or alcoholism during his adult years? These questions suggest that a further investigation of this variable is certainly warranted.

An Interval of Abstinence and the Alcoholic: An Initial Proposal

As mentioned in the introduction to the experiment, an attempt was made to investigate the cognitive dysfunction of the alcoholic patient. The prediction which encouraged

this evaluation was that the alcoholic with less cognitive dysfunction would regain adequate depth perception after a 4 week interval of abstinence, whereas the alcoholic with severe cognitive dysfunction would demonstrate no recovery of perceptual skills or a limited recovery. This proposal was referred to as the 1-4 week interval of dysfunction. To pursue this prediction was not within the scope of the present research, and the brief hospital stay of the alcoholic subjects made it impossible to adequately accumulate the necessary data.

To investigate this aspect of cognitive dysfunction, it would be necessary to find a facility designed to encourage alcoholic patients to stay for at least 1 month of treatment. For those unfamiliar with the treatment of alcoholic patients, this is not an easy requirement to fulfill. However, Leber, Jenkins, and Parsons (1981) investigated the recovery of memory and visual-spatial learning in chronic alcoholics. The study included 32 alcoholics, who had abstained from drinking for 3 to 11 weeks, and they were compared to 16 matched controls. The results revealed that the alcoholics performed significantly poorer on all nonverbal tasks than the control subjects after 3 weeks of abstinence, but there was no significant difference between the alcoholics who had abstained for 11 weeks and the controls. It was suggested that there may be a recovery of some function in alcoholics after at least 10 weeks of abstinence. This study provided two points of information: (1) Facilities for research involving long-term treatment, as far as alcoholic patients are concerned, are available. (2) It may be neces-

sary for the duration of abstinence to exceed 4 weeks, if the recovery of cognitive functioning is to be evaluated. A further understanding of the nature of cognitive functioning during the recovery from alcohol abuse would certainly provide additional information for the treatment plan.

Psychiatric Research and Medication

To adequately analyse the effect of medication on the perceptual response behaviour of patients, it is necessary for psychologists and psychiatrists to combine their research efforts and interpretations. It was not within the scope of the present study or the qualifications of the experimenter to analyse or discuss the possible effects of the medication taken by the participating patients, especially the pharmaceutical variations between the two countries. However, the significance of such a contribution to an interpretation of experimental results is certainly not denied; medication has been offered as a possible explanation for the differences in patient performance. (Russell-Lacy et al., 1979, p. 199)

A recent article by Russell and Howard (1982) discussed the purpose of the clinical drug trial (CDT): (a) whether dosages will lead to improvement of the medical patient's condition and (b) whether long-term toxicity, side effects and/or increased costs present problems. The authors stated that clinical drug trials "could take fuller advantage of the substantial knowledge and expertise present

in the behavourial sciences relevant to some of the problems confronted in the planning, design, implementation, analysis, and interpretation of clinical drug studies" (p. 19). However, if the behavioural and medical sciences are to share a successful partnership, it will be necessary for the behavioural scientists to become familiar with "CDT methodology and research practices and translate theoretical psychosocial concepts into practical applications in the CDT setting" (p. 20). The participation of behavioural scientists in CDT research represents a positive step in overcoming some of the present difficulties surrounding psychiatric research and medication.

During the process of patient selection for the present study, the medication administered to all hospitalized subjects was carefully considered and possible reactions were monitored and recorded. It is anticipated that this data will be evaluated with the assistance of at least one psychiatrist, who is experienced in the treatment of schizophrenics, and any significant findings will be published.

A Network Approach to Diagnosis and Treatment

The above anticipated extension of this research (i.e., team evaluation of medication) reflects a personal opinion, formed as a result of the process associated with this experimental study, and, also, it reflects the purpose of the study itself. Psychiatric hospitals, like all organisations, are comprised of an administrative hierarchy.

Within this hierarchy, and it may vary from hospital to hospital, there are positions which hold more authority than other positions; the psychiatrists sit at the head of the treatment hierarchy. From an objective observer's point of view, it appeared as if the psychologist, psychiatrist, art therapist, nurse, and physical therapist contribute to the treatment of the patient and may share their opinions at staff meetings, but, for the most part, there was not an intermingling of treatment plans. For example, the art therapist and psychiatrist rarely, and sometimes never, consult each other about a joint treatment plan. It is of paramount importance that the people responsible for the treatment of the psychiatric patient actively consult each other and co-ordinate their efforts to understand the disorder and to devise a joint treatment plan.

Recent research efforts with the Alaskan Eskimos reflect a trend toward expanding the diagnostic evaluation of the patient beyond the psychiatric setting. Kleinfeld, Bloom, and Wood (1982) explored the possibility of using physiological symptoms as indicators of psychological disturbances. Their conclusions stated that the tool used for measuring needed to be revised to make it appropriate for the Eskimo culture and encouraged future researchers to look at a combination of indicators designed to detect various forms of psychiatric disturbances. (Kleinfeld et al., 1982) This research (i.e., Kleinfeld et al., 1982) was encouraging because it suggested a team approach to treatment and a possibility of early detection; it was found that physical complaints were easier for the patient to report

and treatment could be initiated sooner. The Kleinfeld et al. research reflected a beginning of a new attitude toward cross-cultural studies, as well as psychiatric research and treatment. As stated previously, the diagnosis and treatment of a psychiatric patient would be improved if various modalities of expression were monitored over a period of time, and it may also be said that the patient would benefit from a team of professionals co-ordinating their efforts during the course of the psychiatric treatment.

SUMMARY

The results of the present research provided the following conclusion: When the painting condition, extraneous variables, and patient selection were controlled, there was no support for Billig's spatial structure theory (1970). However, the findings did provide the following: (1) statistical data to assist in the evaluation of Billig's (1970) spatial structure theory and (2) guidelines for the application of a diagnostic aid to psychiatric evaluation. In addition, the empirical and experimental results allow for the following statements to be formulated: (1) It is possible for other clinical groups to produce spatial structures previously considered to be characteristic of schizophrenic artists. (2) The claim that the spatial structures in schizophrenic paintings may be found <u>universally</u> was not supported by the data. (3) Experimental control may alter painting performance, and, therefore, it may not be

possible to experimentally test Billig's (1970) theory. (4) The spatial structure rating scale has been indicated as an effective tool for the evaluation of paintings, but it was suggested that the spatial structure rating scale would be most effective if it was applied to a series of paintings produced by a single patient during the course of his treatment. (5) The cognitive style of perceptual differentiation, as reflected by field-dependence and field-independence, was submitted as a possible explanation for cultural variation in perceptual and painting performance. It was, in addition, suggested as a possible reason for the inconsistent findings and variability of performance within clinical groups. Generally, then, the results of the present research did not indicate the weakness of measurement or the vulnerability of the research hypotheses, but, rather, the results contributed to the understanding of a diagnostic tool and the methodological boundaries surrounding its investigation and application.

It should be noted that this chapter suggested several proposals for future research, but it was also similar to the first chapter of this dissertation; both chapters have clearly indicated that several sources of information as well as several areas of study were required to adequately investigate these hypotheses. There was a definite indication that a network of facts and findings must be considered in order to properly evaluate the results of the present research, and these results will be placed in future networks of facts and findings to establish new research proposals. The results of the present study and the spatial

structure rating scale will be used by art therapists in various psychiatric settings. It was suggested that the most beneficial treatment for the psychiatric patient would include a network of individuals consulting each other and co-ordinating their efforts to understand the patient's disorder and to devise a joint treatment plan. Just as a research project, perhaps with a team of researchers, benefits from various sources of facts and findings accumulated over a period of time, the diagnosis and treatment of a patient would benefit from various modalities of expression that are monitored over a period of time and a team of professionals co-ordinating their efforts during the course of the patient's treatment.

APPENDIX I

"Schizophrenia From the Inside"

What is it like to have schizophrenia? Dr. James Chapman here throws light on the behaviour of people suffering from schizophrenia by quoting explanations given by patients.

Severe mental disorders affecting young people have been recognised since the earliest times, but only over the past century have they been closely studied. This, in turn, has led to a much better understanding of the abnormal psychological processes involved and also to a gradual sorting out of these illnesses into different categories of which perhaps the most tragic has been called schizophrenia.

Although there have been innumerable investigations into this disease, it is not yet fully understood--particularly as to what causes it. Perhaps it is not surprising, then, that patients suffering from schizophrenia who appear to talk and behave in an irrational, unpredictable and occasionally bizarre manner are regarded by the public with apprehension or suspicion. Such attitudes towards these severely mentally ill people derive from a failure to understand their sufferings. In fact, the more we make an effort to establish a relationship with such patients and communicate with them, the better becomes our insight into their many difficulties. Only then can we realise the depth of their suffering and adopt an appropriate attitude of compassion towards them.

These difficulties in question may be illustrated by briefly describing some of the changes in adaptation to the environment often experienced by patients, and by the personal accounts of other schizophrenic patients, aged 17 to 30, who have been interviewed over the past ten years.

One of the earliest changes experienced by the young schizophrenic involves an impairment in emotional contact with his fellows. He becomes aware that he does not have the same warmth of feeling, the same degree of empathy with others, including his family, as he had before the onset of his illness. This reduction in the capacity to relate emotionally to others is an integral part of the illness over which the patient has little or no control. As the disease develops over two or three years from its onset, this deficiency gets progressively worse, as do the other abnormalities to be described.

As the months go by the subject's visual processes alter so that he begins to view the world around him quite differently. Colours seem to him brighter, objects stand out vividly against their natural background, everything around him appears somehow new and fascinating. At this still early stage these visual, perceptual changes are experienced as being relatively pleasant but tend to make the individual increasingly introspective. He starts to day-dream, ruminate about life in general and take an intense interest in subjects like religion, philosophy, psychology, art and literature, usually to a degree beyond his intellectual capacity.

Unfortunately, these initial alterations in mental function are only a prelude to the turmoil yet to come. Insidiously, perhaps over many months, the patient's visual perception becomes much more disordered. From his own viewpoint, the environment becomes very unstable; objects he looks at appear to change quickly in size and shape or to appear closer or further away from him than they normally should be. Three-dimensional vision may be lost so that at times everything looks flat like a painted canvas. Also, people, vehicles or other objects moving towards him appear to him to be doing so at an alarming speed. In fact the whole way the world appears to the patient is grossly distorted. This is how one patient described it:

> "I see things flat. Whenever there is a sudden change I see it flat. That's why I'm reluctant to go forward. It's as if there were a wall there and I would walk into it. There's no depth but if I take time to look at things I can pick out the pieces like a jigsaw puzzle, then I know what the wall is made of. Moving is like a motion picture. If you move, the picture in front of you changes."

Another patient said: "There is a brightness and clarity of outline of things around me. Last week I was with a girl and suddenly she seemed to get bigger and bigger, like a monster coming nearer and nearer. The situation becomes threatening and I shrink back and back."

Similar experiences are described by a third patient: "Things go too quick for my mind. Everything is too fast and too big for me--too quick to study. Things get blurred and it's like being blind. I can't make them out clearly. It's as if you were seeing one picture one minute and another picture the next. I just stop and watch my feet. If I move, everything alters every minute and I have no control over my legs. My legs are too quick for the top half of my body--it's my head

that's weak; I followed the sun and it seemed to drive me along. The sun seemed too big for me and it was coming closer. Everything else seemed to be coming closer and bigger all the time."

At this stage the patient is subject to bouts of acute anxiety and tension and usually presents a host of complaints such as insomnia, irritability, moodiness, hypochondriacal symptoms, obsessional ideas, suicidal preoccupations or self-consciousness about his physical appearance. Occasionally he may engage in aggressive or even violent behaviour. Generally he begins to have a dread of his environment, particularly of its social aspects.

From the beginning, the young schizophrenic suffers an alienation from society, which steadily gets worse. This is because, as the changes in visual perception develop, the patient also experiences a failure in his capacity to communicate normally. Here two patients described their inability to comprehend other people's conversation:

(1) "Somebody might say something to me. They might say the word 'bare'. I would have to go over three or four words to get the meaning of what 'bare' is. It's like scrambling, the way they used to do in the war. Things are broken up and then they have to be put together again into something I can understand."

(2) "When you lost track of people's conversation it has got to be visual. I have got to see somebody to carry on a conversation. I need to listen longer. It doesn't make sense what they say. You read it in their faces what they are saying."

Simultaneously, a fault develops in the patient's thought processes so that he cannot think clearly or in a logical manner. He often fails to find the words he wants at the right time and also to put his thoughts together into a pattern in order to express himself intelligibly. By now, the patient has not only lost normal emotional contact, but also suffers a breakdown in intellectual communication with his fellows. This progresses to a level where he is forced to try to convey his ideas by using a kind of primitive sign language involving a variety of movements and gestures:

(1) "Often I have to go through two or three things in my head before I find the thought I want-words I don't want come out--not the correct words--not the words I wanted for the meaning I wanted to give. I have to pick out thoughts and put them together. I can't control the actual thoughts I want. I can't compare it with my speech. I think something but I say it different. Thoughts just come out--all kinds of things come out together. People listening might hear something different from what I mean. Sometimes I do not say anything because of this. I keep the words in me."

(2) "If somebody speaks to me, I get on my guard straight away, so that I can make a sensible answer. I try to say something sensible and appropriate, but it is a strain because I'm not speaking automatically and when the conversation is going on or when it is finished. I don't know what they were talking about or what I was talking about. I keep talk to a minimum to prevent these attacks coming on."

(3) "The worst thing has been my face and my speech. The words wouldn't come out right. I know how to explain myself but the way it comes out of my mouth isn't right. My thoughts run too fast and I can't stop the train at the right point to make them go the right way. I've got a lot to say but I can't focus the words to come out so they come out jumbled up. A barrier inside my head stops me from speaking properly and the mind goes blank."

(4) "I like talking to a person but not in audible words. I try to force my thoughts into someone. I concentrate on how they move. I think of a message and concentrate in my head. It's thought you're passing over. I send the messages by visual indication. Sometimes it's my foot, but it might be my arms, legs, sometimes the shoulder, sometimes my whole body. I had the impression other people started this. They made movements first. I could contact back. They had a certain control over my body."

As the disease pursues its course, these various abnormalities become more pronounced and eventually the young schizophrenic finds that his ability even to move normally is disrupted. Things he used to do automatically, simple actions like walking, eating, dressing or shaving, he now finds he has to carry out consciously with great deliberation, so that his movements become slow, awkward, stilted and sometimes, as far as external appearances are concerned, purposeless. Two patients describe the experience: (1) "None of my movements come automatically to me now. I've been thinking too much about them, even walking properly, talking properly and smoking--doing anything. Before they would be able to come automatically." (2) "If I do something like going for a drink of water, I've to go over each detail--find cup, walk over, turn tap, fill cup, turn tap off, drink it. I keep building up a picture. I have to change the picture each time. I've got to make the old picture move. I can't concentrate. I can't hold things. Something else comes in, various things. It's easier if I stay still."

When a schizophrenic illness has advanced as far as this the patient is virtually unable to cope with ordinary everyday tasks and situations and is rendered helpless and very dependent upon others.

If psychiatric treatment is sought at or before this stage so much the better. However, partly because of the nature of the patient's symptoms and his withdrawal from society, quite frequently this does not occur.

Nevertheless, if understanding and help are forthcoming from any source he may be helped to adapt as best he can and attempt to overcome his difficulties. Should he not be offered this support he is likely to develop more severe emotional disturbances and, thereafter, his personality begins steadily to deteriorate with the development of additional symptoms and complications which might have been prevented. Prevention of these secondary changes in general behaviour can be achieved by establishing a relationship with the patient, making an effort to understand what he is going through, and trying to keep open a channel of communication, no matter how limited. However, more often than not this fails to happen and the young schizophrenic's mental apparatus eventually begins to disintegrate.

When this occurs he gets confused, loses touch with reality and experiences a kind of fusion between himself and his environment. He begins to lose the sense of his own identity. He is no longer able to separate the "I" from the "not I." He may seek to regain his own identity by taking over for short periods that of others and imitating them. From his point of view, any identity is better than none. It is at this level particularly that he may engage in what seems to be strange, incomprehensible behaviour, of a kind which may disturb those members of the public who happen to see it.

What is little understood about these patients concerns the fierce struggle they put up in attempting to fight this kind of psychological breakdown. All too often, as they become alienated from society, they slip into more primitive lines of self-defence. One of the easiest, a last-ditch method, is complete mental and physical isolation from the community, and many young schizophrenics elect to do this, living a separate, extremely lonely but hardly independent existence.

(Chapman, 1966a, pp. 6-8)

APPENDIX II

ITEMS DEFINING FRAME OF REFERENCE FOR CASE HISTORY JUDGMENTS

(Kantor, Wallner, & Winder, 1953)

Process Schizophrenia	Reactive Schizophrenia
Birth to the fifth year	
(a) Early psychological trauma	(a) Good psychological history
(b) Physical illness-severe or long	(b) Good physical health
(c) Odd member of family	(c) Normal member of family
Fifth year to adolescence	
(a) Difficulties at school	(a) Well adjusted at school
(b) Family troubles paralleled with sudden changes in patient's behavior	(b) Domestic troubles accompanied by behavior disruptions. Patient "had what it took."
(c) Introverted behavior trends and interests	(c) Extroverted behavior trends interests
(d) History of breakdown of social, physical, mental functioning	(d) History of adequate social, physical mental functioning
(e) Pathological siblings	(e) Normal siblings
(f) Overprotective or rejecting mother. "Momism"	(f) Normally protective, accepting mother
(g) Rejecting father	(g) Accepting father
Adolescence to adulthood	
(a) Lack of heterosexuality	(a) Heterosexual behavior
(b) Insidious, gradual onset of psychosis without pertinent stress	(b) Sudden onset of psychosis; stress present and pertinent. Later onset
(c) Physical aggresion	(c) Verbal aggression
(d) Poor response to treatment	(d) Good response to treatment
(e) Lengthy stay in hospital	(e) Short course in hospital

Adulthood

(a) Massive paranoia	(a) Minor paranoid trends
(b) Little capacity for alcohol	(b) Much capacity for alcohol
(c) No manic-depressive component [Blunting of affect]	(c) Presence of manic-depressive component [Emotionally labile]
(d) Failure under adversity	(d) Success despite adversity
(e) Discrepancy between ability and achievement	(e) Harmony between ability and achievement
(f) Awareness of change in self	(f) No sensation of change
(g) Somatic delusions	(g) Absence of somatic delusions
(h) Clash between culture and environment [Inappropriate behavior for culture]	(h) Harmony between culture and environment [Appropriate behavior for culture]
(i) Loss of decency (nudity, public masturbation, etc.)	(i) Retention of decency

Those who accept a dichotomy of process and reactive schizophrenics adopt the following theoretical position. Schizophrenia is an inherited, organic disease which proceeds inexorably through successive stages of deterioration. The major manifest symptom, formal thought disorder, is present in every case. Onset is insidious, the psychosis developing gradually throughout adolescence and becoming manifest by the twenty-fifth year of life. Prognosis is universally poor, and treatment is virtually useless. Impairment of intellectual functions is inevitable, as is a gradual deterioration of social behavior. Such patients, the true schizophrenics, are regarded as qualitatively different from patients with similar symptoms but acute onset, good premorbid history, and a good prognosis. The later are distinguished by the labels schizophreniform, schizophrenoid, or reactive schizophrenic -- in contrast to the true, nuclear, or process schizophrenic. (Buss, 1966, pp. 219-20)

APPENDIX III

SCHIZOPHRENIA

ACUTE - active psychotic symptoms

MEDICAL
CHRONIC - persistent psychotic features
following attempt at treatment
(e.g., delusions still exist
but otherwise the patient appears
to be functioning)

SOCIAL
CHRONIC - defect of volition
lack of drive for socialization
no active symptoms

Please circle the clinical condition which describes the patient.

Patient's Name: _____

Attending Physician: _____

Date: _____

Return To: J.A. Fellows-Swenson

APPENDIX IV

SUBJECT DATA

Patient/Subject: Hospital/Residence:

Diagnosis/Occupation: Testing Date:

Age:

Sex:

Intelligence/I.Q. Score:

Educational Level Achieved:

Visual Acuity: corrected - uncorrected -

Duration of Hospital Residence:

Previous Training in Art:

Painting Time:

Description of Paintings:

1-

2-

Premorbid Condition:

Patient's File:

Medication:

EXPERIMENTAL DATA
Size Constancy Test

Patient: _____ Score: _____

Distance 7.5m			Distance 15m		
Standard Adjust-ment cm	Patient Adjust-ment cm	Error +- cm	Standard Adjust-ment cm	Patient Adjust-ment cm	Error +- cm
10			7		
15			20		
5			2		
11			18		
6			6		
18			11		
2			5		
14			15		
7			10		
20			16		
4			9		
17			12		
1			8		
13			19		
3			3		
19			13		
8			1		
16			17		
9			4		
12			14		
ERRORS			ERRORS		
MEAN ERROR			MEAN ERROR		
VARIANCE			VARIANCE		

Comments:

EXPERIMENTAL DATA

Distance Constancy Test

Subject: Hospital:

Distances (yards)	Adjusted Distances (inches-yards)	Error (+- yards)
Comments:	Errors	
	Mean Error	

APPENDIX V

Johns Hopkins University Questionnaire

1. Do you require a drink the next morning?
2. Do you prefer to drink alone?
3. Do you lose time from work due to drinking?
4. Is your drinking harming your family in any way?
5. Do you crave a drink at a definite time daily?
6. Do you get the inner shakes unless you continue drinking?
7. Has drinking made you irritable?
8. Does drinking make you careless of your family's welfare?
9. Has drinking changed your personality?
10. Have you harmed your husband or wife since drinking?
11. Does drinking make you restless?
12. Does drinking cause you bodily complaints?
13. Does drinking cause you to have difficulty in sleeping?
14. Has drinking made you more impulsive?
15. Have you less self-control since drinking?
16. Has your initiative decreased since drinking?
17. Has your ambition decreased since drinking?
18. Do you lack preseverance in pursuing a goal since drinking?
19. Do you drink to obtain social ease?
20. Do you drink for self-encouragements?
21. Do you drink to relieve marked feelings of inadequacy?
22. Has your sexual potency suffered since drinking?
23. Do you show marked dislikes and hatreds since drinking?
24. Has your jealousy, in general, increased since drinking?
25. Do you show marked moodiness as a result of drinking?
26. Has your efficiency decreased since drinking?
27. Has your drinking made you more sensitive?
28. Are you harder to get along with since drinking?
29. Do you turn to an inferior environment since drinking?
30. Is drinking endangering your health?
31. Is drinking affecting your piece of mind?
32. Is drinking making your home life unhappy?
33. Is drinking jeopardizing your business?
34. Is drinking clouding your reputation?
35. Is drinking disturbing the harmony of your life?

At the time of drinking: please mark the correct answer...

Daily-one drink__ two drinks__ more than two drinks__

Weekends-one drink__ two drinks__ more than two drinks__

Special Occasions-one drink__ two drinks__ more than two drinks

APPENDIX VI

ALASKA PSYCHIATRIC INSTITUTE
2900 PROVIDENCE AVENUE
ANCHORAGE ALASKA

AUTHORIZATION FOR SPECIAL PROCEDURES

TO: _____
(Patient's Name)

This form is to be used when any API patient is to be involved in research, video taping, voice recording, sleep therapy, barbiturate interviews, aversive techniques, hypnosis, certain induction techniques, psychological tests not meeting the standards of the American Psychological Association, biofeedback, certain experiential therapies and other unusual or conscious altering techniques. Be certain that you fully understand the specific description below. Your signature means that you understand the procedure and agree to participate willingly. The person (therapist/researcher) conducting the procedure with you will sign as proof that the procedure has been reasonably explained to you. The medical staff representative and the Chairman of the Research & Assurance Committee or representative, neither of whom are your therapist, must approve.

Description:

I would like to test your eyes and talk to you about your visual skills. You will, in addition, be involved in a research effort to study perception.

The first section of our time together will include a test composed of a small black rod on a white box; you will be asked to adjust the size of this rod.

The next section deals with creative expression and visual skills. You will be asked to paint for approximately 10 minutes.

The final section will be similar to the first. It will involve the moving of a triangular marker placed at various distances from you.

The tests usually involve about an hour of your time.

Witness	Date	Patient	Date
Medical Staff	Date	Guardian (as applicable)	Date
		Therapist/researcher	Date
		Research & Assurance	Date

Patient Identification:

copy to be filed in medical records

APPENDIX VII

Definitions of the Spatial Structures Outlined in the Rating Scale

Average-Good Representation

Average: The painting represents a landscape, objects, or people in such a way that it is apparent that the individual has had a limited exposure to art training, most likely in the early years of schooling. A primitive or childlike quality may be recognised as characteristic of the painting.

Good: The painting indicates that the artist, in spite of a limited art education, is capable of including appropriate perspective and/or shading in the landscape, objects, or people represented.

All paintings in this category, especially if they represent landscapes or scenes, should indicate an attempt to organise space, with appropriate attention to distance and size.

Emptying Space
Shadowy Figures
Elongation

"The drawings express an emphasis on distance, elongation of objects, and desert-like empty space. The objects become less structured and details become lost. Often landscapes with exaggerated vista effects are painted. Human figures, if they appear at all, are drawn in the barest outline; they are distorted and elongated with little variation in color" (Billig, 1968, p. 2).

Cosmic Destruction

The painting represents an attempt to destroy the entire world; world destruction or "cosmic catastrophe" is the subject of the painting. (Billig, 1966, p. 602)

"X-ray Pictures"

"Painted objects become transparent; surface structure, such as walls of houses, no longer offers any limitations to the viewer." For example, "furniture can be seen through the walls, arranged in various rooms, one piece on top of the other" (Billig, 1968, p. 6).

"Sideview and cross-section, horizontal and vertical views are intermingled" (Billig, 1968, p. 5).

"A 'mixing of perspective directions'" (Billig, 1970, p. 194).

Base Line with Vertical Direction

"The drawings are arranged on a single line...Everything is built up on a single line, usually running horizontally through the lower third of the paper, extending throughout its width" (Billig, 1968, p. 7).

Multidirectional Space

"Disorganized strokes without any particular arrangement or of splotches of color. Splotches may be named arbitrarily...no single direction dominates. Lines may go parallel or criss-cross...in any direction" (Billig, 1968, pp. 8-9).

APPENDIX VIII

0 = none of the following
1 = average-good representation
2 = emptying space/shadowy figures/elongation
3 = cosmic destruction/perseveration
4 = "x-ray pictures"/mixing of planes
5 = base line with vertical direction/ geometric designs
6 = multidirectional space

1 0 1 2 3 4 5 6	21 0 1 2 3 4 5 6	41 0 1 2 3 4 5 6	61 0 1 2 3 4 5 6	81 0 1 2 3 4 5 6
2 0 1 2 3 4 5 6	22 0 1 2 3 4 5 6	42 0 1 2 3 4 5 6	62 0 1 2 3 4 5 6	82 0 1 2 3 4 5 6
3 0 1 2 3 4 5 6	23 0 1 2 3 4 5 6	43 0 1 2 3 4 5 6	63 0 1 2 3 4 5 6	83 0 1 2 3 4 5 6
4 0 1 2 3 4 5 6	24 0 1 2 3 4 5 6	44 0 1 2 3 4 5 6	64 0 1 2 3 4 5 6	84 0 1 2 3 4 5 6
5 0 1 2 3 4 5 6	25 0 1 2 3 4 5 6	45 0 1 2 3 4 5 6	65 0 1 2 3 4 5 6	85 0 1 2 3 4 5 6
6 0 1 2 3 4 5 6	26 0 1 2 3 4 5 6	46 0 1 2 3 4 5 6	66 0 1 2 3 4 5 6	86 0 1 2 3 4 5 6
7 0 1 2 3 4 5 6	27 0 1 2 3 4 5 6	47 0 1 2 3 4 5 6	67 0 1 2 3 4 5 6	87 0 1 2 3 4 5 6
8 0 1 2 3 4 5 6	28 0 1 2 3 4 5 6	48 0 1 2 3 4 5 6	68 0 1 2 3 4 5 6	88 0 1 2 3 4 5 6
9 0 1 2 3 4 5 6	29 0 1 2 3 4 5 6	49 0 1 2 3 4 5 6	69 0 1 2 3 4 5 6	89 0 1 2 3 4 5 6
10 0 1 2 3 4 5 6	30 0 1 2 3 4 5 6	50 0 1 2 3 4 5 6	70 0 1 2 3 4 5 6	90 0 1 2 3 4 5 6
11 0 1 2 3 4 5 6	31 0 1 2 3 4 5 6	51 0 1 2 3 4 5 6	71 0 1 2 3 4 5 6	91 0 1 2 3 4 5 6
12 0 1 2 3 4 5 6	32 0 1 2 3 4 5 6	52 0 1 2 3 4 5 6	72 0 1 2 3 4 5 6	92 0 1 2 3 4 5 6
13 0 1 2 3 4 5 6	33 0 1 2 3 4 5 6	53 0 1 2 3 4 5 6	73 0 1 2 3 4 5 6	93 0 1 2 3 4 5 6
14 0 1 2 3 4 5 6	34 0 1 2 3 4 5 6	54 0 1 2 3 4 5 6	74 0 1 2 3 4 5 6	94 0 1 2 3 4 5 6
15 0 1 2 3 4 5 6	35 0 1 2 3 4 5 6	55 0 1 2 3 4 5 6	75 0 1 2 3 4 5 6	95 0 1 2 3 4 5 6
16 0 1 2 3 4 5 6	36 0 1 2 3 4 5 6	56 0 1 2 3 4 5 6	76 0 1 2 3 4 5 6	96 0 1 2 3 4 5 6
17 0 1 2 3 4 5 6	37 0 1 2 3 4 5 6	57 0 1 2 3 4 5 6	77 0 1 2 3 4 5 6	97 0 1 2 3 4 5 6
18 0 1 2 3 4 5 6	38 0 1 2 3 4 5 6	58 0 1 2 3 4 5 6	78 0 1 2 3 4 5 6	98 0 1 2 3 4 5 6
19 0 1 2 3 4 5 6	39 0 1 2 3 4 5 6	59 0 1 2 3 4 5 6	79 0 1 2 3 4 5 6	99 0 1 2 3 4 5 6
20 0 1 2 3 4 5 6	40 0 1 2 3 4 5 6	60 0 1 2 3 4 5 6	80 0 1 2 3 4 5 6	100 0 1 2 3 4 5 6

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6 = multidirectional space

101 0 1 2 3 4 5 6	121 0 1 2 3 4 5 6	141 0 1 2 3 4 5 6	161 0 1 2 3 4 5 6	181 0 1 2 3 4 5 6
102 0 1 2 3 4 5 6	122 0 1 2 3 4 5 6	142 0 1 2 3 4 5 6	162 0 1 2 3 4 5 6	182 0 1 2 3 4 5 6
103 0 1 2 3 4 5 6	123 0 1 2 3 4 5 6	143 0 1 2 3 4 5 6	163 0 1 2 3 4 5 6	183 0 1 2 3 4 5 6
104 0 1 2 3 4 5 6	124 0 1 2 3 4 5 6	144 0 1 2 3 4 5 6	164 0 1 2 3 4 5 6	184 0 1 2 3 4 5 6
105 0 1 2 3 4 5 6	125 0 1 2 3 4 5 6	145 0 1 2 3 4 5 6	165 0 1 2 3 4 5 6	185 0 1 2 3 4 5 6
106 0 1 2 3 4 5 6	126 0 1 2 3 4 5 6	146 0 1 2 3 4 5 6	166 0 1 2 3 4 5 6	186 0 1 2 3 4 5 6
107 0 1 2 3 4 5 6	127 0 1 2 3 4 5 6	147 0 1 2 3 4 5 6	167 0 1 2 3 4 5 6	187 0 1 2 3 4 5 6
108 0 1 2 3 4 5 6	128 0 1 2 3 4 5 6	148 0 1 2 3 4 5 6	168 0 1 2 3 4 5 6	188 0 1 2 3 4 5 6
109 0 1 2 3 4 5 6	129 0 1 2 3 4 5 6	149 0 1 2 3 4 5 6	169 0 1 2 3 4 5 6	189 0 1 2 3 4 5 6
110 0 1 2 3 4 5 6	130 0 1 2 3 4 5 6	150 0 1 2 3 4 5 6	170 0 1 2 3 4 5 6	190 0 1 2 3 4 5 6
111 0 1 2 3 4 5 6	131 0 1 2 3 4 5 6	151 0 1 2 3 4 5 6	171 0 1 2 3 4 5 6	191 0 1 2 3 4 5 6
112 0 1 2 3 4 5 6	132 0 1 2 3 4 5 6	152 0 1 2 3 4 5 6	172 0 1 2 3 4 5 6	192 0 1 2 3 4 5 6
113 0 1 2 3 4 5 6	133 0 1 2 3 4 5 6	153 0 1 2 3 4 5 6	173 0 1 2 3 4 5 6	193 0 1 2 3 4 5 6
114 0 1 2 3 4 5 6	134 0 1 2 3 4 5 6	154 0 1 2 3 4 5 6	174 0 1 2 3 4 5 6	194 0 1 2 3 4 5 6
115 0 1 2 3 4 5 6	135 0 1 2 3 4 5 6	155 0 1 2 3 4 5 6	175 0 1 2 3 4 5 6	195 0 1 2 3 4 5 6
116 0 1 2 3 4 5 6	136 0 1 2 3 4 5 6	156 0 1 2 3 4 5 6	176 0 1 2 3 4 5 6	196 0 1 2 3 4 5 6
117 0 1 2 3 4 5 6	137 0 1 2 3 4 5 6	157 0 1 2 3 4 5 6	177 0 1 2 3 4 5 6	197 0 1 2 3 4 5 6
118 0 1 2 3 4 5 6	138 0 1 2 3 4 5 6	158 0 1 2 3 4 5 6	178 0 1 2 3 4 5 6	198 0 1 2 3 4 5 6
119 0 1 2 3 4 5 6	139 0 1 2 3 4 5 6	159 0 1 2 3 4 5 6	179 0 1 2 3 4 5 6	199 0 1 2 3 4 5 6
120 0 1 2 3 4 5 6	140 0 1 2 3 4 5 6	160 0 1 2 3 4 5 6	180 0 1 2 3 4 5 6	200 0 1 2 3 4 5 6

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201	0 1 2 3 4 5 6	221	0 1 2 3 4 5 6	241	0 1 2 3 4 5 6	261	0 1 2 3 4 5 6	281	0 1 2 3 4 5 6
202	0 1 2 3 4 5 6	222	0 1 2 3 4 5 6	242	0 1 2 3 4 5 6	262	0 1 2 3 4 5 6	282	0 1 2 3 4 5 6
203	0 1 2 3 4 5 6	223	0 1 2 3 4 5 6	243	0 1 2 3 4 5 6	263	0 1 2 3 4 5 6	283	0 1 2 3 4 5 6
204	0 1 2 3 4 5 6	224	0 1 2 3 4 5 6	244	0 1 2 3 4 5 6	264	0 1 2 3 4 5 6	284	0 1 2 3 4 5 6
205	0 1 2 3 4 5 6	225	0 1 2 3 4 5 6	245	0 1 2 3 4 5 6	265	0 1 2 3 4 5 6	285	0 1 2 3 4 5 6
206	0 1 2 3 4 5 6	226	0 1 2 3 4 5 6	246	0 1 2 3 4 5 6	266	0 1 2 3 4 5 6	286	0 1 2 3 4 5 6
207	0 1 2 3 4 5 6	227	0 1 2 3 4 5 6	247	0 1 2 3 4 5 6	267	0 1 2 3 4 5 6	287	0 1 2 3 4 5 6
208	0 1 2 3 4 5 6	228	0 1 2 3 4 5 6	248	0 1 2 3 4 5 6	268	0 1 2 3 4 5 6	288	0 1 2 3 4 5 6
209	0 1 2 3 4 5 6	229	0 1 2 3 4 5 6	249	0 1 2 3 4 5 6	269	0 1 2 3 4 5 6	289	0 1 2 3 4 5 6
210	0 1 2 3 4 5 6	230	0 1 2 3 4 5 6	250	0 1 2 3 4 5 6	270	0 1 2 3 4 5 6	290	0 1 2 3 4 5 6
211	0 1 2 3 4 5 6	231	0 1 2 3 4 5 6	251	0 1 2 3 4 5 6	271	0 1 2 3 4 5 6	291	0 1 2 3 4 5 6
212	0 1 2 3 4 5 6	232	0 1 2 3 4 5 6	252	0 1 2 3 4 5 6	272	0 1 2 3 4 5 6	292	0 1 2 3 4 5 6
213	0 1 2 3 4 5 6	233	0 1 2 3 4 5 6	253	0 1 2 3 4 5 6	273	0 1 2 3 4 5 6	293	0 1 2 3 4 5 6
214	0 1 2 3 4 5 6	234	0 1 2 3 4 5 6	254	0 1 2 3 4 5 6	274	0 1 2 3 4 5 6	294	0 1 2 3 4 5 6
215	0 1 2 3 4 5 6	235	0 1 2 3 4 5 6	255	0 1 2 3 4 5 6	275	0 1 2 3 4 5 6	295	0 1 2 3 4 5 6
216	0 1 2 3 4 5 6	236	0 1 2 3 4 5 6	256	0 1 2 3 4 5 6	276	0 1 2 3 4 5 6	296	0 1 2 3 4 5 6
217	0 1 2 3 4 5 6	237	0 1 2 3 4 5 6	257	0 1 2 3 4 5 6	277	0 1 2 3 4 5 6	297	0 1 2 3 4 5 6
218	0 1 2 3 4 5 6	238	0 1 2 3 4 5 6	258	0 1 2 3 4 5 6	278	0 1 2 3 4 5 6	298	0 1 2 3 4 5 6
219	0 1 2 3 4 5 6	239	0 1 2 3 4 5 6	259	0 1 2 3 4 5 6	279	0 1 2 3 4 5 6	299	0 1 2 3 4 5 6
220	0 1 2 3 4 5 6	240	0 1 2 3 4 5 6	260	0 1 2 3 4 5 6	280	0 1 2 3 4 5 6	300	0 1 2 3 4 5 6

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301 0 1 2 3 4 5 6	321 0 1 2 3 4 5 6	341 0 1 2 3 4 5 6	361 0 1 2 3 4 5 6	381 0 1 2 3 4 5 6
302 0 1 2 3 4 5 6	322 0 1 2 3 4 5 6	342 0 1 2 3 4 5 6	362 0 1 2 3 4 5 6	382 0 1 2 3 4 5 6
303 0 1 2 3 4 5 6	323 0 1 2 3 4 5 6	343 0 1 2 3 4 5 6	363 0 1 2 3 4 5 6	383 0 1 2 3 4 5 6
304 0 1 2 3 4 5 6	324 0 1 2 3 4 5 6	344 0 1 2 3 4 5 6	364 0 1 2 3 4 5 6	384 0 1 2 3 4 5 6
305 0 1 2 3 4 5 6	325 0 1 2 3 4 5 6	345 0 1 2 3 4 5 6	365 0 1 2 3 4 5 6	385 0 1 2 3 4 5 6
306 0 1 2 3 4 5 6	326 0 1 2 3 4 5 6	346 0 1 2 3 4 5 6	366 0 1 2 3 4 5 6	386 0 1 2 3 4 5 6
307 0 1 2 3 4 5 6	327 0 1 2 3 4 5 6	347 0 1 2 3 4 5 6	367 0 1 2 3 4 5 6	387 0 1 2 3 4 5 6
308 0 1 2 3 4 5 6	328 0 1 2 3 4 5 6	348 0 1 2 3 4 5 6	368 0 1 2 3 4 5 6	388 0 1 2 3 4 5 6
309 0 1 2 3 4 5 6	329 0 1 2 3 4 5 6	349 0 1 2 3 4 5 6	369 0 1 2 3 4 5 6	389 0 1 2 3 4 5 6
310 0 1 2 3 4 5 6	330 0 1 2 3 4 5 6	350 0 1 2 3 4 5 6	370 0 1 2 3 4 5 6	390 0 1 2 3 4 5 6
311 0 1 2 3 4 5 6	331 0 1 2 3 4 5 6	351 0 1 2 3 4 5 6	371 0 1 2 3 4 5 6	391 0 1 2 3 4 5 6
312 0 1 2 3 4 5 6	332 0 1 2 3 4 5 6	352 0 1 2 3 4 5 6	372 0 1 2 3 4 5 6	392 0 1 2 3 4 5 6
313 0 1 2 3 4 5 6	333 0 1 2 3 4 5 6	353 0 1 2 3 4 5 6	373 0 1 2 3 4 5 6	393 0 1 2 3 4 5 6
314 0 1 2 3 4 5 6	334 0 1 2 3 4 5 6	354 0 1 2 3 4 5 6	374 0 1 2 3 4 5 6	394 0 1 2 3 4 5 6
315 0 1 2 3 4 5 6	335 0 1 2 3 4 5 6	355 0 1 2 3 4 5 6	375 0 1 2 3 4 5 6	395 0 1 2 3 4 5 6
316 0 1 2 3 4 5 6	336 0 1 2 3 4 5 6	356 0 1 2 3 4 5 6	376 0 1 2 3 4 5 6	396 0 1 2 3 4 5 6
317 0 1 2 3 4 5 6	337 0 1 2 3 4 5 6	357 0 1 2 3 4 5 6	377 0 1 2 3 4 5 6	397 0 1 2 3 4 5 6
318 0 1 2 3 4 5 6	338 0 1 2 3 4 5 6	358 0 1 2 3 4 5 6	378 0 1 2 3 4 5 6	398 0 1 2 3 4 5 6
319 0 1 2 3 4 5 6	339 0 1 2 3 4 5 6	359 0 1 2 3 4 5 6	379 0 1 2 3 4 5 6	399 0 1 2 3 4 5 6
320 0 1 2 3 4 5 6	340 0 1 2 3 4 5 6	360 0 1 2 3 4 5 6	380 0 1 2 3 4 5 6	400 0 1 2 3 4 5 6

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401	0 1 2 3 4 5 6	421	0 1 2 3 4 5 6	441	0 1 2 3 4 5 6	461	0 1 2 3 4 5 6	481	0 1 2 3 4 5 6
402	0 1 2 3 4 5 6	422	0 1 2 3 4 5 6	442	0 1 2 3 4 5 6	462	0 1 2 3 4 5 6	482	0 1 2 3 4 5 6
403	0 1 2 3 4 5 6	423	0 1 2 3 4 5 6	443	0 1 2 3 4 5 6	463	0 1 2 3 4 5 6	483	0 1 2 3 4 5 6
404	0 1 2 3 4 5 6	424	0 1 2 3 4 5 6	444	0 1 2 3 4 5 6	464	0 1 2 3 4 5 6	484	0 1 2 3 4 5 6
405	0 1 2 3 4 5 6	425	0 1 2 3 4 5 6	445	0 1 2 3 4 5 6	465	0 1 2 3 4 5 6	485	0 1 2 3 4 5 6
406	0 1 2 3 4 5 6	426	0 1 2 3 4 5 6	446	0 1 2 3 4 5 6	466	0 1 2 3 4 5 6	486	0 1 2 3 4 5 6
407	0 1 2 3 4 5 6	427	0 1 2 3 4 5 6	447	0 1 2 3 4 5 6	467	0 1 2 3 4 5 6	487	0 1 2 3 4 5 6
408	0 1 2 3 4 5 6	428	0 1 2 3 4 5 6	448	0 1 2 3 4 5 6	468	0 1 2 3 4 5 6	488	0 1 2 3 4 5 6
409	0 1 2 3 4 5 6	429	0 1 2 3 4 5 6	449	0 1 2 3 4 5 6	469	0 1 2 3 4 5 6	489	0 1 2 3 4 5 6
410	0 1 2 3 4 5 6	430	0 1 2 3 4 5 6	450	0 1 2 3 4 5 6	470	0 1 2 3 4 5 6	490	0 1 2 3 4 5 6
411	0 1 2 3 4 5 6	431	0 1 2 3 4 5 6	451	0 1 2 3 4 5 6	471	0 1 2 3 4 5 6	491	0 1 2 3 4 5 6
412	0 1 2 3 4 5 6	432	0 1 2 3 4 5 6	452	0 1 2 3 4 5 6	472	0 1 2 3 4 5 6	492	0 1 2 3 4 5 6
413	0 1 2 3 4 5 6	433	0 1 2 3 4 5 6	453	0 1 2 3 4 5 6	473	0 1 2 3 4 5 6	493	0 1 2 3 4 5 6
414	0 1 2 3 4 5 6	434	0 1 2 3 4 5 6	454	0 1 2 3 4 5 6	474	0 1 2 3 4 5 6	494	0 1 2 3 4 5 6
415	0 1 2 3 4 5 6	435	0 1 2 3 4 5 6	455	0 1 2 3 4 5 6	475	0 1 2 3 4 5 6	495	0 1 2 3 4 5 6
416	0 1 2 3 4 5 6	436	0 1 2 3 4 5 6	456	0 1 2 3 4 5 6	476	0 1 2 3 4 5 6	496	0 1 2 3 4 5 6
417	0 1 2 3 4 5 6	437	0 1 2 3 4 5 6	457	0 1 2 3 4 5 6	477	0 1 2 3 4 5 6	497	0 1 2 3 4 5 6
418	0 1 2 3 4 5 6	438	0 1 2 3 4 5 6	458	0 1 2 3 4 5 6	478	0 1 2 3 4 5 6	498	0 1 2 3 4 5 6
419	0 1 2 3 4 5 6	439	0 1 2 3 4 5 6	459	0 1 2 3 4 5 6	479	0 1 2 3 4 5 6	499	0 1 2 3 4 5 6
420	0 1 2 3 4 5 6	440	0 1 2 3 4 5 6	460	0 1 2 3 4 5 6	480	0 1 2 3 4 5 6	500	0 1 2 3 4 5 6

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501	0	1	2	3	4	5	6		
502	0	1	2	3	4	5	6		
503	0	1	2	3	4	5	6		
504	0	1	2	3	4	5	6		
505	0	1	2	3	4	5	6		
506	0	1	2	3	4	5	6		
507	0	1	2	3	4	5	6		
508	0	1	2	3	4	5	6		

APPENDIX IX

Table XXXI

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Scottish Control Subjects

Judges	Ratings $\leq$ median [0+1]	Ratings $>$ median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	43	7	.1400	.6098	.7809
Structured paintings	39	11	.2200		
	82	18			
2. Unstructured paintings	39	11	.2200	1.7484	1.3223
Structured paintings	32	18	.3600		
	71	29			
3. Unstructured paintings	41	9	.1800	.0744	.2728
Structured paintings	43	7	.1400		
	84	16			
4. Unstructured paintings	45	5	.1000	.6144	.7838
Structured paintings	48	2	.0400		
	93	7			

$z = 1.5799 = 1.58$ $\quad p > .05$

Table XXXII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Scottish Schizophrenic Subjects

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	37	13	.2600	1.6282	1.2760
Structured paintings	30	20	.4000		
	67	33			
2. Unstructured paintings	33	17	.3400	2.6112	1.6159
Structured paintings	24	26	.5200		
	57	43			
3. Unstructured paintings	38	12	.2400	.0000	.0000
Structured paintings	39	11	.2200		
	77	23			
4. Unstructured paintings	40	10	.2000	.6696	.8183
Structured paintings	44	6	.1200		
	84	16			

$Z = 1.8551 = 1.86$ $p < .05$

Table XXXIII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Scottish Alcoholic Subjects

Judges	Ratings < median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	26	4	.1333	.0000	.0000
Structured paintings	27	3	.1000		
	53	7			
2. Unstructured paintings	19	11	.3667	.0750	.2739
Structured paintings	21	9	.3000		
	40	20			
3. Unstructured paintings	23	7	.2333	.1042	.3228
Structured paintings	25	5	.1667		
	48	12			
4. Unstructured paintings	28	2	.0667	.0000	.0000
Structured paintings	29	1	.0333		
	57	3			

$z = .2984 = .30$ $p > .05$

Table XXXIV

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Eskimo Control Subjects

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	41	9	.1800	.3137	.5601
Structured paintings	44	6	.1200		
	85	15			
2. Unstructured paintings	31	19	.3800	1.6830	1.2973
Structured paintings	38	12	.2400		
	69	31			
3. Unstructured paintings	42	8	.1600	1.6343	1.2784
Structured paintings	47	3	.0600		
	89	11			
4. Unstructured paintings	49	1	.0200	.8421	.9177
Structured paintings	46	4	.0800		
	95	5			

$Z = 2.0268 = 2.03$ $p < .05$

Table XXXV

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Eskimo Schizophrenic Subjects

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	40	4	.0909	.4156	.6447
Structured paintings	37	7	.1591		
	77	11			
2. Unstructured paintings	30	14	.3182	1.7078	1.3068
Structured paintings	23	21	.4773		
	53	35			
3. Unstructured paintings	38	6	.1364	.0000	.0000
Structured paintings	39	5	.1136		
	77	11			
4. Unstructured paintings	42	2	.0455	.0000	.0000
Structured paintings	41	3	.0682		
	83	5			

$Z = .9758 = .98$ $p > .05$

Table XXXVI

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured and Structured Painting Tasks

Eskimo Alcoholic Subjects

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Unstructured paintings	25	5	.1667	.0000	.0000
Structured paintings	24	6	.2000		
	49	11			
2. Unstructured paintings	18	12	.4000	.0718	.2680
Structured paintings	20	10	.3333		
	38	22			
3. Unstructured paintings	22	8	.2667	.9375	.9682
Structured paintings	26	4	.1538		
	48	12			
4. Unstructured paintings	22	8	.2667	1.7811	1.3346
Structured paintings	27	3	.1000		
	49	11			

$z = 1.2854 = 1.29$ $p > .05$

Table XXXVII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Controls and Scottish Schizophrenics

Judges	Ratings $\leq$ median [0+1]	Ratings $>$ median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish controls	43	7	.1400	1.5625	1.2500
Scottish schizophrenics	37	13	.2600		
	80	20			
2. Scottish controls	39	11	.2200	1.2401	1.1136
Scottish schizophrenics	33	17	.3400		
	72	28			
3. Scottish controls	41	9	.1800	.2411	.4910
Scottish schizophrenics	38	12	.2400		
	79	21			
4. Scottish controls	45	5	.1000	1.2549	1.1202
Scottish schizophrenics	40	10	.2000		
	85	15			

$z = 1.9874 = 1.99$ $p < .05$

Table XXXVIII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Controls and Scottish Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish controls	43	7	.1400	.0632	.2514
Scottish alcoholics	26	4	.1333		
	69	11			
2. Scottish controls	39	11	.2200	1.3542	1.1637
Scottish alcoholics	19	11	.3667		
	58	22			
3. Scottish controls	41	9	.1800	.0833	.2886
Scottish alcoholics	23	7	.2333		
	64	16			
4. Scottish controls	45	5	.1000	.0104	.1020
Scottish alcoholics	28	2	.0667		
	73	7			

Z = .9029 = .90 $p > .05$

Table XXXIX

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Controls and Eskimo Controls

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish controls	43	7	.1400	.0744	.2728
Eskimo controls	41	9	.1800		
	84	16			
2. Scottish controls	39	11	.2200	2.3333	1.5275
Eskimo controls	31	19	.3800		
	70	30			
3. Scottish controls	41	9	.1800	.0000	.0000
Eskimo controls	42	8	.1600		
	83	17			
4. Scottish controls	45	5	.1000	1.5957	1.2632
Eskimo controls	49	1	.0200		
	94	6			

z = 1.5318 = 1.53 $p > .05$

Table XL

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Schizophrenics and Scottish Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish schizophrenics	37	13	.2600	1.1204	1.0585
Scottish alcoholics	26	4	.1333		
	63	17			
2. Scottish schizophrenics	33	17	.3400	.0000	.0000
Scottish alcoholics	19	11	.3667		
	52	28			
3. Scottish schizophrenics	38	12	.2400	.0414	.2035
Scottish alcoholics	23	7	.2333		
	61	19			
4. Scottish schizophrenics	40	10	.2000	1.6732	1.2935
Scottish alcoholics	28	2	.0667		
	68	12			

$Z = 1.2778 = 1.28$ $p > .05$

Table XLI

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Schizophrenics and Eskimo Schizophrenics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish schizophrenics	37	13	.2600	3.4477	1.8568
Eskimo schizophrenics	40	4	.0909		
	77	17			
2. Scottish schizophrenics	33	17	.3400	.0000	.0000
Eskimo schizophrenics	30	14	.3182		
	63	31			
3. Scottish schizophrenics	38	12	.2400	1.0232	1.0115
Eskimo schizophrenics	38	6	.1364		
	76	18			
4. Scottish schizophrenics	40	10	.2000	3.7277	1.9307
Eskimo schizophrenics	42	2	.0455		
	82	12			

$Z = 2.3995 = 2.40$ $p < .01$

Table XLII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Scottish Alcoholics and Eskimo Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish alcoholics	26	4	.1333	.0000	.0000
Eskimo alcoholics	25	5	.1667		
	51	9			
2. Scottish alcoholics	19	11	.3667	.0000	.0000
Eskimo alcoholics	18	12	.4000		
	37	23			
3. Scottish alcoholics	23	7	.2333	.0000	.0000
Eskimo alcoholics	22	8	.2667		
	45	15			
4. Scottish alcoholics	28	2	.0667	3.0000	1.7321
Eskimo alcoholics	22	8	.2667		
	50	10			

$z = .8661 = .87$ $p > .05$

Table XLIII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Eskimo Controls and Eskimo Schizophrenics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Eskimo controls	41	9	.1800	.9008	.9491
Eskimo schizophrenics	40	4	.0909		
	81	13			
2. Eskimo controls	31	19	.3800	.1681	.4100
Eskimo schizophrenics	30	14	.3182		
	61	33			
3. Eskimo controls	42	8	.1600	.0010	.0316
Eskimo schizophrenics	38	6	.1364		
	80	14			
4. Eskimo controls	49	1	.0200	.0127	.1127
Eskimo schizophrenics	42	2	.0455		
	91	3			

$Z = .7517 = .75$ $p > .05$

Table XLIV

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Eskimo Controls and Eskimo Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Eskimo controls	41	9	.1800	.0231	.1520
Eskimo alcoholics	25	5	.1667		
	66	14			
2. Eskimo controls	31	19	.3800	.0040	.0632
Eskimo alcoholics	18	12	.4000		
	49	31			
3. Eskimo controls	42	8	.1600	.7500	.8660
Eskimo alcoholics	22	8	.2667		
	64	16			
4. Eskimo controls	49	1	.0200	9.0892	3.0148
Eskimo alcoholics	22	8	.2667		
	71	9			

$Z = 2.0480 = 2.05$ $p < .05$

Table XLV

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Unstructured Painting Task

Eskimo Schizophrenics and Eskimo Alcoholics

Judges	Ratings < median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Eskimo schizophrenics	40	4	.0909	.3803	.6167
Eskimo alcoholics	25	5	.1667		
	65	9			
2. Eskimo schizophrenics	30	14	.3182	.2264	.4758
Eskimo alcoholics	18	12	.4000		
	48	26			
3. Eskimo schizophrenics	38	6	.1364	1.2163	1.1029
Eskimo alcoholics	22	8	.2667		
	60	14			
4. Eskimo schizophrenics	42	2	.0455	5.6958	2.3866
Eskimo alcoholics	22	8	.2667		
	64	10			

$Z = 2.2910 = 2.30$ $p < .05$

Table XLVI

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Controls and Scottish Schizophrenics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	$\sqrt{\chi}$
1. Scottish controls	39	11	.2200	2.9921	1.7298
Scottish schizophrenics	30	20	.4000		
	69	31			
2. Scottish controls	32	18	.3600	1.9886	1.4102
Scottish schizophrenics	24	26	.5200		
	56	44			
3. Scottish controls	43	7	.1400	.6098	.7809
Scottish schizophrenics	39	11	.2200		
	82	18			
4. Scottish controls	48	2	.0400	1.2228	1.1058
Scottish schizophrenics	44	6	.1200		
	92	8			

$z = 2.5134 = 2.51$ $\quad p < .01$

Table XLVII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Controls and Scottish Alcoholics

Judges	Ratings $\leq$ median [0+1]	Ratings $>$ median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish controls	39	11	.2200	1.1313	1.0636
Scottish alcoholics	27	3	.1000		
	66	14			
2. Scottish controls	32	18	.3600	.0932	.3053
Scottish alcoholics	21	9	.3000		
	53	27			
3. Scottish controls	43	7	.1400	.0000	.0000
Scottish alcoholics	25	5	.1667		
	68	12			
4. Scottish controls	48	2	.0400	.2078	.4559
Scottish alcoholics	29	1	.0333		
	77	3			

$Z = .9124 = .91$ $p > .05$

Table XLVIII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Controls and Eskimo Controls

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish controls	39	11	.2200	1.1339	1.0648
Eskimo controls	44	6	.1200		
	83	17			
2. Scottish controls	32	18	.3600	1.1905	1.0911
Eskimo controls	38	12	.2400		
	70	30			
3. Scottish controls	43	7	.1400	1.0000	1.0000
Eskimo controls	47	3	.0600		
	90	10			
4. Scottish controls	48	2	.0400	.1773	.4211
Eskimo controls	46	4	.0800		
	94	6			

$Z = 1.7885 = 1.79$ $p < .05$

Table XLIX

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Schizophrenics and Scottish Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish schizophrenics	30	20	.4000	6.8385	2.6151
Scottish alcoholics	27	3	.1000		
	57	23			
2. Scottish schizophrenics	24	26	.5200	2.8478	1.6875
Scottish alcoholics	21	9	.3000		
	45	35			
3. Scottish schizophrenics	39	11	.2200	.0833	.2886
Scottish alcoholics	25	5	.1667		
	64	16			
4. Scottish schizophrenics	44	6	.1200	.8454	.9195
Scottish alcoholics	29	1	.0333		
	73	7			

$Z = 2.7554 = 2.76$ $p < .01$

Table L

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Schizophrenics and Eskimo Schizophrenics

Judges	Ratings < median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	$\sqrt{\chi}$
1. Scottish schizophrenics	30	20	.4000	5.5101	2.3474
Eskimo schizophrenics	37	7	.1591		
	67	27			
2. Scottish schizophrenics	24	26	.5200	.0427	.2066
Eskimo schizophrenics	23	21	.4773		
	47	47			
3. Scottish schizophrenics	39	11	.2200	1.1972	1.0942
Eskimo schizophrenics	39	5	.1136		
	78	16			
4. Scottish schizophrenics	44	6	.1200	.2507	.5007
Eskimo schizophrenics	41	3	.0682		
	85	9			

$Z = 2.0745 = 2.07$ $p < .05$

Table LI

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Scottish Alcoholics and Eskimo Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Scottish alcoholics	27	3	.1000	.3077	.5547
Eskimo alcoholics	24	6	.2000		
	51	9			
2. Scottish alcoholics	21	9	.3000	.0000	.0000
Eskimo alcoholics	20	10	.3333		
	41	19			
3. Scottish alcoholics	25	5	.1667	.0000	.0000
Eskimo alcoholics	26	4	.1333		
	51	9			
4. Scottish alcoholics	29	1	.0333	.2679	.5176
Eskimo alcoholics	27	3	.1000		
	56	4			

$Z = .5362 = .54$ $p > .05$

Table LII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Eskimo Controls and Eskimo Schizophrenics

Judges	Ratings < median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	λ
1. Eskimo controls	44	6	.1200	.0617	.2484
Eskimo schizophrenics	37	7	.1591		
	81	13			
2. Eskimo controls	38	12	.2400	4.7890	2.1884
Eskimo schizophrenics	23	21	.4773		
	61	33			
3. Eskimo controls	47	3	.0600	.3131	.5596
Eskimo schizophrenics	39	5	.1136		
	86	8			
4. Eskimo controls	46	4	.0800	.0309	.1758
Eskimo schizophrenics	41	3	.0682		
	87	7			

$Z = 1.5861 = 1.59$ $p > .05$

Table LIII

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Eskimo Controls and Eskimo Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	χ
1. Eskimo controls	44	6	.1200	.4183	.6468
Eskimo alcoholics	24	6	.2000		
	68	12			
2. Eskimo controls	38	12	.2400	.4180	.6465
Eskimo alcoholics	20	10	.3333		
	58	22			
3. Eskimo controls	47	3	.0600	.5114	.7151
Eskimo alcoholics	26	4	.1333		
	73	7			
4. Eskimo controls	46	4	.0800	.0104	.1020
Eskimo alcoholics	27	3	.1000		
	73	7			

$Z = 1.0552 = 1.06$ $p > .05$

Table LIV

Differences between the [0+1] and [2-6] Spatial Structure Ratings by the Four Judges for the Structured Painting Task

Eskimo Schizophrenics and Eskimo Alcoholics

Judges	Ratings ≤ median [0+1]	Ratings > median [2-6]	Proportion of ratings exceeding the median	χ^2	γ
1. Eskimo schizophrenics	37	7	.1591	.0204	.1428
Eskimo alcoholics	24	6	.2000		
	61	13			
2. Eskimo schizophrenics	23	21	.4773	.9845	.9922
Eskimo alcoholics	20	10	.3333		
	43	31			
3. Eskimo schizophrenics	39	5	.1136	.0116	.1077
Eskimo alcoholics	26	4	.1333		
	65	9			
4. Eskimo schizophrenics	41	3	.0682	.0034	.0583
Eskimo alcoholics	27	3	.1000		
	68	6			

$Z = .6505 = .65$ $p > .05$

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