

LITERALISM AND ANIMISM IN SCHIZOPHRENIA

by

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This study is dedicated to my wife and daughter.

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I. INTRODUCTION

A. Statement of the Problem

Although the extensive literature on schizophrenia includes papers which are concerned with etiological considerations, and with experimental studies of language and thought and thought disorder, relatively little has been done in the area of literalism in schizophrenia. The studies in the latter area have usually dealt with literalism in schizophrenia as it is manifested in the interpretation of proverbs. The literature in general does include, on the other hand, numerous considerations of the so-called physiognomic and animistic qualities of schizophrenic thinking.

The purpose of the present investigation is to examine the behavior of a group of chronic schizophrenics and of two control groups in a set of situations which seem especially suited to elicit literal and/or animistic responses. An attempt is made to test the hypothesis that chronic schizophrenics have a literal approach to the world.

B. Examples of Literalism in Chronic Schizophrenia

Regardless of etiological preconceptions concerning schizophrenia, it seems to be a state which seriously disturbs interpersonal relationships. The observation of schizophrenics, especially chronic schizophrenics, suggests the hypothesis that they have erected a superstructure of symptoms which are directed towards maintaining them in a state of withdrawal, inactivity, or relaxation; and that the maintenance of this state requires a minimization of interpersonal contact.

Observation also indicates that one way in which chronic schizophrenics minimize interpersonal contact is by the misperception or distortion of the meanings of others. In certain cases, this distortion takes the form of extreme literalism; that is, the literal content of a speaker's words is responded to, rather than the meaning "behind" the speaker's words. This response is, therefore, not directed towards the social situation implied by the speaker's words. The restriction to literalism is tantamount to not entering the required interpersonal relationship, and equivalent to making the minimum necessary contact with the other person. The context of these instances makes it clear that such literalism tends to preclude adequate interaction and communication.

Such literalism can be seen in a variety of situations. For example, a chronic schizophrenic is brought to a staff conference and the interviewer asks him, "How did you come to get here?" The patient responds to this question by stating that he was sitting on his bed, that an aide entered the ward, that the aide took him down the hall, that he was brought into the room, and that he then sat down. It is obvious that the patient and interviewer are not in the same realm of discourse. The patient has responded to the literal meaning of the question and has described his activities in terms of how it developed that he is now sitting in the chair opposite the interviewer. This is not the meaning which the interviewer's question implies, nor is it the meaning which nonschizophrenic patients usually deal with in the context of a hospital staff conference. Rather, the interviewer and nonschizophrenic patient both understand that what is wanted is a general statement about the patient's illness and the circumstances which brought him to the hospital, and so on.

Another illustration of literalism in chronic schizophrenia is seen in a patient's reply to the following item from a Sentence Completion test:

(When told to remain in his place, Henry _____)- "remained standing." This item usually elicits answers, such as "became angry," which leave no doubt that the subject has responded to the question in terms of its interpersonal meaning, namely, that one person has told another to remain within certain psychological boundaries. However, the response given above reveals that the patient has interpreted the item in terms of its literal meaning, that is, in terms of "Henry's" relation to physical space; the effect is that the patient does not deal with the interpersonal ramifications of the question.

Benjamin's study (2) contains illustrations of another form of literalism in schizophrenia in general. He carefully explored schizophrenics' interpretation of proverbs, and found that they tended to give the literal meanings of the proverbs and were unable to provide the more usual, figurative meanings. Benjamin was interested in studying so-called formal thought disorder in schizophrenia, and did not relate literalism in schizophrenia to any particular theoretical framework, in the sense of attempting to discover the function literalism serves in schizophrenia.

Literalism in schizophrenia, then, may be observed in a variety of situations such as psychiatric interviewing, sentence completion, and the interpretation of proverbs. These situations have in common the fact that written or spoken language is the primary stimulus, and the fact that literalism effectively negates interpersonal meaning in the first two cases, and the broader, more figurative (and interpersonal) meanings in the last.

An attempt will be made in this study to find tasks in which the stimuli are not essentially in the form of verbal symbols and which will permit either literal or animistic interpretations. The hope is that such tasks will provide the answers to some questions concerning the extensiveness of literalism in schizophrenia and will also afford a means of evaluating the often-made contention that the schizophrenic's perceptual-cognitive processes tend to

be animistic.

C. The Literal-Animistic Dimension

In this section, some of the literature on literalism in schizophrenia will be mentioned; then literalism will be further described and differentiated from concretism. Then some of the studies on the occurrence of animism in different groups will be described; an attempt will be made to distinguish the animistic from the physiognomic; and several investigators will be mentioned who have referred to the physiognomic and/or animistic qualities of schizophrenic thinking. Finally, the literal-animistic dimension will be related to the potentiality for interpersonal inaction or action.

1. Literalism in Schizophrenia

In the literature, there are numerous studies which have shown that schizophrenics interpret proverbs and fables literally. The study by Benjamin (2) has already been mentioned. Wegrocki (33) mentions the schizophrenics' literal interpretation of proverbs. He found that schizophrenics tended to use superficial criteria in matching proverbs, and he viewed proverb interpretation as involving the function of generalization. Levin (20, 21) gives examples of the literal use of words and sayings in schizophrenia. Hadlich (12) found that schizophrenics tend not to understand proverbs and that the relationships among words and phrases are disturbed. Hanfmann and Kasanin (13) state that Zeigarnik (37) found that organics and schizophrenics both were unable to apprehend the figurative meaning of proverbs.

The above by no means exhausts the literature on literalism in schizophrenia, but it is representative of the fact that these studies have utilized stimuli primarily of a verbal nature, that is, proverbs and fables.

2. Literalism and Concretism

There would seem to be different kinds of literalism. For example, the literalism shown by the organic in the interpretation of proverbs would seem to stem from a different source than that of the schizophrenic. The intention* of the former may or may not involve the "motivated" denial and/or avoidance of the interpersonal or, in this case, more precisely, of the figurative meaning. Indeed, in reference to performance differences between organics and schizophrenics, Hanfmann and Kasanin state that Zeigarnik (37) found that ". . . whereas the organics took into account only a few simple factual connections, the schizophrenics saw a multitude of such connections partially colliding with and superseding each other" (13, p. 101). This corresponds to Cameron's (3, 4) conclusions concerning certain differences between schizophrenics and senile, deteriorated adults and children. Consequently, not only may the kind and degree of literalism differ, but its function may vary according to whether it occurs in organics or schizophrenics. (Further, literalism may serve the ends of humor. The comedienne, Miss Gracie Allen, has long used literalism for humorous effect.)

The highest order of abstraction can involve literalism. For example, Langer (19) discusses the function of a literal, denotative language in the formulation of abstractions upon which knowledge is based. Mathematical symbolism is one form which is literal and abstract. But the literal can also be concrete as when objects which are literally described become so immediate for the observer that he cannot "see" beyond them; he becomes "stimulus-bound."

However, the point must be made that the literal is not identical with

* "Intention," following Allport (1), refers to the direction of an act, and the person may or may not be aware of his intention at any given moment.

the concrete. For example, Hanfmann and Kasanin (13) and Kasanin (17) occasionally discuss the literal performance as if it were merely concrete. Literal interpretations can be abstract or concrete. In the case of proverb interpretation, abstract or concrete contents can be given in the verbal response. At the same time, the literal or figurative response reflects what the person is trying to do with the task. Benjamin has shown, for example, that even the figurative interpretations of the meanings of proverbs can range ". . . from the most specific and concrete examples through the general to the abstract" (2, p. 81).

3. Studies on Animism

The term "animism," as used in this study, is not to be confused with the anthropological reference to primitive man's tendency to consider all nature as possessed of something comparable to a soul. The term does refer to the tendency to ascribe life and/or consciousness to inanimate objects.

Much of the literature on animistic tendencies pertains to studies with children. Piaget (24) uses the term "animism" to refer to the attribution of life or consciousness to inanimate objects, and has outlined the stages through which the child passes in manifesting these phenomena. For the attribution of life, the first stage attributes life to activity in general; then things that move are alive; then that which moves spontaneously is alive; finally life is restricted to animals and plants. For the attribution of consciousness, there are similar states: first, everything is conscious when activity is displayed; then moving things are conscious; then things which move spontaneously are conscious; finally, consciousness is restricted to animals.

Huang and Lee (16) have disagreed with Piaget's position that animistic tendencies are universal in children. These authors claim that animistic concepts are related to the specific object rather than a general animistic

tendency. On the other hand, Strauss (32) has attempted to show that the Huang and Lee results are ambiguous and do not show such specificity conclusively, as these authors believe.

Dennis (5) has outlined the work on child animism prior to Piaget's work in the 1920's. Russell and Dennis (28, 29) developed a procedure of questioning children about the inanimate or animate nature of various objects and then classifying the responses according to the four stages outlined by Piaget. Dennis (6) observed his young daughter over a period of time and found evidence to corroborate Piaget's theory of the autogenous nature of some of the child's "primary" stage ideas. Russell (25) found a correlation between the attribution of life (animism) and the attribution of consciousness to inanimate objects. The same writer found evidence to support Piaget's theory that children pass through stages of animistic concepts until they reach the adult level (26, 27).

Other studies reported that Zuni children exhibit the animistic stages, but may persist longer in the first stage than white children (9); Hopi children 12 to 18 years old were found to believe more in the consciousness of objects than white Americans, but the concepts in both groups were similar (7).

Dennis and Mallinger (8) studied the attribution of life and consciousness in senescent subjects, and found that 75 per cent responded "immaturely" (in terms of Piaget's first three stages) to questions concerning the attribution of life to inanimate objects, so that only 25 per cent were in stage 4; and 53 per cent of these subjects attributed consciousness to inanimate objects. They found that subjects over 80 years old responded more animistically than those under 80; this was explained on the basis of greater neurologic deterioration in the former group. Russell, Dennis, and Ash (30)

reported on the existence of animistic stages in feeble-minded children.

Werner and Carrison (35, 36) compared brain-injured mentally defective children with familial mentally defective children, and found that the former were more animistic both in verbal-abstract and in concrete situations. The more extensive animism in the brain-injured group was related to their abnormally modified perceptual-conceptual behavior. In addition, both groups were found to be less animistic in the concrete situations; this result had been predicted on the basis of the expectation that the children would be less realistic in the unfamiliar (verbal) situations.

Heider and Simmel (15) noted that normal subjects interpreted the movements of geometric figures (two triangles and a circle) as actions of persons. Similarly, Michotte (22, 23) found that normal subjects often interpreted the movements of two rectangles as actions of living beings. These visually presented, nonverbal stimuli are in contrast to the more usual verbal situations used in studies of animism. The tasks used by Heider and Simmel and Michotte (which can be interpreted literally as well), were adapted for use in the present study; a more detailed presentation of their work will be given later in this chapter.

4. The Animistic and the Physiognomic

The physiognomic has been defined by Werner as the perception of expressiveness in inanimate objects ("the lines are gay" (34)), and animism or anthropomorphism as investing inanimate objects with human qualities. Werner (34) discusses animism or personification as a development from physiognomic perception. The child deals with the world of objects physiognomically and only later personifies. Werner suggests that physiognomic perception and personification are not identical and that the latter arises when the child has a need to handle objects as persons. Werner also

states that the personification of the inanimate involves ". . . a consciousness of a polarity between the personal and the impersonal" (34, p. 72), while in physiognomic perception there is a fusion of subject and object. The world of the schizophrenic, according to Werner, can acquire a physiognomic character; examples of such thinking can be found in Storch (31). The occurrence of this mode of perception in schizophrenia is related by Werner to a diminution of the boundaries between subject and object.

However, other investigators (11, 17), in referring to the physiognomic and animistic qualities of schizophrenic thinking, tend to confuse these two properties. For example, Kasanin (17) speaks of the physiognomic and animistic as identical (and seems to equate the concrete and literal). Goldstein (11) speaks of the schizophrenic's physiognomic perception as a form of concreteness, and refers to ". . . the fact that the world of the schizophrenic is much richer and more animated with personalized ideas . . ." (11, p. 36). The present study bears on these statements, insofar as chronic schizophrenics are concerned.

Some of the literature on literalism and animism has been mentioned; the studies of literalism in schizophrenia have dealt mainly with proverbs, while much of the work on animism has been done with children. The distinction between the physiognomic and animistic was alluded to; and several references to a so-called animistic and rich inner life in schizophrenia were mentioned.

Before proceeding with a discussion of literalism and animism as related to chronic schizophrenia, further remarks will be offered concerning the literal and animistic approaches to the world.

5. An Interpretation of the Literal-Animistic Dimension

The literal-animistic dimension refers to the individual's willingness

to take interpersonal action, and the extremes of this dimension exist as possibilities for interpersonal inaction or action, respectively. To be animistic is to express the intention to move-in-the-world, while to be literal may be used to express the intention to remain immobile; to be directed towards immobility is the necessary condition for literalism. Literalism allows the observer to maintain his status in quo and to degrade the interpersonal situation. Once one has the possibility of an animistic world, its possibility of negation is literalism. The literal negates the interpersonal relation; it is purely denotative. It has already been mentioned that the highest order of abstraction can be literalism: things exist for themselves; whereas the interpersonal meaning an object has is its animistic component. For example, the literal possibilities of a typewriter are as it exists for itself, while its animistic possibilities are as it exists for one, what it can do for one. Its animistic qualities are its demand value, its function, what it means to one in terms of one's action possibilities. The literal possibilities of the typewriter, as it exists for itself, are its formal qualities: for example, its beauty or color in themselves. Similarly, it will be seen that the Heider and Simmel stimuli and the Michotte stimuli can be considered from their literal and animistic standpoints.

In reference to the problem of the movement of inanimate objects, it may be stated that one's experiential framework is such that living beings are able to initiate movement and to move independently of their environment. When, as with the Heider and Simmel stimuli particularly, inanimate objects are shown to engage in similar independent movements, the observer, if he intends to remain in the social situation or to move-in-the-world, will deal with these difficult stimulus configurations by organizing them

as acts of persons. It is suggested that the animistic interpretation manifests the observer's intention to deal with events in such a way that he does not deny the implications, the interpersonal implications, of his past experience; and that the animistic response expresses the observer's intention to order events so that they occur in a meaningful world. If the observer does not intend to move-in-the-world, he can become literal when confronted with the difficult stimulus conditions (by describing the stimuli as they are), such that he denies the interpersonal implications of his past experience.

Heider and Simmel (15) mentioned the importance which the organization of events in their film in terms of acts of persons has for the adaptation of the organism to the environment. It would seem, in addition, that the animistic response allows the observer to organize the events meaningfully in interpersonal terms, thus lending relatively greater continuity and organization to his experience. The literal response is not organized around one interpersonally meaningful event, and so will be less continuous or organized.

D. The Literal-Animistic Dimension and Chronic Schizophrenia

The assumption is believed warranted that whatever possibility (whether literal or animistic) is chosen by an observer is itself an expression of an intention on his part, the intention either to move or not to move-in-the-world in terms of interpersonal relationships. As a state of being, chronic schizophrenia seems to be such that it supplies the necessary conditions for literalism to occur.

If the statements made above in reference to chronic schizophrenia are true, namely that it is a state characterized by a disturbance in inter-

personal relationships, and that the defensive maneuvers of this state are directed towards maintaining a condition of inactivity and minimal interpersonal relationships, then it is consistent with these propositions that literalism should occur, under the experimental conditions of this study, more frequently in a group of chronic schizophrenics than in a psychiatric control group and a normal control group.

E. The Work of Heider and Simmel and Michotte

As mentioned above, the tasks used by Heider and Simmel (15) and Michotte (22, 23) in their studies on causal attribution and phenomenal causality, respectively, were found suitable for use in the present study. The work of these investigators, as it relates to the problem of this study, is described below.

1. The Heider and Simmel Study

Heider and Simmel (15) investigated the stimulus conditions which influence one's perception of other persons, their behavior, and personal qualities. They made a movie which depicted two triangles, a circle, and a rectangle; the triangles and circle were shown executing different movements, and the entire film could be interpreted in various ways. (The reader is referred to pages 20 and 22, below, for a description of the scenes of the film.)

In order to ascertain how many subjects (female college students) would treat the objects as living beings, one group was instructed, before viewing the film, to write down what happened in the picture; other groups were instructed, before viewing the film, to interpret the movements as actions of persons, and then answered questions about the picture; all groups were shown the film twice.

They found that 33 of the 34 subjects in the first group spontaneously interpreted the movements of the figures as actions of persons.

Although the relationship among the stimulus conditions, the attribution of origin, and the interpretation of the movements is pertinent to this investigation, the primary interest here is the fact that the stimuli were perceived as living beings, rather than an extended analysis of the structural factors involved in the various interpretations. The factors will be mentioned below. Heider and Simmel indicated that the geometrical objects are described as living beings, as capable of originating movement, because they are able to move independently. They suggested that the organization of the movements in terms of acts of persons is conducive to the adaptation of the organism to the environment. They state:

The changes, when identified with a constant figural unit, no longer follow each other in an arbitrary and unconnected way. They are connected with invariable characteristics of the environment, they are meaningfully embedded in our picture of reality (15, p. 256).

In another paper, Heider (14) discussed the problem of the tendency to attribute changes to personal origins, that is, the problem of animism. After having mentioned different explanations for this phenomenon, he offers the following:

Another explanation besides those in terms of experience or needs seems to be possible. The prevalence of personification in an imperfectly structured environment might be caused, at least in part, by the simplicity of origin-organization. The changes are attributed to a single concrete unit as source, which is certainly a simpler organization than that to which an analysis in terms of a causal nexus with many conditions would lead to (14, p. 360).

It was also suggested that origin attribution or causal attribution follows the laws of unit formation, and Heider provided a detailed analysis of the relations between causal units (origin and effect, or person and his act) and the properties of their parts.

Heider and Simmel, in analyzing the responses of all groups, found that the film tended to be organized around the fight between the two triangles (scene 4), and the productions were grouped according to the imputed causes of this fight; these causes were sometimes attributed to the personality of the large triangle, sometimes to the situation. Heider and Simmel mention the importance of causal interpretation in drawing the events of the film into a unified theme. They state:

A few events stand out and are seen by all Ss in the same way; these events are organized into a meaningful whole which contains causal centers (persons). Events and persons gain their significance by the way they are causally connected (15, pp. 251-252).

Heider and Simmel analyzed in detail the relationships among the stimulus conditions, the attribution of origin, and the interpretation of the movements. They summarized their findings on these relationships as follows:

A characteristic feature of this organization in terms of actions is the attribution of the origin of movements to figural units and to motives. It has been shown that this attribution of the origin influences the interpretation of the movements, and that it depends in some cases on the characteristics of the movements themselves, in others on surrounding objects (15, p. 259).

They also pointed out that the transmission of movement can be by physical causation, as in scene 4, the fight scene, where there is physical or mechanical contact between the stimuli; or the transmission can be by psychological causation, as in scene 10, where the large triangle is seen as chasing the two smaller objects, but there is no physical contact among them. Actually, both causalities can be involved in the animistic response, for once the origin is animated the transmission of movement can be physical or psychological, depending upon whether or not there is actual contact between the stimuli; the literal response, on the other hand, seems

to involve transmission of movement by physical causality only, for, as Heider and Simmel mentioned, the perception of the transmission of movement by psychological causality would seem to demand a prior perception of the origin as a living being; if the origin of the literal response remains inanimate, this fact should mean that two objects moving relative to each other at a distance would not be causally connected at all, that a mere disconnected succession of events in time would be involved.

2. The Work of Michotte

Michotte investigated the perception of functional connections and the perception of causation (22, 23). Using two movable rectangles, he found that certain combinations of these stimuli (varying speed, shape, initial distance between them, and so on) caused certain impressions, for example, that "A" pulls or repels "B". These are called functional connections because ". . . one actually sees some change occurring in an object 'in function' of another" (23, p. 115). These impressions, as noted, are dependent upon the system of stimulation and are ". . . considered as Gestalten, as specific kinetic structures corresponding to the action of a group of successive stimuli on the eye" (23, p. 115). These are considered primitive phenomena and do not involve ". . . 'meanings' which under the influence of acquired experience could be attached to simple impressions of motions merely juxtaposed in space and time" (23, p. 115).

In conducting these experiments, Michotte observed that his subjects had a tendency to animate the stimuli. He states:

Our subjects did not content themselves with merely describing in an objective fashion what they saw in the apparatus, saying, for example, that they saw 'A pushing B forward,' but they often had an obvious tendency to complete these indications by comparisons with human or animal actions, comparisons which implied emotional states, attitudes, tendencies attributed to the objects. The letters A and B did not then signify the little rectangles as such

but took on the value of names of persons, and the experiments gave rise to interpretations of this nature: 'It is as though B was afraid when A approached, and ran off' . . . "(23, p. 115).

Michotte discussed these tendencies from the point of view of the relationships between the physical reactions corresponding to emotions and the conditions of stimulation necessary to produce in an observer the kinetic structures mentioned above.

3. Literalism, Animism, and Causal Attribution

Both the Heider and Simmel (15) and the Michotte (23) situations can be interpreted either literally or animistically. Essentially, an animistic response is one in which the origin is a living being, one in which the movements are organized in terms of acts of persons, and one in which motives and emotional states are attributed to the figures. Unlike the animistic response, the literal response is one in which the attribution of cause or origin of the events is not a living being, a being with motives and affects.

It is obvious that the stimulus configurations, the movements themselves, are necessary for an animistic interpretation and for the phenomenal location of the origin. Yet such animistic interpretations cannot be derived solely from the stimuli themselves, for the stimuli are in fact geometric figures in motion which produce certain retinal effects. Then, in terms of theory given above, interpreting the stimuli as actions of living beings seems to be but one possibility which the observer brings with him to the situation. Another possibility available to the observer is to describe in a literal fashion the events simply as they are, that is, to report that the objects are first in one position and then in another, and so on.

It would seem that literalism is one approach to situations or one way

of organizing one's perceptions; in reference to the stimuli used in this work, the literal approach involves a description of events which reports only the "objective" physical characteristics of the events. The animistic approach to situations would seem to be another way of organizing one's perceptions; these stimuli can be perceived as persons engaged in motive- and affect-laden endeavors, or they can be organized as objects engaged in activities typical of persons or animals. Thus the animistic interpretation is interpersonal, has interpersonal vectors.

If one of the structural conditions for the perception of the origin as a living being is the independence of movement, one would expect the Michotte stimuli to be less conducive to an animistic interpretation than the Heider and Simmel stimuli, for the former are less complex and show less independence of movement. In the less complex situation, a meaningful organization of the stimuli is not so dependent upon an animistic interpretation, whereas the greater structural complexity of the Heider and Simmel stimuli seem to require an animistic interpretation if they are to be meaningfully organized.

Since all the Michotte situations used in this study involved actual contact between the two rectangles, an opportunity was provided to determine whether chronic schizophrenics differ from controls in the perception of physical causality, that is, in the perception of one object moving in function of another. In the Michotte situations, physical causal attribution is said to have occurred when the movement of one rectangle is said to have been induced by the movement of another.

This study will not be concerned with an investigation of the abstract-concrete aspects of the literal and animistic responses. The distinction drawn above between literalism and concretism was in the interest of

theoretical clarity. Similarly, the distinction between physiognomic and animistic responses was given, although the data are not to be examined for their physiognomic possibilities.

F. Hypotheses

1. The psychiatric and normal controls will not differ in the frequency of animistic responses to the Heider-Simmel film, but they will respond animistically more frequently than a group of chronic schizophrenics.
2. The psychiatric and normal controls will not differ in the frequency of animistic responses to a film of the Michotte situations, but they will respond animistically more frequently than the chronic schizophrenics.
3. The same predictions for the groups are made in reference to the degree of organization in the responses to both films.
4. There will be a significant correlation for all groups between animistic responses and degree of organization for responses to the Heider-Simmel film.
5. All groups will respond more animistically to the Heider-Simmel film than to a film of the Michotte situations.

II. METHOD

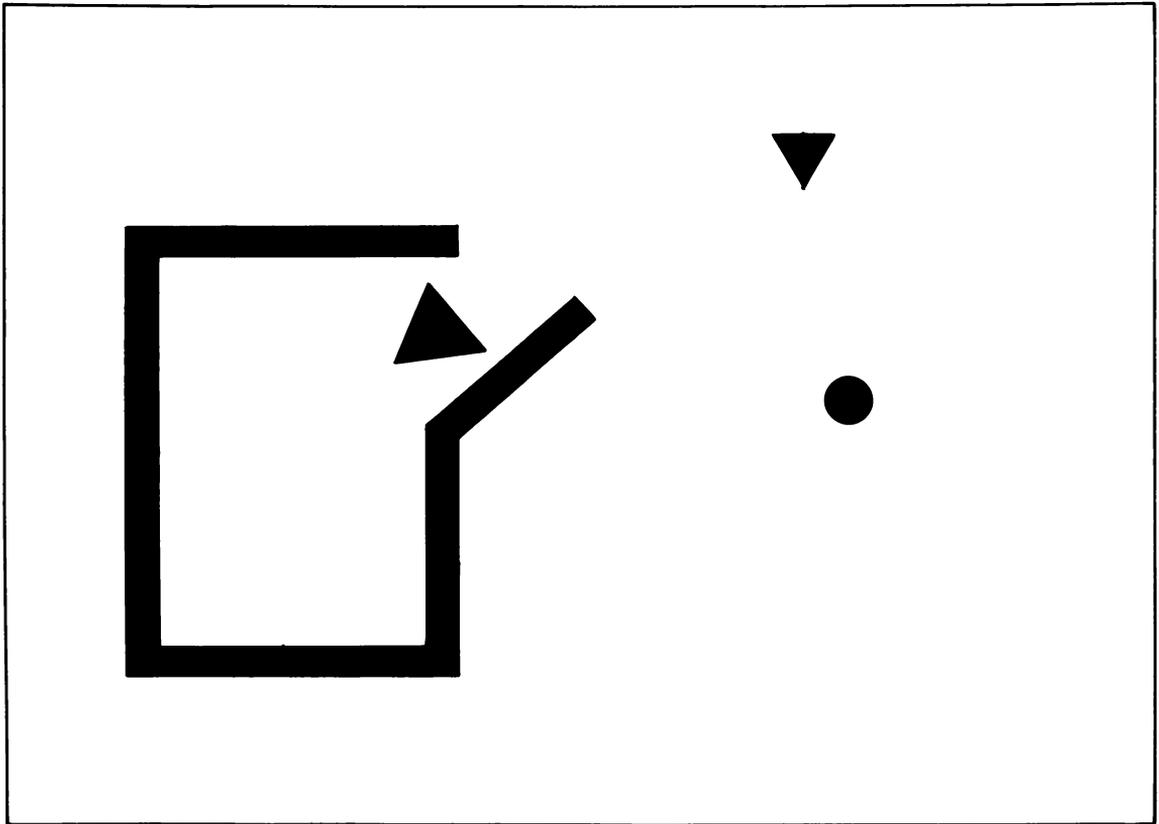
A. Apparatus

The apparatus used in this study consisted of the Heider-Simmel film and a film made of the Michotte situations. The details of these two films and the physical arrangements of the experimental room are described below.

1. The Heider-Simmel Film

Figure 1, below, shows the objects in this film and was adapted from an illustration in their study (15, p. 244). The four geometric figures depicted in their film were a large triangle (T), a small triangle (t), a disc or circle (c), and a rectangle with a section that opened and closed like a door (house). The figures, with the exception of the rectangle, were solid black. The film, which ran for approximately two minutes (when projected at "silent speed," that is, at 16 frames per second), showed the triangles and disc in motion. These writers have described the action of the film in terms of scenes:

1. T moves toward the house, opens the door, moves into the house and closes door
2. t and c appear and move around near the door
3. T moves out of the house toward t
4. T and t fight, T wins: during the fight, c moves into the house
5. T moves into the house and shuts door
6. T chases c within the house; t moves along the outside of the house toward the door
7. t opens the door and c moves out of the house and t and c close the door
8. T seems to try to get out of the house but does not succeed in opening the door: t and c move in circles around outside of the house and touch each other several times



FIGURES IN HEIDER FILM

Fig. 1. Figures in the Heider-Simmel film

9. T opens the door and comes out of the house
10. T chases t and c twice around the house
11. t and c leave the field
12. T hits the walls of the house several times; the walls break (15, p. 245).

Copies of this film are on file with the Department of Psychology, University of Kansas, Lawrence, Kansas; the Medical Illustration Laboratory, Veterans Administration Hospital, Topeka, Kansas; and with the writer.

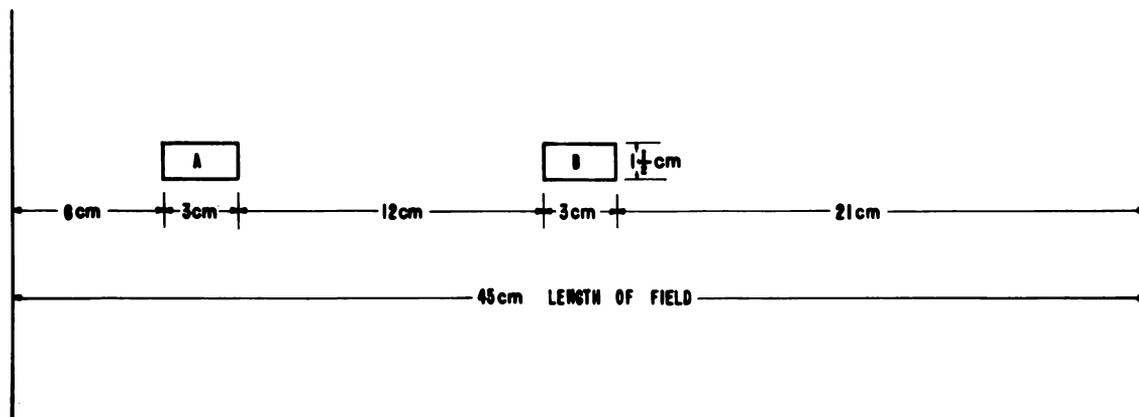
2. The Film of the Michotte Situations

Some of the situations described by Michotte (22, 23) were adapted for use in this thesis. In one paper (23), Michotte described in very general terms the dimensions and movements of two colored rectangles and the impressions which arose when subjects viewed these moving stimuli. In a more complete work (22), Michotte provided details on the dimensions of the stimuli, the speed and direction of their movements, and methods used to present these stimuli. Among other stimuli, he used two rectangles, one red and one black, one centimeter long and one-half centimeter wide; the rectangles moved along a horizontal slot 15 centimeters long and one-half centimeter wide. The reader is referred to the longer work (22) wherein are described experimental variations in the size and shape and color of the stimuli; variations in the speed and direction of their movements; and details of methods of presentation of the stimuli. The specific Michotte situations used herein are described below, as well as the method used in making the motion picture film of the sequences. After a general description of the technique of making the film has been given, each sequence will be described in two ways: first, there will be a brief verbal description of the sequence and the impression which Michotte has said it evokes in observers; then a technical statement of the manner in which

the sequence has been filmed will be given.

The film was made at the Medical Illustration Laboratory, Veterans Administration Hospital, Topeka, Kansas. A Cine Kodak Special camera was mounted vertically over a horizontal piece of glass, diffused on one side, which permitted back illumination. Beneath the piece of glass was a sheet of metric graph paper. The width of the field photographed was 45 centimeters, and the rectangles which moved in relation to one another on the field each measured three centimeters long and one and one-half centimeters wide. Figure 2, below, shows the dimensions of the rectangles, the size of the field, and the placement of the rectangles at the start of each sequence. The black rectangle (A) was six centimeters in from the left and the red rectangle (B) was 21 centimeters in from the right, leaving 12 centimeters between them. The two rectangles moved horizontally along an invisible line, and their movements were calibrated by illuminating the underneath side of the ground glass, making it possible to see the ruled lines on the metric graph paper. During exposure, the light beneath the glass was turned off, so making the graph paper invisible. The illusion of movement of the rectangles was created by utilizing the single frame shutter release on the camera. The sequences were photographed on 16 millimeter Kodachrome film. Thirteen sequences were filmed; the impressions noted below for each sequence are those reported by Michotte (23).

Situation 1. A moves rapidly to B and, after making contact with B, returns to its initial position. The impression received is that A strikes B. Photographically, sixty frames were exposed with A and B in the initial position; then A moved to B at the rate of four centimeters per frame; when A contacted B, A without pause moved to the left to its initial position at the rate of one centimeter per frame; forty frames were exposed with A and B in the final position.



FIGURES IN MICHOTTE SITUATIONS

Fig. 2. Dimensions of the Michotte rectangles, the size of the field, and the placement of the rectangles

Situation 2. A moves slowly to B and, after making contact with B, returns to its initial position. The impression is that A simply touches B. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one and one-half centimeters per frame; when A contacted B, A without pause returned to its initial position at the rate of three-fourths of a centimeter per frame; forty frames were exposed with A and B in the final position.

Situation 3. A moves rapidly to B and, upon contact, B without pause moves slowly to the right, while A stops. The impression is that A throws B forward and this can be interpreted as a reaction of anger. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of four centimeters per frame and, at the moment of contact, A stopped and B without pause moved nine centimeters to the right at the rate of one and one-half centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 4. A moves slowly to B and, upon contact, B without pause moves rapidly to the right, while A stops. The impression is that B's departure is released by the contact, that B's movement seems autonomous and may appear as "flight" which is motivated by A's touch and which can be interpreted as a reaction of fear. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one and one-half centimeters per frame and, upon contact, B without pause moved nine centimeters to the right at the rate of four and one-half centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 5. A moves rapidly to B and, upon contact, there is a slight pause and then B moves rapidly to the right, while A stops. Often

there is the impression that two accomplices meet and momentarily agree, but then disagree and separate. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of four centimeters per frame and, upon contact, there was a pause of six frames and then B moved eight centimeters to the right at the rate of four centimeters per frame, while A stopped; forty frames were exposed with A and B in the final position.

Situation 6. A moves slowly to B and, upon contact, both A and B without pause move slowly to the right. The impression is that A draws or carries B off with it, and the association seems to be gentle or friendly. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one and one-half centimeters per frame and, upon contact, both A and B without pause moved 12 centimeters to the right at the rate of one and one-half centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 7. A moves rapidly to B and, upon contact, both A and B without pause move rapidly to the right. The impression is one of violence. Photographically, A and B were in the initial position for sixty frames; A moved to B at the rate of four centimeters per frame and, upon contact, both A and B without pause moved 12 centimeters to the right at the rate of three centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 8. A moves slowly to B and, upon contact, both A and B without pause move rapidly to the right. The impression is that B is carried off by brute force. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one-half of a centimeter per frame and, upon contact, both A and B without pause moved

12 centimeters to the right at the rate of two centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 9. A moves slowly to B and, upon contact, both A and B without pause move to the left. The impression here is of a kidnapping. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one-half of a centimeter per frame and, upon contact, both A and B moved 12 centimeters to the left at the rate of two centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 10. A moves rapidly to B and, upon contact, there is a slight pause and then both A and B move rapidly to the right. The impression is one of the two rectangles "going together" when they move off together. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of three centimeters per frame and, upon contact, there was a pause of six frames and then both A and B moved 12 centimeters to the right at the rate of three centimeters per frame; forty frames were exposed with A and B in the final position.

Situation 11. A moves rapidly to B and, upon contact, there is a slight pause and then both A and B disappear behind a gray screen observable at the right of the field from the beginning of the sequence. The impression is often a lovers' rendezvous or two accomplices going into hiding together. Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of three centimeters per frame and, upon contact, there was a pause of six frames and then both A and B moved to the right at the rate of two centimeters per frame and disappeared behind a gray screen, which was visible at the right side of the field from the beginning of the sequence.

Situation 12. A moves slowly to B and at the moment of contact B disappears. (This sequence is described only in Michotte's longer work (22).) Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one centimeter per frame and, upon contact, B disappeared; forty frames were exposed with A alone in the final position.

Situation 13. (In this situation A is gray, while B is red.) A moves slowly to B and, upon contact, B becomes gray like A. (This sequence is described only in Michotte's longer work (22).) Photographically, A and B were in the initial position for sixty frames; then A moved to B at the rate of one centimeter per frame and, upon contact, B became gray like A; forty frames were exposed with A and B in the final position.

After the film was exposed and developed, a strip of leader, having a length of approximately fifty frames, was inserted between each of the 13 film sequences. This permitted the experimenter to stop the projector after each sequence to obtain the subject's report. The film was run through the projector at "sound speed," that is, at 24 frames per second.

3. The Physical Arrangements of the Experimental Room.

The experimental room measured approximately 17 feet in length and nine feet in width. Figure 3, below, depicts schematically the places for the subject and experimenter, the movie projector, and the table for the recorder. The subject was seated close to the wall behind. The microphone was placed slightly to the subject's left, so that it picked up the experimenter's voice as well as the subject's. The recorder emitted a faint light, so that the room was never in total darkness. The experimenter was seated between the subject and the movie projector. The latter was a "Bell and Howell, Filmsound, 179, 16 mm. sound-on-film projector," with a

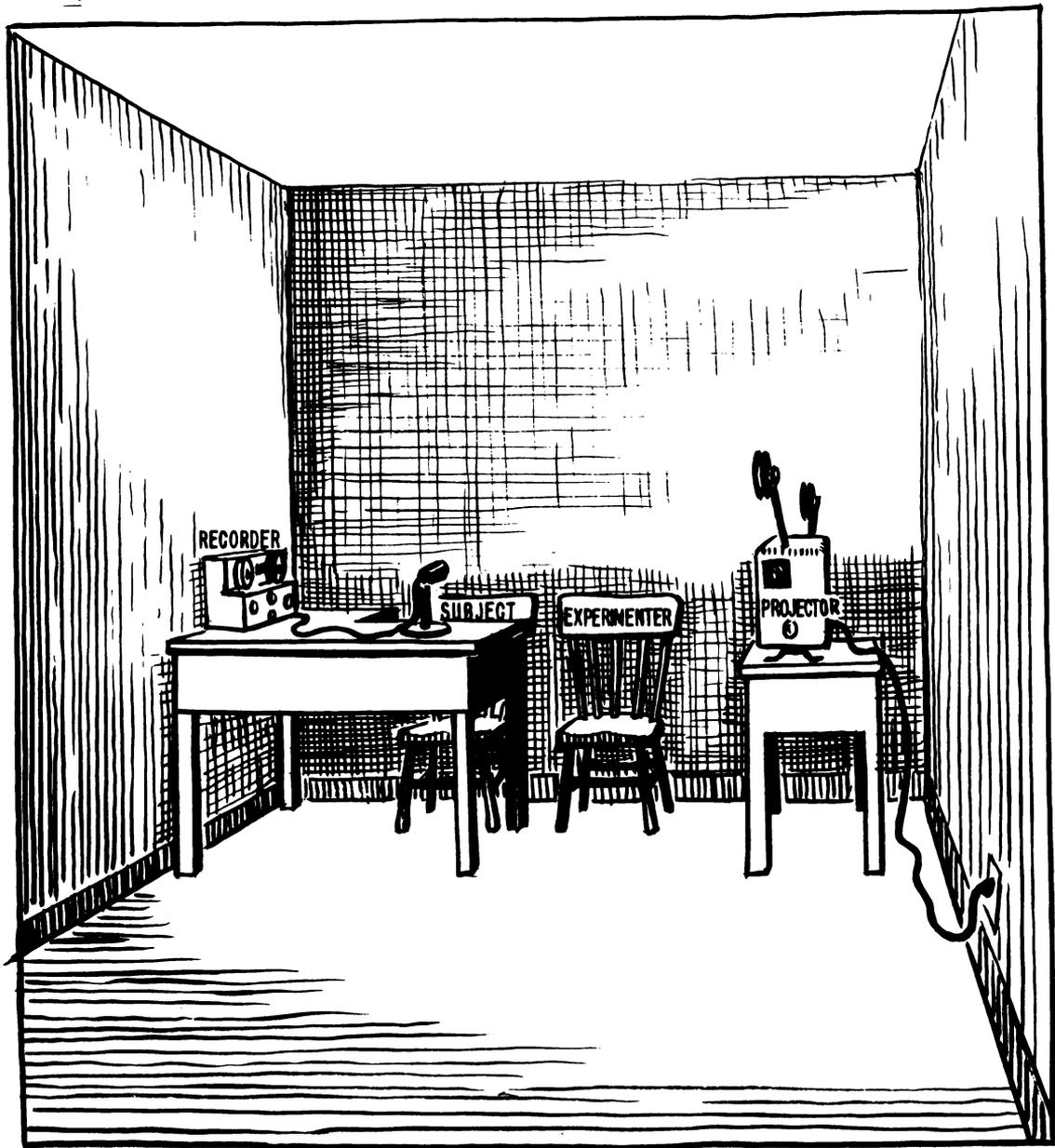


Fig. 3. Placement of the subject, experimenter, movie projector, and the table for the recorder.

two inch lens; the projector could be operated at a speed of 16 frames per second or at a speed of 24 frames per second.

A piece of white cardboard, 44 inches long and 28 inches high, served as a screen, and was placed on the wall opposite the subject; the lower edge of the screen was 41 inches from the floor. The distance from the projector lens to the screen was approximately 14 feet, and the size of the field, as projected on the screen, was 33 inches long and 24 inches high.

B. Subjects

Three groups of subjects were used in this study: hospitalized, chronic schizophrenics; hospitalized, nonpsychotic, psychiatric controls; and normal controls. All subjects were males and veterans of World Wars I or II. The criteria for the selection of the subjects of the three groups are discussed below.

1. Chronic Schizophrenics

Three criteria were followed in selecting the patients of this group:

a. Chronicity. A primary diagnosis of chronic schizophrenia (of any type) was the first consideration. The diagnosis of schizophrenia, established by staff conferences, was made on the basis of the usual considerations of psychiatric nosology. The criteria for chronicity, per se, were a condition existing for at least one and one-half years, and some evidence to indicate that the patient had accepted his psychosis. "Acceptance" of his psychosis implied that the patient's efforts towards actively fighting his illness were minimal, that there were indications of a more or less

comfortable adjustment to the hospital situation, and that the patient's behavior and attitudes led to the inference, by hospital personnel, that he was unable to assume responsibility for himself. The purpose of the criterion of "acceptance" of the psychosis was to exclude those patients who were in transitional states or who were subject to frequent acute exacerbations.

b. Organicity. The patients in this group were judged free of known or suspected complicating organic factors, such as general paresis, seizures, brain damage, and so on.

c. Contact. These patients had to be in "good contact," which implied that they could speak intelligibly, follow simple instructions, and cooperate with the experimenter.

The experimenter explained these criteria to the service chief of one of the continued treatment sections at Winter VA Hospital, Topeka, Kansas. The experimenter and service chief together established a list of patients who met the criteria mentioned above; 35 potential subjects were obtained in this manner. Then the experimenter discussed these patients with their ward physicians; the latter were able to inform the experimenter whether particular patients had suddenly become inaccessible or whether it was inexpedient, for various reasons, for a given patient to participate in the experiment.

Then the experimenter arranged the names of the 35 potential subjects in random order. Beginning at the top of the list, the subjects were approached individually and were told:

I'm a psychologist here in the hospital and would like to have your co-operation in a project I'm conducting here in the hospital. I have spoken to your ward physician, who has told me that it is all right for you to be a subject, if you want to. I'll show you a few movies that I'd like your impressions of. The whole thing will take about thirty minutes. What do you think about it?

Unless there was active opposition or an outright refusal to cooperate, the subject was given an appointment and told that the experimenter would call for him at the designated time. If the patient brought the matter up, he was told that his participation in the project would not influence the length of time he spent in the hospital. Of the 35 patients, 32 were approached by the experimenter. Of the 32 patients, six patients refused to be subjects, and ten patients, although they had agreed to be subjects, either became extremely negative on the way to the experimental room or suddenly refused to continue with the experiment once they had begun. The remaining 16 patients completed the experimental procedures.

Table I, below, provides the following descriptive data for the chronic schizophrenic group: age, educational level in years, number of years since the first hospitalization, and total time spent in hospitalization.

TABLE I
DESCRIPTIVE DATA FOR THE CHRONIC SCHIZOPHRENIC GROUP

	Age in Years	Educational Level in Years	Number of Years since First Hospitalization	Total Years in Hospitals
\bar{X}	31	11	7	3
Median	30	12	4	3
Range	22-43	8-14	2-19	2-6

This group included 12 paranoid schizophrenics, one hebephrenic, one catatonic, and two unclassified schizophrenics.

2. Nonpsychotic, Psychiatric Controls

The patients of this group met the following criteria:

a. Diagnosis. These patients had a primary diagnosis of psychoneurosis or character disorder. These diagnoses, established by staff conferences, were made on the basis of the usual considerations of psychiatric nosology.

b. Nonpsychotic. These patients had no history of schizophrenia or other psychotic disorders.

c. Organicity. This group was free of known or suspected complicating organic factors, such as brain damage, seizures, multiple sclerosis, and so on. (This criterion did not exclude those patients who manifested psychosomatic reactions or conversion reactions.)

The service chief of one of the continued treatment sections at Winter Hospital, Topeka, Kansas supplied the experimenter with a list of twenty patients who met the described criteria. The experimenter then discussed these patients with their ward physicians; none of the patients was excluded as a potential subject as a result of these discussions.

The potential subjects were approached individually. The experimenter's statements to these patients were in essence identical with those given to the schizophrenic patients. (See page 31.) Those patients who agreed to be subjects were asked to come to the experimental room at designated times. Of the twenty patients, two were

discharged before the experimentation began and two refused to cooperate. The remaining 16 subjects completed the experimental procedures.

Table II, below, provides the descriptive data for the nonpsychotic, psychiatric controls: age, educational level in years, number of years since the first hospitalization, and total time spent in hospitalization.

TABLE II
DESCRIPTIVE DATA FOR THE PSYCHIATRIC CONTROL GROUP

	Age in Years	Educational Level in Years	Number of Years since First Hospitalization	Total Years in Hospitals
\bar{X}	42	12	6	2
Median	39	12	6	1
Range	26-61	8-20	1-12	1-4

This group included 12 psychoneurotics and four character disorders.

3. Normal Controls

This group of subjects was drawn from the personnel of Winter VA Hospital, Topeka, Kansas. Some potential subjects were referred to the experimenter by the American Legion Claims Officer of the hospital, while other potential subjects were approached by the experimenter. None of the subjects was well-known to the experimenter, although all of them were recognized as hospital personnel. For the purposes of this study, the experimenter assumed that there was a random distribution of personal adjustment among the 16 subjects of this group. When a potential subject

was approached by the experimenter, he was told:

I'm conducting a research project here in the hospital, and I need a group of normal subjects as a control group. I wonder whether you would be willing to spend about thirty minutes with me. I want to get your impressions of a few movies. What do you think about it?

None of the potential subjects refused to co-operate, although two or three wondered whether the experiment involved "tests" or "personality testing." These subjects were told that this was not the case, that there would be no personal questions, and that there would be no "prying." Such statements seemed to put these individuals at ease.

The mean age of the normal control group was 37 years, with a median of 35 years, and a range of 29 to 60 years. Their mean number of years of schooling was 15, with a median of 14, and a range of 11 to 20 years.

C. Procedure

The subjects were seen individually. When a subject was seated in his chair (See Figure 3, above), the experimenter outlined briefly what was to be done, as follows:

I'm going to show you several movies. I want you to look at them, and when I ask you to do so I want you to tell me what has happened in them. Here beside us is a recorder. The recorder is necessary because there won't be enough light in here for me to write down what we both say. I'm not going to ask you personal questions, and in addition, these records are anonymous. Do you think that this recorder will make you uneasy? Do you have any questions?

None of the normal controls and nonpsychotic, psychiatric controls reported uneasiness because of the recorder. Of the schizophrenics, only two showed some evidence that the recorder bothered them. The experimenter tried to put these two patients at ease by emphasizing the anonymous nature of the records and by pointing out that the conditions of their hospitalization would not be affected by their participation in the project. After a brief

time, these two subjects seemed to be more relaxed and were willing to continue. A few subjects asked whether the movies had sound or inquired about the length of the movies. If a subject asked the experimenter what he meant by "Tell me what has happened" (in the films), the particular instruction was given the subject again. Several subjects asked the experimenter whether he wanted them to describe the films. In these cases the instruction was given again; if a subject persisted in such questioning, he was told that it was up to him, that he was to tell what happened.

For convenience of presentation, the writer will describe the remainder of the procedure in terms of a subject with experimental order as follows:

1. Heider Film, Ongoing
2. Heider Film, Retrospective
3. Michotte Film

Minor changes in wording were made, depending upon the variations in experimental order. After the general instructions, as above, were given, the experimenter proceeded as follows:

1. Heider Film, Ongoing

The experimenter set the projector at "silent speed" (16 frames per second), and then said to the subject:

Now I'm going to show you this film. I want you to look at it and to tell me what is happening in the film as soon as it begins. Continue to tell me what is happening until the film is finished.

Then the recorder was switched on; the overhead light was turned off, and the projector was started. The experimenter seated himself in his chair (See Figure 3, above). If the subject did not start talking within a reasonable time after the beginning of the film, the experimenter said, "Tell me what is happening." The experimenter's remarks were limited to such statements as "Yes," "Continue," and "Now what is happening," which

were used to encourage reticent subjects. When the film was finished, the projector was turned off and the overhead light was turned on. The experimenter then attempted to obtain the subject's general impressions of the film; variants of the following questions were used: "What do you think of this film?"; "Does anything occur to you about it?"; and "Does this film suggest anything to you?" These questions, which seemed to become progressively more direct, were asked in the order mentioned. Care was exercised not to provide the subject with cues as to what the experimenter wanted; other questions were limited to the clarification of ambiguities. The recorder was shut off when this was finished.

2. Heider Film, Retrospective

Then the subject was told:

I'm going to show you the same film again. This time I want you to look at it, and when it is finished, I'll ask you to tell me what has happened in it. Remember, this time you tell me what has happened in the film after you have looked at it to the end.

The overhead light was turned off and the projector was started. The experimenter was seated as before. When the film was finished the projector was stopped; the overhead light was turned on; and the recorder was started. The experimenter then said, "Tell me what happened in the film." After the subject had presented his report, his general impressions were again obtained, using the same questions asked at the conclusion of the initial presentation of the Heider Film. Then the recorder was turned off.

3. Michotte Film

The subject was told:

Now I'll show you the last film that I have. This film has different parts. I'll show you the first part and, after you look at it, I want you to tell me what happened in that part. Then I'll show you the second part and, after you

look at it, you tell me what happened in it. Then I'll show you the third part, and so on, until the film is finished.

The recorder was turned on and the overhead light was switched off. The experimenter returned to his seat, announced "This is number one," and started the projector. When the sequence was finished, the experimenter turned off the projector and said, "Tell me what happened." If ambiguities occurred, the subject was asked to repeat what he had said; if this did not suffice, further questioning was brief and to the point. After the subject had stopped talking, the experimenter announced "This is number two," and again started the projector. Once again, when the sequence was finished, the experimenter turned off the projector and said, "Tell me what happened in that one," if the subject did not begin to speak spontaneously at the end of the sequence. This procedure was followed until all 13 Michotte sequences had been given. (The experimenter announced the number of each sequence in order to facilitate identification when the recordings were later transcribed.) After the thirteenth sequence was done, the overhead light was switched on and the experimenter again sought the subject's general impressions. The same questions were asked as at the end of the two previous film presentations. When necessary, a more complete inquiry was begun at this point to determine the meaning of ambiguous statements and to ascertain at which point animation first occurred to the subject. For those subjects who gave literal descriptions of the stimuli, an attempt was made to learn whether the subject had gotten an animistic impression at all. In these cases, questions such as "Did the film suggest anything at all to you?" were used. In general however, the inquiry was kept flexible to meet the needs of each situation.

D. Experimental Design

There were three tasks:

1. Heider Film, Ongoing
2. Heider Film, Retrospective
3. Michotte Film

In reference to the three tasks, one arbitrary limitation was placed on the experimental order. In order to maintain the continuity of the two Heider Film presentations, the Michotte Film was presented either before or after the two Heider Film presentations and never between them. With this limitation of order in mind, there were four possible experimental orders for the three tasks. With each row, reading from left to right, a different experimental order, and the numbers corresponding to the three tasks as given above, these orders were:

- a) 1 - 2 - 3
- b) 2 - 1 - 3
- c) 3 - 1 - 2
- d) 3 - 2 - 1

There were three groups of subjects, each group having sixteen subjects, for a total of 48 subjects:

- | | |
|------------------------|---------------------------------------|
| 1. Experimental Group; | 16 chronic schizophrenics |
| 2. Control Group I; | 16 nonpsychotic, psychiatric controls |
| 3. Control Group II; | 16 normal controls |

The four experimental orders were repeated four times for each of the three groups, so that four subjects in each group had the identical experimental order. The sixteen experimental orders were randomized for each of the three groups, and then the 16 subjects of each group were randomly assigned to the experimental orders.

III. THE ANALYSIS OF THE DATA

A. The Nature of the Data

The recorded data were transcribed, so that a total of 48 protocols, each ranging from four to eight single-spaced, typewritten pages, were obtained. The quantity and quality of these data presented problems of analysis; a discussion of these problems follows.

It was considered neither feasible nor necessary to include within this study either all the verbatim reports or edited versions thereof. The decision was made to include such reports as were necessary to illustrate the criteria of categorization and analysis applied to all the data. This procedure was adequate to demonstrate these criteria to a reader, and to permit other experimenters to duplicate the categorization and analysis.

The principles of analysis for the Heider-Simmel film and the film of the Michotte situations are given below. This is followed by a discussion of the results obtained when raters were asked to apply some of the categories to sample protocols.

The analyses of the Heider-Simmel and Michotte films, which follow below, frequently refer to the sample protocols and their separate analysis found in Appendix I. These same sample protocols were given to the raters for rating.

B. The Analysis of the Heider-Simmel Film

The Ongoing and Retrospective presentations of the Heider-Simmel film were analyzed separately in terms of the same categories. The first

categorization was the literal or animistic quality of the protocols. Second, both literal and animistic responses were further analyzed for the following factors: (1) the continuity and organization of the responses; and (2) the number of scenes mentioned.

These categories required different kinds of judgments; for example, to ascertain that a subject called the stimuli "triangles" or "objects" was of a different order than to determine the kind of animistic response which was given. The former determination was less complicated and was open to errors of attention, for a subject either did or did not refer to the stimuli as "triangles" or "objects"; however, to judge that a subject gave a particular variant of an animistic response depended upon the criteria established and was open to errors of interpretation. Consequently, some of the categories required definite criteria and some did not.

The categories are discussed below. The reader is referred to Appendix I to the sample protocols and their analysis.

1. The Literal-Animistic Response Categories

The responses to the two Heider-Simmel film presentations fell within four general categories, which indicated a progression from the most literal to the most animistic. There was one literal category and three animistic categories; the latter seemed to represent different degrees of animation.

In the descriptions of the categories, the phrase "imputation of motives and/or affective states" implied several things. The "imputation of motives" exemplified in the statement, "He tried to capture the ball," implied both a motivational state or wish or intention and a kind of activity typical of living beings (human beings or animals). The "imputation of affective states" exemplified in the statement, "The triangle is angry

or mad," implied an emotional experience and pertained either to living beings or inanimate objects (triangles, circle).

a. Literal. In this first category, the stimuli were described as physical objects (figures, triangles, circle) in motion relative to one another, and there was no imputation of motives or affective states. The spontaneous report and inquiry were both literal. The reader is referred to sample protocols, numbers 1 and 2, in Appendix I, for illustrations of the literal category.

b. Animistic (Type I). In this category, the stimuli were again designated as physical objects. Though they were not actually referred to as living beings, there was abundant imputation of motives and/or affective states; that is, the physical objects were reported to have been engaged in activities which were obviously typical for living beings and to have experienced obvious emotional states. Sometimes, apparently literal descriptions occurred along with the imputation of motives and/or affective states; in these cases, however, the latter made it quite clear that animation had occurred. This category also included those cases where pronouns, such as "He" and "She" were used in reference to the physical objects in addition to the actual names of the objects, but where living beings were not mentioned. The spontaneous report and inquiry were both considered for this category. Sample protocols, numbers 3 and 4, in Appendix I, illustrate this category.

c. Animistic (Type II). As in the immediately preceding category, this third category involved the designation of the stimuli as physical objects. And although initially there was abundant imputation of motives and/or affective states without actual reference to living beings, the latter did occur subsequently either towards the end of the spontaneous

production or in the inquiry. This category is illustrated by sample protocols, numbers 5 and 6, in Appendix I.

d. Animistic (Type III). In this fourth category, the animistic response was immediate, both in terms of living beings and the imputation of motives and/or affective states. There was no (or minimal) reference to the stimuli as physical objects, per se. Sample protocols, numbers 7 and 8, in Appendix I, exemplify this category. J

2. The Continuity-Organization Categories

These categories were devised to evaluate the connectedness of the descriptions or interpretations. The events of the film could be organized into a meaningful theme or plot. The theme or plot was considered to be a unitary idea which gave continuity and organization to the events of the film.

The themes showed various degrees of differentiation, ranging from an absence of a theme to a highly differentiated plot. The protocols were judged in terms of three thematic differentiation categories, as follows:

a. No theme. Here the protocol was relatively unorganized, and a mere disconnected recitation of the events in the film.

b. Undifferentiated theme. In this category were placed those responses which involved only a simple theme, such as, "This is a fight" or "This is a butterfly picking on a bug." If more than one theme was involved, no connection was made between them.

c. Differentiated theme. This category pertained to the most highly developed and integrated themes. The differentiated theme connected at least several events of the film. The themes within this category showed varying degrees of differentiation, but no attempt was made to refine further the categorization. The following was considered a differentiated theme, "This is two men fighting over a woman, and when one of them finally gets

her, the other one gets mad and destroys the house."

The judgment of the degree of thematic organization was made, in a sense, independently of whether a particular response had been scored literal or animistic; that is, a literal response did not a priori mean "no theme," nor did an animistic response demand a designation of "differentiated theme." In addition, the thematic judgment was not dependent upon the number of scenes mentioned by the subject, for obviously a subject could mention many scenes without organization or mention relatively few scenes with a high degree of organization.

The spontaneous report and the inquiry were both considered for these categories. The sample protocols in Appendix I exemplify the different organization categories.

3. Scenes Mentioned

The number of scenes to which a subject referred in a given presentation was noted. (The reader is referred to pages 20 and 22, above, for a description of the 12 scenes of the Heider-Simmel film.) Since some of the scenes consisted of more than one component, the rule was followed that a subject was to be credited with having mentioned a particular scene if he referred to at least one of its components; and the reference could occur either in the spontaneous report or in the inquiry. For example, scene number 4 consisted of the three components: the fight between the two triangles, and the large triangle's victory, and the movement of the circle into the house; a subject was credited with having mentioned the scene if he referred to either or both components. The analysis of the sample protocols, in Appendix I, demonstrates this category.

C. The Analysis of the Film of the Michotte Situations

This film was also analyzed for the literal-animistic and continuity-organization categories; the analysis followed the same lines as that for the Heider-Simmel film.

For this film, an additional analysis was made of the perception of physical causality. Whenever one rectangle was said to have moved or acted as a function of the other's movement, physical causality was said to have occurred. Such statements as, "The black knocked the red over," or "The one rectangle pushed the other one over to the right," led to the inference that the subject had perceived physical causality. Physical causality was considered not to have been perceived in such statements as, "The black moved to the right and then the red moved," or "The black touched the red and then they both moved together to the right." Only situations three through thirteen were analyzed in this manner, since in situations one and two only one rectangle moved.

Sample protocol number nine, in Appendix I, illustrates the analysis of the film of the Michotte situations.

D. Reliability of the Categories

The literal-animistic and continuity-organization categories were checked for reliability, since they might be relatively vulnerable to differences of interpretation. The reliability check was done only for the Heider-Simmel film, for it was assumed that a measure of reliability in this case would apply to the film of the Michotte situations as well.

Two protocols were randomly chosen from each of the four literal-animistic categories, making a total of eight protocols. The thematic breakdown

of these same protocols was, according to the writer's judgment, as follows: three were in the "No Theme" category, one in the "Undifferentiated Theme" category, and four in the "Differentiated Theme" category. The eight protocols were rated twice by the writer and by three raters, once for the literal-animistic categories and once for the continuity-organization categories.

The literal-animistic categories were explained to the raters, who knew nothing of the research project, although each had seen the Heider-Simmel film. They were told that the protocols which they were to rate represented different subjects' responses when asked to tell what was happening or had happened in the film. The explanation of the four categories followed, in outline, the criteria described earlier. When it was clear that the raters understood the differences among the categories, they were given copies of the sample protocols, numbers 1 through 8 in Appendix I, in random order.

When these ratings were made, the continuity-organization categories were explained to the raters, and the same procedure followed.

Table III, below, shows that there was perfect agreement among the three raters and the writer for the literal-animistic categories.

TABLE III

LITERAL-ANIMISTIC RATINGS OF THE EIGHT SAMPLE PROTOCOLS

Rater	Sample Protocol Number							
	8	7	6	5	4	3	2	1
Writer	AIII	AIII	AII	AII	AI	AI	L	L
A	AIII	AIII	AII	AII	AI	AI	L	L
B	AIII	AIII	AII	AII	AI	AI	L	L
C	AIII	AIII	AII	AII	AI	AI	L	L

In this table, "L" is Literal; "AI" is Animistic Type I; "AII" is Animistic Type II; and "AIII" is Animistic Type III. The coefficient of concordance (W), as described by Kendall (18), is, of course, unity. This agreement is statistically significant ($\chi^2_r = 28.00$, P is .0002, seven degrees of freedom).

Table IV, below, gives the results of the sample protocol ratings for the continuity-organization categories.

TABLE IV
CONTINUITY-ORGANIZATION RATINGS OF THE EIGHT SAMPLE PROTOCOLS

Rater	Sample Protocol Number							
	3	6	7	8	5	4	2	1
Writer	D	D	D	D	U	N	N	N
A	D	U	D	D	U	D	N	N
B	D	D	D	D	U	D	N	N
C	D	D	D	D	U	D	N	U

In this table, "D" is Differentiated Theme; "U" is Undifferentiated Theme; and "N" is No Theme. The agreement among the raters and the writer is not quite as good as for the literal-animistic dimension. It is sample protocol number 4, which contains animated description, that produces the only case in which the three raters unanimously disagreed with the writer. The coefficient of concordance (W) is .84; this agreement is statistically significant ($\chi^2_r = 23.43$, P is .002, seven degrees of freedom).

IV. RESULTS

It will be noticed in the reported results which follow that, with the exception of the perception of physical causality in the film of the Michotte situations, the two control groups are first compared and, if there is no significant difference between them on a given variable, they are combined and then tested against the chronic schizophrenic group. This procedure, rather than an initial over-all test among the three groups, is justified, since the prediction of no difference between the control groups was made.

In the results given below, the order of presentation of the Heider-Simmel film and the film of the Michotte situations was not important. In addition, there was no apparent relationship between animistic or literal responses and a particular diagnostic subgroup within the chronic schizophrenic and psychiatric control groups.

A. The Heider-Simmel Film

1. The Literal-Animistic Categories

Table V, in Appendix II, provides the literal-animistic scores for all subjects. The table is arranged so that the first eight subjects in each of the three groups are those who received the Ongoing presentation first and the Retrospective presentation second; the second eight subjects in each group are those for whom this order was reversed. There are Ongoing and Retrospective scores for each of the 16 persons in each of the three groups.

Table VI, in Appendix II, presents the frequencies of literal and animistic responses for all groups. The frequencies for each paired row are

based on the same individuals; for example, for the chronic schizophrenic group, the eight literal and animistic scores in the "Ongoing first" row are based on the same persons who gave the eight literal and animistic scores in the "Retrospective second" row. Again, in the chronic schizophrenic group, the eight literal and animistic scores in the "Retrospective first" row are based on the same persons who gave the eight literal and animistic scores in the "Ongoing second" row, and so on.

Tables VII and VIII, below, present, for the two control groups and the chronic schizophrenics, respectively, the comparisons for the frequencies of literal and animistic responses. The three types of animistic response are put into the one animistic category. Fisher's (10) direct method for the calculation of a set of observed frequencies in a four-fold contingency table was used in all cases.

None of the control groups comparisons in Table VII reaches the .05 level of significance. The fifth and thirteenth comparisons are the only ones which come close to statistical significance; these are for the total (combined controls) Ongoing first versus the total (combined controls) Ongoing second, and for the total (combined controls) Ongoing first versus the total (combined controls) Retrospective first comparisons. The comparisons in Table VIII, for the chronic schizophrenics, are all manifestly nonsignificant.

These data justify the combination of the two control groups in subsequent tests against the chronic schizophrenics. The data in general do not reveal significant differences between the first and second presentation of a particular mode of presentation, and between the Ongoing and Retrospective modes themselves.

Table IX, below, compares the frequency of animistic responses in the combined control and chronic schizophrenic groups for the Ongoing and Retrospective presentations.

TABLE VII

COMPARISONS OF THE FREQUENCIES OF LITERAL AND ANIMISTIC
RESPONSES TO THE HEIDER-SIMMEL FILM FOR THE PSYCHI-
ATRIC CONTROLS (PC) AND NORMAL CONTROLS (NC)

No.	Comparison	Category		Probability
		Literal	Animistic	
1.	PC: Ongoing I	3	5	> .95
	NC: Ongoing I	2	6	
2.	PC: Ongoing II	1	7	> .95
	NC: Ongoing II	0	8	
3.	PC: Ongoing I	3	5	.57
	PC: Ongoing II	1	7	
4.	NC: Ongoing I	2	6	.47
	NC: Ongoing II	0	8	
5.	Ongoing I (PC + NC)	5	11	.17
	Ongoing II (PC + NC)	1	15	
6.	PC: (Ongoing I + II)	4	12	.65
	NC: (Ongoing I + II)	2	14	
7.	PC: Retrospective I	1	7	> .95
	NC: Retrospective I	0	8	
8.	PC: Retrospective II	1	7	> .95
	NC: Retrospective II	0	8	

TABLE VII (Continued)

No.	Comparison	Category		Probability
		Literal	Animistic	
9.	PC: Retrospective I	1	7	> .95
	PC: Retrospective II	1	7	
10.	NC: Retrospective I	0	8	> .95
	NC: Retrospective II	0	8	
11.	Retrospective I (PC + NC)	1	15	> .95
	Retrospective II (PC + NC)	1	15	
12.	PC (Retrospective I + II)	2	14	.48
	NC (Retrospective I + II)	0	16	
13.	Ongoing I (PC + NC)	5	11	.17
	Retrospective I (PC + NC)	1	15	
14.	Ongoing II (PC + NC)	1	15	> .95
	Retrospective II (PC + NC)	1	15	

TABLE VIII

COMPARISONS WITHIN THE CHRONIC SCHIZOPHRENIC GROUP
 FOR THE FREQUENCIES OF LITERAL AND ANIMISTIC
 RESPONSES TO THE HEIDER-SIMMEL FILM

No.	Comparison	Category Frequencies		Probability
		Literal	Animistic	
1.	Ongoing I	6	2	> .95
	Ongoing II	6	2	
2.	Retrospective I	7	1	> .95
	Retrospective II	6	2	
3.	Ongoing I	6	2	> .95
	Retrospective I	7	1	
4.	Ongoing II	6	2	> .95
	Retrospective II	6	2	

TABLE IX

NUMBER OF SUBJECTS IN THE CHRONIC SCHIZOPHRENIC AND
COMBINED CONTROL GROUPS IN THE LITERAL AND
ANIMISTIC CATEGORIES FOR THE ONGOING AND
RETROSPECTIVE PRESENTATIONS

Group	Mode			
	Ongoing		Retrospective	
	Literal	Animistic	Literal	Animistic
Chronic schizophrenic	12	4	13	3
Combined control	6	26	2	30

For the Ongoing presentation, the frequency of animistic responses in the combined control group was significantly greater than that for the chronic schizophrenic group ($\chi^2 = 12.10$, corrected for continuity; P is .001, one degree of freedom). For the Retrospective presentation, the difference is also significant statistically ($\chi^2 = 24.55$, corrected for continuity; P is .000001, one degree of freedom).

These results provide evidence confirming the hypotheses that the control groups would not differ between themselves but would respond animistically more frequently than the chronic schizophrenics to the Heider-Simmel Ongoing and Retrospective presentations.

2. The Continuity-Organization Categories

Table X, in Appendix II, gives the continuity-organization scores for all subjects, and is arranged in the same manner as Table V, Appendix II. The order of subjects in both tables is identical.

Table XI, below, shows the number of subjects in each group in each category for the Ongoing presentation. (The Ongoing first and second scores

for each group were combined (N = 16 for each group).)

TABLE XI
 NUMBER OF SUBJECTS IN EACH GROUP IN EACH ORGANIZATION
 CATEGORY FOR THE ONGOING PRESENTATION ONLY

Group	Category		
	No Theme	Undifferentiated Theme	Differentiated Theme
Chronic schizophrenic	11	4	1
Psychiatric control	5	4	7
Normal control	3	2	11

The distributions of frequencies for the two control groups are not significantly different ($\chi^2 = 2.04$, P is .36, two degrees of freedom). It will be noticed that when the two control groups are compared in the 2 X 3 table, the statistically expected frequencies in each of the "No Theme" and "Undifferentiated Theme" cells are four and three, respectively; these expected frequencies fall below the usually accepted minimum of five. The undifferentiated and differentiated theme categories were combined for each control group separately; when the control groups were again tested against each other (2 X 2 table) by Fisher's direct method of calculation, P is .68, the hypothesis of no difference between the two control groups was still accepted.

There is a significant difference (2 X 3 table) between the distributions of frequencies in the three categories for the combined control and chronic schizophrenic groups ($\chi^2 = 12.10$, P is .002, two degrees of freedom). The "Undifferentiated Theme" category for the chronic schizophrenics is the only cell in which the expected frequency (3.3) falls below five. Although this was not believed to affect seriously the rejection of the hypothesis of no

difference between the two groups, the undifferentiated and differentiated theme categories were again combined for the combined control and chronic schizophrenic groups separately. For the 2 X 2 table, $\chi^2 = 6.81$, P is .01, one degree of freedom, resulting in the same conclusion.

Table XII, below, presents the number of subjects in each group in each category for the Retrospective presentation.

TABLE XII
NUMBER OF SUBJECTS IN EACH GROUP IN EACH ORGANIZATION
CATEGORY FOR THE RETROSPECTIVE PRESENTATION ONLY

Group	Category		
	No Theme	Undifferentiated Theme	Differentiated Theme
Chronic schizophrenic	9	6	1
Psychiatric control	3	3	10
Normal control	0	2	14

For the 2 X 3 table, the control groups are not significantly different ($\chi^2 = 3.88$, P is .15, two degrees of freedom). However, the expected frequencies in the "No Theme" and "Undifferentiated Theme" are below five. These two categories were combined, and when the control groups were again tested, they were still nonsignificantly different (P is .23, Fisher's direct method for 2 X 2 table).

There is a significant difference (2 X 3 table) between the distributions of frequencies in the three categories for the combined controls and chronic schizophrenics ($\chi^2 = 21.28$, P is .00003, two degrees of freedom). In view of the extent of this statistical significance, the possible error introduced by the fact that the expected frequencies for the chronic schizophrenic "No

Theme" and "Undifferentiated Theme" categories (4 and 3.7, respectively) were below five, was not believed to be serious.

There is evidence, then, for the prediction that the control groups, though not differing between themselves, would show a greater degree of continuity and organization in their responses.

3. Correlation between the Literal-Animistic and Continuity-Organization Categories

For the literal-animistic dimension, the various animistic scores are combined into one category; for the continuity-organization dimension, the "Undifferentiated Theme" and "Differentiated Theme" are grouped together. T_b (Tau_b) correlations for dichotomized variables consisting of tied ranks, as described by Kendall (18), are computed. These correlations are done for the Ongoing and Retrospective presentations separately, and for the chronic schizophrenics and combined controls separately.

Table XIII, below, gives the categorization on both variables of the 16 chronic schizophrenics' Ongoing presentation, and the categorization of the (same) 16 subjects' Retrospective presentation.

TABLE XIII

NUMBER OF CHRONIC SCHIZOPHRENICS IN THE LITERAL-ANIMISTIC AND CONTINUITY-ORGANIZATION CATEGORIES FOR THE HEIDER-SIMMEL ONGOING AND RETROSPECTIVE PRESENTATIONS

Organization	Ongoing		Retrospective	
	Literal	Animistic	Literal	Animistic
Theme	1	4	4	3
No theme	11	0	9	0

For the Ongoing presentation, $Tau_b = .86$; the test of significance of this correlation indicates that it is significant ($CR = 2.71$, P is $.01$). Tau_b , for the Retrospective presentation, is $.54$, but this correlation is not statistically significant ($CR = 1.48$, P is $.14$).

Table XIV, below, provides the categorization on both variables for the combined control group ($N = 32$) for the Ongoing and Retrospective presentations.

TABLE XIV

NUMBER OF COMBINED CONTROLS IN THE LITERAL-ANIMISTIC AND CONTINUITY-ORGANIZATION CATEGORIES FOR THE HEIDER-SIMMEL ONGOING AND RETROSPECTIVE PRESENTATIONS

Organization	Ongoing		Retrospective	
	Literal	Animistic	Literal	Animistic
Theme	1	23	0	29
No theme	5	3	2	1

Tau_b , for the Ongoing presentation, is $.65$, and is statistically significant ($CR = 3.09$, P is $.002$). For the Retrospective presentation $Tau_b = .80$, and is statistically significant ($CR = 3.24$, P is $.001$).

These data, with the exception of the Retrospective performance of the chronic schizophrenics, point to significant correlations between the literal-animistic and continuity-organization variables. The evidence seems to corroborate the hypothesis of a relationship between them.

4. Comparisons for Scenes Mentioned

These data are placed in Appendix III, which includes Tables XV through XXI. Since the various comparisons are considered in detail in Appendix III, only the data presented in Tables XX and XXI, in Appendix III, will be dis-

cussed here, for these are the only ones which involve significant comparisons.

Table XX indicates that the mean number of scenes mentioned by the combined controls is significantly greater than the chronic schizophrenic mean, for both the Ongoing and Retrospective presentations. Table XXI shows that the mean number of scenes mentioned for the Ongoing presentation is significantly greater than that for the Retrospective presentation, for both the combined controls and chronic schizophrenics.

B. The Film of the Michotte Situations

1. The Literal-Animistic Categories

Table XXII, in Appendix II, provides the literal-animistic scores for all subjects; the order of subjects is the same in this table as for the other Appendix II tables.

Table XXIII, below, shows the frequencies of literal and animistic responses in each group. In this table, a subject was considered in the animistic category if at least one of the 13 sequences had been animated. The particular kind of animistic response was ignored.

TABLE XXIII

NUMBER OF SUBJECTS IN EACH GROUP IN THE LITERAL OR ANIMISTIC
CATEGORY FOR THE FILM OF THE MICHOTTE SITUATIONS

Group	Category	
	Literal	Animistic
Chronic schizophrenic	15	1
Psychiatric control	12	4
Normal control	10	6

All groups tend to be more literal than animistic. The control groups did not differ significantly in the frequency of animistic responses ($\chi^2 = .14$, corrected for continuity; P is .71, one degree of freedom). The frequency of animistic responses in the combined control group is not significantly different from the frequency of animistic responses in the chronic schizophrenic group ($P = .10$, Fisher's direct method), although the difference is in the predicted direction.

These results do not confirm the hypothesis of significant differences between the controls and chronic schizophrenics for animistic responses to the film of the Michotte situations, although the differences are in the predicted direction. The prediction that the controls would not differ is substantiated.

2. The Continuity and Organization Categories

Table XXIV, in Appendix II, gives the continuity and organization category scores for all subjects, in the same order as before.

Table XXV, below, shows the frequencies in the three categories for each group.

TABLE XXV

NUMBER OF SUBJECTS IN EACH GROUP IN EACH ORGANIZATION
CATEGORY FOR THE FILM OF THE MICHOTTE SITUATIONS

Group	Category		
	No Theme	Undifferentiated Theme	Differentiated Theme
Chronic schizophrenic	15	1	0
Psychiatric control	12	3	1
Normal control	10	4	2

The distributions of frequencies for the two control groups are not significantly different ($\chi^2 = .66$, P is .72, two degrees of freedom). However, because of the low statistically expected frequencies in the "Undifferentiated Theme" and "Differentiated Theme" for both groups, for the 2 X 3 table, these two categories were grouped and the controls were tested again. For the 2 X 2 table, $\chi^2 = .15$, P is .70, one degree of freedom, still indicating nonsignificance.

The distributions, for the 2 X 3 table, of the combined controls and chronic schizophrenics are also nonsignificant ($\chi^2 = 4.01$, P is .14, two degrees of freedom). Because of the low expected frequencies, the "Undifferentiated Theme" and "Differentiated Theme" categories were grouped. For the 2 X 2 table, P is .10 (Fisher's direct method), still indicating nonsignificance.

3. Physical Causality

Table XXVI, in Appendix II, ordered as before, gives the number of times each subject reported the perception of physical causality for the Michotte situations three through thirteen. That is, the first chronic schizophrenic reported one instance, the first psychiatric control a total of eight instances, and so on.

The chronic schizophrenics ($N = 16$) report a mean of 3.00 instances of physical causality. The normal controls ($N = 16$) report a mean of 3.69 instances and the psychiatric controls ($N = 16$) a mean of 4.25 instances.

Table XXVII, below, is the summary of the analysis of variance which compares the three groups for this factor.

TABLE XXVII

SUMMARY OF ANALYSIS OF VARIANCE FOR ALL GROUPS FOR THE
PERCEPTION OF PHYSICAL CAUSALITY

Source of Variation	Sum of Squares	<u>df</u>	Mean Square	<u>F</u>
Between groups	12.54	2	6.27	-
Within groups	<u>420.44</u>	<u>45</u>	9.34	
Total	432.98	47		

The analysis of variance shows nonsignificant differences among the means of the three groups, although the schizophrenics score lower than the two control groups.

C. Comparison of the Heider-Simmel and Michotte Films
For the Literal-Animistic Category

For each group, the hypothesis was tested that there was no difference between the frequencies of animistic responses for the two films. (Since the frequencies in each of the following contingency tables are based on the same individuals, allowance is made for the correlation in testing the stated hypothesis.)

The Ongoing and Retrospective presentations of the Heider-Simmel film are not separately compared with the film of the Michotte situations. Instead, each subject is categorized once for both Heider-Simmel presentations; in this analysis, if a given subject gave an animistic response (of any type) to either the Ongoing or Retrospective presentation, he is considered in the animistic category for this film; thus, those who are categorized as literal for this film were literal on both presentations. For the film of the Michotte situations, a subject is counted in the

animistic category if he gave an animistic response (of any type) to at least one of the 13 Michotte situations.

Table XXVIII, below, gives the frequencies of response in either the literal or animistic category for the chronic schizophrenic group (N = 16), for both films.

TABLE XXVIII

NUMBER OF CHRONIC SCHIZOPHRENICS IN THE LITERAL OR ANIMISTIC CATEGORY FOR BOTH FILMS

Heider-Simmel ↓	Michotte	
	Literal	Animistic
Animistic	3	1
Literal	12	0

The χ^2 test ($\chi^2 = 1.33$, corrected for continuity; P is .25, one degree of freedom), indicates that the frequency of animistic responses, for both films, was not significantly different for the chronic schizophrenics. (There was no correction for the fact that the observed frequencies of the "change" or "shift" cells of this table do not total to ten.)

Table XXIX, below, compares the frequencies of animistic responses for the psychiatric controls (N = 16), for both films.

TABLE XXIX

NUMBER OF PSYCHIATRIC CONTROLS IN THE LITERAL OR ANIMISTIC CATEGORY FOR BOTH FILMS

Heider-Simmel ↓	Michotte	
	Literal	Animistic
Animistic	10	4
Literal	2	0

The frequencies of animistic responses for both films are significantly different for the psychiatric controls ($\chi^2 = 8.10$, corrected for continuity; P is .004, one degree of freedom).

Table XXX, below, shows the frequencies of animistic or literal responses for the normal controls ($N = 16$), for both films.

TABLE XXX
NUMBER OF NORMAL CONTROLS IN THE LITERAL OR ANIMISTIC
CATEGORY FOR BOTH FILMS

Heider-Simmel ↓	Michotte	
	Literal	Animistic
Animistic	10	6
Literal	0	0

For the normal controls, the frequencies of animistic responses for both films were significantly different ($\chi^2 = 8.10$, corrected for continuity; P is .004, one degree of freedom).

With the exception of the chronic schizophrenics, there is some evidence for the hypothesis that the Heider-Simmel film would result in a greater degree of animation.

V. DISCUSSION OF RESULTS

A. The Heider-Simmel Film

The fact that all subjects were given an Ongoing and a Retrospective presentation of the film permitted an examination of the possibility that the frequency of animistic responses might be influenced either by the mode (Ongoing or Retrospective) or by the frequency (one or two) of presentation.

The frequency of animistic responses was not significantly greater for the second presentation than for the first presentation for both the Ongoing and Retrospective modes. This was true for the chronic schizophrenics and the combined controls. In fact, the only difference which approached the .05 level of significance was that for the combined control Ongoing first versus the combined control Ongoing second (P is .17); the Ongoing second presentation had more animistic responses. (See Tables VII and VIII, above.)

Similarly, animistic responses were not significantly more frequent in the Retrospective presentation than in the Ongoing presentation. This was true for the chronic schizophrenics and the combined controls. The only difference which approached the .05 level of significance was that for the combined control Ongoing first versus the combined control Retrospective first (P is .17); the Retrospective first presentation had more animistic responses. (See Tables VII and VIII, above.)

The generalization seems to be warranted that the occurrence of the animistic response to the Heider-Simmel film requires only one presentation and that this presentation can be either Ongoing or Retrospective. Whatever the processes involved in the animistic or literal response, these processes

were little affected by variations in the mode and number of presentations. However, the two differences mentioned above do approach statistical significance and so suggest that a real difference may exist in the number of presentations of a given mode and in the mode (Ongoing or Retrospective) of presentation itself.

The analysis of the data showed that the psychiatric and normal controls did not differ significantly in the frequency of animistic responses to the Heider-Simmel film. (See Table VII, above.) However, the differences between the chronic schizophrenics and combined controls were significant. (See Table IX, above.) The significance of these differences leaves little doubt of a real difference between these two groups. However, certain factors must be discussed which might qualify the obtained results, before they are discussed in terms of the theoretical structure given in Chapter I.

The possibility arises that the literal-animistic differences between the chronic schizophrenics and the combined controls are a function of the former group's unwillingness to co-operate. Although this possibility must be considered when schizophrenic patients are studied, certain additional factors must be weighed.

Hanfmann and Kasanin (13) have pointed out the importance of avoiding experimentation with schizophrenics who are in excited states or who show advanced deterioration, for they are unable to satisfy the demands of the task, and so the process studied is obscured. The schizophrenics in the present study were in good contact, so that the assumption is warranted that they understood the task and the instructions, and thus were "capable" of responding.

However, the immediately preceding remarks do not answer the question: "Does the literal performance of the schizophrenics actually mirror their experience?" This question is logically unanswerable, for the investigator

of schizophrenic behavior has only verbal or motor performance as data. If the question is answered in the negative, one implies, for example, that the schizophrenics did interpret the stimuli animistically and that they were "deliberately" literal.

That investigators usually assume otherwise is seen from the following. In his work on conceptual thinking in schizophrenia, Goldstein (11) described the impairment of the abstract attitude as typical for many schizophrenics.

Goldstein and other researchers who have studied conceptual thinking in schizophrenia assume that the concrete behavior of the schizophrenic is not "deliberate" but arises spontaneously, that he tries but cannot do better.

Goldstein states:

It is characteristic of the impairment of the abstract attitude that the subject is not able to give himself an account of what he is doing, and so it is but natural that he is incapable of communicating his inner experiences by spontaneous description. However, these inner experiences may become manifest in his concrete actions because here they belong to the situation and arise without deliberate effort, of which the patient is deprived by his pathologic condition (11, p. 29).

It is seen, then, that the patient's performance is taken to indicate inner experience and is used as the basis for making statements about the processes being studied. This writer believes that the statement can be made, both in reference to the studies on conceptual thinking and to this investigation of literalism and animism, that it is immaterial from the point of view of practical consequences whether the schizophrenic is "deliberately" concrete or literal. That is, in the case of literalism, the schizophrenic just as effectively precludes interpersonal communication whether he is literal "deliberately" or whether he is actually unable to be otherwise. Finally, the fact that the literal protocols are so similar strongly suggests that the literal subjects had no animistic impression. That is, it would

seem improbable that all the literal chronic schizophrenics, if they were trying "deliberately" to confound the experimenter, would by chance resort to physical description of the stimuli.

The possibility arises that the literalism of the schizophrenics is attributable to the effects of anxiety. That is, since the schizophrenics are motivated to avoid the interpersonal, the experimental situation would be expected to make them anxious; anxiety could be viewed as a constrictive influence which is conducive to literalism. Actually; this possibility must remain open, since anxiety was not measured in any of the groups. However, since one may assume some degree of anxiety in the psychiatric controls in particular and in all subjects when placed in a strange situation, then the effect of anxiety in the chronic schizophrenic group might be related to a differential response producing more literalism.

Further, it would not seem that the differences in animistic responses between, say, the chronic schizophrenics and psychiatric controls are attributable to the differences between the groups in the attention paid to the external situation. Table XX, in Appendix III, it is true, does reveal that the combined controls mention a mean number of the Heider-Simmel film scenes which is significantly greater than the chronic schizophrenic mean.

Moreover, if the animistic response were somehow related to the verbal productivity of the subjects, one would expect a significant correlation between animism and verbal productivity for each group. An attempt was made to determine this correlation as follows: The literal-animistic category was dichotomized, as is the continuum of the number of scenes mentioned. For each group, the dichotomy was made at the mean of the number of scenes mentioned by the group; this was done to avoid the extreme distribution which might arise if the dichotomy were made around $\bar{X} = 6$. The correlations are τ_{b} for dichotomized variables.

Table XXXI, below, gives the categorization of the 16 chronic schizophrenics on both variables for the Ongoing and Retrospective presentations separately.

TABLE XXXI

NUMBER OF CHRONIC SCHIZOPHRENICS IN THE LITERAL-ANIMISTIC AND SCENES MENTIONED VARIABLES FOR THE HEIDER-SIMMEL ONGOING AND RETROSPECTIVE PRESENTATIONS

Scenes Mentioned	Ongoing		Scenes Mentioned	Retrospective	
	Literal	Animistic		Literal	Animistic
6-12	5	3	4-12	3	1
1-5	7	1	1-3	10	2

For the Ongoing presentation, $Tau_b = .29$, which is nonsignificant ($CR = .56$, P is $.58$). Tau_b , for the Retrospective presentation, is $.09$, which is nonsignificant ($CR = 0.00$, P is 1.00).

Table XXXII, below, shows the same comparisons for the 32 combined controls for the Ongoing and Retrospective presentations.

TABLE XXXII

NUMBER OF COMBINED CONTROLS IN THE LITERAL-ANIMISTIC AND SCENES MENTIONED VARIABLES FOR THE HEIDER-SIMMEL ONGOING AND RETROSPECTIVE PRESENTATIONS

Scenes Mentioned	Ongoing		Scenes Mentioned	Retrospective	
	Literal	Animistic		Literal	Animistic
11-12	1	10	7-12	0	15
1-10	5	16	1-8	2	15

For the Ongoing presentation, τ_b is .18, which is nonsignificant ($CR = .53$, P is .60). τ_b for the Retrospective presentation, is .24, which is nonsignificant ($CR = .63$, P is .53).

These results strongly suggest that the relationship between animistic responses and productivity, as measured by the number of scenes mentioned, is not decisive.

From Table XXVII, above, it is seen that the three groups do not differ significantly among themselves in perception of physical causality, although the chronic schizophrenic mean (3.00) is the lowest of the three. There would be some difficulty, then, in attributing the differences in animistic responses to differences among the groups in the capability of perceiving that one object moves as a function of another.

The descriptive data in Chapter II indicate that the subjects in the three groups are comparable in age and educational level. Moreover, the chronic schizophrenics and psychiatric controls are comparable in the length of time spent in hospitals and the number of years since the first hospitalization. In view of the latter, it is unlikely that the results between, say, the chronic schizophrenics and the psychiatric controls are related to any effects of hospitalization per se.

A possible explanation for these results, consistent with the theoretical structure presented in Chapter I, follows. The Heider-Simmel film presents the observer with a difficult situation, and the structure of the experimental setting demands an organization of the stimuli. In the first place, the subject is aware that the experimenter is a psychologist who is conducting some kind of a project; for the normal subject, this usually involves a set to co-operate, a set to meet the demands of the experimental conditions. Second, when he is shown the film, he is asked to tell the experimenter what is happening. The normal subject, then, feels that he has to

"do something" with the stimuli. There are a number of possibilities, from the writer's point of view, as to how the subject can comply with the instructions, "Tell me what is happening?" or "Tell me what has happened?" Among others, he can describe just what he sees or he can organize what he sees in a meaningful manner. Given these particular stimuli and these attitudinal directions, the animistic interpretation would seem to be that which can provide the events with meaning.

In the initial inquiry, excluding nine persons who were not asked, all subjects, in all groups, who gave one of the animistic response variants, interpreted the general question, "What do you think of this film?" or some form of this question, to be directed towards their interpretations of the scenes or action. That is, the latter question was taken to pertain to the organization which they had imposed on the stimuli. (This occurred in 54 of the 63 animistic protocols.) Characteristically, all subjects, excluding five persons who were not asked, who had given literal responses interpreted the question to refer to the experimenter's purpose in showing the film. (This occurred in 28 of the 33 literal protocols.) These subjects often referred to the film as a test of observation, "to see how good you can remember," or "to see how fast your mind is," or said simply that they had no idea at all about it. This occurred in the film of the Michotte situations as well.

The chronic schizophrenic subject, in the same situation, is also aware, if imperfectly, that he is participating in a project. And since he was chosen only if he was in contact and showed a willingness to participate, one may assume that he had at least a partial set to co-operate. He, too, is faced with two general possibilities of organizing the film: the literal or animistic. However, since he is in-schizophrenia, the assumption is made that he is motivated to minimize the interpersonal aspects of situations, that he

utilizes certain devices to preclude the interpersonal. Now the results published by Heider and Simmel (15) and the results on the normal control group of this study, to say nothing of the psychiatric controls, show conclusively that the preferred mode of responding to the Heider-Simmel film is animistic, as defined herein. And the results on the chronic schizophrenic group show that their preferred mode of response is literal. The proposition is offered that a set towards maintaining himself in a state of withdrawal, and a set towards minimizing interpersonal contact, are the factors which produce the literalism of the chronic schizophrenic in the present situation.

One of the implications of this finding seems to be that it calls into question, as far as chronic schizophrenics are concerned, the frequently made allusions to the "richness" and physiognomic and/or animistic qualities of schizophrenic thinking; that is, as far as these stimuli may be considered as capable of releasing such propensities. One wonders, for example, why the presentation of these stimuli does not elicit physiognomic percepts. Moreover, if the schizophrenics have what is described as a rich inner life and a tendency to project and embellish things with personal inner phantasies, one wonders at the absence of such behavior. Clearly, physiognomic and animistic responses to the stimuli did not occur.

Perhaps one answer to this is the fact that many of the statements which refer to the schizophrenic's physiognomic and/or animistic performance do not clearly specify the population in which this occurs. The subjects in this study are chronic schizophrenics; these other forms of response may occur in the acutely ill. Another possibility may concern the nature of the task. The physiognomic and animistic aspects of schizophrenic thinking may become manifest under other conditions of observation. However, the statement

seems justified that investigators who report such instances should report more fully the nature of the performance, the conditions under which it occurs, and the type of patient studied.

The meaning of the different kinds of animistic response is not clear. The hypotheses tested applied to differences in the frequencies of animistic responses, irrespective of types I, II, or III, and no hypotheses were made concerning the distribution of these responses within the groups. However, the differentiation of these different degrees of animistic interpretation seemed to offer some clues as to what might be involved in the animistic approach.

Table XXXIII, below, gives the number of subjects in each group in the literal category and the three animistic categories, for the Ongoing and Retrospective presentations.

TABLE XXXIII

NUMBER OF SUBJECTS IN EACH GROUP IN THE FOUR-LITERAL-ANIMISTIC CATEGORIES FOR BOTH PRESENTATIONS

Group	ONGOING			
	Category			
	Literal	Animistic I	Animistic II	Animistic III
Chronic schizophrenic	12	1	2	1
Psychiatric control	4	7	3	2
Normal control	2	4	9	1

Group	RETROSPECTIVE			
	Category			
	Literal	Animistic I	Animistic II	Animistic III
Chronic schizophrenic	13	2	0	1
Psychiatric control	2	4	7	3
Normal control	0	4	10	2

For the Ongoing distributions, the controls are not significantly different ($\chi^2 = 4.80$, P is .20, three degrees of freedom); the combined controls and chronic schizophrenics are significantly different ($\chi^2 = 14.80$, P is .002, three degrees of freedom). For the Retrospective distributions, the controls are not significantly different ($\chi^2 = 2.72$, P is .43, three degrees of freedom); the combined controls and chronic schizophrenics are significantly different ($\chi^2 = 29.29$, P is .000002, three degrees of freedom).

However, because at least one-half of the expected frequencies of the cells in each portion of Table XXXIII fall below five, these statistics must be viewed with extreme caution.

This table does indicate, however, that the animistic responses, for the control groups, tend to be concentrated in the Animistic I and II categories. The former category, it will be remembered, involves the imputation of motive and/or affect to the objects, which are called by their "object-names." The Animistic II response involves the same thing, but with an eventual reference to the objects as persons or animals. Type III is the immediate reference to persons or animals.

Perhaps these two categories represent, to the controls, a "safe" way of responding in a doubtful situation. That is, when the subject gets an animistic impression, perhaps he feels somewhat foolish or that the experimenter will consider him such. Thus, he responds in such a way as to convey both the animistic impression and the fact that he "knows" that the stimuli are, after all, only objects. (The implication here is not that this is done in a deliberate manner.) This would seem to apply particularly to the Animistic II responses, which seem to fall between a closeness to the stimuli (Type I) and a (relative) disregard of the stimuli (Type III). The relationships among these different animistic responses and the characteristics of the persons who give them suggest areas for future study.

The significant correlations between the literal-animistic and continuity-organization variables strongly suggest the importance of the animistic response to the meaningful organization of the stimuli, as defined by the presence or absence of a unifying theme. (With the exception of the Retrospective presentation for the chronic schizophrenics, the correlations are high.) That the combined controls invest their productions with a greater degree of organization is not surprising in view of these findings.

The subjects in all groups who responded contrary to the literal-animistic dimension predictions will be considered. In the Heider-Simmel film, three chronic schizophrenics gave animistic responses to both presentations and one schizophrenic gave an animistic response to one presentation. In the psychiatric control group, two subjects gave literal responses to both presentations and two subjects gave literal responses to one presentation. In the normal control group, only two subjects gave literal responses to one presentation.

Two of the schizophrenics who gave animistic responses might have been in "partial remission." That is, they seemed to be able to assume a greater degree of responsibility for themselves, in terms of engaging in hospital activities and using "open ward" privileges. The possibility arises, then, that the animistic performance of these two subjects is related to the fact that they did not tend to minimize interpersonal contact. There is no immediate explanation for the other two schizophrenics who gave animistic responses. Further investigation is needed to determine the conditions under which schizophrenics will not be literal in these experimental conditions. However, the fact that 75 per cent of the chronic schizophrenics were literal on both Heider-Simmel film presentations strongly suggests that this kind of performance is typical for them as a group. Moreover, considering the fact that literalism is manifested both in verbal (proverbs) and

the present nonverbal situations, one has some evidence for concluding that literalism in (chronic) schizophrenia is fairly extensive.

The control subjects who gave literal responses present another problem. These subjects, though clearly not schizophrenic, in effect seem to preclude the interpersonal by responding literally. One possible explanation for this is that, under the particular conditions of the experiment, it did become necessary for some controls to avoid the interpersonal. This does not make them schizophrenic, but it does suggest the conclusion that literalism is not the exclusive property of schizophrenia.

An interesting finding, not systematically studied, emerges from the responses in all groups. Often these subjects reported experiences which might be termed uncanny. These reports seemed to come more frequently from the literal subjects. These subjects sometimes reported feelings which reflected a sense of strangeness or wonder. These feelings often were conveyed by a glance or a nod of the head, or by statements such as, "I just can't understand it," or "That's very strange to me . . . it's funny."

Perhaps this experience of the uncanny is related to the absence of organization in the literal response. Without the organization of the events which is provided by the animistic response, the literal subject is faced with a situation which he is unable to comprehend, which does not make sense; hence it assumes an aspect of being unreal, strange, or uncanny. The objects, in this case, seem to move this way and that, without apparent purpose. These movements, it may be conjectured, induce in the observer a vague idea of something alive, and it is possible that it is this vague, covert awareness of objects which are alive which produces the experience of the uncanny. Further, the subject who gives an animistic response is overtly aware of an impression of life; the organization given the events by such a response might tend to eliminate the experience of the uncanny, since the animistic organization "makes sense."

B. Film of the Michotte Situations

The prediction that the control groups would not differ significantly in the frequency of animistic responses to the film is substantiated, but the combined controls also do not differ significantly from the chronic schizophrenics. The combined controls changed to significantly fewer animistic responses in this film, when compared with their Heider-Simmel film performance; they then were nonsignificantly different from the chronic schizophrenics in the number of animistic responses to the film of the Michotte situations, although the combined controls still produced more animistic responses. The chronic schizophrenics were more literal on the film of the Michotte situations, but nonsignificantly so.

It would seem that the Michotte scenes are less conducive to animistic interpretations. An explanation of this in terms of the lesser complexity of the presented situations is possible. The movements themselves, when compared with the Heider-Simmel stimuli, are less conducive to animistic interpretations, so that a simple organization in terms of physical or mechanical causality is readily possible. In the inquiry, moreover, many of the subjects were content with interpreting the film in terms of a "test of observation" and so on.

Table XXXIV, below, shows the categorization for the literal-animistic variable for this film.

TABLE XXXIV

NUMBER OF SUBJECTS IN EACH GROUP IN EACH LITERAL-ANIMISTIC
CATEGORY FOR THE FILM OF THE MICHOTTE SITUATIONS

Group	Category			
	Literal	Animistic I	Animistic II	Animistic III
Chronic schizophrenic	15	1	0	0
Psychiatric control	12	1	3	0
Normal control	10	3	3	0

Statistics are not computed for this table; it is used for illustrative purposes only. However, the same relationship, as for the Heider-Simmel film, is seen to hold. That is, the animistic responses tend to be Types I and II; the supposed reason for this is the same as advanced earlier, that is, that these are "safer" ways of responding.

For the continuity-organization variable, the differences between the controls are nonsignificant, and the differences between the combined controls and chronic schizophrenics do not quite reach significance. This is not surprising since all groups tend towards literalism on this film.

In general, the differences in animistic response between the controls and chronic schizophrenics become obscured in this film. The stimuli are such that all groups tend towards literalism and matter-of-fact perception of the events.

VI. SUMMARY AND CONCLUSIONS

Groups of psychiatric controls were shown two films depicting inanimate objects in motion and were asked to tell what happened in the films. This study was designed to compare the groups' interpretations of the films. The following summarizes the major findings:

1. Insofar as the more complex Heider-Simmel film is concerned, the chronic schizophrenics are more literal (produce fewer animistic responses) than the control groups; the chronic schizophrenics' responses are less organized in terms of themes.
2. For the same film, there is a correlation between the animistic responses and degree of thematic organization, for each group. And although the controls mentioned a greater number of scenes than the chronic schizophrenics, there is a nonsignificant correlation between animistic responses and productivity, as measured by the number of scenes mentioned, for each group; and the influence of kind of presentation and number of presentations on the frequency of animistic responses is not significant.
3. For the film of the less complex Michotte situations, the controls do not differ from the chronic schizophrenics in the frequency of animistic responses; nor are the differences significant for the degree of thematic organization; the three groups do not differ significantly in the perception of physical causality. The control groups became significantly more literal on this film as compared to the Heider-Simmel film.

An attempt was made to explain the literal response of the chronic schizophrenics as a denial of the interpersonal, which is implied by the

animistic response. It was suggested that the frequently made references to the animistic tendencies of schizophrenic thought must be considered in terms of the conditions under which they occur, and that they should be distinguished from physiognomic perception.

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APPENDIX I

SAMPLE PROTOCOLS

Sample Protocol #1. (Chronic Schizophrenic #9, Heider Retrospective)

(Tell me what happened.) In the picture there was a small enclosure with one triangle in it, and outside the enclosure were another triangle and a circle. In the enclosure there was a gate and the gate opened for the large triangle to go out and it did. And then as the circle went into the enclosure and the . . . then the circle and large triangle came out of the enclosure. Then, after that, the large triangle and circle went out of the enclosure, and they went around the enclosure to the right. The small circle or the circle and the triangle, the large triangle, seemed to follow the small triangle, and they went around about three times; and then the small triangle and the circle stayed on the outside, and the large triangle went in the enclosure and seemed to break the enclosure around the gate of it and at the top of it. Then it broke the enclosure- and that's what happened. Then the film ended with the large triangle, I believe, still remaining in the enclosure, and the circle and the small triangle staying on the outside; with the enclosure remaining at the end broken.

Inquiry: (What do you think of this film?) Nothing much. (Does anything about it occur to you?) No. (Does it suggest anything to you?) Nothing at all.

Analysis:

1. The quality of the response is literal; there is no imputation of motive or affect, just description on a physical level.
2. There is no theme or organization; the events are not connected.
3. A total of eight scenes is mentioned.

Sample Protocol #2. (Normal Control #14, Heider Ongoing)

There seems to be a triangle moving down in a square. I see another triangle and a dot. The triangle moving around in a circle, one moving around the square and one of the triangles is smaller than the other. The dot is moving into the region of the square or rectangle. The triangles are moving on the right, and now are moving in a . . . the triangle is now moving at the lower portion of the rectangle and another triangle is now moving around to the right. The dot is moving within the rectangle. The triangle is entering the rectangle. The smaller triangle is at the lower side, resting on the outer surface, moving towards the upper portion. The dot is moving in the lower portion of the rectangle, and now the smaller triangle is entering the rectangle. The dot is at the upper portion and has gone out of the rectangle. The large triangle is now out of the rectangle and has entered the rectangle and is out again. The dot and the triangle have left the field. The larger triangle is probing and entered the rectangle and is bursting the sides.

Inquiry: (What did you think of this film?) I think it's very good. (Did anything occur to you?) Well, motion, different shapes . . . I can't seem to gather any thought or trend. (Did it suggest anything?) Nothing whatsoever, other than the dot and the rectangle and the larger triangle and the smaller triangle in a moving demonstration. That's all I can gather.

Analysis:

1. This response is also literal; there is description of the objects in space.
2. There is no theme or unitary idea connecting the events.
3. A total of nine scenes is mentioned.

Sample Protocol #3. (Psychiatric Control #10, Heider Retrospective)

(Tell me what happened.) Well, the nearest I can describe it, they had this big cage and the bigger object was in the cage and went outside through the cage and tried to force the little round object in to the cage, and it seemed like the smaller object was trying to protect the little object, and it was also trying, I believe, to force the bigger object to . . . the bigger object was trying to force the other object in the cage. And the smaller, little round ball went in the cage and the big object went in after it and tried to force it down in the corner and trap it. Then the little object also came to the cage and more or less kind of held the door open, and the little round object came on out through the door and enclosed the big object inside the cage. He tried to catch both of them and they disappeared and he got mad and tore up the cage.

Inquiry: (Anything else you can think of?) No, just trying to protect each other. The two smaller objects were trying to stick together from the big object. When he couldn't corral either one of them, he couldn't capture them, he got mad.

Analysis:

1. This response is in the Animistic I category, for there is imputation of motive and emotion but the objects are not referred to as living beings.
2. The theme is differentiated, as the two smaller objects are psychologically together against the large triangle; and the large triangle's anger is seen as a consequence of his failure to capture the smaller objects.
3. A total of nine scenes is mentioned.

Sample Protocol #4. (Psychiatric Control #4, Heider Ongoing)

Well, there's an object just formed into a shape and a triangle which dropped down towards the center. And there's a triangle and a ball opposite the square there. The triangle in the square came out and made contact with the other triangle- and shoving the other triangle away. In the meantime, the ball that was by the triangle worked its way over towards the corner of the square, and now it looks like that one triangle is a little larger than the other one and it's trying to push that small triangle against the square. In the meantime, the circle has went into the square and the square is opening up, enclosing the big triangle, leaving the smaller triangle outside. The smaller triangle is moving around the edge of the square, trying to open the square up, apparently to let the ball out; and the triangle is chasing the ball in the square. The small triangle did open up the square and let the ball out, and it's running away with the ball. The big triangle was chasing the ball and triangle, and it looks like it hasn't caught it so far. It's trying to make up its mind whether it's going back in the square or not. It finally busted through the square as though it was mad or something.

Inquiry: (What do you think of this film?) Just that the large triangle was trying to get the other two, and the little one helped the ball get out of the square. Then they ran away from the big triangle. (Anything else?) No. (Does it suggest anything else to you?) No.

Analysis:

1. This response is in the Animistic I category, because of the imputation of motive and affect to the objects.
2. This response is considered to have no theme. It is rather just animated description, with no connection among the different events.
3. A total of nine scenes is mentioned.

Sample Protocol #5. (Chronic Schizophrenic #8, Heider Ongoing)

Right now I see a complete rectangle with a triangle inside it and small dot, and the large triangle moving out of the rectangle through an opening. They are moving around. The small dot is in guard of the part of the enclosure of the rectangle. Now it's moving out, and the small triangle is upon the side of the rectangle, and it moved around to another side of the rectangle. It started moving over, and the larger triangle is going through the opening of the large rectangle to find the small circle, which had already moved into the rectangle, and the door is closing. The large triangle is on the inside of the rectangle, and the dot is moving around, going up to meet it at the top. The small triangle is at the opening of the rectangle and going in, and the dot and large triangle are chasing each other around. Now they are on the outside of the rectangle and they are chasing each other. Now all three seem to be chasing each other on the outside of the fence. Now there are only two objects in the picture- the rectangle and the triangle. The triangle busted the rectangle.

Inquiry: (What do you think of this film?) Well, it could be used to describe almost anything, I would say. A rodeo. (Rodeo?) Yes. Or a baseball game. When I came to think about it instead of describing the objects as they really were, as a rectangle or triangles, I thought maybe, perhaps, you could think of it as a bullfight. (What suggested this?) The triangle moved in and broke up the fence, leaving the impression of a bullfight or a stampede of cattle or bucking broncos.

Analysis:

1. This is in the Animistic II category, because there is the attribution of motive with the eventual reference to the objects as animals.
2. The theme is undifferentiated, for there is no connection among the events; rather, there seems to be a global impression of activity or a fight.
3. A total of eight scenes is mentioned.

Sample Protocol #6. (Normal Control #13, Heider Retrospective)

(Tell me what happened.) It looked like a fight of domination of two objects, the larger gaining the domination and going after or for a second object of different classification. The larger was finally overcome by the original domineered object and foiled in his attempts or its attempts to its ultimate goal. I expect that's all.

Inquiry: (Anything else?) No, except that it might be related to human nature or human life, that is. (How's that?) With respect to the grown or an adult trying to inveigle or entice the young into places or into doing things that they do not wish to, and then being finally overcome by the ones being trapped. (Anything particular in mind?) Yes, it can be related largely to the workings of an adult toward the child; let's say malformed adult is persuading the child to go with him or do things that are not proper. The large triangle was the adult and the other two were the young. The outcome was a total loss on the part of the adult, or failure on his part, and complete freedom of the young.

Analysis:

1. This response is in the Animistic II category, because of the initial imputation of motive and the eventual reference to the objects as people.
2. The theme is here differentiated and organized around an idea which integrates some of the events of the film.
3. A total of four scenes is mentioned.

Sample Protocol #7. (Normal Control #14, Heider Retrospective)

(Tell me what happened.) The impression I received on the second showing of the film seems to remind me of a dog in a field taking two different types of animals, maybe one a sheep and one a pig- and taking one in to a field that is fenced off, opening the gate, and leaving them separated. And then at the close of the day, taking the animals back to the beginning place or home. I don't understand the destructive process at the end of the film. I can't get any significance to that.

Inquiry: (Tell me which one of these things was which.) The larger element seemed to refer to possibly a dog- in my experience, maybe a collie. I have seen them when I work out on the farm. And the smaller dot possible a young calf and the smaller triangle might be the mother cow; with the idea of keeping the calf away from the cow during the day. My thought on this is that at the close of the day, or the time these animals should be back in the barn, the collie or the dog has come back to the field and opened the gates and has taken them back to the barn. (And at the end?) At the end, I still can't understand the significance; it seems like the dog has entered the field and he has opened it or made several entrances to this rectangular field. At the beginning, the dog was bringing them into the general area and then he was trying to keep the two separate. (Can you remember what brought this to mind?) The larger triangle seemed to be probing or acting as if a dog would be nipping at the heels- during the second showing, this one.

Analysis:

1. The response is in the Animistic III category, because of the immediate reference to the objects as animals engaged in some activity.
2. The theme is differentiated; an idea is presented which links the different events and provides them with organization.
3. There is a total of five scenes mentioned.

Sample Protocol #3. (Psychiatric Control #6, Heider Ongoing)

This is the jailer and the jailer is inside, and there's a prisoner on the outside, and the round one is the prisoner. The jailer is in for getting the prisoner in the jail. He's driving his accomplice away, and the jailer is at the door now. The jailer is driving his accomplice further away. They're having a little battle, which has got the accomplice bluffed. The prisoner thought he would come down and help his accomplice. The prisoner is now in jail, and the jailer on the outside watching the accomplice. Now he's going in with the prisoner, to probably beat him up, I wouldn't know. The prisoner is in one corner, and the jailer is in the other corner, and the gate is closed. They are in separate rooms. The accomplice is on the outside, going up the side. The prisoner is pretty nervous on the inside, going from corner to corner. His accomplice comes in one corner of the room and got the prisoner out and locked the jailer in. Then the jailer broke out after both of them. He goes back in to be sure he's gone. Now the jailer is searching for the prisoner and his accomplice. He tore up the jail entirely- they got clear away from him, and that's all I saw of the deal.

Inquiry: None.

Analysis:

1. This response is in the Animistic III category; there is an immediate interpretation of the figures as persons, with the imputation of motive and affect.
2. The theme is differentiated with extensive organization of the events.
3. A total of eleven scenes is mentioned.

Sample Protocol #9. (Normal Control #5, Michotte Situations)

1. The blue rectangle moved rapidly to the red rectangle, almost touched, and moved away again.
2. The blue rectangle moved over and hit the red rectangle and moved back again.
3. The blue rectangle moved over, hit the red rectangle, and stayed in the center of the picture where the red one had been, while the red moved to the right.
4. The blue rectangle repeated the same action, moved from the left, hit the red rectangle, and took its place in the center of the picture, while the red rectangle moved to the right.
5. The blue rectangle moved from the left, hit the red rectangle, and stayed in place while the red rectangle moved over to the right.
6. The blue one- rectangle- moved over and hit the red rectangle, and they moved together over to the right of the picture and stayed together.
7. The blue rectangle moved over and hit the red rectangle and kept moving the red rectangle over to the right of the picture.
8. The blue rectangle moved from the left, came in contact with the red rectangle, which was in the center of the picture and they moved together to the right side of the picture.
9. The blue rectangle moved over from the left side until it touched the red rectangle, and then they moved back together to the left side of the picture.
10. The blue rectangle moved over and touched the red rectangle, and after a very brief stop, they moved together to the right of the picture.
11. The blue rectangle moved over to touch the red rectangle, and they moved together behind a large blue rectangle on the right.
12. The blue rectangle moved over to touch the red rectangle, which disappeared. The blue rectangle remained where it was when it touched the red rectangle.
13. The blue rectangle moved over, touched the red rectangle which immediately turned blue. They stayed in the center of the picture.

Sample Protocol #9: Continued

Inquiry: (What do you think of this film?) Just objects moving in a geometric pattern. (Geometric pattern?) Yes, the movements reminded me of the laws of motion- action and reaction. (Suggest anything else?) Just motion and color. Maybe it involves how one sees something move around and recall the motion. It certainly shows how one perceived and remembers. That's what occurred to me.

Analysis:

1. This series of responses is literal.
2. There is no theme in terms of the stimuli themselves. The subject makes some attempt to organize the material by referring to laws of motion and by implying that the sequences are some kind of a test to see how one perceives and remembers.
3. There is one instance of the perception of phenomenal causality (item #7).

APPENDIX II

RAW SCORES

TABLE V

LITERAL-ANIMISTIC SCORES FOR ALL SUBJECTS;
HEIDER-SIMMEL FILM

Chronic Schizophrenics		Psychiatric Controls		Normal Controls	
Ongoing First	Retrospective Second	Ongoing First	Retrospective Second	Ongoing First	Retrospective Second
L	L	L	AII	AI	AI
L	L	AI	AII	AI	AII
L	L	AI	AII	AI	AII
AII	AIII	AI	AII	AII	AII
AIII	AI	L	AI	AII	AII
L	L	AI	AII	L	AIII
L	L	L	L	AI	AI
L	L	AII	AII	L	AII

Retrospective First	Ongoing Second	Retrospective First	Ongoing Second	Retrospective First	Ongoing Second
L	L	L	L	AI	AII
L	L	AI	AI	AI	AII
AI	AI	AIII	AIII	AII	AII
L	L	AI	AI	AII	AII
L	L	AIII	AIII	AII	AII
L	AII	AII	AII	AIII	AIII
L	L	AI	AI	AII	AII
L	L	AIII	AII	AII	AII

"L" is Literal

"AI" is Animistic Type I

"AII" is Animistic Type II

"AIII" is Animistic Type III

TABLE VI

FREQUENCIES OF ANIMISTIC AND LITERAL RESPONSES TO
THE HEIDER-SIMMEL FILM FOR ALL GROUPS

Group	Order	Category	
		Literal	Animistic
Chronic schizophrenics	Ongoing I	6	2
	Retrospective II	6	2
	Retrospective I	7	1
	Ongoing II	6	2
Psychiatric controls	Ongoing I	3	5
	Retrospective II	1	7
	Retrospective I	1	7
	Ongoing II	1	7
Normal controls	Ongoing I	2	6
	Retrospective II	0	8
	Retrospective I	0	8
	Ongoing II	0	8

TABLE X

CONTINUITY-ORGANIZATION SCORES FOR ALL SUBJECTS;
HEIDER-SIMMEL FILM

Chronic Schizophrenics		Psychiatric Controls		Normal Controls	
Ongoing First	Retrospective Second	Ongoing First	Retrospective Second	Ongoing First	Retrospective Second
1	1	2	2	3	3
1	1	1	3	1	3
1	1	1	3	3	3
2	2	3	3	3	3
3	3	1	3	3	3
1	1	3	3	1	3
1	1	1	1	2	3
1	2	3	3	1	3

Retrospective First	Ongoing Second	Retrospective First	Ongoing Second	Retrospective First	Ongoing Second
1	1	1	1	3	3
2	2	2	2	2	3
2	2	3	3	3	3
1	1	1	2	3	3
1	1	2	2	3	3
2	2	3	3	3	3
2	1	3	3	2	2
1	1	3	3	3	3

"1" is No Theme

"2" is Undifferentiated Theme

"3" is Differentiated Theme

TABLE XXII

LITERAL-ANIMISTIC SCORES FOR ALL SUBJECTS: FILM
OF THE MICHOTTE SITUATIONS

Chronic Schizophrenics	Psychiatric Controls	Normal Controls
L	L	AII
L	L	AI
L	L	L
L	AII	AI
AI	L	AI
L	AII	AII
L	L	L
L	L	L
L	L	AII
L	L	L
L	AII	L
L	L	L
L	L	L
L	L	L
L	L	L
L	AI	L
L	L	L

"L" is Literal

"AI" is Animistic Type I

"AII" is Animistic Type II

"AIII" is Animistic Type III

TABLE XXIV

CONTINUITY-ORGANIZATION SCORES FOR ALL SUBJECTS;
 FILM OF THE MICHOTTE SITUATIONS

Chronic Schizophrenic	Psychiatric Control	Normal Control
1	1	3
1	1	2
1	1	1
1	2	2
2	1	2
1	3	3
1	1	1
1	1	1
1	1	2
1	1	1
1	2	1
1	1	1
1	1	1
1	1	1
1	1	1
1	2	1
1	1	1

"1" is No Theme

"2" is Undifferentiated Theme

"3" is Differentiated Theme

TABLE XXVI

NUMBER OF TIMES PHYSICAL CAUSALITY WAS PERCEIVED BY EACH
SUBJECT FOR MICHOTTE SITUATIONS THREE TO THIRTEEN

Chronic Schizophrenic	Psychiatric Control	Normal Control
1	8	9
2	3	1
0	9	3
9	3	9
4	9	4
1	7	1
10	0	4
5	2	2
6	8	7
1	2	0
3	5	2
1	4	1
3	0	4
0	2	0
0	4	5
2	2	7

APPENDIX III

HEIDER-SIMMEL SCENES MENTIONED

Table XV, below, shows the number of scenes mentioned by each subject for the Ongoing and Retrospective presentations for the Heider-Simmel film.

TABLE XV

NUMBER OF SCENES MENTIONED BY EACH SUBJECT: HEIDER-SIMMEL FILM

Chronic Schizophrenics		Psychiatric Controls		Normal Controls	
Ongoing First	Retrospective Second	Ongoing First	Retrospective Second	Ongoing First	Retrospective Second
1	3	2	2	9	8
6	1	11	9	10	8
6	1	9	11	8	6
8	1	10	8	7	11
4	6	10	10	10	12
4	7	9	5	9	5
9	2	9	5	8	7
2	0	12	9	12	12

Retrospective First	Ongoing Second	Retrospective First	Ongoing Second	Retrospective First	Ongoing Second
3	5	6	6	9	11
6	2	9	9	11	8
2	6	4	11	11	12
1	1	5	12	10	9
8	8	3	10	4	10
1	8	12	12	3	7
1	7	9	12	9	11
0	1	5	9	4	11

Table XVI, below, indicates the mean number of scenes mentioned by each group for the Ongoing and Retrospective presentations. (The means of the first and second rows, and the means of the third and fourth rows, are based on the same individuals; and N = 8 for each cell.)

TABLE XVI
 MEAN NUMBER OF HEIDER-SIMMEL SCENES MENTIONED BY SUBJECTS
 IN EACH GROUP FOR BOTH ORDERS OF PRESENTATION

Order of Presentation	Group		
	Chronic Schizo- phrenic	Psychiatric Control	Normal Control
Ongoing first	5.00	9.00	9.12
Retrospective second	2.62	7.37	8.62
Retrospective first	2.75	6.62	7.62
Ongoing second	4.75	10.12	9.87

Table XVII, below, is the summary of the analysis of variance which compares the number of scenes mentioned by the subjects in both control groups who received the Ongoing presentation first (N = 16) with those who received the Ongoing presentation second (N = 16); and the psychiatric controls (N = 16) are compared with the normal controls (N = 16) for the combined Ongoing (first plus second) presentation.

TABLE XVII

SUMMARY OF ANALYSIS OF VARIANCE OF THE NUMBER OF SCENES MENTIONED
IN THE ONGOING FIRST AND ONGOING SECOND SITUATIONS FOR
BOTH CONTROL GROUPS

Source of Variation	Sum of Squares	<u>df</u>	Mean Square	<u>F</u>
Between control groups	0.03	1	0.03	-
Between ongoing I and II	7.03	1	7.03	1.48
Interaction: controls X ongoing I and II	0.27	1	0.27	-
Within groups	<u>132.64</u>	<u>28</u>	4.74	
Total	139.97	31		

The control groups are not significantly different in the mean number of scenes mentioned for the Ongoing presentations. Although the subjects in both control groups who received the Ongoing presentation second tend to mention more scenes than those who received the Ongoing presentation first, this difference is not significant at the .05 level of significance ($F = 1.48$, one and 28 degrees of freedom). The interaction between control groups and Ongoing first and Ongoing second presentations is not significant.

Table XVIII, below, presents the summary of the analysis of variance which compares the number of scenes mentioned by the subjects in both control groups who received the Retrospective presentation first ($N = 16$) with those who received the Retrospective presentation second ($N = 16$); and the psychiatric controls ($N = 16$) are compared with the normal controls ($N = 16$) for the combined Retrospective (first plus second) presentation.

TABLE XVIII

SUMMARY OF THE ANALYSIS OF VARIANCE OF THE NUMBER OF HEIDER-SIMMEL
SCENES MENTIONED IN THE RETROSPECTIVE FIRST AND RETROSPECTIVE
SECOND SITUATIONS FOR BOTH CONTROL GROUPS

Source of Variation	Sum of Squares	df	Mean Square	F
Between control groups	10.13	1	10.13	1.08
Between Retrospective I and II	6.13	1	6.13	-
Interaction: controls X retrospective I and II	0.10	1	0.10	-
Within groups	<u>263.52</u>	<u>28</u>	9.41	
Total	279.88	31		

The difference between the mean number of scenes mentioned for the two control groups for the Retrospective presentations is not significant at the .05 level of significance ($F = 1.08$, with one and 28 degrees of freedom), although the mean number of scenes mentioned tends to be greater for the normal controls. Similarly, although the mean number of scenes mentioned by the subjects who received the Retrospective presentation second tends to be greater than the mean number of scenes mentioned by those who received the Retrospective first, the means are not significantly different at the .05 level of significance. The interaction between control groups and Retrospective first and Retrospective second presentations is not significant.

Table XIX, below, compares, for the chronic schizophrenic group, those subjects who received the Ongoing presentation first ($N = 8$) with those who received it second ($N = 8$); then the Retrospective second and first scores, for the same subjects, are compared.

TABLE XIX

MEANS AND t TESTS FOR THE CHRONIC SCHIZOPHRENICS FOR ONGOING PRESENTATION FIRST VERSUS SECOND AND RETROSPECTIVE PRESENTATION FIRST VERSUS SECOND AND THE HEIDER-SIMMEL SCENES MENTIONED

	Ongoing First	Ongoing Second	Retrospective First	Retrospective Second
<u>N</u>	8	8	8	8
<u>X</u>	5.00	4.75	2.75	2.62
<u>t</u>		.17		.096
<u>P</u>		.86		.92
<u>df</u>		14		14

It is seen that, contrary to both control groups, those chronic schizophrenics who received the Ongoing presentation first mention a greater mean number of scenes than those who received it second; a similar relationship holds when the Retrospective scores for the same subjects are compared. These differences between means, however, are not significant (Ongoing: $t = .17$, P is .86, 14 degrees of freedom; Retrospective: $t = .096$, P is .92, 14 degrees of freedom).

The Ongoing first and Ongoing second chronic schizophrenics were combined ($N = 16$); similarly, the Ongoing first and Ongoing second subjects of both control groups were combined ($N = 32$). The same procedure was followed for the Retrospective presentations (based on the same subjects). Table XX, below, compares the mean of the combined control group with the mean of the chronic schizophrenics for the total Ongoing scenes mentioned; and the means for the total Retrospective scenes mentioned, for the same subjects, are compared.

TABLE XX

MEANS, VARIANCES, t TESTS, AND F TESTS FOR THE CHRONIC SCHIZOPHRENICS AND COMBINED CONTROLS FOR THE TOTAL ONGOING AND TOTAL RETROSPECTIVE HEIDER-SIMMEL SCENES MENTIONED

	Ongoing (First plus Second)		Retrospective (First plus Second)	
	Chronic Schizophrenic	Combined Control	Chronic Schizophrenic	Combined Control
N	16	32	16	32
\bar{X}	4.87	9.53	2.69	7.56
S^2	7.85	4.52	6.76	9.03
t	6.43		5.52	
P	<.001		<.001	
df	46		46	
F	1.74		1.34	

For the Ongoing presentation, there is a significant difference between the means for the chronic schizophrenics and combined controls ($t = 6.43$, $P < .001$, 46 degrees of freedom). The F test ($F = 1.74$, $P > .05$) indicates that the two groups are drawn from populations with a common variance.

Further, for the Retrospective presentation, the means of the chronic schizophrenics and combined controls differ significantly ($t = 5.52$, $P < .001$, 46 degrees of freedom). The F test ($F = 1.34$, $P > .05$) shows that the two groups do not differ significantly in variance.

The Ongoing first and Ongoing second presentations were combined for both control groups ($N = 32$) and the same was done for the same subjects' Retrospective presentations ($N = 32$). For the chronic schizophrenics, the Ongoing first and second presentations were combined ($N = 16$), as were the

same subjects' Retrospective first and second (N = 16) presentations. The Ongoing and Retrospective means for the chronic schizophrenics, and the same means for the combined controls, are correlated, since they are based on the same individuals. Table XXI, below, compares the Ongoing and Retrospective means for the same subjects for the chronic schizophrenic and combined control groups separately.

TABLE XXI
 MEANS AND t TEST FOR THE ONGOING AND RETROSPECTIVE PRESENTATIONS
 OF THE COMBINED CONTROL GROUP AND OF THE CHRONIC SCHIZO-
 PHRENIC GROUP

	Combined Control		Chronic Schizophrenic	
	Ongoing	Retrospective	Ongoing	Retrospective
N	(32 pairs of observations)		(16 pairs of observations)	
\bar{X}	9.53	7.56	4.87	2.69
t	3.80		2.31	
P	<.001		<.05	
df	31		15	

For the combined controls, the difference between the Ongoing and Retrospective means is statistically significant ($t = 3.80$, $P < .001$, 31 degrees of freedom). The difference between the Ongoing and Retrospective means, for the chronic schizophrenics, is also statistically significant ($t = 2.31$, $P < .05$, 15 degrees of freedom).