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THE ROLE OF CONFLICT AND INCONSISTENCY
IN SCHIZOPHRENIC THOUGHT DISORDER

by

Richard Galgan

M.A., University of Windsor, 1985
B.A. (Hons.), University of Winnipeg, 1983

A dissertation
submitted to the Faculty of Graduate Studies
through the Department of Psychology
in partial fulfillment
of the requirements for the degree
of Doctor of Philosophy
at the University of Windsor

Windsor, Ontario, Canada

1989
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To Martin, who taught me a lot about schizophrenia
ABSTRACT

The present study tests (1) Katan's (1960) theory that psychic conflict is critical in the development and manifestation of thought disorder and (2) Bannister's (1962) and Shakow's (1962) common tenet that inconsistency is a general characteristic of schizophrenics.

The author used the Picture-Preference Test (PPT) to address these issues. To assess Katan's theory, the author created two picture-preference scales: (1) a Conflict Scale, containing pictures that were highly provocative of conflict and (2) a Non-Conflict Scale, containing pictures low in provocation to conflict. The author also used the original Thought Disorder Scale that had been developed by Rudzinski (1979). In these scales, each item was presented to the subjects twice. An Inconsistency score was calculated as the number of items on which the subject's choice on the first presentation of an item did not match his choice on the second presentation of that same item. Besides using the PPT scales, the author administered the Whitaker Index of Schizophrenic Thinking, the Grid Test of Thought Disorder, and the Schedule for Affective Disorders and Schizophrenia-Change Version (SADS-C). The author tested 43 nonparanoid schizophrenics and 43 mood-disordered patients in two psychiatric hospitals.
Both the schizophrenic and the mood-disordered patients showed a greater breakdown of thought consistency on the Conflict Scale than they did on the Non-Conflict Scale. Overall, the data indicated that conflict may play a role in thought disorder, although not the central role that Katan (1960) had proposed in his theory. The data also fit with Bannister's (1962) and Shakow's (1962) notion that inconsistency is characteristic of schizophrenics. Inconsistency on each of the PPT scales and on the Grid Test discriminated the two diagnostic groups.

Besides testing these theories, the author introduced new methods for scoring the Grid Test. The most promising of these were a Chi-Square index of the similarity of the two Grids and a Perseveration score.

The theoretical and practical implications of the findings were discussed. The author argued that both the TD Scale and the new Grid scores could be useful in future research.
ACKNOWLEDGEMENTS

First and foremost I would like to thank my chairman, Dr. Frank Auld, who generously provided direction, encouragement, and his expertise throughout this project. I feel most fortunate to have had a supervisor with his dedication and breadth of knowledge. Frank, I thank you for guiding me through this difficult process.

I would like to thank my other committee members, Dr. William Balance, Dr. Roland Engelhart, and Dr. Laurie Carty, for their careful reading of each draft of the manuscript, and for their valuable feedback. I would also like to thank my external examiner, Dr. Richard Steffy, for his interest in this project, and for his helpful comments.

My appreciation is also extended to Dr. Helene Lycaki and Dr. Jesse Bell of Lafayette Clinic in Detroit, for their initial feedback on my research design, and for their provision of training in the use of the SADS-C.

I am grateful for the kindness and cooperation of the Departments of Psychology, Psychiatry, and Nursing at St. Thomas Psychiatric Hospital and Windsor Western Hospital Centre. Their help was certainly one of the key elements in the completion of this study.

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I am greatly indebted to my mother-in-law, Mrs. Yetta Novak, who most generously provided her car so that I could commute weekly to St. Thomas to collect the data. I deeply appreciate her ongoing support and her being there when I needed her.

I would like to thank my parents, Norma and Frank Galgan, for encouraging me, helping me through some difficult times, and following me through each step of the very long program of study involved in obtaining three degrees in psychology. I know that they are as pleased as I am that I have completed this program of study.

My appreciation is also extended to all of the patients who gave of themselves by participating in this research; without them, this project would not have been possible.

Last but certainly not least, I would like to thank the love of my life, Dr. Harriett Mable, my wife. Harriett, you were with me during every moment of this arduous process, including the testing of 72 of the patients in this dissertation. Your support, encouragement, and love enabled me to keep on going when I did not feel like it. It's amazing what can happen to two people who get stuck on an elevator together.
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CHAPTER I

INTRODUCTION

Thought disorder has long been regarded as one of the main components of psychopathology. In fact, the ancients believed that a wide variety of abnormal behaviour was the product of a disordered mind. For example, Plato (Payne, 1973) postulated that people who were too sad or too happy were devoid of reason. With the advent of modern science, many scientifically trained observers have provided rich written descriptions of such disturbance (e.g. Bleuler, 1911/1950; Kraepelin, 1893). Traditionally, thought disorder has been considered to be the central symptom of schizophrenia (Berrios, 1985; Harrow, Grossman, Silverstein, Meltzer & Kettering, 1986), and it has also been found in other psychotic conditions (Holzman, Shenton & Solovay, 1986; Marengo & Harrow, 1987; Shenton, Solovay & Holzman, 1987; Solovay, Shenton & Holzman, 1987). The relevance of thought disorder to these psychopathological conditions has prompted researchers to develop conceptual models for understanding it and to devise clinical measures to identify it.

The present study examines both the theory and measurement of thought disturbance. More specifically, it is concerned with the clarification of the role that
conflict and response inconsistency may play in the manifestation of disordered thinking, and with the investigation of a promising new picture-preference measure of thought disorder. First, however, the most prominent theories and measures of the disorder will be reviewed, to provide the background for this undertaking.

Theories of Thought Disorder

The earliest modern accounts of thought disturbance were rooted in the associationist psychology that was popular during much of the nineteenth century. Esquirol, in 1838, described a group of patients suffering from "dementia" and observed that they could not "compare or associate ideas," nor could they employ "the powers of abstraction." Kraepelin (1893) classified several types of psychoses under the term "dementia praecox," and noticed that a "loss of connection" of associations and ideas was evident in all of these syndromes. Bleuler (1911/1950) and his young assistant C. G. Jung (1909/1936) emphasized a "loosening of associations" in the thinking of such patients. Bleuler invented his own term, schizophrenia, to capture what he viewed as the primary disturbance that might explain all other symptoms of these psychoses: "the splitting of associative threads." When associative connections are severed, confusion and illogic result, and thinking becomes bizarre and unpredictable. The patient consequently manifests a variety of symptoms such as thought
blocking, neologisms, word substitutions, displacements, symbolism, inappropriate generalizations, perseveration, indirect associations, and clang associations.

Emphasizing the role of loose associations in thought disorder, other theorists have expanded on Bleuler's (1911/1950) model within the framework of learning theory. Mednick (1958) asserted that schizophrenics are extremely anxious, and that their heightened anxiety reduces their capacity for stimulus discrimination and produces excessive stimulus generalization. They consequently develop loose, inappropriate associations which in turn create the variety of bizarre symptoms that are characteristic of schizophrenia. Broen and Storms (1966) characterized thought disorder in terms of an increase in the relative strengths of associational habits that is produced by heightened arousal in schizophrenics.

Representing a clear break with the associationist/learning theory approach, Sigmund Freud (1911/1958) was the first of several theorists to explain the thinking of schizophrenics in terms of a developmental disturbance. Freud explicated a theory of thinking which holds that as appetite tension increases, the infant perceives a vivid sensory representation of the need-satisfying object. This representation is a memory of previous experiences of gratification that is elicited when the need-satisfying experience is absent. The memory of the object serves as a hallucinatory substitute for the missing real object and is
an attempt to gain satisfaction magically. This type of thinking, which is not logical or rational, and which has as its aim the immediate gratification of wishes regardless of the constraints of reality, is referred to as the primary process. During the course of maturation, the theory continues, as the infant experiences the greater satisfaction provided by real as opposed to hallucinatory gratification, a more logical, reality-oriented process develops, called secondary process thinking. This process is aimed at accurately perceiving and attempting to manipulate conditions in the environment so as to obtain need fulfillment.

Freud (1911/1958) postulated that thought disorder in schizophrenia results from a withdrawal of cathexis or meaning from an individual's internal representation of words, such that the schizophrenic speaks as if words had no meaning. As the schizophrenic person withdraws cathexes, he regresses to an infantile state of psychic development in which primary process thinking predominates. According to Sullivan (1946; cited in Arieti, 1955), who expanded upon Freud's model, the schizophrenic regresses in this way because as a child, his or her parents failed to provide basic feelings of love, security, and acceptance. The peculiar thought and language patterns that the schizophrenic displays are thus manifestations of emotionally-rooted withdrawal and regression.

Katan (1961) incorporated Sullivan's (1946) focus on
emotions, and also applied Freud's (1926/1948) concept of the response-produced cue to explain thought disturbance. Freud, in discussing anxiety, postulated that the initial response of feeling anxious in the presence of stimuli that are associated with a prior traumatic experience acts as an internal stimulus or cue for further responses.

The notion of internal cues has been more fully developed by Osgood (1957) and Dollard and Miller (1950). According to Osgood, a word comes to represent an object because it produces in a person some internal replica of the actual response towards the object; Osgood called this replica an internal mediating response or meaning. Internal mediating responses to heard or read words are learned through differential reinforcement. Over time, a word may take on several meanings or internal representations, with each meaning being correct depending on the context. The dominant or conventional internal response to a word will be the one most frequently required by the environmental context. The relative rate of internal responding with a number of different mediating responses to a given word can be expressed on a modified generalization gradient (see Dollard and Miller, 1950): The more semantically relevant an internal response is to the context in which the word is usually encountered (i.e. the conventional usage), the more frequently that response will be invoked.

In addition to employing the concept of internal cues, Katan's (1960) model of schizophrenia and thought disorder
incorporated psychoanalytic notions regarding the early
development of the schizophrenic. Because of the
schizophrenic's traumatic and hurtful childhood, many of his
internal responses to words involve intense conflict.
According to Katan, such conflict operates in the following
manner. The thought-disordered schizophrenic was raised in
a family of cold, distant, and in some cases, abusive
parents. The child in such a family possesses wishes
emanating from the id, which are repeatedly disappointed and
frustrated. Initially, the child strives to have these
wishes gratified. Each time the child strives, his parents
do not respond, and may even punish him. Feelings of
disappointment, frustration and punishment gradually build
up.

As the feelings of disappointment increase, the child's
ego works to ward off further psychic pain by developing a
countermotivation to avoid striving for wish gratification.
The ego represses the wish into unconsciousness so that the
child will not be reminded of the pain and disappointment
that has become associated with the wish. As long as the
wish is repressed, the pain is repressed.

Whenever the child encounters situations in which the
wish could be gratified, anxiety is aroused as a cue for the
child to avoid the situation. The anxiety is a cue that the
wish and its associated pain may enter into consciousness.
Hence the developing schizophrenic is torn between two
conflicting motivations. Within his mind, there is both the
unconscious striving to gratify a wish and the motivation to avoid the anxiety that becomes aroused whenever the child is in a situation in which he could again strive for the wish.

In essence, the thought-disordered schizophrenic gradually develops psychic conflicts, conflicts between the motivation to strive for various wishes and the motivation to avoid striving for these wishes. On the one hand, he deeply wants wish gratification, but on the other hand, he does not want to once again face the sorrowful disappointment of a given wish. For example, the young child wishes for his parents to love him. When the child approaches the parents seeking love and approval, the parents respond coldly or perhaps even punitively. As this happens repeatedly, the child becomes increasingly disappointed. Rather than continuing to face the disappointment that his parents do not seem to love him, the child's ego represses the wish for love, and the child becomes anxious in situations when he could once again strive for their attention. The anxiety is uncomfortable for him, and he responds to the anxiety by avoiding the situation and not striving. In this example, then, the child is in conflict between the unconscious wish for love and the motivation to ward off the anxiety associated with further striving for love.

In this conflict model, there are two results of the schizophrenic's psychic conflicts. First, the schizophrenic is intensely ambivalent. While all of us could be said to
have some intrapsychic conflicts, the schizophrenic's childhood is one of severe disappointment and frustration of wishes. His conflicts are therefore intense. That is, the schizophrenic has deeply deprived wishes for nurturance and love, and strong countermotivations to avoid seeking out nurturance and love. This conflict between two opposing inner forces manifests itself in ambivalent feelings and behavior. The schizophrenic on one occasion may approach a person seeking acceptance and friendship, and then become threatened by it, and on the next occasion, behave in an unfriendly or hostile manner to the same person. The hostile behavior is a defense against facing the possible disappointment of the wish for love.

The second manifestation of psychic conflict, thought disorder, is the focus of Katan's conflict theory. Unlike Freud (1911/1958), Katan (1961) postulated that for the traumatized schizophrenic words are invested with excessive meaning. For example, for a schizophrenic who has a rejecting and unloving mother, the dominant meaning of the word "mother" may have associated with it feelings of painful rejection and conflicts about dependency and being loved. "Mother" consequently has excessive meaning for the patient because of the extra baggage added on by the conflict.

According to Katan, the difficulty that the schizophrenic has in using language comes about because many of the conventional or dominant meanings of words provoke
internal conflict. The internal conflict in turn creates anxiety. The patient avoids the anxiety by repressing the meanings that would otherwise produce inner turmoil and lead to anxiety. The pleasure principle motivates the development of the repression, as the schizophrenic finds it rewarding to avoid anxiety. Once the repression is instituted, it requires energy to maintain it; this investment of psychic energy is known as a countercathexis. With the affect-connected meanings blocked by a countercathexis, the patient is forced to resort to emotionally-neutral, displaced meanings that are based on less central aspects of the word. For example, for the word "mother," the patient might use "smother" and "apron" as meanings derived from two of the word's less important aspects, viz. rhyme and apparel.

To restate Katan's (1961) theory in the terminology of Osgood (1957) and Dollard and Miller (1950), many of the schizophrenic's dominant internal mediating responses to words provoke emotional conflict in him. Such conflict creates anxiety in the patient. To avoid the anxiety, the patient prevents the future use of those mediating responses that would otherwise provoke inner strife and in turn create anxiety. This blocking of affect-connected mediating responses is reinforced because it enables the schizophrenic to avoid anxiety. Moreover, competing responses become stronger because they crowd out the conflict-provoking meanings. As the meanings that are most relevant
semantically to the conventional context of a word are inhibited by competing responses, the schizophrenic is forced to resort to these other responses which include phonemic connections and less-disturbing but rarely used definitions. The thought-disordered person is thus disallowed from using words in the conventional way and forced to rely on less conventional usages.

Essentially, Katan postulates that schizophrenic thought disorder is a defense which allows the schizophrenic to avoid the conflicts associated with the conventional meanings of many words. Disorganized thinking and senseless trains of thought feel much better to the schizophrenic than facing the hurt that may be associated with rational, logical thoughts about one's painful disappointment of wishes.

Like Katan, Cameron (1963) developed an explanation of thought disturbance that incorporated aspects of Freud's (1911/1958) theory. Cameron described a number of characteristics of thought disorder, most notably overinclusion, which he viewed as the inability to retain the boundaries of a concept within appropriate limits. As a result of overinclusion, the concepts of thought-disordered individuals become broad, vague, and imprecise. Even mutually exclusive ideas can come to share common elements.

Cameron (1963) considered thought disorder to result from a regressive breakthrough of primary process thinking. Similarly, Fenichel (1945, p. 421) asserted that disordered
thinking is "identical with primitive, magical thinking; that is with a form of thinking that is also found in small children, in normal persons under conditions of fatigue, as antecedents of thought, and in primitive man."

More recently, Arieti (1974) questioned the notion that the presence of primary process thinking is necessarily pathological, pointing out that it is also seen in normal thought: in dreams, humour, imagination, and creativity. He asserted that the pathological manifestation of the primary process can be distinguished from the adaptive in that:

1. It involves a larger segment of mental life.
2. It is not corrected, neutralized, or rejected by the secondary process; rather, it resists or overpowers the influence of secondary process.
3. It is not harmoniously integrated with the secondary process to form a creative product.

Other theorists have also viewed thought disorder as a regression toward more primitive cognitive functioning. Working within a comparative developmental framework, Werner (1948) described schizophrenic thought as global and undifferentiated, and thus similar to the thinking of children and persons from primitive cultures. Feffer (1967) viewed schizophrenic cognition as regressive and attempted to apply Piaget's developmental stages to the description of schizophrenic thought disturbance.

There is also a camp of theorists who have explained thought disorder as arising from various specific deficits
in cognitive processing, Goldstein (1944, 1959) asserted that thought disorder comes about as a result of an impairment of abstract thinking and a concomitant increase in concrete thinking. Goldstein proposed that abstract and concrete attitudes represent capacity levels of the total personality. When the abstract function is impaired, the individual cannot help being influenced by the immediate concrete experience of things or situations. Adults who do not suffer from this impairment are able to transcend immediate specific characteristics or sensory impressions and to abstract concepts from environmental stimuli. The capacity for abstract thought, according to Goldstein, is essential to the following abilities:

1. the ability to assume a mental set voluntarily;
2. the ability to shift voluntarily from one aspect of the situation to another;
3. the ability to keep in mind simultaneously various aspects of a problem;
4. the ability to grasp the essentials of a given whole;
5. the ability to abstract common properties, to generalize, to plan, to assume an attitude towards the "mere possible," and to think or perform symbolically;
6. the ability to detach the ego from the outer world.

Goldstein contended that normal persons can utilize both concrete and abstract attitudes and shift between them.
according to situational demands. Thought disordered schizophrenics, however, are limited to the concrete mode of thinking. Shinkunas (1972) modified Goldstein's model by postulating that schizophrenic concrete thinking is the product both of overinclusion and undergeneralization; he contends that these are alternative manifestations of a deficiency in abstract thought.

Von Domarus (1944) and subsequently Arieti (1955, 1974) attempted to explain thinking disturbance in terms of a deficit in another cognitive process: logical reasoning. These writers observed that disordered thinking follows a "law of predicate logic" in which the identity of two things is determined on the basis of a common predicate rather than on the basis of a common subject. Arieti presented the following example of the use of such logic:

The Virgin Mary is a virgin.
I am a virgin.
Therefore, I am the Virgin Mary (p. 230).

Arieti suggested that this hypothesis explains various aspects of thought disturbance, including delusions of being a famous person, word substitutions, and confusion of one person with another. In each instance, the thought-disordered person concludes that two or more concepts are identical on the basis of shared characteristics.

David Shakow (1963) proposed that schizophrenic thought disorder involves a deficit in another cognitive function: the ability to maintain a set or rule to respond
appropriately in a given situation. He based his theory on
the results of a number of reaction-time studies (Rodnick &
Shakow, 1940; Shakow, 1962, 1963; Zahn, Rosenthal & Shakow,
1963) in which both schizophrenic and normal subjects were
presented with a series of trials on a reaction-time task.
On each trial, the experimenter first presented a brief
warning sound or visual stimulus (S₁), then, after a delay
(or "preparatory interval," PI) presented a second auditory or
visual stimulus (S₂) to which the subject was to respond by
releasing a response key. Two warning procedures were used.
In the regular warning condition, the PIs of all trials were
of the same duration; in the irregular procedure, PIs were
of varying durations, and PIs of various lengths were
presented in random order. The general finding of Shakow's
studies was that for PIs greater than 4 s, normal subjects
responded more quickly under the regular procedure than
under the irregular procedure, whereas schizophrenics
responded no faster under the regular condition. Shakow
argued that normal subjects were able to take advantage of
the predictability of regular trials to perform better on
regular than on irregular trials, whereas schizophrenics
were unable to capitalize on the predictability. He
concluded that schizophrenics had difficulty taking
advantage of the information provided by regular trials
because they were unable to effectively maintain the
response rule concerning the amount of time that would pass
before S₂ would occur, or to use it consistently. He argued
that this inability to use a major set could account for the abnormal behavior on the task and the abnormal speech of the schizophrenics, although some researchers (e.g. Galbraith, MacCrimmon & Steffy, 1983) have questioned some of Shakow's interpretations.

Other investigators have proposed conceptualizations of thought disorder based on the information processing model developed by Broadbent (1958). McGhee and Chapman (1961) and Salzinger (1971) have asserted that thought disorder reflects an impairment of the ability to select appropriate stimuli and to filter out irrelevant information. The result is a pathological distractability. Cromwell and Dokecki (1968) maintained that thought disorder involves information processing defects both in the ability to disattend from a strong stimulus and the ability to scan other stimuli of lesser strength for relevant information. More recently, George and Neufeld (1985) have suggested that the inappropriate and idiosyncratic associations found in thought disorder may reflect a deficit in the ability to search through or implement the network of semantic relations that is relevant to the stimuli currently in the patient's environment.

Chapman and Chapman (1973) proposed a hypothesis which, they contended, could explain such manifestations of thought disorder as errors in formal reasoning, concreteness, and overinclusion. They proposed that thought disorder results from an accentuated yielding to normal response biases. They
developed this hypothesis after carrying out a series of word association studies (for reviews, see Chapman & Chapman, 1973; Silverstein & Chalifetz, 1984) that showed that thought-disordered schizophrenics had difficulty in inhibiting from consciousness the dominant meaning of a word that has multiple meanings. That is, these patients exhibited a tendency to interpret words according to their dominant meanings and neglect weaker meanings, in spite of contextual uses that would suggest that the weaker meaning would be more appropriate in a given context. The schizophrenics neglected to use weak aspects of meaning even though they could later demonstrate knowledge of those aspects. As an example, the following is a test item used in one of these studies (Chapman, Chapman & Daut, 1976):

When the farmer bought a herd of cattle, he needed a new pen. This means:

A. He needed a new writing implement. (strong meaning)
B. He needed a new fenced enclosure. (weak meaning)
C. He needed a new pick-up truck. (irrelevant statement) (p. 35)

In this example, schizophrenics, much more than normal subjects, ignored the context provided by the sentence and interpreted "pen" as a "writing implement," which is the stronger of the meanings when the word is encountered out of context. Although Chapman and Chapman (1973) claimed that their theory could explain many of the deficits postulated
by others to describe thought disorder, they admitted that their theory does not account for the bizarre, autistic quality of disordered thinking. As well, Chapman and Chapman did not identify the processes underlying accentuated response biases.

Other researchers have attempted to explain disordered thought using Kelly's (1955) Personal Construct Theory. Kelly's theory maintains that all persons have their own repertoire of predictive constructs which they use to codify their experiences. Researchers working within this framework (Bannister, 1962; Bannister, Fransella & Agnew, 1971; Livesay, 1984) have found that thought-disordered schizophrenics show a severe loosening of links between constructs, especially with regard to constructs related to people as opposed to objects. Bannister (1962) proposed that this loosening of links may be the product of a history of early and repeated invalidations of predictions about people. Whereas the loosened construing protects the patient against further invalidations in the present, it also makes it difficult for him to develop consistent predictions about others, or to make sense of interpersonal events. Hence the schizophrenic is confused and his thinking is disordered.

One of the most recently developed conceptualizations of thinking disturbance has been proposed by Rochester and Martin (1979). These theorists noted that the notion and most of the theories of thought disorder are based on inferences about the speech of schizophrenic patients, and
therefore, that the definition of thought disorder is circular. That is, thought disorder has been defined in terms of the presence of incoherent speech, and incoherent speech has been explained as being the product of thought disorder.

These writers argue that as thought disorder is an inferred construct, it would be more parsimonious to use the term "discourse failure," the failure to produce a coherent flow of speech, than to continue to write about disordered thought. Thus they see verbalization disorder, or "schizophrenia," as being the central disturbance in schizophrenia. Their research consequently analyzed the discourse of schizophrenics. They found that the speech of thought-disordered (TD) schizophrenics (defined by ratings made before the speech measures were taken) could be discriminated both from that of normals and from that of non-thought-disordered (NTD) schizophrenics. Not surprisingly, the TD schizophrenics presented a pattern of discourse that was not easy to follow, and they provided fewer and less useful semantic links between ideas than did NTD schizophrenics and normals.

In light of the work of Rochester and Martin, Harvey and Neale (1983) attempted to incorporate the notion of discourse failure into a definition of thought disorder by defining the latter term as "the deviant cognitive processes that relate to discourse failure" (p. 175). Along the same lines, Lanin-Kettering & Harrow (1985) recommended that the
disorder most frequently observed in schizophrenic speech be viewed as a conceptual-linguistic one, and not just as a speech problem. In addition, Andreason (1986) has apparently attempted to incorporate the notions of speech and thought disorder into a single concept, advocating that the term "thought disorder" be replaced with the more inclusive term "thought, language, and communication disorders."

As is evident from the previous discussion, each theorist of thought disturbance has typically tried to fit the broad range of symptoms of disordered cognition into his or her own conceptual scheme. The bulk of the research evidence suggests that none of these explanations has been successful in accounting for the whole range of disturbance in thought disorder (for further exposition, see Chapman & Chapman, 1973; Harvey & Neale, 1983; Payne, 1973). Nevertheless, these attempts to conceptualize thought disorder have stimulated the development of a number of tests. Many of these measures, like the theories on which they were based, focus on limited aspects of the subject and possess considerable shortcomings, which will be reviewed in the next section.

**Measures of Disordered Thinking**

Proponents of Arieti's (1955, 1974), Cameron's (1963), Goldstein's (1944), and Von Domarus's (1944) theories of disordered cognition have employed object-sorting tasks for
the purposes of (1) testing hypotheses related to their specific theories and (2) discriminating thought-disordered individuals from individuals without thought disorder. Object-sorting tests have been created by Feldman and Drasgow (1951), Payne, Matussek and George (1959), Chapman and Taylor (1957), and Goldstein and Scheerer (1941). Modifications of the latter object-sorting measure have been introduced by Harrow, Himmeloch, Tucker, Hersh and Quinlan (1972), McGaughran (1954), and Rapaport, Gill and Schafer (1946/1968).

Although these measures have been used to provide support for various theories and to test for the presence of thought disorder, a variety of evidence suggests that performance on object-sorting tasks is influenced by characteristics of the subject other than disordered thinking. Performance on object-sorting tests has been shown to be related to intelligence, memory ability, and acute disorganization (Harrow, Harkavy, Bromet & Tucker, 1973; Hemsley, 1976). Moreover, Bromet and Harrow (1973) concluded that object-sorting tasks primarily measure level of responsiveness to testing, and that disturbances in level of responsiveness are characteristically associated with the severity of emotional distress among psychiatric patients. This evidence thus suggests that object-sorting tasks do not adequately measure disordered cognition.

Investigators of the models of Arieti (1955, 1974), Goldstein (1944), and Von Domarus (1944) have also used
proverb interpretation problems to test their hypotheses about thought disorder. Bénjamin (1944) and Gorham (1956) both developed proverbs tests. As in the case of object sorting tasks, performance on proverbs tests has been shown to be influenced by variables other than thought disorder. Hanfmann and Kasanin (1942) found proverb-test performance to be correlated with education. Reed (1970) and Wright (1975) demonstrated that performance on proverb-interpretation tasks is related to vocabulary-test scores and degree of intelligence. Harrow, Adler and Hanf (1974) showed that proverb-test performance is considerably disrupted during the acute phases of psychiatric illness, thus limiting the utility of this format for assessing disordered thinking in such patients. Consequently, proverb-interpretation problems do not seem to be adequate measures of thought disturbance.

Bannister, Fransella, and Agnew (1971) created a Grid Test of Thought Disorder to evaluate their hypotheses about and measure the loosening of links between constructs in thought disorder. The examiner shows the subject an array of eight photographs of individual people, and then proceeds to ask the subject to rank order the eight photographs on six personality dimensions or constructs: kind, stupid, selfish, sincere, mean, and honest. Once the subject has completed the rankings on all six constructs, the examiner asks the subject to complete the entire test again on the same photographs, ranking for the same constructs.
Bannister and his associates have developed two indices of loose or inconsistent responding for this test: the Intensity score and the Consistency score. The Intensity score is obtained by (1) calculating the Spearman rank order correlations (rhos) between all possible pairs of constructs on the first administration and between all possible pairs of constructs on the second administration, (2) squaring each correlation and multiplying it by 100 (to yield transformed correlations) and (3) summing the absolute values of the transformed correlations. The Intensity score is the sum of these absolute values. The Intensity score represents the degree of relationship between the constructs for a subject. In other words, it measures the level of consistency that the subject displays in ranking for the constructs within each grid or administration. High scores reflect high internal consistency; that is, they indicate that the subject is rank-ordering as if the qualities he is judging are related. Low scores indicate that he is judging the qualities as if they are unrelated.

The Consistency score is calculated by (1) rank-ordering the 15 rhos of the first administration, (2) rank-ordering the rhos from the second administration in the same manner and (3) computing the Spearman rho between these two sets of rank orderings. The rho between the two sets of rank orderings is the Consistency score, and reflects the degree to which the subject maintains the pattern of relationships between the constructs from Grid I to Grid II.
In effect, it measures consistency between the grids, and is a test-retest correlation.

Bannister et al. (1966, 1971) provided evidence of the validity of the Grid Test as a measure of thought disorder. They found that the Intensity score and the Consistency score could each significantly discriminate thought-disordered schizophrenics from non-thought-disordered schizophrenics. However, Hemsley (1976) and Romney and Leblanc (1975) found a substantial influence of memory on grid test performance. As well, Presly (1969) demonstrated that slowness of responding is correlated with both grid test scores. Moreover, the Intensity and Consistency scores have been criticized for being mathematically crude and very burdensome to calculate (Cyr, 1983; Gabriel, 1986).

Using an associationist theory of schizophrenia as their rationale, some researchers have employed word association tests to study schizophrenic cognition. The most frequently used instrument was created by Kent and Rosanoff (1910). In addition, Silverstein and his associates (Gordon, Silverstein & Harrow, 1982; Silverstein & Chaifetz, 1984; Silverstein & Harrow, 1982) have recently developed their own word association test.

In studies involving these tests, thought-disordered patients gave more repetitions of previously given responses, more incoherent replies, more responses based on the sound of stimulus words, more idiosyncratic associations, and a greater number of remote associations to
stimulus words than did normals (Kent & Rosanoff, 1910; Shakow & Jellinek, 1965; Silverstein & Harrow, 1982). However, Mefferd and his colleagues (Mefferd, 1978, 1979; Moran, Mefferd & Kimble, 1964) found that thought-disordered schizophrenics showed the same basic types and structures of associations as normals. Moon and his associates (Moon, Mefferd, Wieland, Pokorny & Falconer, 1968) accounted for many of the idiosyncratic associations given by thought-disordered subjects on the basis of mishearing, which they attributed to an attentional deficit. Willner (1971) criticized the technique for not allowing a full understanding of the associational structure of a patient. O'Brian and Weingartner (1970) argued that performance on word association tests is related to variables other than thought disorder, including the speed of response, anxiety, perceptual dysfunction, and style of responding. Consequently, there is some question as to the adequacy of word association tests as measures of disordered cognition.

The Whitaker Index of Schizophrenic Thinking (WIST) was developed primarily to assess the disturbance in logical reasoning of thought-disordered schizophrenics (Whitaker, 1980). Each of its 25 multiple-choice items has as alternatives a correct choice, a loose associate, a personal reference item, a nonsense associate, and a clang associate; the four error types were designed to be sensitive to particular aspects of disordered reasoning in schizophrenia. Whitaker found the test to discriminate thought-disordered
patients from non-thought-disordered patients. However, as is the case with other measures of disordered cognition, evidence has accumulated which suggests that the WIST has some limitations in terms of its adequacy as a measure of thought disturbance. Lovallo and his colleagues (Lovallo, Sengel, Leber, Shaffer & Pishkin, 1982; Pishkin, Lovallo, Lenk & Bourne, 1977) have demonstrated that scores on the WIST are related to intelligence. Rudzinski (1979) noted that the test requires reading and comprehension skills and that it can involve a substantial time investment on the part of patients whose distress may lead them to be distractable.

Psychoanalytically oriented methods of defining and measuring thought disorder have focused on the unusual and deviant verbalizations of subjects in testing and interview situations. Such measures include: (1) scales for rating indications of disordered cognition as they occur in an interview and (2) systems for scoring the Rorschach, and sometimes the WAIS, in order to obtain an overall score of indications of thought disorder.

Cancro (1969) created a four-point scale for rating thought disorder in an interview: (0) no formal signs; (1) literalness, circumstantiality, and concreteness; (2) loosening of associations, predicate logic, and autistic intrusion; and (3) echolalia, perseveration, neologisms, blocking, and incoherence.

Similarly, Grinker and Holzman (1973) developed a
seven-point index for rating "language problems" within their Schizophrenia State Inventory:

0. Well-modulated, no impairment discernible.
1. Mild paucity of thought and reduced richness of language.
2. Language well-modulated in reference to impersonal things, but occasional impairment with reference to the self or a threat to the self.
3. Circumstantiality, literalness, concreteness.
4. Antithetical meanings expressed.
5. Autistic intrusions, predicative thinking, blocking, loosening of associations.
6. Perseverations, echolalia, neologisms, incoherence.

Both of these scales enable the clinician to rate a psychiatric patient on a continuum of thought disorder ranging in severity from mild idiosyncracies of cognition and speech to bizarre incoherence. However, the free expressions of thought-disordered subjects vary widely and do not easily fit into limited sets of categories. In addition, Chapman and Chapman (1973) argue that a disadvantage of such rating scales is that they lack detailed specification of the stimuli that elicit the behaviour being evaluated.

Turning now to the psychodynamically-oriented use of tests, one of the most significant attempts to develop indices of thought disorder from the Rorschach test was
pioneered by Rapaport, Gill, and Schafer (1946/1968). Through a detailed and systematic examination of Rorschach responses, these researchers described several kinds of deviant verbalizations which they identified as indicating disordered thinking. "Fabulized responses" on the Rorschach, according to Rapaport and associates, are inappropriate elaborations upon a percept with little attention to the limitations of the test stimuli. "Confabulations" are responses to Rorschach stimuli in which the subject brings different percepts into a single concept. "Fabulized combinations" represent apparently impossible perceptual combinations which indicate bizarre thinking. "Contaminations" are responses reflecting the fusing together of ideas with little regard to reality. Rapaport et al. identified responses demonstrating weak or idiosyncratic reasoning as examples of "autistic logic."

Watkins and Stauffacher (1952) devised a system of quantifying the categories of deviant verbalizations outlined by the Rapaport group. Their "Delta Index" assigned weighted scores of .25, .5, .75, and 1.0 to Rorschach responses, with higher weightings indicating greater pathology. The overall score was calculated as the sum of all the weighted scores divided by the number of responses, and was expressed as a percentage. The authors found that the scale differentiated thought-disordered schizophrenic patients from other groups. Pope and Jensen (1957) had similar findings. These studies also found high
inter-scorer reliabilities for the overall score.

Johnston and Holzman (1979) revised the Delta Index, naming the revised scale the Thought Disorder Index (TDI). Some categories that did not provide evidence of disordered cognition were removed, and other categories such as perseveration and concreteness were added. In a validation study, the researchers found that the index was able to distinguish between three groups: (1) psychotic patients, (2) acutely disturbed nonpsychotic patients, and (3) normal controls (also see Shenton, Solovay & Holzman, 1987; Solovay, Shenton & Holzman, 1987).

Exner (1974), who is known for his extensive research on the Rorschach, also devised a measure of disordered thinking utilizing the deviant verbalization categories developed by Rapaport et al. (1946/1968). According to Exner, thought disorder is present if the following two criteria are met: (1) the presence in a subject's test protocol of one or more human movement responses of poor form quality (viz., M-) and (2) three or more instances of deviant verbalization. In two validation studies, Exner (1974) found that his measure discriminated thought-disordered schizophrenics from non-thought-disordered psychiatric controls.

Research evidence thus suggests that these Rorschach indices can be used to measure thought disturbance. However, the test does have definite limitations. Whitaker (1980) noted that the Rorschach requires a substantial
investment of time for both the examiner and patient, and that verbal-expressive proficiency and level of responsiveness to testing influence performance on the test.

Wayne Holtzman and his associates (Holtzman, Thorpe, Swartz & Herron, 1961) developed a projective device similar to the Rorschach but one designed to control for the influence of the subject’s level of responsiveness to testing. The Holtzman Inkblot Technique (HIT) features a set of 45 inkblots, to each of which only one response is given, the intention being to hold constant the number of responses per person. Thought disorder on the HIT is measured by a pathognomonic verbalization score that incorporates the deviant verbalization categories of Rapaport et al. (1946/1948). Each HIT response is categorized and assigned a pathognomonic verbalization score on a 5-point scale, in accordance with the severity of implied thought disturbance. The total pathognomonic verbalization score (PV) for a person is the sum of the response scores. However, if the number of card rejections (R) is greater than 20 or if the obtained PV score is greater than 80, then the obtained score must be corrected with the following formula (Holtzman et al., 1961, p.45):

\[
\text{Corrected PV Score} = \frac{\text{PV}}{45 - R}
\]

Holtzman and his colleagues found that with this score,
the HIT was able to successfully discriminate schizophrenics from normals and from other psychiatric patients. However, as in the case of other measures of thinking disturbance, the HIT possesses certain limitations. Research evidence has revealed that performance on this projective test is influenced by factors other than thought disorder, including the warmth of the examiner (Hamilton & Robertson, 1966), and the age (Hayslip, 1982), sex (Hanssen & Teigen, 1971), and level of motivation of the subject (Branton, 1969). Whitaker (1980) showed that the instrument does not adequately circumvent the problem of variability of responsiveness, as psychiatric patients vary widely in terms of the number of HIT cards that they reject. Moreover, he has noted that the technique possesses another major disadvantage of the Rorschach in that it is time-consuming and arduous.

In summary, most of these instruments tap only an aspect of what clinicians mean by thought disorder, and some of the tests demand excessive amounts of time on the part of both the examiner and the subject. As well, each test is influenced by characteristics of the patient beside his disordered thinking, such as memory ability, intelligence, verbal skills, and responsiveness to testing. A test is thus required which would be free of such limitations. Ruzinski (1979) attempted to create such a measure; the result of his work was the Picture-Preference Test of
Thought Disorder. It will be reviewed in the following section.

The Picture-Preference Approach

The Picture-Preference Test of Thought Disorder consists of 31 pairs of pictures. Subjects are instructed to indicate which of the pictures in each pair they prefer. Pictures within a pair are intended to differ from each other in one psychologically important aspect: one of the pictures in each pair was designed to represent an important characteristic of disordered cognition and to appeal to the subject who manifests this trait. Five aspects of disturbed thinking were represented in the thought-disordered pictures: (1) overinclusive thinking (Cameron, 1963); (2) idiosyncratic, overpersonalized thought (Bleuler, 1911/1950; Goldstein, 1944); (3) clang associations (Bleuler, 1911/1950); (4) regressive, autistic thought (Freud, 1911/1958); and (5) fabulized combinations (Rapaport et al., 1946/1968).

This test of thought disorder was adopted from a format developed by Cowan (1967/1971). The rationale for this approach to measuring personality dimensions is based upon assumptions about the mental organization or structuring of experiences in psychological functioning. Authors such as Henry (1973) and Rapaport and his associates (1946/1968) have taken the stance that the manner in which an individual behaves is governed by the way in which he organizes or
structures his experiences. All of an individual's behaviour is consequently representative and revealing of his underlying organizing principles or, in other words, his psychological structure.

Accepting this assumption, one would expect that a person in choosing between two pictures, especially when the task is not defined for him beyond the instruction to choose the picture that he likes better, cannot avoid revealing something about himself. Certainly, the choice between two pictures of a pair may be influenced by any one of a variety of characteristics of the pictures. However, as Auld (1979) suggests, if the entire set of picture-pairs represents some latent disposition, then the whole set of choices of the person should measure, somewhat imperfectly, the degree to which the person has this disposition.

The original Picture-Preference Test designed by Cowan (1967/1971) consisted of 106 picture-pairs that were designed to measure 10 main traits of the addictive personality; each trait scale had from 4 to 23 items. Pictures created to appeal to persons high in the trait being measured were paired with pictures devised to appeal to persons not having addictive propensities. The test was found to discriminate alcoholics from normals, although not from neurotics. Other investigators have built upon Cowan's (1967/1971) research and have further demonstrated the utility of the picture-preference format for measuring personality variables. Begin (1972/1975) and Morrison
(1973/1975) both attempted to improve Cowan's test of addictive traits, yielding seven scales of increased reliability which as a group could distinguish between alcoholics and neurotics, and between alcoholics and normals. As well, Amin (1974/1976) developed a 45-item measure of the avoidance of sexual intimacy, and found it to have a correlation of .64 with ratings of sex-anxiety derived from stories told to five TAT pictures.

With respect to the more recently developed Picture-Preference Test of Thought Disorder, Rudzinski and Auld (1980) showed that the instrument was able to discriminate a group of thought-disordered psychiatric patients from a group of patients judged to be non-thought-disordered, and from a group of non-patients. Presence of thought disorder was evaluated on the basis of a composite of ratings from the three scales of the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962) that presumably measure thought disorder: Conceptual Disorganization, Hallucinatory Behaviour, and Unusual Thought Content. The investigators found that the picture-preference scale had a moderate correlation ($r = .38$) with the BPRS composite. Among the psychiatric patients, a significant correlation ($r = .26$) was also found between the Thought Disorder scale and the Psychotic Tendencies scale of the Differential Personality Inventory (Jackson & Messick, 1964). The internal consistency of the picture-preference measure was high.
Apanasiewicz (1982) suggested that the explanation for the Thought Disorder Scale's ability to discriminate between thought-disordered and non-thought-disordered subjects may at least in part be due to the scale's measurement of something other than thought disorder. She proposed that one reason for the scale's discriminatory power may be that thought-disordered subjects are poorly motivated and respond inattentively or randomly to the items. As previously noted, the picture-choices that are keyed in the thought-disordered direction are bizarre and hence infrequently chosen by normals. A subject responding at random would inadvertently choose the thought-disordered pictures on 50% of the items. Because normal subjects who are paying attention to the test choose very few of the thought-disordered alternatives, the inattentive subject would obtain a score on the TD Scale that was significantly higher than that of a normal person.

Noting the question raised by the inattentiveness hypothesis, Apanasiewicz set out to strengthen the case for the TD Scale in two ways. First, she attempted to validate the scale against measures of thought disorder other than the BPRS, a scale that Rudzinski (1979) had used. She decided upon the Thought Disorder Index (Johnston & Holtzman, 1979), and the Whitaker Index of Schizophrenic Thinking (Whitaker, 1980) as validation measures. She also gave to the subjects the original 31-item TD Scale. Second, she tried to rule out the inattentiveness hypothesis as an
explanation for the TD Scale's discriminatory power. In connection with her second aim, she selected the 20 items identified by Rudzinski as being most related to the total score on the scale, and presented each of them twice to her subjects. She calculated the score on this revised TD Scale as the total number of the repeated TD Scale items on which a subject made the same pathological choice twice. She believed that if a schizophrenic made the same pathological choice on an item twice, it would be indisputable that he made the choice because he was thought-disordered. A person who was merely inattentive would not likely choose many of the pathological pictures twice.

Apanasiewicz's (1982) results showed that the original Thought Disorder Scale discriminated schizophrenic inpatients from university students, and that schizophrenics' scores on the test correlated significantly with scores on the Rorschach component of the Thought Disorder Index (Johnston & Holzman, 1979). However, she also found that the original TD Scale was not related to thought disorder as evidenced in responses to the WAIS test, nor to scores on the WIST. With regard to the second aim of her study, the revised 20-item version of the Thought Disorder Scale did not correlate significantly with any of the criterion measures of disordered cognition, nor did the revised test discriminate the schizophrenics from the normals.

Apanasiewicz (1982) did not accomplish her original aim
of ruling out the inattentiveness hypothesis. That is, when she calculated scores on the TD Scale by counting only those items on which subjects made the same bizarre choice twice, the resulting scores did not discriminate between thought-disordered and non-thought-disordered groups, nor did the scores correlate with any of the criterion measures of disordered thinking. However, when no requirement was made that responses be consistent in order for them to be counted as thought-disordered, the TD Scale produced results that indicate that it is related to thought disorder. This pattern of findings suggested to Apanasiewicz that inconsistency of responding might be related to thought disorder, rather than being a contaminant in its measurement. She therefore calculated an Inconsistency score on the revised Thought Disorder Scale by counting the number of items on which the subject's choice on the first presentation of an item is not the same as his or her choice on the second presentation of that item.

Apanasiewicz (1982) found that the Inconsistency score correlated significantly with the Rorschach component of the Thought Disorder Index, the WAIS-R component of the Thought Disorder Index, the original Thought Disorder Scale, and marginally significantly with the WIST. She also found that schizophrenics were significantly more inconsistent than normals in making choices on the revised Thought Disorder scale. These findings lead one to wonder about the role of response inconsistency in schizophrenia and thought
disorder. A discussion of other findings of schizophrenic inconsistency is presented in the next section.

Findings of Schizophrenic Response Inconsistency

Schizophrenic response inconsistency has been found with a variety of measures. In some instances, schizophrenic inconsistency has occurred on measures that were designed for purposes other than measuring thought disorder. For example, Koh & Shears (1970) found that schizophrenics showed poorer internal consistency than did normals for judging line lengths and musical excerpts. Wilson and Barrett (1985) administered the Wilson-Patterson Conservatism Scale, a measure of liberal and conservative attitudes, to 34 schizophrenic and 34 non-schizophrenic patients in a Dutch mental hospital. The researchers found the schizophrenics to be more inconsistent than the non-schizophrenics in endorsing attitudes on the scale.

Livesay (1981) found greater response inconsistency in schizophrenics, using a test originally designed to measure interpersonal attraction in the general population. In his study, 13 thought-disordered schizophrenic and 13 non-thought-disordered psychiatric outpatients were administered the Interpersonal Judgment Scale, a test in which subjects are asked to rate someone they know on a number of personal attributes (e.g., morality, intelligence). The investigator gave the scale to the subjects twice in order to attain an index of interpersonal
judgment consistency. Results showed that the schizophrenic subjects were significantly less consistent in their assignment of ratings on the scale than were the non-schizophrenic subjects.

In another study involving scales not designed to measure thought disorder, Evans (1984) revealed interesting results with the MMPI. He found that psychiatric inpatients who were identified as inconsistent on the Test-Retest Index (TRI) of the MMPI F Scale had significantly higher scores on the Whitaker Index of Schizophrenic Thinking than did inpatients who responded consistently to the TRI.

Aside from the patchwork of studies just described, most of the findings related to schizophrenic inconsistency have involved the Grid Test approach, an approach based on Kelly's (1955) Personal Construct Theory. Using Bieri's Modified Repertory Grid Test, a measure designed for the general population, Livesay (1984) found that schizophrenic subjects were significantly less consistent than non-schizophrenics in making interpersonal judgments. All of the other studies in this area that have involved the grid approach have used the Grid Test of Thought Disorder (Bannister, Fransella & Agnew, 1971), the grid technique specifically designed to measure thought disorder. A number of studies have found that schizophrenics, especially schizophrenics judged to be thought disordered, are significantly more inconsistent on the Grid Test than are

Moreover, other studies (Heather, 1976; McPherson, Armstrong & Heather, 1975; McPherson & Buckley, 1970) have shown that the amount of inconsistency displayed by schizophrenics is affected by the content of the grid constructs. In an investigation by McPherson and his associates (McPherson, Armstrong & Heather, 1975), two versions of the Grid Test were constructed, one of which asked the subjects to make judgements about the personalities of the stimulus persons (e.g., happy, brave) and the other which asked them to make judgements about physical characteristics (e.g., young, tall). In a preliminary study, the versions had been matched for difficulty, defined in terms of the amount of consensual agreement in ranking for the construct. For example, "young" was labelled an easy construct because the judges in the preliminary study had shown a high rate of agreement on the rankings of the photographs for this construct. Similarly, "brave" was identified as a difficult construct because the judges in the preliminary study had shown a lower rate of agreement in the rankings of the photographs for this construct. The two versions were administered to
thought-disordered schizophrenic and neurotic and normal control groups. A difficult and an easy version of the grid test were also constructed and administered to the three groups.

Intensity and Consistency scores were calculated for all four versions, and the pattern of results indicated that, whereas level of difficulty had no effect on grid test scores, the content of the constructs (viz., personality vs. physical) did affect the amount of inconsistency displayed by the groups. On both personality and physical constructs, the thought-disordered group was more inconsistent than were the other two groups. However, the thought-disordered group had significantly lower consistency scores on the personality version than on the physical one, whereas neither the neurotic controls nor the normal controls had significantly different scores on the two versions. These findings were interpreted by the authors as indicating that schizophrenics find it especially difficult to consistently make judgements about people's personalities, thus supporting Bannister's (1960) hypothesis that thought disorder is a response to invalidating interpersonal relationships in the patient's family situation.

Some authors (Frith & Lillie, 1972; Williams, 1971) had suggested that the inconsistency of schizophrenics on the Grid Test may be due to these patients being unable to extract information from small photographs of people they have never met. To test this hypothesis, Heather (1976) had
thought-disordered schizophrenics, non-thought-disordered schizophrenics and normal subjects each complete two repertory grids, one using photographs and one using people they know well (e.g., relatives). Results showed that thought-disordered schizophrenics were more inconsistent than either of the control groups regardless of whether photographs or known people were used as elements in the Grid Test. Moreover, the thought-disordered schizophrenics were equally inconsistent on both the photograph and known-people grids; the control groups showed the same pattern. These findings thus disconfirmed the explanation that schizophrenics are inconsistent on the grid test because they are not familiar with the stimulus persons about whom they are supposed to make judgements.

Another plausible explanation for the greater inconsistency of schizophrenics was that schizophrenics are not interested in or motivated to persist with the long and somewhat tedious Grid Test. To test this hypothesis, Higgins and Sherman (1978) administered the Grid Test to 40 male schizophrenics. Half of them received a monetary reward for their performance, and half did not. The efficacy of this motivation-enhancing manipulation was verified by the fact that the group that was working for the money completed a card sorting task significantly faster than the group that received no compensation. However, the group that was working for money also exhibited greater inconsistency on the grid test. The results were
interpreted in terms of drive theory. It was argued that the rewarded group was more motivated and therefore more highly aroused, and that this high arousal level disrupted performance on the more complex task. These findings thus discredit the hypothesis that lack of motivation contributes to schizophrenic inconsistency.

Overall, the findings reviewed to this point suggest that inconsistency is relevant to both thought disorder and schizophrenia. As well, these findings show that this inconsistency is not the product of poor motivation on the part of the subjects.

Statement of the Problem

The considerations raised in the previous discussion of thought disorder and inconsistency led the author to pose several research questions. Of central relevance was Katan's (1960) theory of conflict as an explanation of thought disorder. Before discussing the questions, however, it is important to clarify the author's conceptual definitions of thought disorder and conflict. First, by thought disorder, the author is referring to Bleuler's (1911/1950) conceptualization of the disorder in thinking that has traditionally been considered a central symptom of schizophrenia. The author views thought disorder as the splitting of associative connections. That is, the connections or associations between ideas and meanings are blocked or severed. Associations thus appear loose or
disconnected. This disassociation of ideas manifests itself in the variety of speech disturbances identified by Spitzer, Endicott, and Robins (1978) in their Research Diagnostic Criteria as characteristic of schizophrenic thought disorder. These speech disturbances include the lack of logical or meaningful connections between words, phrases, or sentences; excessive use of incomplete sentences; excessive irrelevancies or abrupt changes in subject matter; distorted grammar or syntax; idiosyncratic word usage; repeated statements in juxtaposition which lack a readily understandable relationship (derailment); thinking which contains logical contradictions or in which one premise does not follow from another; poverty of content of speech; and neologisms.

Second, by conflict the author is referring to the psychoanalytic definition of conflict outlined by Brenner (1976), Burnham (Burnham, Gladstone, & Gibson, 1969), and Katan (1960). This conceptualization involves intrapsychic conflict, the existence in a person's mind of two opposing forces or motivations. One of these motivations is a wish emanating from the id. This wish, for example, could be a wish for love, a wish for sexual gratification, or a wish for someone to die. When a given wish results in consequences that are painful for the individual (e.g., frustration, disappointment, punishment, etc.), the wish becomes associated with pain. The person comes to fear striving for the wish because he does not want to face the
possibility of further unpleasantness. The ego works to prevent the individual from facing the unpleasantness associated with the wish by repressing the wish into unconsciousness. Furthermore, in situations in which the person could once again strive for wish gratification, anxiety occurs as a cue that the wish and its associated pain may become conscious. The anxiety motivates the individual to get out of the situation and to avoid other situations in which the wish could be gratified. Paradoxically, the person becomes anxious in situations in which wish gratification is possible.

Psychic conflict, then, refers to the state in which an individual has a wish for gratification and a motive to avoid that gratification; a motive to gratify the wish, and a motive to avoid gratification.

Given these definitions, the author raised nine questions related to theoretical and measurement issues in thought disorder. In brief, he set out to answer these questions using the aforementioned Picture Preference Test (Rudzinski, 1979), the Whitaker Index of Schizophrenic Thinking (Whitaker, 1980), the Grid Test of Thought Disorder (Bannister & Fransella, 1966), and a diagnostic interview schedule. He employed two groups of patients: (1) schizophrenics, who would be expected to possess varying degree of thought disorder, and (2) mood-disordered patients, who would be expected to possess relatively little thought disorder. This research design is fully explained
in the Design section. The research questions will now be discussed in sequence.

Theoretical Issues

Issue I: The Role of Conflict in Schizophrenic Thought Disorder

Katan (1960) outlined a theory of thought disorder which identifies psychic conflict as the central element of the disturbance. The author wished to examine this theory with four research questions.

Question 1: Does the avoidance of conflict relate to schizophrenic thought disorder? According to Katan (1960), thought-disordered persons are characterized by intense conflicts between the motive to strive for the gratification of wishes that were gravely disappointed early in life, and the motive to avoid striving for the gratification of these wishes. For example, the classic schizophrenic conflict between the wish for love and the avoidance of love is postulated by Katan to develop because the thought-disordered schizophrenic's parents strongly frustrated the wish. Because of the early and intense frustration of the wish, the thought-disordered person represses the wish and avoids or repels persons who may offer a degree of love and acceptance. The conflict here is between the motive to strive for and the motive to avoid love.

In Katan's theory, thought disorder results because
words become invested with conflict-laden meanings in the schizophrenic's mind. For example, for a schizophrenic who has a rejecting and unloving mother, the dominant meaning of the word "mother" may have associated with it feelings of painful rejection and conflicts about dependency and being loved. "Mother" consequently has excessive meaning for the patient because of the extra baggage added on by the conflict.

In Katan's model, the difficulty that the schizophrenic has in thinking comes about because many of the conventional or dominant meanings of words provoke internal strife. The internal conflict in turn creates anxiety. The patient avoids the anxiety by repressing the meanings that would otherwise produce conflict and lead to anxiety. The pleasure principle motivates the development of the repression, as the schizophrenic finds it rewarding to avoid anxiety. Once the repression is instituted, it requires energy to maintain it; this investment of psychic energy is known as a countercathexis. With the affect-connected meanings blocked by a countercathexis, the patient is forced to resort to emotionally-neutral, displaced meanings that are based on less central aspects of the word. For example, for the word "mother," the patient might use "smother" and "apron" as meanings derived from two of the word's less important aspects, viz. rhyme and apparel.

As the meanings that are most relevant semantically to the conventional context of a word are inhibited by
competing responses, the schizophrenic is forced to resort to these other responses which include phonemic connections and less-disturbing but rarely used definitions. The thought-disordered person is thus disallowed from using words in the conventional way and forced to rely on less conventional usages. Thus Katan postulates that schizophrenic thought disorder is a defense which allows the schizophrenic to avoid wish conflicts that are associated with the conventional meanings of many words.

If the motivation to avoid conflict leads to the development of thought disorder in the first place, then those persons with thought disorder may demonstrate a tendency to avoid conflict-provoking stimuli on a measure of conflict-avoidance. In other words, as a person's level of thought disorder increases, his tendency to avoid conflict-provocative stimuli might also increase.

Question 2: Does the avoidance of conflict relate to diagnosis as a blunt measure of thought disorder? As noted in the discussion for Question 1, Katan's (1960) theory postulates that thought-disordered persons are intensely conflicted, and that this conflict originally led to the development of their thought disorder. The author attempted to use diagnosis as a second means of investigating the avoidance of conflict in thought-disordered persons. Assuming that a group of schizophrenics would on average be more thought-disordered than a group of mood-disordered patients, the author wanted to see if schizophrenics would
exhibit a stronger tendency to avoid conflict-provoking stimuli than would mood-disordered patients. Katan's theory would predict that the schizophrenics would exhibit a greater tendency to avoid conflict than would mood-disordered patients.

Question 3: Does inconsistency on picture-preference scales varying in the degree of conflict-provocativeness relate to measures of thought disorder? As previously noted, items on the Picture Preference Test contain pairs of pictures. The subject is asked to choose which of the two pictures in each pair he likes better. Apanasiewicz (1982) developed a measure of inconsistency on the PPT. She presented a series of picture-preference items twice to her subjects. She calculated an Inconsistency score which was equal to the total number of items on which the patient's picture choice on the first presentation of an item was not the same as his picture choice on the second presentation of that same item. Apanasiewicz found that the Inconsistency score on a scale of thought disorder items was related to measures of thought disorder. Conceptually, it seems reasonable to assume that inconsistency in choosing among pictures from one trial to the next is an indication of disorganized thinking. According to the logic of Katan's theory, as a patient's degree of thought disorder increases, his degree of inconsistency or disorganization of responding should increase on PPT items depicting conflictual themes, whereas the degree of thought disorder should not relate to
the degree of inconsistency of responding to PPT items depicting banal or nonconflictual themes. In other words, if conflict is crucial in the development of thought disorder, then degree of thought disorder should correlate with inconsistency on a set of conflict items, but should show little relationship with inconsistency on a set of non-conflict items.

Question 4: Do increasing levels of conflict in PPT items produce greater inconsistency, and is this effect more pronounced in schizophrenics than in mood-disordered patients? The author also examined the relationship of conflict to thought disorder (as represented by inconsistent responding) by testing for differences in inconsistency between schizophrenic and mood-disordered patients. Assuming that schizophrenics on average are more thought-disordered than are mood-disordered patients, the author wanted to see if the two groups of patients would show different patterns of response inconsistency to conflictual and non-conflictual picture-preference scales. If thought disorder is the long-term result of intense inner conflict, as Katan's (1960) theory suggests, then one would expect that schizophrenics would be more inconsistent in choosing between pictures on PPT scales depicting conflictual themes than they would in choosing between pictures on a PPT scale depicting neutral themes. Moreover, as mood-disordered patients are generally not characterized by high levels of schizophrenic thought disorder, one would
expect that such patients would be equally consistent in choosing pictures regardless of whether the picture-preference items were conflictual or non-conflictual in content.

**Issue II: The Relationship of Inconsistency to Schizophrenia**

**Question 5:** Is inconsistency a response characteristic of schizophrenics regardless of the content of the material to which they are responding? Two theorists have independently suggested that schizophrenics possess a characteristic tendency to behave inconsistently. Shakow (1962) suggested that schizophrenics cannot maintain a general set or response rule in situations requiring them to apply such rules, because these persons become distracted by various irrelevant aspects of the stimuli from moment to moment. According to this view, schizophrenics behave inconsistently because they cannot dependably follow simple rules of thumb for appropriate behavior. Bannister (1962) postulated that schizophrenics construe the world in very loose terms and behave in an inconsistent fashion because when they were growing up their expectations and opinions of people were repeatedly invalidated. As a result, the opinions and expectations held by schizophrenics are loose and contradictory. As already indicated, the author administered conflictual and nonconflictual picture-preference scales, as well as the Grid Test of Thought Disorder, the most frequently-used measure of inconsistency.
in schizophrenia research. If Bannister's and Shakow's basic tenet that inconsistency is a general style of schizophrenia is accurate, then schizophrenics should respond more inconsistently on all measures of inconsistency used in the present study, including the conflictual and nonconflictual scales of the PPT, and the Grid Test of Thought Disorder. If, on the other hand, inconsistency is not a general characteristic of schizophrenics, then the content of the measures (viz., whether the scale is conflictual or nonconflictual in content; whether the scale involves choosing between pictures or ranking photographs of people on personality constructs) may determine the degree of inconsistency such that on some measures schizophrenics are more inconsistent than mood-disordered patients, whereas on other measures, schizophrenics and mood-disordered patients are equal in response inconsistency.

Measurement Issues

Issue I: Validity of the TD Scale and Its Inconsistency Score

As previously indicated, the available measures of thought disorder possess a variety of shortcomings. In this regard, Rudzinski's (1979) Thought Disorder Scale has a number of distinct advantages. First, the TD Scale was designed to measure a wider range of thought disturbances than most instruments currently in use. Second, unlike many of the other measures, the TD Scale takes little time for the examiner to score. Third, the scale's format minimizes
the influence of variables which are unrelated to disordered thinking, but which have been shown to affect the test performance of severely disturbed patients. More specifically, its picture-preference approach makes little or no demand on subjects for language skills or sustained concentration. Variations in productivity and responsiveness to testing are not likely to have a strong influence, in view of the forced-choice format. As well, the TD Scale is virtually free from the influence of social desirability response biases (Rudzinski, 1979). Finally, Ryan (1976/1977) has noted that the picture-preference task is an interesting one for subjects and that it can maintain their attention during testing.

Noting these many strengths, the author thought that further investigation of TD Scale was warranted; he raised two questions about the scale.

Question 6: Can the TD Scale and its Inconsistency score discriminate schizophrenic from mood-disordered patients? Previously, Rudzinski (1979) and Apanasiewicz (1982) found that the TD Scale could discriminate between thought-disordered and non-thought-disordered psychiatric patients, and between schizophrenics and university students. As well, Apanasiewicz found that the TD Scale-Revised Inconsistency score could discriminate between schizophrenics and university students, and between thought-disordered and non-thought-disordered schizophrenics. The author wanted to see if the TD Scale
and the Inconsistency score on the TD Scale-Revised were each sufficiently sensitive to show a reliable difference between schizophrenics and another equally broad diagnostic category of patients (viz., mood disorders). More specifically, he wanted to check on the actual number of patients that these two measures could correctly identify as schizophrenic or mood-disordered.

Question 7: How do the TD Scale and its Inconsistency score compare to the other measures of thought disorder used in the present study in terms of validity? As noted in the literature review, Rudzinski (1979) found that the TD Scale correlated with the Thought Disorder Composite Score on the Brief Psychiatric Rating Scale (Overall & Gorham, 1962) and the Psychotic Tendencies Scale of the Differential Personality Inventory (Jackson & Messick, 1964). Apanasiewicz (1982) found that the TD Scale was correlated with the Johnston-Holzman Rorschach Index, but not with the Johnston-Holzman WAIS Index, nor with the WIST. She also found that the TD Scale-Revised Inconsistency score correlated with the Johnston-Holzman Rorschach and WAIS indices, but not with the WIST. These correlations were based on samples of schizophrenics. The author wanted to see whether the TD Scale and its Inconsistency score would correlate with the thought disorder measures used in the present study (viz., the rating of the presence of thought disorder in the diagnostic interview, the WIST, and the Grid Test) in a diagnostically broader sample of psychiatric
patients. If notable correlations were found, this would certainly strengthen the case for these PPT thought disorder indices.

**Issue II: Scoring the Grid Test**

**Question 8:** Are there more elegant and convenient ways of scoring the Grid Test than the methods devised by Bannister? As indicated in the literature review, Bannister's method for measuring within-grid consistency (viz., the Intensity score) and between-grid consistency (viz., the Consistency score) entails a series of operations involving the calculation of numerous Spearman rhos, and the squaring, adding, and ranking of those rhos. Even with the use of a computer statistical package, these various steps are quite time-consuming (Gabriel, 1986). As well, Cyr (1983) has pointed out that the Bannister's scoring method is insensitive to the total variability of the data points. With these shortcomings in mind, the author proposed alternative methods of calculating intensity and consistency that are more elegant mathematically and that can be directly calculated with readily available computer packages.

According to Bannister, Fransella, and Agnew (1971), the Intensity score represents the looseness of construing or degree of relationship between the constructs for a subject; that is, the degree of consistency in rankings that the subject displays within each grid. High scores indicate that the subject is rank-ordering as if the qualities he is
judging are related; low scores indicate that he is judging the qualities loosely, as if they are unrelated. The author proposed two alternative methods of measuring within-grid consistency. The first and more elegant method was to use the determinant of the Pearson correlation matrix for each grid administration. The determinant reflects all of the variability among the construct rankings. It is a more direct index of variability or looseness of construing than the Intensity score, as the Intensity score is a rank correlation and as such, only represents some of this variability.

The author proposed the use of Kendall's W (Kendall, 1970) as a second method for measuring within-grid consistency. Kendall's W measures the degree of agreement between the rankings of the constructs, regardless of the meaning of the constructs. It ranges from 0 (no agreement) to 1.00 (perfect agreement). It is in effect a measure of perseveration, as it assesses the degree to which the subject placed the pictures in the same rank order regardless of which construct he was asked to rank. The higher the score, the greater the extent to which the rankings of all of the constructs agree with each other, and the greater the extent to which the subject perseverated on a specific rank ordering of the photographs. Researchers have found perseveration to be a useful index in other measures of thought disorder, such as the Rorschach (Johnston & Holzman, 1979) and the Language Problems Scale.
(Grinker & Holzman, 1973). As no perseveration score had been developed for the Grid Test, the author set out to examine the utility of such a score for the test.

The author also proposed two alternative methods of measuring between-grid stability or consistency on the Grid Test. According to Bannister, Fransella, and Agnew (1971), their Consistency score reflects the degree to which the subject maintains the pattern of relationships between the constructs from the first administration to the second administration. The most elegant and direct measure of this type of consistency is the Chi-square goodness of fit index for covariance matrices. This Chi-square index, developed by Bartlett (1947), tests the equality of two covariance matrices, or in other words, the equality of the pattern of relationships in two covariance matrices. The author also proposed a method of using Kendall's W (Kendall, 1970) as a second method for calculating between-grid consistency. These scores are described in greater detail in the Method section.

**Issue III: Relationship of the Picture Preference Test to the Grid Test**

**Question 9:** What is the relationship of inconsistency on the PPT to inconsistency on the Grid Test?

Apanasiewicz's (1982) Inconsistency score indicates the number of times on a picture-preference scale that a subject changes his mind in choosing between pictures from the first to the second presentation of repeated items. In other
words, the Inconsistency score equals the total number of items on a scale in which a subject chose one picture on the first presentation of an item, and the other picture of the pair on the second presentation of that same item. In contrast, on the Grid Test, the Intensity score reflects the degree to which the subject ranks the pictures on each construct in a logically consistent fashion. For example, if the subject is being consistent, a picture that he ranks highly on the construct "kind" should receive a low ranking on the construct "mean". The Grid Test Consistency score represents the degree to which the subject's rankings across the constructs on the first grid administration is similar to the subject's rankings across the constructs on the second administration. For example, consistent ranking from the first to the second grid would be demonstrated by a subject if he ranked photograph Number 4 as being high on kindness, low on meanness, and moderate on sincerity on the first grid administration, and then he ranked Number 4 similarly on the second administration.

It has already been repeatedly demonstrated that the Intensity and Consistency scores correlate moderately with each other (e.g., Bannister & Fransella, 1966). However, to date, no study has investigated whether inconsistency on the Grid Test and inconsistency on the PPT are related to each other. Inconsistency on the PPT and inconsistency on the Grid Test reflect two different types of behavior, one reflecting the inconsistency of choosing between two
pictures, and the other of ranking photographs of people on personality constructs. The author wanted to determine the degree to which inconsistency on these two tasks is correlated.

**Design**

As the study undertaken by the author was quite complex, the author thought it best to clearly outline the design for addressing the theoretical questions. As outlined in the Statement of the Problem, the author was interested in answering questions related to response inconsistency, thought disorder, and psychic conflict in a sample of schizophrenic and mood-disordered patients. The operational definitions of these concepts were as follows. To measure the inconsistency of responding in these patients, the author employed Apanasiewicz's (1982) Inconsistency score on scales of the Picture Preference Test. The author also measured inconsistency with the Grid Test of Thought Disorder, the most frequently-used measure of inconsistency in schizophrenia research.

As noted in the Statement of the Problem, the author defined thought disorder as a disconnection of associations that is manifested in a variety of pathological speech patterns such as neologisms, frequent irrelevant changes in subject matter, and a lack of logical connection between words and phrases. The most direct measure of this conceptual definition of thought disorder would be a rating
of the presence and severity of these speech symptoms occurring in a diagnostic interview with the patient. The author therefore measured thought disorder with a diagnostic rating scale of speech manifestations of thought disorder in an interview. He also measured thought disorder less directly with the patient's score on the Whitaker Index of Schizophrenic Thinking (Whitaker, 1980). This score reflects the degree to which the patient chooses illogical answers to questions asking him to define words, identify similarities between word pairs, and predict logical outcomes of situations. Although the WIST is not a direct measure of the manifestation of thought disorder in the patient's speech, it does seem to tap the illogical thinking that is characteristic of thought disorder. The author also considered inconsistency on the Grid Test of Thought Disorder as a manifestation of disorganized or disordered thinking, as previous researchers have done (e.g., Higgins & Sherman, 1978).

To diagnose patients as schizophrenic or mood-disordered, the author employed the current standard of diagnostic criteria, the Diagnostic and Statistical Manual of Mental Disorders, Volume III - Revised (American Psychiatric Association, 1987).

Having established these basic operational definitions, the author will now outline his strategy for answering the questions related to the theoretical issues in the study.
Issue 1: The Role of Conflict and Thought Disorder in Schizophrenia

The main theoretical issue addressed by the author involved testing Katan's (1960) theory of conflict. In brief, Katan's theory is that thought disorder is the result of the patient's defensive attempt to repress intense conflicts between the motivation to strive for the gratification of frustrated wishes and the motivation to avoid the further disappointment that may occur if the patient again strives for gratification of such wishes. According to this view, the thought-disordered person resorts to a disorganized, senseless train of associations because it feels much better to him than does facing the pain of rational associations that are connected to the disappointment of wishes.

To assess the role that conflict may play in the manifestation of thought disorder, the author employed items from the Picture Preference Test (Rudzinski, 1979). As no picture-preference measures of conflict were available, the author had to develop PPT scales containing stimuli that varied in the ability to remind schizophrenics of conflictual wishes. The author created two such scales. Specifically, he developed a Conflict Scale containing picture-preference items that were rated by qualified judges as being high in the ability to elicit intrapsychic conflict in schizophrenics. He also developed a Non-Conflict Scale containing picture-preference items that were rated by
qualified judges as being low in the ability to elicit intrapsychic conflict in schizophrenics. He had to develop these scales before he could address any of the research questions outlined in the Statement of the Problem. Consequently, he conducted a preliminary study to create these scales; their development is fully outlined in the Preliminary Study chapter.

Question 1: Does the avoidance of conflict relate to measures of thought disorder?. As previously noted, each picture-preference item contains two pictures, and the subject is asked to make a choice between these two pictures. One of the ways of scoring the Conflict Scale is to score it for the avoidance of conflict. Most of the items in the Conflict Scale contain picture-pairs in which one picture depicts a conflictual theme, and the other depicts a neutral, non-conflictual theme. If a patient chooses the non-conflictual picture on many or most of the Conflict Scale items, he could be said to be avoiding conflictual material. The author identified those items on the Conflict Scale on which one of the pictures was conflictual, and one of the pictures was non-conflictual. These items formed the Conflict-Avoidance Subscale; the score on the subscale represented the total number of items on which the patient avoided choosing the conflictual picture. The few Conflict Scale items that were not included in the Conflict-Avoidance Subscale were those which could not be scored for conflict-avoidance, because both pictures in
these items were highly provocative of conflict.

Katan's (1960) theory states that thought disorder is the result of the patient's defensive strategy of avoiding the recollection of conflictual wishes by repressing or blocking word associations that resurrect these wishes. If the avoidance of conflict led to the development of thought disorder in the first place, then the tendency to avoid conflictual themes on the Picture Preference Test (as measured by the Conflict-Avoidance Subscale) might correlate with the measures of thought disorder included in the study (viz., the interview rating of thought disorder, the WIST, and the Grid Test). The author thus predicted that the conflict-avoidance measure would correlate meaningfully (viz., $r \geq .30$) with the thought disorder measures.

Question 2: Does the avoidance of conflict relate to diagnosis? To answer this question, the author conducted an analysis of variance between the diagnostic groups on the Conflict-Avoidance Subscale scores. As schizophrenics would be expected to possess more thought disorder as a group than would mood-disordered patients, the author predicted that the schizophrenics would have significantly higher scores on the conflict-avoidance measure than would the mood-disordered patients. If conflict-avoidance is critical to the development of thought disorder, then persons possessing higher levels of thought disorder (viz., schizophrenics) might be expected to demonstrate a greater
tendency to avoid conflict than would persons possessing lower levels of thought disorder (viz., mood-disordered patients).

Question 3: Does inconsistency on picture-preference scales varying in the degree of conflict relate to measures of thought disorder? In addition to using conflict-avoidance, the author employed Apanasiewicz's (1982) Inconsistency score as a means of evaluating Katan's (1960) theory. As noted previously, the Inconsistency score indicates the total number of repeated items in a picture-preference scale on which the subject's choice on the first presentation of an item did not match his choice on the second presentation of that same item. The author included four PPT scales in which each scale item was presented to the subjects twice: (1) the Conflict Scale, (2) the Conflict-Avoidance Subscale, (3) the Non-Conflict Scale, and (4) the Thought Disorder Scale-Revised. The author calculated an Inconsistency score for each of the four scales. In inconsistently choosing between pictures, a patient would be displaying a type of disorganization of thinking.

If conflict is critical in the manifestation of thought disorder, than one would expect that as the level of thought disorder increases, the degree of inconsistency or thought disorganization would increase on the conflictual scales (Conflict Scale, Conflict-Avoidance Subscale). That is, persons who were more thought-disordered would be more
mentally disturbed by (show greater inconsistency on) conflict items than would persons who were less thought-disordered. However, this relationship would not occur on the Non-Conflict Scale, because the neutral content of the items would not elicit thought disorder as measured by the inconsistency of responding. Highly thought-disordered persons would not be any more disturbed by neutral items than would persons with little thought disorder. Consequently, the author expected meaningful correlations between the Inconsistency score on the Conflict Scale and the measures of thought disorder included in the study, as well as between the Inconsistency score on the Conflict-Avoidance Subscale and the thought disorder measures. He expected insubstantial correlations between Inconsistency on the Non-Conflict Scale and the various measures of thought disorder.

To statistically test these expectations, he conducted pairwise comparisons of the difference between (1) the correlations of the thought disorder measures with Inconsistency on each of the two conflictual scales and (2) the corresponding correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale. He predicted that the correlations of the thought disorder measures with Inconsistency on the conflictual scales would be significantly larger than would the corresponding correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale. For example, he
predicted that the correlation between the WIST and Inconsistency on the Conflict Scale would be significantly larger than would the correlation between the WIST and Inconsistency on the Non-Conflict Scale.

In addition, the author believed that the items on the Thought Disorder Scale-Revised depict conflictual themes for schizophrenics, as this measure was originally developed to represent various aspects of schizophrenic thinking disturbance. The author therefore expected that Inconsistency on the Thought Disorder Scale-Revised would correlate meaningfully with the thought disorder measures. He predicted that the correlations of the thought disorder measures with Inconsistency on the TD Scale-Revised would be significantly larger than would the correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale. For example, he predicted that the correlation between the WIST and Inconsistency on the TD Scale-Revised would be significantly larger than would the correlation between the WIST and Inconsistency on the Non-Conflict Scale.

In summary, the author expected that thought disorder would correlate with Inconsistency on the three scales presumed to represent conflictual themes (Conflict Scale, Conflict-Avoidance Subscale, TD Scale-Revised), but not with Inconsistency on the scale presumed to represent neutral themes. He predicted that this pattern would be strong enough to result in a significant difference between the
size of the correlations involving the three conflictual scales and the size of the correlations involving the Non-Conflict Scale. More specifically, the author predicted that the correlations of the thought disorder measures with Inconsistency on each of the three conflictual scales would be significantly larger than would the correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale.

Question 4: Do increasing levels of conflict in PPT items produce greater inconsistency, and is this effect more pronounced in schizophrenics than in mood-disordered patients? In addition to examining Katan's theory using the continuous measures of thought disorder, the author employed the diagnostic grouping as a more blunt measure of thought disorder. He expected that schizophrenics as a group would be more thought disordered than would mood-disordered patients. Thinking in terms of Katan's (1960) model, one would predict that schizophrenics would be significantly more inconsistent on the Conflict Scale than on the Non-Conflict Scale, whereas mood-disordered patients would be equally consistent on both scales. As well, as the author believed that the TD Scale was conflictual in nature, he predicted that the schizophrenics would be significantly more inconsistent on the TD Scale than on the Non-Conflict Scale, whereas the mood-disordered patients would be equally consistent on both scales.

The author planned to test these predictions by
conducting a between-groups repeated measures analysis of variance on the Inconsistency scores of these three PPT scales. A significant Diagnostic Group x Degree of Conflict (Conflict, Non-Conflict, TD Scale -Revised) interaction would have borne out his predictions.

Essentially, the author expected that the schizophrenics would suffer a greater breakdown of thought consistency as a result of seeing the two conflictual scales (Conflict, TD) than they would as a result of seeing the Non-Conflict Scale. As mood-disordered patients were not expected to be particularly thought disordered, the author predicted that these persons would not show a notable breakdown of the consistency of thinking to any of the scales.

**Issue 2: Relationship of Inconsistency to Schizophrenia**

**Question 5:** Is inconsistency a response characteristic of schizophrenic's regardless of the content of the material to which they are responding? Bannister's (1962) and Shakow's (1962) theories suggest that inconsistent behavior is a characteristic of schizophrenics. To investigate this possibility, the author conducted t-tests to test for the significance of between-group differences on all the measures of inconsistency used in the study: the Conflict Inconsistency score, the Conflict-Avoidance Inconsistency score, the Non-Conflict Inconsistency score, the TD Scale-Revised Inconsistency score, the Grid Test Intensity score, and the Grid Test Consistency score. The author predicted
that schizophrenics would show significantly greater inconsistency than would the mood-disordered patients on all of these indices. As well, he predicted a significant main effect of diagnostic group in the between-groups repeated measures analysis of variance conducted on the Inconsistency scores of the Conflict Scale, the Non-Conflict Scale, and the TD Scale-Revised (viz., the same ANOVA conducted for Question 4). The author expected schizophrenics to be more inconsistent than the mood-disordered patients on all of these measures, because he believed that the specific content of the measures would be irrelevant to the manifestation of this schizophrenic characteristic.

In addition to these theoretical issues, the author addressed specific methodological questions in the main study. The procedure for addressing these measurement questions is described in the main study Method section.
CHAPTER II
PRELIMINARY STUDY

Before the main study described in Chapter 1 could be conducted, the author had to decide upon the composition of the Conflict and Non-Conflict picture-preference scales. To do so, he searched through the complete 210-item Picture-Preference Test (Rudzinski, 1979) for items that could be judged as being either conflictual or non-conflictual to a schizophrenic. He chose an initial set of 15 items that he judged to be low in the ability to provoke conflict in a schizophrenic; he labelled these items non-conflict items. He also chose an initial set of 15 items that he judged to be high in the ability to provoke conflict in a schizophrenic; he labelled these items conflict items.

To ensure that his labelling of these items was reliable, he asked a panel of independent qualified judges to rate each of these items in terms of their ability to provoke conflict in a schizophrenic. In order to use the scales in research, the author had to ensure empirically that all 15 of the items he had labelled as conflict items were rated by the judges as being more provocative of conflict in schizophrenics than were any of the 15 items that he believed produce little conflict in schizophrenics. As well, the author wanted to obtain an objective estimate of the degree of conflict provoked by the items of the
Thought Disorder Scale. He consequently had the judges rate for conflict the 15 TD Scale items that he would be presenting twice to the patients in the main study.

In summary, the purpose of the preliminary study was two-fold: (1) to decide upon the composition of the Conflict and Non-Conflict Scales, and (2) to obtain an estimate of the level of conflict represented in the items of the TD Scale-Revised. In this chapter, the author will guide the reader through the procedure that he followed and the results that were produced.

**METHOD**

**Subjects**

Five experienced licensed clinical psychologists (three men, two women) served as raters. All of the raters were employed full-time in clinical settings at the time of the study. The raters rated each of the PPT items (viz., conflict, non-conflict, TD Scale-Revised) as described above. Although the author would be giving the PPT items to schizophrenic patients in the main study, he decided against using schizophrenics in the preliminary study to rate the items. As the author was advancing the hypothesis that schizophrenics have great difficulty dealing with conflict, he believed that such persons would not be able to rate the items adequately on the dimension of conflict-provocativeness. He decided instead to use experienced clinical psychologists, because their training
and approach to provocative material would presumably enable
them to rate such material without having their judgement
distorted by the conflicts aroused by the items.

Materials

Picture-Preference Booklet 1. The researcher prepared
an initial booklet of picture-preference items. It
consisted of the following: (1) the 15 items of the Thought
Disorder Scale that the author would be presenting twice to
the patients in the main study; these were 15 of the 20
items that Rudzinski (1979) found to form the most
internally consistent scale out of the total 31 items. (2)
15 other items of the Picture-Preference Test rated by the
author as being high in the ability to provoke conflict in a
schizophrenic, and (3) 15 items of the Picture-Preference
Test rated by the author as being low in the ability to
provoke conflict in a schizophrenic. The following
instructions were printed at the top of the first page of
the booklet:

This booklet contains a series of picture-pairs.
Under each picture-pair, there is a line with 7
points ranging from (1) Not at all provocative of conflict
to (7) Puts one in terrible conflict. We are asking
you to rate each picture-pair with regard to how
disturbing you think it would be to a schizophrenic,
using this 7-point scale. On the line beneath each pair,
please indicate your rating of that item by circling the
number which you feel best represents the degree to which
that picture-pair would provoke conflict in a schizophrenic.

The 45 picture-preference items were presented in random order in the booklet. Under each item, the following line was printed:

/--------/--------/--------/--------/--------/--------/

1 2 3 4 5 6 7

Not at all provocative

Puts one in terrible conflict

PROCEDURE AND RESULTS

The author sent to each of five judges the booklet of the 15 conflict and 15 non-conflict items, as well as the 15 items of TD Scale-Revised. He asked that each rater complete the booklet independently.

Upon receiving the conflict rating booklets completed by the judges, he calculated the average of the five judges's conflict ratings for each of the items in the booklet. The frequency plot of these conflict ratings is displayed in Figure 1. As can be seen, the TD Scale had the greatest range of conflict ratings for its items, with
Figure 1. Frequency Plot of Item Conflict Ratings for the First Rating Booklet

Note: a = 1 item
b = 2 items
c = 3 items

Non-Conflict Scale Items (X Rating = 2.47)  Conflict Scale Items (X rating = 4.43)  Thought Disorder Scale-Revised Items (X rating = 3.19)
average ratings ranging from 1.8 to 5.6. The Non-Conflict Scale items had ratings ranging from 1.0 to 4.0, and the Conflict Scale had ratings ranging from 3.0 to 6.0. The author wished to produce Conflict and Non-Conflict scales in which the item ratings of one scale did not overlap with the item ratings of the other scale. Clearly, there were three items in the Non-Conflict Scale whose ratings were greater than or equal to the ratings of the items at the bottom end of the Conflict Scale rating distribution (see Figure 1). Similarly, there were five items in the Conflict Scale whose ratings were equal to or below the top end of the ratings distribution for the Non-Conflict Scale.

*Picture-Preference Booklet 2.* As the author wanted to produce scales whose conflict rating distributions did not overlap, he had to try out a second set of items in order to replace the eight poor items (three Non-Conflict, five Conflict) with eight items that could be agreed upon by the judges and the author. The author sent out a second booklet of 15 more items that he rated as conflictual for schizophrenics, and 15 more items that he rated as nonconflictual for schizophrenics. None of the items in the second booklet had appeared in the first booklet. This second booklet had the same instructions and format as the first booklet, except that the second booklet did not include any items from the TD Scale.

Upon receiving the completed rating booklets (Booklet 2) from the judges, he once again calculated the average
conflict rating for each of the items in the booklet. Figure 2 displays the frequency plot of these conflict ratings. As can be seen, the distributions of item ratings for the two scales are more separated than the distributions for the first rating booklet. Before proceeding any further, the author pooled the ratings of the 75 items that he had asked the raters to rate in the two booklets (viz., 15 TD Scale items, 30 Non-Conflict items, 30 Conflict items). Intraclass correlation coefficients (Winer, 1971) were calculated as reliability estimates for the inclusion of one, two, three, four, and all five judges. These intraclass correlation estimates are displayed in Table 1. As Winer indicates, the small number of judges may lead to an underestimate of the reliability of the ratings. Therefore the author also calculated the unbiased estimate of intraclass correlation for the ratings of the five judges. The resulting unbiased estimate of the reliability of the five judges's ratings was .90.

Satisfied that the judges agreed sufficiently with each other on the conflict ratings of these items, the author proceeded to determine if the judges's ratings concurred with the author's classification of the items as conflict or non-conflict. He also wanted to see how the 15 items of the TD Scale-Revised would compare to the other two scales with regard to the conflict ratings. A 3 (Scale: Non-Conflict, Conflict, TD) X 5 (Judges) analysis of variance was conducted on the judges's ratings. The summary table of
Figure 2. Frequency Plot of Item Conflict Ratings for the Second Rating Booklet

Note: a = 1 item
    b = 2 items
    c = 3 items
    d = 4 items
    e = 5 items
    f = 6 items
Table 1

Estimates of Intraclass Correlation for the Judges' Ratings

<table>
<thead>
<tr>
<th>Number of Judges Included</th>
<th>Estimate of Intraclass Correlation (Biased)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.64</td>
</tr>
<tr>
<td>2</td>
<td>.78</td>
</tr>
<tr>
<td>3</td>
<td>.84</td>
</tr>
<tr>
<td>4</td>
<td>.88</td>
</tr>
<tr>
<td>5</td>
<td>.90</td>
</tr>
</tbody>
</table>

Unbiased Estimate of Intraclass Correlation (5 raters) .90
that analysis is presented in Table 2. As indicated, there was a significant difference among the conflict ratings of the three scales ($F_{3, 77} = 34.16, p < .0001$), and a significant difference among the average ratings of the judges ($F_{2, 32} = 40.30, p < .0001$).

To determine which scales differed from each other in terms of conflict ratings, pairwise $t$-tests were performed on the ratings. The means, standard deviations, and $t$-tests for the pooled ratings of the judges on the three scales are displayed in Table 3. For comparisons in which the variances of the two samples being compared differed significantly from each other, the standard $t$ value has been replaced by a $t$ value based on the separate variance estimates from the two samples. Separate-variance $t$'s were used in these cases, because standard $t$ values are not interpretable when the variances of the samples being compared are unequal (SAS Institute, 1985).

As indicated in the table, the Conflict Scale ($X$ rating = .39) was rated as significantly more conflict provocative than was the Non-Conflict Scale ($X$ rating = 2.26) ($t = 9.21, p < .0001$). The Conflict Scale was also rated as significantly more conflict provocative than was the TD Scale ($X$ rating = 3.19) ($t = -3.48, p < .001$). The TD Scale was rated as more conflict provocative than was the Non-Conflict Scale ($t = 2.44, p < .05$). These analyses provided corroboration for the author's ratings of the items
Table 2

Analysis of Variance of the Judges’ Ratings of all 75 Items

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale (Non-Con, Con, TD)</td>
<td>340.32</td>
<td>2</td>
<td>170.16</td>
<td>34.16*</td>
</tr>
<tr>
<td>Error</td>
<td>358.52</td>
<td>72</td>
<td>4.98</td>
<td></td>
</tr>
<tr>
<td>Judge</td>
<td>129.72</td>
<td>4</td>
<td>32.43</td>
<td>40.30*</td>
</tr>
<tr>
<td>Scale x Judge</td>
<td>9.07</td>
<td>8</td>
<td>1.13</td>
<td>1.41</td>
</tr>
<tr>
<td>Error</td>
<td>231.75</td>
<td>288</td>
<td>.80</td>
<td></td>
</tr>
</tbody>
</table>

*P < .0001
### Table 3

Mean Conflict Ratings and t-tests for Each Scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Rating of the 5 Judges</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Conflict Items</td>
<td>4.39</td>
<td>.95</td>
</tr>
<tr>
<td>15 TD-R Items</td>
<td>3.19</td>
<td>1.34</td>
</tr>
<tr>
<td>30 Non-Conflict Items</td>
<td>2.26</td>
<td>.84</td>
</tr>
</tbody>
</table>

**t-tests**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD vs. Conflict</td>
<td>-3.48*</td>
</tr>
<tr>
<td>TD vs. Non-Conflict</td>
<td>2.44*</td>
</tr>
<tr>
<td>Conflict vs. Non-Conflict</td>
<td>9.21*</td>
</tr>
</tbody>
</table>

* p < .05  
** p < .01  
*** p < .001  
**** p < .0001
as conflict or non-conflict. They also suggested that the
TD Scale is more conflict-laden than the Non-Conflict Scale
and less conflict-laden than the Conflict Scale.

Having established that the judges agreed with each
other and with the author on the overall scale assignment of
these items, the author proceeded to determine the final
composition of the Conflict and Non-Conflict scales. In the
final two sets, the author decided to include only those
items from the Conflict and Non-Conflict scales in the first
booklet that had been clearly delineated as conflict or
non-conflict. He therefore eliminated the five conflict
items in the original set that had received the lowest
conflict ratings (ranging from 3.0 to 3.6). He also
eliminated the three non-conflict items in the original set
that had the highest conflict ratings (ranging from 3.4 to
4.0). The author replaced the five poor conflict items from
booklet 1 with the five most highly rated conflict items
from booklet 2. He replaced the three poor non-conflict
items from booklet 1 with the three non-conflict items from
booklet 2 that had the lowest conflict ratings. This
strategy resulted in a set of 15 non-conflict items with a
mean conflict rating of 1.99 (range = 1.0 to 3.4) and a set
of 15 conflict items with a mean conflict rating of 5.07
(range = 4.4 to 6.0). By contrast, the mean of the TD
Scale-Revised was 3.19 (range = 1.8 to 6.0). The frequency
plot of the item conflict ratings for the final Conflict and Non-Conflict scales is displayed in Figure 3.

Figures 4, 5, and 6 show typical items from each of the three picture-preference scales discussed in this chapter. The author chose to use these particular items as examples, because each one was the item in its scale that had the conflict rating that was closest to the average conflict rating for that scale. Thus each item could be considered to represent the typical level of conflict elicited by its respective scale. Figure 4 displays a typical item from the Conflict Scale. The conflict rating for this item (No. 7) was 5.00; the mean conflict rating for the Conflict Scale was 5.07. Figure 5 displays a typical item from the TD Scale-Revised. The conflict rating for this item (No. 27) was 3.20; the mean conflict rating for the TD Scale-Revised Scale was 3.19. Figure 6 displays a typical item from the Non-Conflict Scale. The conflict rating for this item (No. 5) was 1.80; the mean conflict rating for the Non-Conflict Scale was 1.99.

DISCUSSION

The goals of the preliminary study were: (1) to decide upon the composition of the Conflict and Non-Conflict Scales, and (2) to obtain an estimate of the level of conflict represented in the items of the TD Scale-Revised. The author accomplished both of these objectives, creating two scales, and finding that the TD Scale-Revised is more
Figure 3. Frequency Plot of Item Conflict Ratings for the Final Scales

Note: a = 1 item
     b = 2 items
     c = 3 items
Figure 4. Example of an Item from the Conflict Scale
Figure 5. Example of an Item from the TD Scale-Revised
Figure 6. Example of an Item from the Non-Conflict Scale
conflict-laden than the Non-Conflict Scale and less conflict-laden than the Conflict Scale.

The final composition of the Conflict Scale is shown in Appendix B; the items from the first booklet that were replaced are listed at the end of the appendix. The final composition of the Non-Conflict Scale is shown in Appendix C; the items from the first booklet that were replaced are listed at the end of the appendix.
CHAPTER III
MAIN STUDY METHOD

Subjects

The sample consisted of 86 psychiatric inpatients (43 men, 43 women), of whom 73 were hospitalized at St. Thomas Psychiatric Hospital in St. Thomas, Ontario, and 13 at Windsor Western Hospital Centre in Windsor, Ontario. Forty-three of these patients were diagnosed as schizophrenic and 43 were diagnosed as mood-disordered. All diagnoses were made in accordance with DSM-III-R (American Psychiatric Association, 1987) criteria. The procedure that was used to select patients was as follows: Hospital records were used to identify those patients whose clinical record indicated a diagnosis of non-paranoid schizophrenia or mood-disorder uncomplicated by organic brain pathology, lobotomy, mental retardation, drug addiction, or chronic alcoholism.

The author excluded paranoid schizophrenics from the sample on the basis of advice from Dr. Helene Lycaki, an experienced schizophrenia researcher at Lafayette Clinic in Detroit. Dr. Lycaki suggested that paranoid schizophrenics be excluded, as these patients typically do not exhibit much thought disorder. As the author wanted to obtain as many thought-disordered patients as possible, he followed this advice. Patients diagnosed as schizoaffective were also not included in the sample, in order to obtain a more pure
comparison between schizophrenic and mood-disordered patients. In addition, only persons who had at least a grade 8 education, and who were at least 18 years of age were considered. Finally, persons of foreign nationality who had lived in Canada less than 10 years were not considered for the study, since it is not known how their cultural backgrounds might have influenced their responses to the picture-preference items.

Materials

**Picture-Preference Battery.** The author presented to the patients five picture-preference scales in a battery of 158 picture-preference items. The five scales were (1) the Thought Disorder Scale, (2) the Thought Disorder Scale-Revised, (3) the Conflict Scale, (4) the Conflict-Avoidance Subscale, and (5) the Non-Conflict Scale. These five scales consist of a total of 104 items, including items that are repeated. The author presented an additional 54 filler items garnered from a variety of picture-preference scales. The 54 items provided a background for the five scales under study. The filler items and the items from the five scales were intermingled and presented in random order. In addition, the author presented two sample items not included in the test battery (Items X and Y) at the beginning of the test to acquaint the subjects with the picture-preference task. Item X shows a lamp on a table as Picture A, and a tree as Picture B. Item Y shows a triangle as Picture A, and a square as Picture B.
The theoretical basis for the Picture-Preference Test is discussed in Chapter I. The items of the scales are listed with descriptions in Appendices A, B, and C. The item numbers assigned to each picture-pair indicate the serial position or positions of that item in the 158-item battery.

Thought Disorder Scale and Thought Disorder Scale-Revised. Rudziński's (1979) Thought Disorder Scale consists of 31 pairs of pictures, 29 of which were used in the present study. In each pair a picture representing bizarre thinking is shown on one side, and a picture representing more sensible thinking is shown on the other side. The examiner asked the subjects which of the two pictures they prefer, "A" or "B." The examiner calculated the score on this scale by counting the number of items on which the subject chose the picture keyed as the thought-disordered alternative.

Five characteristics of disturbed cognition are represented among the thought-disordered alternatives of the items. The following list presents these five characteristics, the item numbers for each, and an example of an item:

1. Overinclusive thinking (Item Nos. 15, 45, 61, 71, 86, 114, and 120). Example: Item 15 (A) (thought-disordered alternative) spoon, fork, sword; (B) spoon, fork, knife.
Example: Item 69 (A) (thought-disordered alternative) figure on television screen reaching out of set to viewer; (B) viewer watching figure on the television screen.

3. **Regressive, autistic thought** (Item Nos. 1, 27, 60, and 109). Example: Item 27 (A) (thought-disordered alternative) childish drawing of a human figure; (B) well-drawn head of a man.

4. **Clang Associations** (Item Nos. 16, 24, 30, 32, 59, and 75). Example: Item 75 (A) pair of shoes and pair of socks; (B) (thought-disordered alternative) a box and a pair of socks.

5. **Fabulized Combination** Item No. 20 (A) a telephone receiver; (B) (thought-disordered alternative) a receiver with human lips protruding out of one end.

In order to minimize the possible effects of a tendency to choose pictures on the basis of their position, half of the keyed thought-disorder pictures are assigned to the "A" position in the items, and half to the "B" position.

The author believes that the 29 items he included from the original 31-item scale provide a very close approximation of the original Thought Disorder Scale. Therefore he will subsequently refer to the 29 item version as the Thought Disorder Scale.

As previously described, the author presented 15 of the 29 TD Scale items to the subjects twice. These were 15 of
the 20 items that Rudzinski (1979) had found to form the most internally consistent scale out of the 31 items. These 15 items were included in the calculation of the scores on the 29-item TD Scale, and they also formed the Thought Disorder Scale-Revised (TD-Rev.). The author presented the other 14 items of the original TD Scale to the subjects once.

In calculating each subject's score on the original Thought Disorder Scale, the author only counted the subject's choice on the first presentation of the TD items that were repeated. Hence the score on the original 29-item TD Scale was determined on the basis of the 14 items that were presented once, and the first presentation of the 15 items that were presented twice. The author calculated an Inconsistency score on the revised TD Scale by counting the number of instances when the subject's selection on the first presentation of an item did not match his or her selection on the second presentation of that item. Further information on the scoring of these scales is provided in the work of Apanasiewicz (1982) and Rudzinski (1979).

The validity and reliability of the TD Scale is described fully in the Picture-Preference section of Chapter I (see pages 31-37). The TD Scale items are listed with descriptions in Appendix A. The Appendix is divided into a section listing the 15 items that were presented to each subject twice (viz., TD-Rev.), and a section listing the 14 items that were presented to each subject once.
Conflict Scale and Conflict-Avoidance Subscale. The Conflict Scale consists of 15 picture-preference items that were identified by 5 clinical psychologists and the author as being high in the ability to provoke conflict in a schizophrenic (see Preliminary Study). Each item was presented to the subjects twice. As with other PPT scales, the examiner asked the subjects which of two pictures they prefer, "A" or "B." The examiner calculated an Inconsistency score on this scale by counting the number of instances when the subject's selection on the first presentation of an item did not match his or her selection on the second presentation of that item.

The items that were selected for the Conflict Scale contain pictures depicting sexuality, nudity, death, dependency, and anger. A total of 10 items are related to the theme of sexual intimacy. Four of these (Nos. 12, 31, 53, and 56) are items from Cowan's (1967/1971) Picture-Preference Test that Amin (1974/1976) chose for his Avoidance of Sexual Intimacy Scale. One of the items (No. 11) is an item that Auld and Kline (1984) found to be correlated with the avoidance of sexual intimacy items, although Cowan had originally included it in his Narcissism Scale. Five of the items (Nos. 9, 13, 52, 108, and 126) were items that Amin created specifically for his Avoidance of Sexual Intimacy Scale. An example of one of the avoidance of intimacy picture-pairs is No. 31, which shows a bedroom with two figures in bed for Choice A, and a
bedroom with one figure in bed for Choice B.

The five remaining items (Nos. 6, 7, 42, 79, and 84) in the Conflict Scale are from several of Cowan's (1967/1971) subscales, and represent a variety of themes.

The Conflict-Avoidance Subscale consists of 11 of the 15 Conflict Scale items. These 11 items have in common a property that allows them to be scored for conflict-avoidance: In each pair a picture representing distressing or conflictual content is shown on one side, and a picture representing a mundane or less distressing theme is shown on the other side. If a subject chooses the mundane pictures on many or most of these items, then he or she is demonstrating a tendency to avoid choosing conflictual material. An example of a Conflict-Avoidance item is Number 108, which shows two couples playing cards as Choice A (conflict-avoidance choice), and a woman on a man's shoulders in a swimming pool as Choice B. The examiner calculates the score on this subscale by counting the number of items on which the subject chooses the picture keyed as the non-conflictual alternative.

The remaining four items of the Conflict Scale contain pairs of pictures in which both pictures represent equally disturbing themes. Hence these items could not be keyed for conflict-avoidance. An example of such an item is Number 42, which depicts a man being whipped as Choice A, and a woman being whipped as Choice B.

The Conflict and Conflict-Avoidance items are listed
with descriptions in Appendix B. The Appendix is divided into a section listing the 11 items that comprise the Conflict-Avoidance Subscale, and a section listing the four additional items that do not belong to the Conflict Avoidance Subscale but that are included in the full 15-item Conflict Scale. The 11 Conflict-Avoidance items are used to calculate a Conflict-Avoidance score, and are also used along with the four additional items in the calculation of an Inconsistency score based on the full 15-item Conflict Scale.

**Non-Conflict Scale.** The Non-Conflict Scale consists of 15 picture-preference items that were identified by five clinical psychologists and the author as being low in the ability to provoke conflict in a schizophrenic (see Preliminary Study). Each item was presented to the subjects twice. The examiner asked the subjects which of two pictures they prefer, "A" or "B." The examiner calculated an Inconsistency score on this scale by counting the number of instances when the subject's selection on the first presentation of an item did not match his or her selection on the second presentation of that item.

A total of seven of the items that were selected for the Non-Conflict Scale are items that Volini (1977) included in his Introversion/Extroversion Scale. Two of these (Nos. 4 and 37) are items from Cowan's (1967/1971) Picture-Preference Test that Volini chose for his I-E Scale. The other five items (Nos. 2, 5, 19, 21, and 46) are items that
Volini-created specifically for his scale. An example of one of these items is No. 2, which has a picture of a mathematician writing a formula as Choice A, and a picture of a physician writing a prescription as Choice B.

The eight remaining items (Nos. 25, 40, 50, 51, 72, 76, 80, and 93) in the Non-Conflict Scale are from several of Cowan's (1967/1971) subscales, and represent a variety of themes.

The items in the Non-Conflict Scale are listed with descriptions in Appendix C.

Whitaker Index of Schizophrenic Thinking. The Whitaker Index of Schizophrenic Thinking (WIST) was used as a criterion measure of disordered thinking for the patients in this study. It is a brief, objectively scored, paper-and-pencil test consisting of 25 multiple-choice items. Essentially the test measures the degree of "unwitting illogicality" of the subject's responses to verbal tasks requiring him to define words, find semantic similarities between pairs of words, and choose the most probable outcome of hypothetical inventions. These tasks are presented in the form of three subtests: Similarities (nine items), Word Pairs (nine items), and New Inventions (seven items). The subject selects an answer to each item from alternatives arranged in random order. The alternatives consist of a correct (logical) answer, and in order of increasing illogicality, a loose association, a personalized association, a clang association, and a
nonsense association. For example, in the Similarities subtest, the subject is asked to select the answer that is "most similar in meaning" to the word mother. The alternatives are: "female parent" (correct), "feed" (loose association), "dress me" (personalized association), "smother" (clang association), and "sklew" (nonsense association).

The Wist has two forms, A and B, distinguished by the degree of affect aroused by the verbal content of the test items. Form A contains stimulus words such as kill, rape, suck, and breast, which Whitaker (1980) identified as being anxiety-provoking for schizophrenics. Form B, while being structurally identical, contains stimulus words which Whitaker selected as being less emotionally provocative, such as talk, find, table, and cause. As the author of the present study was investigating conflict and anxiety, he gave to the subjects the more anxiety-provoking Form A.

Three scores can be computed from the test results. The first, an error score, is calculated by summing weighted error scores across all items. The weights are based on the degree of illogicality of the incorrect response. The second measure, a time score, is the number of minutes taken to give the initial set of answers. The third, the Index score, is the sum of the other scores. The author used the Index score, in accordance with Whitaker's (1980) recommendations.

Whitaker (1980) presented evidence for the reliability
and validity of the WIST. He reported Hoyt reliability coefficients of approximately .80 for each form as estimates of intra-test reliability. With regard to validity, he found that WIST Index scores were able to significantly differentiate schizophrenics from nonschizophrenics. He demonstrated that a cutoff score of 20 on Form A correctly identified as schizophrenic or nonschizophrenic 89 of 111 subjects, for 80% correct classification. On Form B, a cutoff Index score of 17 correctly identified 87 of 114 subjects, for 76% correct classification. Other researchers have shown that WIST scores could successfully predict degree of deficit in conceptual rule-learning tasks in schizophrenic samples (Bourne et al. 1977; Pishkin, Lovallo, Lenk, & Bourne, 1977). Bilett (1974) found that the WIST could more accurately discriminate between schizophrenics, nonschizophrenic psychiatric inpatients, and normals than could the Rorschach or the WAIS thought disorder indices. A variety of other studies have demonstrated that the WIST is useful for assessing thought disorder and discriminating among diagnostic groups (Fishkin, Lovallo, & Pishkin, 1977; Lovallo, Sengel, Leber, Shaffer, & Pishkin, 1982; Newmark, Simpson, & Jones, 1978; Puente & Andersson, 1987; Whitaker, 1978).

**Schedule for Affective Disorders and Schizophrenia—
Change Version.** Endicott and Spitzer's (1978) SADS-C is a structured interview schedule that consists of symptom-rating scales designed to assess symptomatology
specifically related to mood disorders and schizophrenia. Each of the symptom ratings is made on a scale of 0 (no information given by the patient) to 6 or 7 (extreme level of the symptom present). The SADS-C is a subset of the full Schedule for Affective Disorders and Schizophrenia (Endicott & Spitzer, 1978). The rating items in the SADS-C are those SADS items that evaluate the patient's symptoms for the past week. The SADS items are based on the Research Diagnostic Criteria (Spitzer, Endicott & Robins, 1978) for psychiatric diagnoses. The SADS-C contains four scales: (1) Depression (20 items), which assesses the main diagnostic criteria for depression, (2) Mania (5 items), which assesses the main diagnostic criteria for mania, (3) Schizophrenia (7 items), which assesses the main diagnostic criteria for schizophrenia, and (4) the Global Assessment Scale (GAS; 1 item), which assesses on a 100-point scale (100 = superior functioning in all areas) the patient's lowest level of functioning during the past week. The items in these scales are shown in Appendix D. In addition to these four scales, the author included in his analyses the following three individual items from the Schizophrenia scale: (1) Impaired Understandability due to Psychopathology, which is an overall rating of the degree of thought disorder manifested by the patient in the interview, (2) Severity of Delusions, and (3) Severity of Hallucinations. He also included the SADS-C summary score (SADS-Total = Depression + Mania + Schizophrenia + [100 - GAS]), a summary of all of the SADS-C
scale scores which reflects the patient's overall level of psychopathology.

An interviewer begins with a 20 to 30 minute unstructured interview in which he asks the patient to describe the history of his psychiatric problems and to discuss how he has been feeling during the current episode. At the end of the unstructured interview, the interviewer states that he will be asking the patient a series of questions from an interview booklet and that the questions will focus on how the patient has been feeling during the past week. The interviewer then asks the subject the questions in the SADS-C booklet for each of the symptom scales, filling in the ratings as the discussion proceeds.

The SADS-C symptom scales have been shown to be reliable and valid. Endicott and Spitzer (1978) found inter-rater reliability coefficients ranging from .82 to .97 for the main symptom scales relating to schizophrenia and mood disorders. Endicott, Spitzer, Fleiss, and Cohen (1976) found inter-rater reliability coefficients ranging from .69 to .91 for the Global Assessment Scale. Considering the issue of validity, Johnson, Magaro, and Stern (1986) found that the Depression, Mania, and Schizophrenia scales could each reliably discriminate between paranoid schizophrenic, nonparanoid schizophrenic, manic, depressed, and normal subjects. They found the Depression scale to correlate with the Beck Depression Inventory ($r = .81$) and the Hamilton Depression Rating Scale ($r = .96$), the Mania scale to
correlate with the Bech-Rafaelsen Mania Scale (r = .89), and the Schizophrenia scale to correlate with the Maine Paranoid and Non-paranoid Schizophrenia Scales (r = .70 with each scale). Endicott, Spitzer, Fleiss, and Cohen (1976) found that former psychiatric inpatients with low GAS scores had a significantly higher probability of being rehospitalized than did former inpatients with higher GAS scores. A variety of other studies have shown that the SADS-C scales are useful in assessing psychopathology and differentiating among psychiatric groups (e.g., Rogers & Wettstein, 1985; Herzog, 1984; Baldwin, Cole & Baldwin, 1982).

Endicott (1987) recommends that individuals planning to use the SADS or SADS-C in research should (1) complete a training program in the use of the instrument, and (2) obtain an estimate of the reliability of the ratings used in the study by calculating the inter-rater reliability with two raters on at least 15 cases. Following these recommendations, the author obtained a research colleague to provide for a reliability check on his SADS-C ratings. The colleague was a senior graduate student in clinical psychology who, like the author, had completed 16 months of full-time clinical internship in two major psychiatric hospitals. Both the author and his colleague underwent the standard 20-hour SADS training program at Lafayette Clinic in Detroit, Michigan, a hospital that regularly trains individuals in the use of the SADS and SADS-C. Upon completion of the training, the author and his colleague set
out to interview together as many of the patients in his sample as their schedules would permit. Over the next six months, they were able to interview together 72 patients out of a total sample size of 86. For each of the 72 patients, the author and his colleague independently completed the SADS-C ratings. The author later calculated the inter-rater reliability of these ratings (see Results section).

**Grid Test of Thought Disorder.** Bannister and Fransella's (1966) Grid Test of Thought Disorder is a repertory grid test designed to measure schizophrenic thought disorder. The examiner sits at a table with the subject and asks the subject to study an array of eight passport-type, black and white photographs, four of men and four of women. The examiner then asks the subject which of the people whose photographs he had examined was the most likely to be kind. The photograph selected by the subject as most kind is turned face down, and the examiner enters the number of the photograph in a test sheet as ranked first for the construct kind. The examiner then asks the subject to choose the person most likely to be kind from the seven remaining photographs. The examiner turns this picture face down and notes its number on the test sheet. This procedure is repeated until the subject has ranked all eight photographs from the most kind to the least kind. The examiner then turns all the photographs face up, moves them around to change their positions on the table, and asks the subject to select the person most likely to be stupid and so
forth. In this way the subject rank-orders the eight photographs on six constructs presented in the following order: kind, stupid, selfish, sincere, mean, and honest. The examiner then has the subject complete the entire test again on the same photographs, ranking for the same constructs. He explains to the subject that this repetition is not to test his memory and that he should undertake the test as if he were doing it for the first time.

Two scores, Intensity and Consistency, are generated from the test results. The Intensity score is obtained by (1) calculating the Spearman rank order correlations (rhos) between all possible pairs of constructs on Grid I (the first administration) and between all possible pairs of constructs on Grid II (the second administration), (2) squaring each correlation and multiplying it by 100 (to yield transformed correlations) and (3) summing the absolute values of the transformed correlations. The Intensity score is the sum of these absolute values. The Intensity score represents the degree of relationship between the constructs for a subject. High scores indicate that the subject is rank-ordering as if the qualities he is judging are related; low scores indicate that he is judging the qualities as if they are unrelated.

The Consistency score is calculated by (1) rank-ordering the 15 rhos of Grid I from the highest positive through zero to the highest negative, (2) rank-ordering the rhos from Grid II in the same manner and (3) computing the Spearman
rho between these two sets of rank orderings. The rho between the two sets of rank orderings is the Consistency score, and reflects the degree to which the subject maintains the pattern of relationships between the constructs from Grid I to Grid II. It is in effect a test-retest correlation.

Bannister and Fransella (1966) emphasize that the Consistency score is mathematically independent of the Intensity score. The Consistency score measures the degree to which the subject continues on retest to see the qualities being related in a particular fashion, whereas the Intensity score reflects the size of the relationships between each construct.

Bannister et al. (1966, 1971) provided evidence of the validity of the Grid Test as a measure of thought disorder. They found that the Intensity score and the Consistency score could each significantly discriminate thought-disordered schizophrenics from non-thought-disordered schizophrenics, depressives, neurotics, and normals. Similar results have been found in a number of other studies (Bannister, 1962; Heather, 1976; Foulks, Hope, McPherson & Mayo, 1967; McFayden & Foulks, 1972; McPherson, Blackburn, Draffan & McFayden, 1973; Spelman, Harrison & Hellsop, 1971; Williams, 1971).

The author used both Intensity and Consistency scores as measures of thought disorder in the present investigation. In addition, as explained in the Statement
of the Problem, he scored the Grid Test data using other measures. According to Bannister, Fransella, and Agnew (1971), the Intensity score represents the degree of relationship between the constructs for a subject; that is, the degree of consistency in rankings that the subject displays within each grid. High scores indicate that the subject is rank-ordering as if the qualities he is judging are related; low scores indicate that he is judging the qualities as if they are unrelated.

The author proposed two alternative methods of measuring within-grid consistency. The first and more elegant method was to calculate the determinant of the Pearson correlation matrix for each grid administration, and then add together the two determinants for each subject to yield a determinant total score for the subject. The determinant was chosen as a measure of within-grid consistency as the determinant reflects the total amount of interrelationship among the elements of a correlation matrix. In other words, it is a measure of the generalized variance of a matrix (Tabachnick & Fidell, 1983). Its lowest value, 0, indicates the presence of at least one perfect multiple correlation among the elements of the matrix. Larger values reflect decreasing levels of interrelationship among the matrix elements. The determinant can be directly calculated by the SPSS-PC+ Factor program (SPSS, 1988).
A 2 x 2 matrix is shown below:

\[
D = \begin{vmatrix} a & b \\ c & d \end{vmatrix}
\]

where D is a variance-covariance matrix, with a and d as variances, and b and c as covariances.

In this matrix the determinant is defined by the following formula (Tabachnick & Fidell, 1983):

\[
| D | = ad - bc
\]

The determinant thus equals variance (ad) minus covariance (bc).

The author proposed the use of Kendall's W (Kendall, 1970) as a second method for measuring within-grid consistency. Kendall's W measures the degree of agreement between the rankings of the constructs, regardless of the meaning of the constructs. It ranges from 0 (no agreement) to 1.00 (perfect agreement). It is in effect a measure of perseveration, as it assesses the degree to which the subject placed the pictures in the same rank order regardless of which construct he was asked to rank. The higher the score, the greater the extent to which the rankings of all of the constructs agree with each other, and the greater the extent to which the subject perseverated on a specific rank ordering of the photographs. Researchers
have found perseveration to be a useful index in other measures of thought disorder, such as the Rorschach (Johnston & Holzman, 1979) and the Language Problems Scale (Grinker & Holzman, 1973). As no perseveration score had been developed for the Grid Test, the author set out to examine the utility of such a score for the test. For each subject, the author calculated a W for each of the two grid administrations, and then summed the two W values to yield a Kendall Within-Grid score for that subject. W can be directly calculated by the SPSS-PC+ Npar Tests program (SPSS, 1988).

W is calculated with the following formula (Kendall, 1970):

\[
W = \frac{12S}{m^2 (n^2 - n)}
\]

where \( S \) = sum of squared deviations from the mean ranking of all variables
\( m \) = number of variables or constructs
\( n \) = number of photographs or objects being ranked

The author also proposed two alternative methods of measuring between-grid stability or consistency on the Grid Test. According to Bannister, Fransella, and Agnew (1971), their Consistency score reflects the degree to which the subject maintains the pattern of relationships between the
constructs from the first administration to the second administration. The most elegant of the two proposed measures of consistency is the Chi-square goodness of fit index for covariance matrices. This Chi-square index, developed by Bartlett (1947), tests the equality of two covariance matrices, or in other words, the equality of the pattern of relationships in two covariance matrices. It is available through the LISREL-6 (Joreskog & Sorbom, 1986) computer package. The smaller the value of Chi-square, the greater the fit of the two matrices, and the more similar or consistent the pattern of relationships in the two matrices. For each subject, the author analyzed the covariance matrices of the two grid administrations using the LISREL-6 program, and obtained the Chi-square value for the fit of the two matrices. Essentially, smaller Chi-square values indicate greater consistency.

The formula for the Chi-square index is shown below:

\[ X^2 = - \left( 1 - \frac{\sum_{j=1}^{n} 1/(N_j - 1) - 1/(N - n)}{(2p^2 + 3p - 1)/6(p + 1)(n - 1)} \right) \times \left( \sum_{j=1}^{n} (N_j - 1) \ln |D_j| - (N - n) \ln |E| \right) \]

where
- \( p \) = number of variables or constructs
- \( N \) = number of subjects
- \( n \) = number of matrices
- \( |D_j| \) = determinant of covariance matrix \( j \)
- \( |E| \) = pooled within-matrix unbiased estimate of common covariance matrix
ln = natural logarithm

The author proposed the use of Kendall's W (Kendall, 1970) as a second method for calculating between-grid consistency. To measure between-grid consistency, the author used W to analyze a different set of values than the values he analyzed for the Kendall within-grid consistency analysis. In the Kendall-Within analysis for each subject, the data yielded a mean ranking for each of the eight Grid Test photographs. Each grid had its own set of mean rankings for the photographs. Thus each subject had two sets of mean photograph rankings, one set for each grid administration. The author took the two sets of rankings produced by the Kendall-Within analysis and used these in the Kendall between-grid analysis. Using Kendall's W, he calculated the degree of relationship between the two sets of mean rankings for the eight photographs. Large W-Between values would indicate that the patient had maintained the same pattern of ranking the photographs from the first to the second administration. Small W-Between values would indicate that the subject had not been consistent in ranking the stimulus pictures from the first to the second administration.

In summary, the author scored the Grid Test using determinants, the Chi-square goodness-of-fit index, and Kendall's W in order to investigate the possibility of finding more elegant and time-efficient scoring procedures. The author's strategy for calculating these scores was as
follows. Each subject's data were analyzed separately to yield scores for each subject. The author used the SPSS-PC+ (SPSS, 1988) Correlation program to generate correlation matrices from the raw data of each of the two grids. He then entered the correlation matrices into the SPSS-PC+ Factor program (SPSS, 1988) to calculate determinants for the correlation matrices of each of the two grid administrations. The resulting two determinants were summed by the author to yield a Determinant total score. The author entered the raw data of the two grid administrations into the SPSS-PC+ Npar Tests program (SPSS, 1988) to calculate Kendall's (1970) W coefficients for each of the two grids. The author summed the two W values to yield a Kendall Within-Grid score for each subject.

The author entered the correlation matrices created by the SPSS-PC+ Correlation program into LISREL-6 (Joreskog & Sorbom, 1986) to calculate the Chi-Square test of the goodness of fit of the covariance matrices from the first and second grid administrations. This analysis yielded a Chi-Square score for each subject. Finally, the author entered the mean photograph rankings for each administration (obtained from the Kendall intensity analysis) into the SPSS-PC+ Npar Tests program to calculate Kendall's W coefficients. The W's from this analysis would reflect the stability of the mean rankings of the two administrations. This analysis yielded a Kendall Between-Grid score for each subject.
Procedure

The author and his colleague first examined the patients' charts on the ward to obtain the names of patients who would be diagnostically appropriate for the study; that is, patients with either an affective or schizophrenic diagnostic label. The researchers then consulted with the head nurse, the patient's primary nurses and/or the patient's psychiatrists regarding symptomatology and case history. The researchers also asked if these diagnostically suitable patients could tolerate testing and if they would be available for at least a half-day period. When the subjects had been chosen, the researchers then reexamined the charts to obtain demographic and general background information. As well, information about medications and dosage level was obtained from the medication log for each subject. The medication information, along with age, sex, education, occupation, recent employment history, and number of weeks since admission to hospital were recorded for each subject.

The researchers then asked the head nurse to introduce them to each patient, and to briefly explain the nature of the study. If the patient initially agreed to participate, the investigators brought him or her to a room on the ward designated for the study, and explained the project in more detail. They explained to the patient that the research concerned people's preferences for certain kinds of pictures, and that they would be asking participants to look
at pictures and indicate which ones they liked best. The
researchers also informed the prospective subject that he
would be taking several other tests, the purpose of the
additional testing being to learn more about how people make
choices among pictures. The researchers emphasized to the
patient that participation in the study was voluntary, and
that all test responses would be kept confidential. Before
testing could proceed, the patient was asked to sign a
consent form required by the hospital (see Appendix E). At
this point, three of the patients refused to participate in
the study and left.

The researchers administered to each subject the
SADS-C, the WIST, the Grid Test of Thought Disorder, and the
the 158-item picture preference battery. All patients were
tested individually. Sequence of test presentation was
randomized to minimize order effects. The author and his
colleague followed Endicott and Spitzer's (1978)
recommendations for completing the SADS-C, Whitaker's (1960)
recommendations for administering the WIST, and Bannister
and Fransella's (1966) recommendations for administering the
Grid Test of Thought Disorder. Fourteen of the SADS-C test
protocols were obtained by the author alone. The remaining
72 SADS-C questionnaires were administered alternately by
the author and his colleague, both of whom were in
attendance. The author and his colleague separately rated
each of the 72 subject's responses to the SADS-C items.

The picture-preference items were presented by a slide
projector; each item was viewed for 10 seconds. The total viewing time was 27 minutes for each subject. The investigators gave the following instructions to the patients taking the test:

In taking this picture-preference test, your task is simply to choose which of the two pictures presented together you prefer, filling in "A" on your answer sheet if you prefer the left-handed picture designated "A" or filling in "B" on your answer sheet if you prefer the picture on the right designated "B." A sample item is shown now on the screen. You should fill in "A" on the answer sheet if you prefer the picture of the lamp on the left, or "B" if you prefer the picture of the tree on the right. (Switch to Example Y).

Each of the pictures will be shown for about ten seconds. You should make your choice within this time period. Even if you find it difficult to make a choice, please make one. If you don't like either picture, choose the one that you dislike least. The pictures will begin now.

The average time for each patient to complete the entire battery of measures was 2 1/4 hours. Four patients could not complete the tests in a reasonable period of time; their protocols were discarded.

Upon completion of the battery, the researchers thanked
the patient for participating in the study. After the
patient had left the room, the researchers then decided upon
a DSM III-R (American Psychiatric Association, 1987)
diagnosis for the patient, independent of the diagnosis made
by the patient's psychiatrist. The DSM III-R diagnosis was
based on information gained from the charts, discussions
with ward staff and the psychiatrist, and during the testing
session.
CHAPTER IV

RESULTS

Description of Subjects

Table 4 displays the characteristics of patients, both as a whole and by diagnostic group. As can be seen from Table 4, there were equal numbers of men and women in the study (n's = 43), with somewhat more men in the schizophrenic category, and somewhat more women in the mood-disordered category. These differing proportions of men and women in the major diagnostic categories in this sample reflect the gender composition of the two diagnostic groups at the hospitals at which the patients were staying. The mean age for each group was just under 36 years (X = 35.93 for schizophrenics; X = 35.72 for mood-disordered patients). The average social status was upper-lower class for both groups of patients. The social status scores shown in the table are based on the Hollingshead Two-Factor Index of Social Position (Myers & Bean, 1968), an index which takes into account a person's education and occupation in order to evaluate his or her social status. The author scored social status such that low scores reflect low social status and high scores reflect high social status.

Turning back to Table 4, both diagnostic groups showed similar average levels of education (1 to 3 years of high school). Schizophrenics, on average, received a higher level of antipsychotic dose (X = 774.21), as measured by
Table 4

Characteristics of Patients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>S.D.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Subjects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 86</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>35.83</td>
<td>10.01</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Sex</td>
<td>43 men, 43 women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Status</td>
<td>22.56 (upper-lower class)</td>
<td>13.12</td>
<td>8</td>
<td>62</td>
</tr>
<tr>
<td>Education Level</td>
<td>3.67 (1-3 y. high school)</td>
<td>.91</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Antipsychotic dose</td>
<td>576.42</td>
<td>704.56</td>
<td>0</td>
<td>3600</td>
</tr>
<tr>
<td>(mg. CPZ per day)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeks in Hospital</td>
<td>5.81</td>
<td>5.88</td>
<td>(1)</td>
<td>22</td>
</tr>
</tbody>
</table>

**Schizophrenics**

n = 43

| Age                     | 35.93 | 9.21  | 21      | 57      |
| Sex                     | 25 men, 18 women |       |         |         |
| Social Status           | 21.25 (upper-lower class) | 13.73 | 8       | 62      |
| Education Level         | 3.91 (1-3 y. high school) | .89   | 2       | 5       |
| Antipsychotic dose      | 774.21 | 546.44 | 0       | 2300    |
| (mg. CPZ per day)*      |       |       |         |         |
| Weeks in Hospital       | 6.16  | 6.68  | (1)     | 22      |

**Mood-Disordered Patients**

n = 43

| Age                     | 35.72 | 9.21  | 21      | 57      |
| Sex                     | 18 men, 25 women |       |         |         |
| Social Status           | 23.96 (upper-lower class) | 12.52 | 8       | 51      |
| Education Level         | 3.44 (1-3 y. high school) | .88   | 2       | 5       |
| Antipsychotic dose      | 378.63 | 791.16 | 0       | 3600,   |
| (mg. CPZ per day)*      |       |       |         |         |
| Weeks in Hospital       | 3.47  | 3.76  | (1)     | 14      |

*Note: Neuroleptic dosages of all patients were converted into milligrams of chlorpromazine (mg. CPZ) per day using Squibb's (1967) Equivalency table.
milligrams of chlorpromazine per day, than did mood-disordered patients ($X = 378.63$). As well, schizophrenics, on average, were hospitalized for a greater number of weeks ($X = 8.16$) and for a more variable period of time ($s.d. = 6.68$) than were mood disordered patients ($X = 3.47$, $s.d. = 3.76$).

Table 5 presents the frequency distribution of DSM-III-R diagnoses for schizophrenics. As is evident from Table 5, the modal diagnosis for schizophrenics was undifferentiated - chronic (295.92); this DSM-III-R diagnostic category comprised 23.3% of the total sample. The next most frequent schizophrenic diagnostic category was residual - chronic (295.62), comprising 10.5% of the total sample. The least frequent diagnostic categories for the schizophrenic sample were disorganized chronic with acute exacerbation (295.14) and disorganized chronic (295.12), with only one and two patients, respectively, receiving these labels.

Table 6 presents the frequency distribution of DSM-III-R diagnoses for mood-disordered patients. The most frequent diagnostic categories for mood disordered patients were major depression, recurrent - severe, no psychosis (296.33) and major depression, recurrent - severe, with psychosis (296.34). These diagnoses of major depression were made for 11.6% and 5.8%, respectively, of the total sample. The remaining patients in the mood-disordered group
Table 5

Frequency Distribution of DSM-III-R Diagnoses for Schizophrenics

<table>
<thead>
<tr>
<th>DSM-III-R Code</th>
<th>Label</th>
<th>Number of Cases</th>
<th>Percentage of Total Sample (n=86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>295.12</td>
<td>Disorganized - chronic</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>295.14</td>
<td>Disorganized - chronic with acute exacerbation</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>295.62</td>
<td>Residual - Chronic</td>
<td>9</td>
<td>10.5</td>
</tr>
<tr>
<td>295.91</td>
<td>Undifferentiated - subchronic</td>
<td>5</td>
<td>5.8</td>
</tr>
<tr>
<td>295.92</td>
<td>Undifferentiated - chronic</td>
<td>20</td>
<td>23.3</td>
</tr>
<tr>
<td>295.94</td>
<td>Undifferentiated - chronic with acute exacerbation</td>
<td>6</td>
<td>7.0</td>
</tr>
<tr>
<td>All Schizophrenics</td>
<td></td>
<td>43</td>
<td>50.0</td>
</tr>
</tbody>
</table>
### Table 6

Frequency Distribution of DSM-III-R Diagnoses for Mood-Disordered Patients

<table>
<thead>
<tr>
<th>DSM Code</th>
<th>Label</th>
<th>No.</th>
<th>% of Total (n=86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>296.21</td>
<td>Major Depression, Single Episode - mild</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>296.22</td>
<td>Major Depression, Single</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>Episode - moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.23</td>
<td>Major Depression, Single</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Episode - Severe, no psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.24</td>
<td>Major Depression, Single</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Episode - Severe, with psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.32</td>
<td>Major Depression, Recurrent - moderate</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>296.33</td>
<td>Major Depression, Recurrent -</td>
<td>10</td>
<td>11.6</td>
</tr>
<tr>
<td></td>
<td>Severe - no psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.34</td>
<td>Major Depression, Recurrent -</td>
<td>5</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>Severe - with psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.41</td>
<td>Bipolar Disorder, Manic - mild</td>
<td>2</td>
<td>2.3</td>
</tr>
<tr>
<td>296.42</td>
<td>Bipolar Disorder, Manic - moderate</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>296.43</td>
<td>Bipolar Disorder, Manic -</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Severe, no psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.44</td>
<td>Bipolar Disorder, Manic -</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Severe, with psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.53</td>
<td>Bipolar Disorder, Depressed -</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Severe, no psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.54</td>
<td>Bipolar Disorder, Depressed -</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Severe, with psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>296.61</td>
<td>Bipolar Disorder, Mixed - Mild</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>296.62</td>
<td>Bipolar Disorder, Mixed - Moderate</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>296.64</td>
<td>Bipolar Disorder, Mixed -</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Severe, with psychosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Mood-Disordered Patients</td>
<td>43</td>
<td>50.0</td>
</tr>
</tbody>
</table>
received various diagnoses of the major depressive and bipolar disorder categories.

At this point, the differences in the schizophrenic and mood-disordered groups with respect to the frequency of psychotic symptoms should be noted. Because the DSM III-R (American Psychiatric Association, 1987) criteria for schizophrenia require that psychotic symptoms (e.g., delusions, hallucinations, thought disorder) be present for at least one week during the active phase of the disturbance, all of the schizophrenics in the present sample necessarily have had an active psychotic phase in their illness. However, psychosis is not a requisite symptom for the diagnosis of a mood disorder. Nevertheless, certain categories of mood disorder do include psychosis as a diagnostic criterion; one of these (viz., 296.34) has been mentioned in the previous paragraph. Table 6 reveals that 13 (30.2%) of the mood-disordered patients have psychotic diagnoses. In summary, then, all of the schizophrenics, and approximately one-third of the mood-disordered patients have psychotic diagnoses.

Preliminary Issues and Analyses

Before proceeding to answer the research questions, the author had to attend to a number of preliminary issues. First, examination of the distributions of each of the variables in the study (viz., SADS-C scales, the thought disorder measures, the Picture-Preference scales, and the
patients's demographic and treatment characteristics) revealed that many of the distributions were badly skewed. To reduce or eliminate the skewing of the distribution, data transformation was applied to those variables which required it. Transformations were performed in accordance with Tukey's (1977) recommendations. The skewness score generated by the SAS (SAS Institute, 1985) Univariate program was used as the index of skewness for the distributions.

Most of the distributions were positively skewed; that is, they had a pile-up of cases with low scores. For positively skewed distributions, Tukey recommends (1) logarithmic transformations, in which the natural logarithm is calculated for each raw score and used in place of the raw score, or (2) square-root transformations in which the square root of the raw score is substituted for the raw score. The author tried both square root and logarithmic transformations of each of the positively skewed variables, and retained the transformation which resulted in the lower skewness score. Consequently, the natural logarithm transformation was retained for the following variables which had positively skewed distributions: Antipsychotic Drug Dosage, the Grid Intensity score, and the Depression, Mania, Delusions, and Hallucinations scales of the SADS-C. The square-root transformation was retained for the following positively skewed variables: Social Status, the TD Scale, The Conflict-Avoidance Scale, Inconsistency on the
TD Scale-Revised, Inconsistency on the Conflict Scale, Inconsistency on the Conflict-Avoidance Scale, Inconsistency on the Non-Conflict Scale, the WIST, and the Impaired Understandability, Schizophrenia, Global Assessment Scale, and Total Score of the SADS-C.

The distribution of the Grid Test Consistency score was negatively skewed; that is, it had a pile-up of cases with high scores. For negatively skewed distributions, Tukey (1977) recommends the square transformation, in which the raw scores are squared, and the squared values are used in the place of the raw scores. Consequently, Grid Test Consistency scores underwent square transformation. Transformed scores were used in all subsequent analyses, although raw-score conversions of the transformed means are included in many of the tables.

In addition to addressing the problem of distribution skew, the author had to check on the psychometric properties of the interview ratings and diagnoses before proceeding to answer the research questions. The first step in this check was to determine whether the SADS-C interview ratings were reliable. The inter-rater reliability of the SADS-C scales, based on 72 cases, is shown in Table 7. The inter-rater reliabilities ranged from .88 to .95, with the overall SADS-C Total score having an interrater reliability of .90 (p's < .0001). The author's mean for overall psychopathology as measured by the SADS-C total score was 112.60 (s.d. = 22.56), whereas his colleague's mean for
Table 7
Inter-Rater Reliability of SADS-C Scales (72 cases)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Author Mean</th>
<th>Author S.D.</th>
<th>Colleague Mean</th>
<th>Colleague S.D.</th>
<th>Inter-Rater r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenia</td>
<td>11.81</td>
<td>4.91</td>
<td>11.04</td>
<td>4.63</td>
<td>.93</td>
</tr>
<tr>
<td>Impaired Understandability</td>
<td>1.63</td>
<td>1.18</td>
<td>1.63</td>
<td>1.34</td>
<td>.89</td>
</tr>
<tr>
<td>(Thought Disorder)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delusions</td>
<td>1.43</td>
<td>1.09</td>
<td>1.42</td>
<td>1.21</td>
<td>.89</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>1.57</td>
<td>1.50</td>
<td>1.51</td>
<td>1.38</td>
<td>.88</td>
</tr>
<tr>
<td>Depression</td>
<td>34.91</td>
<td>15.74</td>
<td>34.29</td>
<td>15.30</td>
<td>.95</td>
</tr>
<tr>
<td>Mania</td>
<td>6.22</td>
<td>2.63</td>
<td>6.26</td>
<td>2.94</td>
<td>.90</td>
</tr>
<tr>
<td>Global Assessment Scale</td>
<td>40.34</td>
<td>15.34</td>
<td>40.61</td>
<td>16.84</td>
<td>.91</td>
</tr>
<tr>
<td>SADS-Total Score</td>
<td>112.60</td>
<td>22.56</td>
<td>110.99</td>
<td>24.19</td>
<td>.90</td>
</tr>
</tbody>
</table>

*p<.0001
overall psychopathology was 110.99 (s.d. = 24.19). A perusal of the means and standard deviations for each of the SADS-C scales reveals comparable means and standard deviations for the author and his colleague.

The author also had to check on the internal consistency of the SADS-C ratings. The issue of internal consistency could be addressed by examining the intercorrelations among the SADS-C measures used in the study. Twenty-two of the 28 correlations among the SADS-C scales, presented in Table 8, attained significance. In view of the many significant correlations that are presented in the Results section, only meaningful correlations (i.e., $r \geq .30$) will be discussed. The highest correlation was between the Global Assessment Scale (GAS) and the SADS-C Total score ($r = -.78$, $p < .0001$). The GAS score also correlated negatively with the Schizophrenia Scale ($r = -.59$, $p < .0001$) and with its component subscales of Impaired Understandability ($r = -.53$, $p < .0001$), Delusions ($r = -.37$, $p < .001$) and Hallucinations ($r = -.35$, $p < .001$). Impaired Understandability, Delusions, and Hallucinations, which are components of the Schizophrenia Scale, correlated .74, .73, and .61 ($p$'s < .0001), respectively, with the Schizophrenia Scale. Impaired Understandability correlated positively with Delusions ($r = .55$, $p < .0001$) and Hallucinations ($r = .31$, $p < .01$);
Table 8
Correlations Among SADS-C Scales

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand</td>
<td>.74^a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delusions</td>
<td>.73^a</td>
<td>.55^d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallucinations</td>
<td>.61^a</td>
<td>.31^b</td>
<td>.31^b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>-.41^a</td>
<td>-.32^e</td>
<td>-.30^e</td>
<td>-.21^e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mania</td>
<td>.12</td>
<td>.08</td>
<td>.19</td>
<td>.24^a</td>
<td>-.29^a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS</td>
<td>-.59^a</td>
<td>-.53^e</td>
<td>-.37^e</td>
<td>-.35^e</td>
<td>.01</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>SADS-C Tot.</td>
<td>.31^b</td>
<td>.22^a</td>
<td>.25^a</td>
<td>.57^a</td>
<td>-.11</td>
<td>.78^a</td>
<td></td>
</tr>
</tbody>
</table>

Note: Impaired Understandability, Delusions, and Hallucinations are components of the Schizophrenia Scale. All scales are included in the SADS-C Total Psychopathology score.

^p<.05
^p<.01
^p<.001
^p<.0001
Delusions and Hallucinations were intercorrelated ($r = .31$, $p < .01$).

Depression correlated negatively with the Schizophrenia scale ($r = -.41$, $p < .0001$), and its Impaired Understandability ($r = -.32$, $p < .001$) and Delusions ($r = -.30$, $p < .01$) component. Mania did not correlate meaningfully with any of the other SADS-C scales, which may be due to the relatively small portion of the sample who were manic at the time of interview.

In terms of overall degree of pathology, the SADS-C total score correlated with Depression ($r = .57$, $p < .0001$), the Schizophrenia scale ($r = .34$, $p < .001$), and Impaired Understandability ($r = .31$, $p < .01$). Overall, the sensible pattern of correlations among the SADS-C scales suggests that the SADS-C ratings are consistent internally.

The issue of the meaningfulness of the diagnoses also had to be addressed. This issue could be investigated by examining the differences in the characteristics and symptoms of the two diagnostic groups. Table 9 presents means, $t$-tests, and correlations for all variables by diagnostic category. Of the demographic variables, only education demonstrated significant differences between the two diagnostic groups of patients. Mood-disordered patients were significantly more educated ($t = -2.43$, $p < .05$) than were schizophrenic patients, although patients in both groups were of about the same social status ($t = 1.01$, $p > .05$). As one would expect, an examination of treatment
Table 9

Means, t-tests, and Correlations for All Variables by Diagnostic Category

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mood-Disordered Mean</th>
<th>S.D.</th>
<th>Schizophrenic Mean</th>
<th>S.D.</th>
<th>Correlation with Diagnostic Category</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEMOGRAPHIC Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>1.58</td>
<td>.50</td>
<td>1.40</td>
<td>.50</td>
<td>-19</td>
<td>1.73</td>
</tr>
<tr>
<td>Education</td>
<td>3.44</td>
<td>.88</td>
<td>3.91</td>
<td>.89</td>
<td>.26</td>
<td>-2.43</td>
</tr>
<tr>
<td>Social Status</td>
<td>23.96</td>
<td>12.52</td>
<td>21.25</td>
<td>13.73</td>
<td>-.11</td>
<td>1.01</td>
</tr>
<tr>
<td>TREATMENT REGIMEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Dosage</td>
<td>378.63</td>
<td>791.16</td>
<td>774.21</td>
<td>545.44</td>
<td>.28</td>
<td>-2.70</td>
</tr>
<tr>
<td>Weeks in Hospital</td>
<td>3.47</td>
<td>3.76</td>
<td>8.16</td>
<td>6.68</td>
<td>.40</td>
<td>-4.02</td>
</tr>
<tr>
<td>SADS-C SCALES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>8.35</td>
<td>.11</td>
<td>14.82</td>
<td>.32</td>
<td>.72</td>
<td>-9.56</td>
</tr>
<tr>
<td>Understandability</td>
<td>1.02</td>
<td>.36</td>
<td>2.05</td>
<td>.19</td>
<td>.55</td>
<td>-6.02</td>
</tr>
<tr>
<td>Delusions</td>
<td>1.13</td>
<td>.64</td>
<td>2.47</td>
<td>1.70</td>
<td>.46</td>
<td>-4.80</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>1.30</td>
<td>1.05</td>
<td>1.95</td>
<td>1.40</td>
<td>.26</td>
<td>-2.43</td>
</tr>
<tr>
<td>Depression</td>
<td>44.56</td>
<td>17.11</td>
<td>25.26</td>
<td>4.20</td>
<td>-.62</td>
<td>7.18</td>
</tr>
<tr>
<td>Mania</td>
<td>6.60</td>
<td>3.20</td>
<td>5.84</td>
<td>1.85</td>
<td>-.13</td>
<td>1.36</td>
</tr>
<tr>
<td>GAS</td>
<td>46.24</td>
<td>1.30</td>
<td>32.26</td>
<td>1.00</td>
<td>-.47</td>
<td>4.84</td>
</tr>
<tr>
<td>SADS-Total</td>
<td>112.14</td>
<td>27.43</td>
<td>113.40</td>
<td>16.70</td>
<td>.03</td>
<td>-.26</td>
</tr>
<tr>
<td>THOUGHT DISORDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIST</td>
<td>11.76</td>
<td>3.60</td>
<td>33.29</td>
<td>4.80</td>
<td>.58</td>
<td>-6.58</td>
</tr>
</tbody>
</table>

Note: Where necessary, data have been transformed to reduce the skewing of the distributions.

*p<.05
*p<.01
*p<.001
*p<.0001
regimen revealed group differences: Schizophrenics received significantly higher medication dosages ($t = -2.70, p < .01$) and remained in hospital for longer periods of time ($t = -4.02, p < .0001$) than did the mood-disordered patients. On the SADS-C, all of the scales except for Mania differentiated the diagnostic groups. The schizophrenics received higher rating scores than did the mood-disordered patients on the Schizophrenia scale ($t = -9.56, p < .0001$), and on the psychotic symptom scales of Delusions ($t = -4.80, p < .0001$), and Hallucinations ($t = -2.43, p < .05$). As the author had expected, the schizophrenics received significantly higher ratings of thought disorder than did the mood-disordered patients on the Impaired Understandability scale ($t = -6.02, p < .0001$). The mood-disordered patients received higher rating scores than did the schizophrenics on Depression ($t = 7.18, p < .0001$) and the Global Assessment Scale ($t = 4.84, p < .0001$). It is notable that although the schizophrenic and mood-disordered patients differed on almost all of the measures shown in Table 9, these two groups did not differ in terms of overall level of psychopathology, as measured by the SADS-C total score ($t = -2.26, p > .05$).

The schizophrenics scored more highly on the WIST than did the mood-disordered patients, further confirming the author's expectation that the schizophrenics would be more thought-disordered than would the mood-disordered patients ($t = -6.58, p < .0001$). Overall, the pattern of group
differences shown in Table 9 suggests that the diagnoses make sense, and that they resulted in two symptomatically distinct groups of patients who nevertheless did not differ in overall degree of psychiatric disturbance. In other words, the mood-disordered patients were as disturbed on the mood dimension (viz., depression, suicidal ideation, self-reproach, sleep problems, mania, etc.) as were the schizophrenics on the schizophrenic dimension (viz., thought disorder, delusions, hallucinations, bizarre behavior, etc.).

Having attended to the preliminary issues and analyses involving the diagnoses and the skew of the various distributions, the author was ready to address the questions raised in the Statement of the Problem. The questions will now be dealt with in sequence.

Theoretical Issues

Issue I: The Role of Conflict in Schizophrenic Thought Disorder

Question 1: Does the avoidance of conflict relate to schizophrenic thought disorder? Table 10 presents the correlations of the Conflict-Avoidance Subscale with the SADS-C and thought disorder measures. As can be seen in the table, the Conflict-Avoidance Subscale did not correlate meaningfully with any of the thought disorder measures or SADS-C diagnostic scales.
### Table 10

Correlations of Conflict-Avoidance Subscale with SADS-C and Thought Disorder Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Correlation with Conflict-Avoidance Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SADS-C</strong></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>-.02</td>
</tr>
<tr>
<td>Impaired Understandability</td>
<td>.01</td>
</tr>
<tr>
<td>Delusions</td>
<td>-.07</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>.08</td>
</tr>
<tr>
<td>Depression</td>
<td>.18&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mania</td>
<td>-.23&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>GAS</td>
<td>-.08</td>
</tr>
<tr>
<td>SADS-C Total Psychopathology</td>
<td>.16</td>
</tr>
<tr>
<td><strong>Thought Disorder Measures</strong></td>
<td></td>
</tr>
<tr>
<td>TD Scale</td>
<td>-.25&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>TD Scale-Revised</td>
<td>-.01</td>
</tr>
<tr>
<td>(Inconsistency)</td>
<td></td>
</tr>
<tr>
<td>WIST</td>
<td>-.02</td>
</tr>
<tr>
<td>Grid-Intensity</td>
<td>-.02</td>
</tr>
<tr>
<td>Grid-Consistency</td>
<td>.03</td>
</tr>
</tbody>
</table>

<sup>*</sup>p<.05
Question 2: Does the avoidance of conflict relate to diagnosis as a blunt measure of thought disorder? Table 11 shows the analysis of variance of scores on the Conflict-Avoidance Subscale by diagnostic group. As can be seen, the schizophrenics did not differ significantly from the mood-disordered patients on the Conflict-Avoidance Subscale ($F_{1,55} = .38$, $p > .05$).

Taken together, the findings of Tables 10 and 11 suggest that the avoidance of conflict measure is not related to thought disorder, either as it is measured by continuous scales or as it is more indirectly tapped by diagnosis.

Question 3: Does inconsistency on picture-preference scales varying in the degree of conflict-provocativeness relate to measures of thought disorder? The correlations among the inconsistency scores and other pertinent measures are presented in Table 12. In this table and many subsequent tables, correlations involving all of the major diagnostic variables are presented. These correlations are displayed for the purpose of providing thorough information about all of the main variables included in the study. However, only relationships directly relevant to the questions being addressed will be discussed in the text. The reader is invited to examine the other relationships included in the tables for his or her own interest.
Table 11

Analysis of Variance of Conflict-Avoidance Subscale Scores by Diagnostic Group

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.67</td>
<td>1</td>
<td>1.67</td>
<td>.38</td>
</tr>
<tr>
<td>Within Groups</td>
<td>369.21</td>
<td>84</td>
<td>4.40</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>370.88</td>
<td>85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics</td>
<td>16.53</td>
<td>2.07</td>
</tr>
<tr>
<td>Mood-Disordered Patients</td>
<td>16.81</td>
<td>2.12</td>
</tr>
</tbody>
</table>
**Table 12**

Correlation of Inconsistency on the PPT Scales with SADS-C and Thought Disorder Measures

<table>
<thead>
<tr>
<th></th>
<th>TD Scale-Rev. Inconsistency</th>
<th>Conflict Inconsistency</th>
<th>Conflict-Avoidance Inconsistency</th>
<th>Non-Conflict Inconsistency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WIST</strong></td>
<td>(0.40^a)</td>
<td>(0.25^a)</td>
<td>(0.37^a)</td>
<td>(0.27^b)</td>
</tr>
<tr>
<td><strong>Grid Test</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>(-0.42^a)</td>
<td>(-0.30^b)</td>
<td>(-0.34^c)</td>
<td>(-0.25^b)</td>
</tr>
<tr>
<td>Consistency</td>
<td>(-0.32^c)</td>
<td>(-0.21^a)</td>
<td>(-0.31^b)</td>
<td>(-0.12)</td>
</tr>
<tr>
<td><strong>SADS-C</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>(0.40^a)</td>
<td>(0.39^a)</td>
<td>(0.38^b)</td>
<td>(0.26^b)</td>
</tr>
<tr>
<td>Understand</td>
<td>(0.33^c)</td>
<td>(0.16)</td>
<td>(0.20^a)</td>
<td>(0.21^a)</td>
</tr>
<tr>
<td>Delusions</td>
<td>(0.24^a)</td>
<td>(0.15)</td>
<td>(0.19^a)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>(0.32^c)</td>
<td>(0.31^b)</td>
<td>(0.32^a)</td>
<td>(0.17)</td>
</tr>
<tr>
<td>Depression</td>
<td>(-0.28^b)</td>
<td>(-0.18^a)</td>
<td>(-0.16)</td>
<td>(-0.08)</td>
</tr>
<tr>
<td>Mania</td>
<td>(-0.03)</td>
<td>(-0.04)</td>
<td>(-0.07)</td>
<td>(-0.05)</td>
</tr>
<tr>
<td>GAS</td>
<td>(-0.44^a)</td>
<td>(-0.34^c)</td>
<td>(-0.39^a)</td>
<td>(-0.40^d)</td>
</tr>
<tr>
<td>SADS-C Tot.</td>
<td>(0.17)</td>
<td>(0.17)</td>
<td>(0.22^a)</td>
<td>(0.24^a)</td>
</tr>
</tbody>
</table>

\(^a p < 0.05\)
\(^b p < 0.01\)
\(^c p < 0.001\)
\(^d p < 0.0001\)
As mentioned in Statement of the Problem, the author postulated that the TD Scale-Revised, Conflict Scale, and Conflict-Avoidance Subscale all depict themes that would elicit conflicts in schizophrenics, whereas the Non-Conflict Scale does not depict such themes. Turning now to Table 12, the three scales presumed to contain conflictual content all relate meaningfully to measures pertinent to thought disorder. Inconsistency on the Conflict Scale correlated meaningfully with the Schizophrenia scale ($r = .38$, $p < .0001$), Hallucinations ($r = .31$, $p < .01$), and Grid Test Intensity ($r = -.30$, $p < .01$). Inconsistency on the Conflict-Avoidance Subscale correlated with the Schizophrenia scale ($r = .38$, $p < .0001$), the WIST ($r = .37$, $p < .0001$), Grid Test Intensity ($r = -.34$, $p < .001$), Hallucinations ($r = .32$, $p < .001$), and Grid Test Consistency ($r = -.31$, $p < .01$). Inconsistency on the TD Scale-Revised correlated with more of the criterion measures than did Inconsistency on any of the other three PPT scales; it was also the only score to correlate meaningfully with Impaired Understandability in the SADS-C interview, the most direct measure of thought disorder in the study ($r = .33$, $p < .001$).

These findings show a trend suggesting that inconsistency on a set of items depicting themes most salient to thought disorder is more related to thought disorder than is inconsistency on other sets of PPT items. Inconsistency on the TD Scale-Revised also correlated with
Grid Test Intensity ($r = -.42, p < .0001$), the WIST ($r = .40, p < .0001$), the Schizophrenia scale ($r = .40, p < .0001$), Grid Consistency ($r = -.32, p < .001$), and Hallucinations ($r = .32, p < .001$). In contrast to the scales presumed to depict conflictual themes, Inconsistency on the Non-Conflict Scale did not correlate meaningfully with any of the relevant thought disorder measures.

The overall pattern of correlations presented in Table 12 shows a trend suggesting that Inconsistency on scales of items depicting conflictual themes is related to measures of thought disorder, especially if those themes are highly salient to thought disorder. This trend also suggests that Inconsistency on a set of neutral items is not meaningfully related to thought disorder. To determine if this trend was supported by statistically significant differences between the correlations involving these PPT scales, the author first transformed all $r$'s into $z$ scores, as suggested by Fisher (1970). The author then conducted pairwise $t$-tests (viz., standard normal deviate tests) between (1) the transformed correlation of each thought disorder variable with the Non-Conflict Scale and (2) the corresponding transformed correlation of each thought disorder variable with each of the conflictual scales (Conflict, Conflict-Avoidance, TD Scale-Rev.). In effect, each correlation in Table 12 involving the conflictual scales (Conflict, Conflict-Avoidance, TD Scale-Revised) was
individually tested against the corresponding correlation involving the Non-Conflict Scale. These pairwise tests did not reveal a single significant difference. Thus the correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale were not significantly lower than were the correlations of these measures with Inconsistency on the scales presumed to be conflictual (viz., Conflict, Conflict Avoidance, TD Scale-Rev.).

In summary, the data showed a trend suggesting that Inconsistency on the conflictual scales is meaningfully related to thought disorder measures and that Inconsistency on the Non-Conflict Scale is not meaningfully related to thought disorder measures. Individual pairwise t-tests revealed that this trend was not corroborated by significant differences between relevant comparisons of correlations. The correlations of Non-Conflict Inconsistency with the thought disorder indices were not significantly smaller than were the correlations of Inconsistency on the conflictual scales with the thought disorder indices. These results thus demonstrated that the Inconsistency scores of the various PPT scales included in the study were related to measures of thought disorder, but that there was no significant difference between the scales in terms of the size of their correlations with these measures.
Question 4: Do increasing levels of conflict in PPT items produce greater inconsistency, and is this effect more pronounced in schizophrenics than in mood-disordered patients? The next set of analyses was conducted to see if schizophrenics (who are demonstrably more thought disordered) respond differently than do mood-disordered patients to conflictual material by being more inconsistent in their choices on conflict-laden items. A 2 (Diagnostic Group) X 3 (Level of Conflict) repeated measures ANOVA was conducted on the Inconsistency scores of the three Picture Preference scales (Non-Conflict, Conflict, and TD-Revised). Table 13 displays the summary table for this analysis. As can be seen, the groups differed significantly from each other in terms of their inconsistency in choosing pictures on the three PPT scales ($F_{1,84} = 13.10, p < .001$). As well, there was a significant main effect of scale conflict level ($F_{2,168} = 6.90, p < .001$). That is, in both diagnostic groups, there was a significant difference in the inconsistency of responding as a function of the degree of conflict contained in the items (viz., Non-Conflict, TD Scale-Revised, Conflict). The Diagnostic Group X Level of Conflict interaction was not significant. Thus patients in both diagnostic groups responded in parallel fashion to the different levels of conflict contained in the three PPT scales.
Table 13

Analysis of Variance of Inconsistency Scores by Diagnostic Group and Level of Conflict

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>HS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>150.19</td>
<td>85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostic Group</td>
<td>20.27</td>
<td>1</td>
<td>20.27</td>
<td>13.10</td>
</tr>
<tr>
<td>Subjects within groups</td>
<td>129.92</td>
<td>84</td>
<td>1.55</td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td>60.88</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of conflict (Nonconflict, Conflict, TD)</td>
<td>4.51</td>
<td>2</td>
<td>2.26</td>
<td>6.90</td>
</tr>
<tr>
<td>Group x Conflict</td>
<td>1.40</td>
<td>2</td>
<td>.70</td>
<td>2.14</td>
</tr>
<tr>
<td>Con. x subj. within groups</td>
<td>54.97</td>
<td>168</td>
<td>.33</td>
<td></td>
</tr>
</tbody>
</table>

Mean Inconsistency Scores Across the Three Scales for Each Group

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Transformed Mean</th>
<th>S.D.</th>
<th>Raw Score Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics</td>
<td>1.70</td>
<td>.93</td>
<td>2.89</td>
</tr>
<tr>
<td>Mood-Disordered Patients</td>
<td>1.14</td>
<td>.77</td>
<td>1.30</td>
</tr>
</tbody>
</table>

*P < .001
To elucidate the differences in inconsistency as a function of the level of conflict in the PPT scales, Fisher's protected pairwise t-tests (SAS Institute, 1985) were conducted on the Inconsistency scores of the three PPT scales. The results of these pairwise comparisons are displayed in Table 14. As indicated in the table, subjects were significantly more inconsistent on the Conflict (X Inconsistency score = 1.57) and Non-Conflict (X Inconsistency score = 1.43) scales than they were on the TD Scale-Revised (X Inconsistency score = 1.25). As well, they were significantly more inconsistent on the Conflict Scale than they were on the Non-Conflict Scale. The mean inconsistency scores for the three scales by diagnostic group are displayed graphically in Figure 7.

To answer Question 4, then, varying levels of conflict as defined by the three PPT scales (Non-Conflict, Conflict, TD Scale-Revised) produced different levels of inconsistency, but this effect was not more pronounced in the schizophrenic group.

'Issue II: The Relationship of Inconsistency to Schizophrenia

Question 5: Is inconsistency a response characteristic of schizophrenics regardless of the content of the material to which they are responding? The ANOVA displayed in Table 13 indicates that both schizophrenic and mood-disordered patients showed a similar pattern of response inconsistency to the levels of conflict contained in the three scales.
Table 14
Mean Differences in Inconsistency Between the Three PPT Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Inconsistency Score (n = 86)</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought Disorder-Rev.</td>
<td>1.25</td>
<td>.91</td>
</tr>
<tr>
<td>Non-Conflict</td>
<td>1.43</td>
<td>.89</td>
</tr>
<tr>
<td>Conflict</td>
<td>1.57</td>
<td>.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison of Scales</th>
<th>Mean Difference in Inconsistency Scores</th>
<th>S.D.</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought Disorder-Rev. and Conflict Scales</td>
<td>-.32</td>
<td>.86</td>
<td>-3.47*</td>
</tr>
<tr>
<td>Thought Disorder-Rev. and Non-Conflict Scales</td>
<td>-.18</td>
<td>.80</td>
<td>-2.07*</td>
</tr>
<tr>
<td>Conflict and Non-Conflict Scales</td>
<td>.14</td>
<td>.78</td>
<td>1.79*</td>
</tr>
</tbody>
</table>

*p < .05 one-tail test
*p < .05 two-tail test
*p < .01
*p < .001
Figure 7. Mean Inconsistency Scores of the Two Groups on the Three PPT Scales
Although the two groups did not differ from each other in terms of the pattern of responding to the three PPT scales, they did differ in terms of the level of inconsistency with which they respond to the scales. To more thoroughly examine the relationship of inconsistency to schizophrenia, the author tested the difference between the groups on the main measures of inconsistency used in the study. Before these analyses could be conducted, however, the author wanted to first check to see if any of the demographic characteristics covaried with the inconsistency measures. If any notable covariates were found, the author would have to control for these covariates in many of the analyses.

Table 15 displays the correlations of the PPT and Grid Test inconsistency measures with the patient's demographic characteristics. As shown in the table, none of the inconsistency scores correlated meaningfully with age, sex, education, or social status. Consequently, none of the demographic variables would have to be partialled out or controlled for in subsequent analyses involving these inconsistency measures.

A separate t-test was conducted on each of the inconsistency scores. The results of these t-tests are displayed in Table 16. As indicated, schizophrenics were significantly more inconsistent than mood-disordered patients on the TD Scale-Revised, Conflict Scale, Conflict-Avoidance Subscale, and Non-Conflict Scale (p's < .05). As well, schizophrenics were significantly less consistent than
Table 15

Correlations of Inconsistency Measures with Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Education</th>
<th>Soc.St.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD Scale-Rev Inconsistency</td>
<td>.10</td>
<td>-.17</td>
<td>.11</td>
<td>.17</td>
</tr>
<tr>
<td>Conflict Inconsistency</td>
<td>-.09</td>
<td>-.08</td>
<td>-.02</td>
<td>.07</td>
</tr>
<tr>
<td>Conflict-Avoidance Inconsistency</td>
<td>-.07</td>
<td>-.10</td>
<td>.01</td>
<td>.08</td>
</tr>
<tr>
<td>Non-Conflict Inconsistency</td>
<td>-.05</td>
<td>-.11</td>
<td>.10</td>
<td>.14</td>
</tr>
<tr>
<td>Grid Intensity</td>
<td>.12</td>
<td>-.03</td>
<td>-.11</td>
<td>-.04</td>
</tr>
<tr>
<td>Grid Consistency</td>
<td>-.05</td>
<td>-.02</td>
<td>-.18</td>
<td>.13</td>
</tr>
</tbody>
</table>
Table 16

Group Means and t-tests for the Inconsistency Measures

<table>
<thead>
<tr>
<th>Inconsistency Measure</th>
<th>Mood-Disordered</th>
<th>Schizophrenic</th>
<th>1-tail t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transformed Mean</td>
<td>S.D.</td>
<td>Transformed Mean</td>
</tr>
<tr>
<td>TD Scale-Rev. Inconsistency</td>
<td>.88</td>
<td>.72</td>
<td>1.62</td>
</tr>
<tr>
<td>Conflict Inconsistency</td>
<td>1.30</td>
<td>.86</td>
<td>1.85</td>
</tr>
<tr>
<td>Conflict-Avoidance Inconsistency</td>
<td>1.05</td>
<td>.78</td>
<td>1.59</td>
</tr>
<tr>
<td>Non-Conflict Inconsistency</td>
<td>1.24</td>
<td>.74</td>
<td>1.62</td>
</tr>
<tr>
<td>Grid Test Intensity</td>
<td>6.87</td>
<td>.43</td>
<td>6.67</td>
</tr>
<tr>
<td>Grid Test Consistency</td>
<td>.47</td>
<td>.27</td>
<td>.23</td>
</tr>
</tbody>
</table>

a p<.05
b p<.01
c p<.001
d p<.0001
were mood-disordered patients on the Grid Test Intensity and Consistency scores (p's < .05). To see a graphical representation of the difference in inconsistency between the two groups on the PPT, one can refer back to Figure 7.

In addition to assessing Inconsistency on the PPT scales using Apanasiewicz's (1982) Inconsistency score, the PPT scales were analyzed using commonly-employed measures of consistency. These other measures were calculated for the purpose of providing further information on the relationship of inconsistency to diagnosis. The consistency analyses of the PPT scales for each diagnostic group are presented in Table 17. Cronbach's Alphas reveal that the internal consistency of the TD Scale and the TD Scale-Revised was similar for both groups of patients. For example, the Alpha of the TD Scale for the schizophrenics was .76; for the mood-disordered patients, it was .73. However, on the Conflict-Avoidance Subscale, the average of the Alphas for the first and second presentation of the items was .30 for the schizophrenics; the average Alpha on this subscale was .59 for the mood-disordered patients.

For the Spearman split-half and test-retest reliability coefficients, r's were first transformed to z scores as suggested by Fisher (1970), and then the critical ratio of the difference between pairs of the z scores, using the standard normal deviate, was computed. Spearman split-half reliability coefficients show that the schizophrenics were significantly less consistent than the mood-disordered
Table 17

Measures of Consistency of the PPT Scales by Diagnostic Group

Cronbach's Alphas

<table>
<thead>
<tr>
<th>Scale</th>
<th>Schizophrenics</th>
<th>Mood-disordered Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought Disorder Scale</td>
<td>.76</td>
<td>.73</td>
</tr>
<tr>
<td>Thought Disorder-Rev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st presentation of items</td>
<td>.68</td>
<td>.67</td>
</tr>
<tr>
<td>2nd presentation of items</td>
<td>.65</td>
<td>.69</td>
</tr>
<tr>
<td>Conflict-Avoidance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st presentation of items</td>
<td>.46</td>
<td>.58</td>
</tr>
<tr>
<td>2nd presentation of items</td>
<td>.14</td>
<td>.60</td>
</tr>
</tbody>
</table>

Spearman Split-Half Reliability

<table>
<thead>
<tr>
<th>Scale</th>
<th>Schizophrenics</th>
<th>Mood-disordered Patients</th>
<th>1-tail t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought Disorder-Rev.</td>
<td>.81</td>
<td>.89</td>
<td>1.31</td>
</tr>
<tr>
<td>Conflict</td>
<td>.74</td>
<td>.93</td>
<td>3.17*</td>
</tr>
<tr>
<td>Conflict-Avoidance</td>
<td>.79</td>
<td>.94</td>
<td>3.00*</td>
</tr>
<tr>
<td>Non-Conflict</td>
<td>.75</td>
<td>.88</td>
<td>1.80*</td>
</tr>
</tbody>
</table>

Test-Retest (First to Second Presentation) Correlations

<table>
<thead>
<tr>
<th>Scale</th>
<th>Schizophrenics</th>
<th>Mood-disordered Patients</th>
<th>1-tail t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thought Disorder-Rev.</td>
<td>.67</td>
<td>.80</td>
<td>1.29</td>
</tr>
<tr>
<td>Conflict</td>
<td>.59</td>
<td>.85</td>
<td>2.58*</td>
</tr>
<tr>
<td>Conflict-Avoidance</td>
<td>.65</td>
<td>.89</td>
<td>2.89*</td>
</tr>
<tr>
<td>Non-Conflict</td>
<td>.60</td>
<td>.79</td>
<td>1.70*</td>
</tr>
</tbody>
</table>

*p < .05
**p < .01
patients on the Conflict Scale ($t = 3.17, p < .01$), the Conflict-Avoidance Subscale ($t = 3.00, p < .01$) and the Non-Conflict Scale ($t = 1.80, p < .05$). However, schizophrenic and mood-disordered patients did not differ in terms of inconsistency on the TD Scale-Revised. Test-retest correlations of the subject’s choice on the first presentation of an item with his choice on the second presentation of an item revealed a similar pattern of results. Schizophrenics were less consistent than mood-disordered patients on the Conflict Scale ($t = 2.58, p < .01$), the Conflict-Avoidance Subscale ($t = 2.89, p < .01$), and the Non-Conflict Scale ($t = 1.70, p < .05$). Taken together, the findings displayed in Table 17 show that with the exception of the TD Scales (original and revised versions), the schizophrenics were less consistent than the mood-disordered patients on the Picture Preference items. The TD Scales thus seem unique among these measures in their ability to produce internally consistent responding, as assessed by these coefficients, in schizophrenics.

Measurement Issues

**Issue I: Validity of the TD Scale and Its Inconsistency Score**

**Question 6:** Can the TD Scale and its Inconsistency score discriminate schizophrenic from mood-disordered patients? To investigate the issue of discriminative ability, the author conducted separate discriminant function analyses of the TD Scale and its Inconsistency score. The
results of these analyses are presented in Table 18. Discriminant function analysis of scores on the TD Scale revealed that the TD Scale was able to significantly discriminate between the two diagnostic groups (Wilks's Lambda = .88, $F_{1.64} = 11.45$, $p < .001$). Schizophrenics had significantly higher scores on the TD Scale than did mood-disordered patients. More specifically, the schizophrenics chose an average of approximately seven bizarre pictures on the scale, whereas the mood-disordered patients chose an average of about four bizarre pictures on the scale. Using the sample median of the transformed distribution ($Md = 2.45$) as the cutoff value, the TD Scale was able to correctly identify 66% of the sample as schizophrenic or mood-disordered.

Discriminant function analysis of Inconsistency scores on the TD Scale-Revised showed that the Inconsistency score was able to significantly discriminate between the two diagnostic groups (Wilks's Lambda = .83, $F_{1.64} = 16.94$, $p < .0001$). Schizophrenics were significantly more inconsistent on the TD Scale-Revised than were mood-disordered patients (see also Table 16). In raw score values, schizophrenics were inconsistent in choosing between pictures on an average of about 3 TD Scale items, whereas mood-disordered patients were inconsistent on an average of about 1 TD Scale item. Using the sample median of the transformed distribution ($Md = 1.41$) as the cutoff value, the TD Scale-Revised
Table 18

Discriminant Analyses of the TD Scale and Its Inconsistency Score

**Discrimination of Schizophrenics from Mood-Disordered Patients Using the TD Scale**

Score Cutoff = 2.45 (Sample Median)

<table>
<thead>
<tr>
<th>Actual Diagnostic Group</th>
<th>Schizophrenic</th>
<th>Mood-Disordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenic</td>
<td>30 (70%)</td>
<td>13 (30%)</td>
</tr>
<tr>
<td>Mood-Disordered</td>
<td>16 (37%)</td>
<td>27 (63%)</td>
</tr>
</tbody>
</table>

| | 46 | 40 | 86 |

Percentage of patients correctly classified: 66%

**Discrimination of Schizophrenics from Mood-Disordered Patients Using the Inconsistency Score on the TD Scale-Revised**

Score Cutoff = 1.41 (Sample Median)

<table>
<thead>
<tr>
<th>Actual Diagnostic Group</th>
<th>Schizophrenic</th>
<th>Mood-Disordered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenic</td>
<td>32 (74%)</td>
<td>11 (26%)</td>
</tr>
<tr>
<td>Mood-Disordered</td>
<td>16 (37%)</td>
<td>27 (63%)</td>
</tr>
</tbody>
</table>

| | 48 | 38 | 86 |

Percentage of patients correctly classified: 69%
Inconsistency score was able to correctly identify 69% of the sample as schizophrenic or mood-disordered.

Thus both of these measures were fairly good at correctly classifying the patients according to their diagnostic category.

Question 7: How do the TD Scale and its Inconsistency score compare to the other measures of thought disorder used in the present study in terms of validity? Table 19 presents the correlations among the thought disorder measures. As these instruments are all measures of thought disorder, we would expect them to correlate with one another. Examination of the table reveals that they do so, and therefore that they are all presumably tapping an underlying construct of thought disorder. All of the correlations are significant, with only one (viz., the correlation between the TD Scale and Grid Intensity) being below .30. The highest correlation in the matrix is between the Grid Test Intensity and Grid Test Consistency scores ($r = .58$, $p < .0001$).

With regard to the PPT thought disorder measures, the TD Scale correlated meaningfully with inconsistency on the TD Scale-Revised ($r = .53$, $p < .0001$), the WIST ($r = .47$, $p < .0001$), and Grid Test Consistency ($r = -.35$, $p < .001$). In addition to correlating with the TD Scale, Inconsistency on the TD Scale-Revised correlated meaningfully with Grid Test Intensity ($r = -.42$, $p < .0001$), the WIST ($r = .40$, $p < .0001$), and Grid Consistency ($r = -.32$, $p < .001$). These
Table 19

Correlations Among Thought Disorder Measures

<table>
<thead>
<tr>
<th>TD Scale</th>
<th>TD Scale-Rev</th>
<th>Inconsistency</th>
<th>WIST</th>
<th>Grid Test</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD Scale-Rev (Inconsist.)</td>
<td>.53*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIST</td>
<td>.47*</td>
<td>.40*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grid Test</td>
<td></td>
<td></td>
<td>.32*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>-.28*</td>
<td>-.42*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>-.35*</td>
<td>-.32*</td>
<td>.31*</td>
<td>.58*</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05
**p<.01
***p<.001
****p<.0001
findings suggest that the TD Scale and its Inconsistency score are valid measures of thought disorder as it is assessed by these other tests.

Further information on the convergent validity of the TD Scale and its Inconsistency score can be obtained by examining its correlations with the SADS-C scales. Table 20 shows the correlations of the thought disorder measures with the SADS-C scales. For the purpose of addressing Question 7, only those correlations pertinent to thought disorder and schizophrenia will be discussed. The original Thought Disorder Scale correlated meaningfully with the Schizophrenia scale ($r = .40, p < .0001$) and the Global Assessment Scale ($r = -.34, p < .001$). The Inconsistency score on the Revised Thought Disorder Scale correlated with the Schizophrenia scale ($r = .40, p < .0001$), Impaired Understandability ($r = .33, p < .001$), and the Global Assessment Scale ($r = -.44, p < .0001$). The WIST correlated .61 with Impaired Understandability, the highest correlation in the table ($p < .0001$). The WIST also correlated with the Schizophrenia scale ($r = .56, p < .0001$), Delusions ($r = .35, p < .001$), and the Global Assessment Scale ($r = -.58, p < .0001$). The Grid Test Intensity score did not correlate meaningfully with any of the SADS-C scales. The Grid Test Consistency score correlated with the Schizophrenia scale ($r = -.30, p < .01$) and the Global Assessment Scale ($r = .34, p < .001$).
Table 20
Correlation of Thought Disorder Measures with SADS-C Scales

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TD Scale</td>
<td>.40^d</td>
<td>.26^b</td>
<td>.27^b</td>
<td>.29^b</td>
<td>-.17</td>
<td>.07</td>
<td>-.34^c</td>
<td>.20</td>
</tr>
<tr>
<td>TD Scale-Rev</td>
<td>.40^d</td>
<td>.33^c</td>
<td>.24^c</td>
<td>.27^b</td>
<td>-.28^b</td>
<td>-.03</td>
<td>-.44^d</td>
<td>.17</td>
</tr>
<tr>
<td>(Inconsist.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIST</td>
<td>.56^d</td>
<td>.61^d</td>
<td>.35^c</td>
<td>.21^c</td>
<td>-.37^d</td>
<td>.08</td>
<td>-.58^d</td>
<td>.24^c</td>
</tr>
<tr>
<td>Grid Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>-.14</td>
<td>-.16</td>
<td>-.08</td>
<td>-.10</td>
<td>.12</td>
<td>.05</td>
<td>.25^b</td>
<td>-.12</td>
</tr>
<tr>
<td>Consistency</td>
<td>-.30^b</td>
<td>-.23^a</td>
<td>-.23</td>
<td>-.13</td>
<td>.28^c</td>
<td>.05</td>
<td>.34^c</td>
<td>-.09</td>
</tr>
</tbody>
</table>

^a p<.05
^b p<.01
^c p<.001
^d p<.0001
These findings show that the TD Scale and its Inconsistency score compare favourably with the other tests of thought disorder with respect to diagnostic ratings of schizophrenia-related variables. Moreover, the TD Scale-Revised Inconsistency score was one of the only two measures that correlated meaningfully with the SADS-C interview rating of thought disorder.

The author wanted to check on the possibility that the correlations involving the schizophrenia variables presented in Table 20 may have been affected by relationships with demographic characteristics. In this regard, the correlations of schizophrenia-related variables with demographic characteristics are presented in Table 21. As can be seen, the TD Scale, the TD Scale-Revised, and Delusions, Hallucinations, and the total score of the SADS-C did not correlate with any of the demographic characteristics. In fact, none of the variables were significantly related to age. Some of the other measures, however, did correlate with sex, education, and social status. The WIST correlated significantly with sex ($r = - .29, p < .01$), education ($r = .35, p < .001$), and social status ($r = - .25, p < .01$). The SADS-C Schizophrenia scale correlated significantly with sex ($r = - .28, p < .01$), education ($r = .19, p < .05$), but not with social status ($r = - .09, p < .05$). Impaired Understandability correlated only with sex ($r = - .28, p < .01$). The Global Assessment Scale correlated significantly with sex ($r = .26, p < .01$),
Table 21

Correlations of Schizophrenia-Related Variables with Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Education</th>
<th>Soc.Stat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD Scale</td>
<td>-.13</td>
<td>-.15</td>
<td>.04</td>
<td>.00</td>
</tr>
<tr>
<td>TD Scale-Rev</td>
<td>.10</td>
<td>.17</td>
<td>.16</td>
<td>-.11</td>
</tr>
<tr>
<td>WIST</td>
<td>-.08</td>
<td>-.29b</td>
<td>.35c</td>
<td>-.25b</td>
</tr>
<tr>
<td>SADS-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>-.03</td>
<td>-.28b</td>
<td>.19a</td>
<td>-.09</td>
</tr>
<tr>
<td>Understand</td>
<td>.05</td>
<td>-.28b</td>
<td>.16</td>
<td>-.04</td>
</tr>
<tr>
<td>Delusions</td>
<td>.05</td>
<td>-.13</td>
<td>.03</td>
<td>.05</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>-.01</td>
<td>-.10</td>
<td>.13</td>
<td>-.10</td>
</tr>
<tr>
<td>GAS</td>
<td>-.00</td>
<td>.26b</td>
<td>.32b</td>
<td>.30b</td>
</tr>
<tr>
<td>SADS-C Tot.</td>
<td>.01</td>
<td>-.09</td>
<td>.16</td>
<td>.16</td>
</tr>
</tbody>
</table>

*p<.05
*b<p<.01
*c<p<.001
education ($r = .32$, $p < .01$), and social status ($r = .30$, $p < .01$).

Table 21 shows that the WIST, as well as the Schizophrenia, Impaired Understandability and Global Assessment scales of the SADS-C are all correlated with demographic characteristics. According to Cohen and Cohen (1975), correlations should be partialled when both variables involved in the correlation are related to a third variable such as a demographic characteristic. The partial correlation between variables A and B is defined as the correlation between A and B with the correlation between A and C removed from A, and the correlation between B and C removed from B. The partial correlation thus reveals the unique relationship between two variables with the effects of a third variable removed from both variables. Partial correlations were calculated for relationships in which the WIST, Schizophrenia, Impaired Understandability, and Global Assessment Scale were involved. Partial correlations were calculated only for those relationships in which both variables were related to at least one of the demographic characteristics. To avoid redundancy, the effect of education was not partialled out of these relationships as education is one of the two components of the social status score.

The partial correlations controlling for sex and social status are shown in Table 22. Four correlations were calculated in which the effect of sex was partialled out.
Table 22
Partial Correlations Controlling for Demographic Variables

<table>
<thead>
<tr>
<th>Variables in Relationship</th>
<th>Zero-Order</th>
<th>Variables Controlled For</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIST &amp; Impaired Understand.</td>
<td>.61*</td>
<td>Sex</td>
<td>.55*</td>
</tr>
<tr>
<td>WIST &amp; Schizophrenia Scale</td>
<td>.56*</td>
<td>Sex</td>
<td>.52*</td>
</tr>
<tr>
<td>Schizophrenia Scale &amp; GAS</td>
<td>-.62*</td>
<td>Sex</td>
<td>-.59*</td>
</tr>
<tr>
<td>Impaired Understandability &amp; GAS</td>
<td>-.59*</td>
<td>Sex</td>
<td>-.56*</td>
</tr>
<tr>
<td>WIST &amp; GAS</td>
<td>-.58*</td>
<td>Sex, Social Status</td>
<td>-.52*</td>
</tr>
</tbody>
</table>

dp<.0001
The resulting partial correlations are: the WIST and Impaired Understandability (r = .55, p < .0001), the WIST and the Schizophrenia scale (r = .52, p < .0001), Impaired Understandability and the Global Assessment Scale (r = .56, p < .0001), and the Schizophrenia scale and the Global Assessment Scale (r = .59, p < .0001). In addition, one correlation was calculated in which the shared relationship of sex and social status was partialled out. The resulting partial correlation, between the WIST and the Global Assessment Scale, is - .52 (p < .0001). As can be seen, all of the correlations in Table 22 stayed about the same size after partialling out the demographic component.

**Issue II: Scoring the Grid Test**

**Question 8:** Are there more elegant and convenient ways of scoring the Grid Test than the methods devised by Bannister? Findings mentioned earlier suggest that inconsistency of responding is a characteristic of schizophrenics that shows up on a variety of measures. The remaining analyses are concerned with the investigation of the new ways introduced by the author of scoring the most widely-used test of schizophrenic inconsistency, the Grid Test. The Grid Test data were reanalyzed to calculate the Determinant score, the Kendall Within-Grid score, the Chi-Square score, and the Kendall Between-Grid score for each subject.

As shown in the Method section, the determinant is a
component of the formula for calculating Chi-Square; a zero determinant results in a mathematically undefined value. Consequently, the Chi-Square score cannot be calculated when either of the Grid matrices has a zero determinant.

Thirty-eight of the subjects (18 mood-disordered patients, 20 schizophrenics) had a zero determinant for at least one of their matrices, and thus could not have a Chi-Square score calculated on their Grid Test data. In order that each subject would have a Chi-Square value, the author calculated predicted Chi-Square values for the 38 subjects for whom a Chi-Square could not be calculated. This predicted value was obtained using a multiple regression formula that included the Bannister Consistency score and the two measures that correlated most highly with the Chi-Square score in the 48 subjects for whom a Chi-Square could be calculated: the Determinant score and Impaired Understandability. The regression formula, yielding a multiple R of .69 ($F_{3,44} = 11.75, p < .0001$) was as follows:

\[
\text{Predicted } \chi^2 = [-26.78 \times \text{Grid-C}] + [4.17 \times \text{Under}] - [7.75 \times \text{Determ}] + 76.99
\]

where Grid-C = Grid Consistency

Under = Impaired Understandability

Determ = Determinant score

These predicted values were used as the Chi-Square score for the 38 subjects who had zero determinants. The obtained Chi-Square values were used for the other 48 subjects.

Examination of the frequency distributions of the
Determinant, Kendall-Within, and Chi-Square scores revealed that these distributions were positively skewed; the Determinant score was severely skewed. Tukey (1977) recommends using root functions greater than the second root for severely positively skewed distributions. The author transformed the Determinant score using square, fourth, sixth, and eighth root transformations, and found that the fourth root produced the distribution with the lowest skewing score (SAS Institute, 1985). The author therefore retained the fourth root transformation for the Determinant score and the standard square root transformation for the Kendall and Chi-Square scores.

Analyses involving these new Grid Test scores are displayed in Tables 22 through 25. Table 23 presents the correlations among the Grid Test scores. Ten of the 15 correlations are significant, the largest being between Bannister's Intensity score and the Determinant score ($r = -.75, p < .0001$). This correlation suggests that Bannister's Intensity score is largely a measure of the generalized variance of the two Grid Test matrices. With regard to the new within-grid scores, the Determinant also correlated with Bannister's Consistency score ($r = -.53, p < .0001$), the Chi-Square score ($r = -.49, p < .0001$), and the Kendall-Within score ($r = .36, p < .001$). The Kendall-Within score correlated meaningfully with Bannister's Intensity score ($r = -.49, p < .0001$), Bannister's Consistency score
Table 23

Correlations among Grid Test Scores

<table>
<thead>
<tr>
<th>Within-Grid Scores</th>
<th></th>
<th>Between-Grid Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bannister-I</td>
<td>Determinant</td>
<td>Kendall-W</td>
</tr>
<tr>
<td>Within-Grid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determinant</td>
<td>-.75⁺⁺⁺</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kendall-Within</td>
<td>-.49 smarter</td>
<td>.36⁺⁺⁺</td>
<td></td>
</tr>
<tr>
<td>Between-Grid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bannister-C</td>
<td>.58⁺⁺⁺</td>
<td>-.53⁺⁺⁺</td>
<td>-.42⁺⁺⁺</td>
</tr>
<tr>
<td>Chi²</td>
<td>.24⁺⁺⁺</td>
<td>-.49⁺⁺⁺</td>
<td>.05</td>
</tr>
<tr>
<td>Kendall-Between</td>
<td>.12</td>
<td>-.20⁺⁺⁺</td>
<td>.13</td>
</tr>
</tbody>
</table>

⁺⁺⁺p<.05  
⁺⁺⁺⁺p<.01  
⁺⁺⁺⁺⁺p<.001  
⁺⁺⁺⁺⁺⁺p<.0001
$\phi = -.42, \ p < .0001$, and the Determinant score ($\tau = .36, \ p < .0001$). Considering the new between-grid scores, the Chi-Square score only correlated meaningfully with the Determinant score ($\tau = -.49, \ p < .0001$). The Kendall-Between score did not substantially correlate with any of the other Grid Test measures, its largest relationship being with the Bannister Consistency score ($\tau = .28, \ p < .05$).

Having examined the interrelationships among the Grid Test scores, the next psychometric concern was the relationship of the Grid Test scores to relevant criterion variables. Table 24 presents the correlations of the Grid Test scores with the criterion measures. Of all of the Grid Test scores, the Chi-Square measure was the only Grid Test score that correlated meaningfully ($\tau = .46, \ p < .0001$) with Impaired Understandability, the scale which directly assesses the presence of thought disorder in the SADS-C interview. The Chi-Square score also correlated with the Schizophrenia scale ($\tau = .32, \ p < .001$). Of the three between-grid measures, Bannister's Consistency score correlated with the greatest number of the criterion variables, including the WIST ($\tau = -.51, \ p < .0001$), diagnostic group ($\tau = -.43, \ p < .0001$), the TD Scale ($\tau = -.35, \ p < .0001$), the Global Assessment Scale ($\tau = .34, \ p < .001$), and the Schizophrenia scale ($\tau = -.30, \ p < .01$). It is notable that the Bannister Consistency score correlated more highly with diagnostic group than any of the other Grid
Table 24
Correlations of Grid Test Scores with Criterion Measures

<table>
<thead>
<tr>
<th></th>
<th>Within-Grid Scores</th>
<th>Between-Grid Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bannister-I</td>
<td>Determinant</td>
</tr>
<tr>
<td>Diagnostic Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIST</td>
<td>-.34&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.22&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TD Scale</td>
<td>-.28&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.35&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Conflict-Avoid.</td>
<td>-.02</td>
<td>-.02</td>
</tr>
<tr>
<td>SADS-C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>-.14</td>
<td>.07</td>
</tr>
<tr>
<td>Understand</td>
<td>-.16</td>
<td>-.03</td>
</tr>
<tr>
<td>Delusions</td>
<td>-.10</td>
<td>.00</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>-.08</td>
<td>.13</td>
</tr>
<tr>
<td>Depression</td>
<td>.12</td>
<td>-.01</td>
</tr>
<tr>
<td>Mania</td>
<td>.05</td>
<td>-.12</td>
</tr>
<tr>
<td>GAS</td>
<td>.25&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.17</td>
</tr>
<tr>
<td>SADS-C Tot.</td>
<td>-.13</td>
<td>.09</td>
</tr>
</tbody>
</table>

<sup>a</sup>p<.05  
<sup>b</sup>p<.01  
<sup>c</sup>p<.001  
<sup>d</sup>p<.0001
Test scores. Kendall's Between-Grid score correlated meaningfully with only one of the criterion variables, Conflict-Avoidance ($r = .39, p < .0001$).

Considering the within-grid scores, the Kendall-Within (Perseveration) score correlated with more of the criterion variables than did the other within-grid scores. The Kendall score correlated with the WIST ($r = .36, p < .0001$), the Global Assessment Scale ($r = -.33, p < .001$), and diagnostic group ($r = .30, p < .01$). Bannister's Intensity score correlated meaningfully with the WIST ($r = -.34, p < .001$), and also showed a significant relationship to diagnosis ($r = -.21, p < .05$). The Determinant score only correlated meaningfully with the TD Scale ($r = .35, p < .0001$).

As the Kendall Within-Grid (Perseveration) score was significantly related to diagnostic group, a between-groups analysis of variance was conducted on these Kendall scores. Table 25 presents the analysis of variance statistics at the top of the page, and the means and standard deviations of the two groups at the bottom. As indicated, schizophrenics had significantly higher scores on the measure than did mood-disordered patients ($F_{1,64} = 8.28, p < .01$). Thus the schizophrenics perseverated more, or in other words, exhibited a stronger tendency than did the mood-disordered patients to rank the photographs in the same order regardless of the construct being presented to them.
Table 25

Analysis of Variance of Kendall Within-Grid (Perseveration) Scores by Diagnostic Group

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.08</td>
<td>1</td>
<td>.08</td>
<td>8.28&lt;sup&gt;p&lt;/sup&gt;</td>
</tr>
<tr>
<td>Within Groups</td>
<td>.86</td>
<td>84</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.94</td>
<td>85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Transformed Mean</th>
<th>S.D.</th>
<th>Raw Score Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophrenics</td>
<td>.73</td>
<td>.10</td>
<td>.28</td>
</tr>
<tr>
<td>Mood-Disordered Patients</td>
<td>.66</td>
<td>.11</td>
<td>.19</td>
</tr>
</tbody>
</table>

<sup>p</sup>.<01
Issue III: Relationship of the Picture Preference Test to the Grid Test

Question 9: What is the relationship of inconsistency on the PPT to inconsistency on the Grid Test? Before investigating the relationship of PPT inconsistency to Grid Test inconsistency, it is interesting to note the intercorrelations among the PPT Inconsistency scores. The correlations among the PPT Inconsistency measures are shown in Table 26. All of the correlations are significant (p's < .0001), ranging from .54 to .90. The largest correlation, .90, occurred between Inconsistency on the Conflict Avoidance Subscale and Inconsistency on the Conflict Scale. This finding is not surprising as Conflict-Avoidance is a subscale of the Conflict Scale. Overall, this table shows that the Inconsistency scores of all four PPT scales are related to each other.

Table 27 displays the correlations of the Grid Test scores with the PPT scales. The significant correlations range from -.21 to -.42, with the largest correlation being between Inconsistency on the TD Scale-Revised and Bannister's Intensity score ($r = -.42, p < .0001$).

Bannister's Intensity score also correlated meaningfully with Inconsistency on the Conflict-Avoidance Subscale ($r = -.34, p < .001$) and on the Conflict Scale ($r = -.30, p < .01$). The Determinant score was meaningfully related to Inconsistency on the TD Scale-Revised ($r = .39, p < .0001$). Of the all of the Grid Test scores, the Kendall-W
Table 26
Correlations among PPT Inconsistency Measures

<table>
<thead>
<tr>
<th></th>
<th>TD Scale-Rev. Inconsistency</th>
<th>Conflict Inconsistency</th>
<th>Conflict-Avoidance Inconsistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict Inconsistency</td>
<td>.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict-Avoidance Inconsistency</td>
<td>.56&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.90&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Non-Conflict Inconsistency</td>
<td>.61&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.62&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.59&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>p<.0001

Note: Conflict-Avoidance is a subscale of the Conflict Scale.
Table 27

Correlation of Grid Test Scores with PPT Scales

<table>
<thead>
<tr>
<th></th>
<th>Within-Grid Scores</th>
<th>Between-Grid Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bannister-1</td>
<td>Determinant</td>
</tr>
<tr>
<td>TD Scale-Rev.</td>
<td>-.42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.39&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(Inconsistency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict</td>
<td>-.30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.24&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(Inconsistency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict-Avoidance</td>
<td>-.34&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>(Inconsistency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Conflict</td>
<td>-.25&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.23&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>(Inconsistency)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>p<.05
<sup>b</sup>p<.01
<sup>c</sup>p<.001
<sup>d</sup>p<.0001
(Perseveration) score was the only one related meaningfully to all of the PPT Inconsistency scores, suggesting that Inconsistency on the Picture Preference Test is more related to Perseveration than to Intensity or generalized variance (viz., Determinant) on the Grid Test. Kendall-Within was related to Inconsistency on the TD Scale-Revised ($r = .44, p < .0001$), Inconsistency on the Conflict-Avoidance scale ($r = .41, p < .0001$), Inconsistency on the Non-Conflict scale ($r = .40, p < .0001$), and Inconsistency on the Conflict scale ($r = .30, p < .01$). It is worth noting that each of the three within-grid scores correlated significantly, though not necessarily substantially, with Inconsistency on each of the Picture Preference scales.

Considering the Grid Test Consistency scores, Bannister's Consistency score correlated with the greatest number of the Picture Preference scales. Bannister's score correlated with Inconsistency on the TD Scale-Revised ($r = -.32, p < .001$), and Inconsistency on the Conflict-Avoidance scale ($r = -.30, p < .01$). The Kendall Between-Grid score and the Chi-Square score did not correlate significantly with any of the Picture-Preference scales.

The overall pattern of correlations in Table 27 suggests that inconsistent responding on the Grid Test is related to inconsistent responding on the Picture-Preference scales under investigation. To be more precise, inconsistency on the picture-preference scales is more
related to within-grid consistency than to between-grid consistency on the Grid Test. Furthermore, of the three within-grid scores, Perseveration is the one most related to PPT Inconsistency.

As the newly introduced Grid Test scores appear to relate to a variety of measures, and in some cases, correlate more highly with those measures than do Bannister's original scores, the author has calculated the decile norms for the six Grid Test scores for those who may wish to use them in the future. The decile norms for the Grid Test within-grid scores are presented in Table 28; the decile norms for the Grid Test between-grid scores are presented in Table 29. These norms can be used to compare values across the different scoring methods.
Table 28

Decile Norms for the Three Within-Grid Scores

<table>
<thead>
<tr>
<th>Grid Score</th>
<th>Group</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>BANNISTER INTENSITY</td>
<td>Schizophrenics</td>
<td>447</td>
<td>532</td>
<td>592</td>
<td>655</td>
<td>720</td>
<td>809</td>
<td>932</td>
<td>1426</td>
<td>1687</td>
</tr>
<tr>
<td></td>
<td>Mood-Disorder Patients</td>
<td>530</td>
<td>611</td>
<td>746</td>
<td>840</td>
<td>1005</td>
<td>1129</td>
<td>1229</td>
<td>1430</td>
<td>1697</td>
</tr>
<tr>
<td>DETERMINANT</td>
<td>Schizophrenics</td>
<td></td>
<td>10</td>
<td>22</td>
<td>70</td>
<td>190</td>
<td>328</td>
<td>546</td>
<td>974</td>
<td>2208</td>
</tr>
<tr>
<td></td>
<td>Mood-Disorder Patients</td>
<td></td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>20</td>
<td>50</td>
<td>96</td>
<td>310</td>
<td>408</td>
</tr>
<tr>
<td>KENDALL WITHIN-GRID</td>
<td>Schizophrenics</td>
<td>.14</td>
<td>.16</td>
<td>.21</td>
<td>.23</td>
<td>.25</td>
<td>.30</td>
<td>.38</td>
<td>.47</td>
<td>.53</td>
</tr>
<tr>
<td>(Persev.)</td>
<td>Mood-Disorder Patients</td>
<td></td>
<td>.08</td>
<td>.11</td>
<td>.14</td>
<td>.15</td>
<td>.20</td>
<td>.24</td>
<td>.27</td>
<td>.35</td>
</tr>
</tbody>
</table>

*For clearer presentation, Determinant values were multiplied by 10* to yield the values shown in the Table.*
Table 29

Decile Norms for the Three Between-Grid Scores

<table>
<thead>
<tr>
<th>Grid Score</th>
<th>Group</th>
<th>Percentile</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BANNISTER CONSIST. Schizophrenics</td>
<td></td>
<td>-.18</td>
<td>.05</td>
<td>.16</td>
<td>.26</td>
<td>.32</td>
<td>.50</td>
<td>.61</td>
<td>.68</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>Mood-Disorder Patients</td>
<td></td>
<td>.14</td>
<td>.47</td>
<td>.52</td>
<td>.65</td>
<td>.69</td>
<td>.72</td>
<td>.86</td>
<td>.88</td>
<td>.90</td>
</tr>
<tr>
<td></td>
<td>CHI-SQUARE Schizophrenics</td>
<td></td>
<td>39</td>
<td>47</td>
<td>53</td>
<td>57</td>
<td>61</td>
<td>67</td>
<td>70</td>
<td>79</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Mood-Disorder Patients</td>
<td></td>
<td>41</td>
<td>47</td>
<td>52</td>
<td>56</td>
<td>58</td>
<td>59</td>
<td>61</td>
<td>64</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>KENDALL BETWEEN-GRID Schizophrenics</td>
<td></td>
<td>.24</td>
<td>.50</td>
<td>.58</td>
<td>.64</td>
<td>.72</td>
<td>.75</td>
<td>.81</td>
<td>.86</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td>Mood-Disorder Patients</td>
<td></td>
<td>.36</td>
<td>.52</td>
<td>.56</td>
<td>.66</td>
<td>.75</td>
<td>.77</td>
<td>.81</td>
<td>.87</td>
<td>.92</td>
</tr>
</tbody>
</table>

*Predicted Chi-Square values were used for those subjects for whom the LISREL-6 program could not calculate a Chi-Square test.*
CHAPTER V
DISCUSSION

In the preliminary study, the author was able to create two Picture-Preference scales, a Conflict Scale containing items that the judges in the study had rated as high in the ability to provoke conflict in a schizophrenic, and a Non-Conflict Scale, containing items that the judges had rated as being low in the ability to provoke conflict in a schizophrenic. In the main study, the author employed the DSM III-R diagnostic criteria to separate the patients in his sample into two distinct groups, a group of schizophrenics and a group of mood-disordered patients. With these patients and the newly-developed PPT scales, the author set out to answer the questions proposed in the Statement of the Problem.

Before discussing the findings, the author would like to point out the limitations of the study. First, most of the patients in both groups were not drug-free. Moreover, the two groups differed with respect to level of medication and length of hospitalization. We cannot be certain how these differences may have affected the results. However, with regard to medication, the findings of several studies suggest that thought disorder is not markedly influenced by neuroleptic dosage (Neborsky, Janowsky, Munson, & Depry, 1981; Pishkin, Lovallo, Lenk, & Bourne, 1977; Puente & Andersson, 1987; Simpson, Bourne, Justesen, & Rhodes, 1979;
Tune et al., 1976).

Having acknowledged these limitations, ones that are endemic to this area of research (Whitaker, 1980), the findings pertinent to each question will now be reviewed in sequence.

Theoretical Issues

**Issue I: The Role of Conflict in Schizophrenic Thought Disorder**

The main theoretical issue addressed by the author involved testing Katan's (1960) theory of conflict. The predictions stemming from this theory received some support.

**Question 1:** Does the avoidance of conflict relate to schizophrenic thought disorder? In brief, Katan's (1960) theory is that thought disorder is the result of the patient's defensive attempt to repress intense conflicts between the motivation to strive for the gratification of highly frustrated wishes and the motivation to avoid the further disappointment that may occur if the patient again strives for gratification of such wishes. The patient avoids the recollection of conflictual wishes by repressing word associations that resurrect these wishes. The thought-disordered person thus resorts to a disorganized, senseless train of associations because it feels much better to him than does facing the pain of rational associations that are connected to the disappointment of wishes.

In investigating Katan's theory, the author first
wanted to see if the proposed relationship between conflict and thought disorder would be manifested in patients’s responses to a set of picture-preference items on which they could avoid conflictual material. The author thought that if the avoidance of conflictual wishes led to the development of thought disorder in the first place, then the picture-preference measure of conflict-avoidance might correlate with the measures of thought disorder included in the study (viz., the interview rating of thought disorder, the WST, and the Grid Test). The results revealed, however, that scores on the Conflict-Avoidance Subscale did not correlate meaningfully with any of the thought disorder measures.

Question 2: Does the avoidance of conflict relate to diagnosis as a blunt measure of thought disorder? The author attempted to use diagnosis as a second means of investigating the avoidance of conflict in thought-disordered persons. Assuming that a group of schizophrenics would on average be more thought-disordered than a group of mood-disordered patients (an assumption supported by the data), the author wanted to see if schizophrenics would exhibit a stronger tendency to avoid conflict-provoking stimuli than would mood-disordered patients. The author speculated that if schizophrenics are especially conflicted, as Katan's (1960) theory would suggest, then they might exhibit a greater tendency to avoid conflict than would mood-disordered patients. The results revealed, however, that the schizophrenics did not
demonstrate any greater tendency than did the mood-disordered patients to avoid choosing conflict-laden pictures on the PPT.

The findings for Questions 1 and 2 did not confirm the predictions based on Katan's (1960) theory. These findings discredit the hypothesis derived from Katan's theory that thought disorder would be expressed on picture-preference items as an avoidance of choosing conflict-provocative pictures. The findings do not, however, entirely discount Katan's theory. Rather, they suggest that if there is a relationship between thought disorder and psychological conflict, it is not expressed as an avoidance of conflictual material on the Picture-Preference Test.

Question 3: Does inconsistency on picture-preference scales varying in the degree of conflict relate to measures of thought disorder? In addition to conflict-avoidance, the author employed Apanasiewicz's (1982) Inconsistency score to evaluate Katan's (1960) theory. The author chose to use this score as an index of thought disturbance, as it seems reasonable to assume that inconsistency in choosing among pictures from one trial to the next is an indication of disorganized thinking (Apanasiewicz, 1982).

The author noted that if conflict is critical in the development and manifestation of thought disorder, then one would expect that as the level of thought disorder increases, the degree of inconsistency or thought disorganization would increase on the Conflict Scale and the
Conflict-Avoidance Subscale. That is, highly thought-disordered persons would be more mentally disturbed by conflict items than would persons who were minimally thought-disordered. However, this relationship would not occur on the Non-Conflict scale, because the neutral content of the items would not elicit thought disorder as measured by the inconsistency of responding. Highly thought-disordered persons should not have been any more disturbed by neutral items than would have persons with little thought disorder. Consequently, the author expected meaningful correlations between the Inconsistency score on the Conflict Scale and the measures of thought disorder included in the study, as well as between the Conflict-Avoidance Inconsistency score and the thought disorder measures. He also expected insubstantial correlations between Inconsistency on the Non-Conflict Scale and the thought disorder measures.

In addition, the author believed that the items on the Thought Disorder Scale-Revised depict conflictual themes for schizophrenics, as this measure was originally developed to represent various aspects of schizophrenic thinking disturbance. The author therefore expected that Inconsistency on the Thought Disorder Scale-Revised would correlate meaningfully with the thought disorder measures.

The data showed a pattern of correlations that was consistent with all of these expectations. The results displayed a trend suggesting that Inconsistency on
the scales presumed to be conflict-provocative (viz., Conflict Scale, Conflict-Avoidance Subscale, TD Scale-Revised) was meaningfully related to relevant thought disorder and schizophrenia indices, and that Inconsistency on the Non-Conflict Scale was not meaningfully related to any of the thought disorder or schizophrenia measures. However, although the pattern of correlations showed this trend, the trend was not supported by pairwise significance tests of the difference between correlations.

The author compared (1) each correlation of a thought disorder measure and Inconsistency on each of the conflictual scales with (2) the corresponding correlation of that thought disorder measure and Inconsistency on the Non-Conflict Scale. He had predicted that the correlations of the thought disorder measures with Inconsistency on each of the three conflictual scales (Conflict Scale, Conflict-Avoidance Subscale, TD Scale-Revised) would be significantly larger than would the correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale. Pairwise comparisons revealed that the correlations of the thought disorder measures with Inconsistency on the conflictual scales were not significantly larger than were the correlations of the thought disorder measures with Inconsistency on the Non-Conflict Scale.

In summary, although there was a trend that was consistent with predictions based on Katan's (1960) theory,
the trend was not backed by statistical significance.
Nevertheless, this nonsignificant trend could be interpreted as providing a hint of support for the theory. Perhaps with a larger sample size the relevant contrasts of correlations would reach significance and in that event might more strongly support the theory. However, as the present sample size of 86 was not sufficiently large to show significant differences between these correlations, it is likely that the effect in question is fairly small. The present results do more definitely suggest that the Inconsistency scores of the various PPT scales included in the study are significantly related to measures of thought disorder.

Question 4: Do increasing levels of conflict in PPT items produce greater inconsistency, and is this effect more pronounced in schizophrenics than in mood-disordered patients? The author also examined the relationship of conflict to thought disorder (as represented by inconsistent responding) by testing for differences in inconsistency between schizophrenic and mood-disordered patients. Assuming that schizophrenics on average are more thought-disordered than are mood-disordered patients (an assumption supported by the data), the author wanted to see if the two groups of patients would show different patterns of response inconsistency to conflictual and non-conflictual picture-preference scales. The author postulated that if thought disorder is the long-term result of intense inner conflict, as Katan's (1960) theory suggests, then one would
predict that schizophrenics would suffer a greater breakdown of thought consistency as a result of seeing the items in the Conflict Scale than they would as a result of seeing the items in the Non-Conflict Scale. As mood-disordered patients were not expected to be particularly thought disordered, the author predicted that these persons would not show a notable breakdown of the consistency of thinking to any of the scales. As well, as the author believed that the TD Scale was conflictual in nature, he predicted that the schizophrenics would be significantly more inconsistent on the TD Scale than on the Non-Conflict Scale, whereas the mood-disordered patients would be equally consistent on both scales.

Essentially, the author was testing the hypothesis that schizophrenics uniquely become more thought-disordered when presented with conflictual situations or material. The author tested this overall hypothesis by conducting a between-groups repeated measures analysis of variance on the Inconsistency scores of these three PPT scales. His predictions would have been supported by a significant Diagnostic Group x Degree of Conflict (Conflict, Non-Conflict, TD Scale-Revised) interaction.

The author found, however, that there was no significant Diagnostic Group X Conflict interaction in the ANOVA for inconsistency on the PPT scales. In other words, schizophrenics and mood-disordered patients displayed the same pattern of relative inconsistency on the scales.
Specifically, both groups of patients were more inconsistent in responding to the Conflict Scale than to the Non-Conflict Scale.

The finding that conflictual content produced greater inconsistency is in concordance with previous research on the Grid Test that shows that the content of the constructs (viz., personality vs. physical) has an effect on the inconsistency of responding (McPherson, Armstrong, & Heather, 1975). The present finding provided some support for the prediction that conflictual material would produce greater disorganization of thinking than would non-conflictual material. Further, it is consistent with Katan's (1960) theory that conflict may be involved in the development of thought disorder. However, this effect is apparently not exclusive to schizophrenics. The finding that the effect is not exclusive to schizophrenics is reminiscent of Whitaker's (1963) demonstration that the conflictual version (viz., Form A) of the WIST makes all groups of individuals, including normals, respond in a more thought-disordered fashion than does the neutral version (viz., Form B).

It thus appears that presenting a patient with conflictual material on the PPT makes it difficult for him to consistently make choices on that material, regardless of whether or not he is a schizophrenic. To state this finding in terms of Katan's theory, presenting a patient with a conflictual item creates anxiety in the patient as conflicts
in him become aroused. The resulting anxiety upsets him sufficiently such that he is unable to choose consistently on that item.

The expectation that the schizophrenics would be more inconsistent on the TD Scale-Revised than on the Non-Conflict Scale was not substantiated. This expectation was based on the assumption that the TD Scale items were conflictual for the schizophrenics and that they would therefore respond more inconsistently to this scale than to the Non-Conflict Scale. The findings of the preliminary study were compatible with this assumption for, indeed, the raters in the preliminary study rated the items in the TD Scale as being significantly more conflictual than the items in the Non-Conflict Scale. However, in the main study, all patients were more inconsistent in responding to the Non-Conflict Scale than they were in responding to the TD Scale-Revised. One might interpret this finding as suggesting that psychiatric patients find the TD Scale items less conflictual than the Non-Conflict Scale items. Such an interpretation, though, is not in line with the raters's judgement that the TD Scale is more conflictual than the Non-Conflict Scale, nor with a quick perusal of the items on the TD Scale. For example, the TD Scale consists of pictures depicting a girl watching a TV screen from which an arm is extended, a telephone receiver with a mouth protruding from the listening end of the receiver, a child touching the sun with his hand, and a picture of a girl
split into segments (see Appendix A). One would think that such items are not neutral in content to a schizophrenic or to other psychiatric patients. Hence, accounting for the greater inconsistency of subjects on the Non-Conflict Scale than on the TD Scale in terms of the TD Scale being less conflictual does not seem satisfactory.

An alternative explanation which is more congruent with the content of the TD Scale focusses on the way in which Rudzinski (1979) originally devised the scale. Rudzinski's intention was to select a set of items that would clearly differentiate patients who could not help but choosing pictures that appeared crazy from individuals who could avoid choosing the same crazy pictures. The scale was specifically designed for psychiatric inpatients, and originally validated on a sample of 71 inpatients from a variety of diagnostic groups. He found that this set of items had an internal consistency coefficient of .72 in these patients. Thus he created a scale which produced internally consistent responding in schizophrenic and other psychiatric patients.

In the present study, the author found in both mood-disordered and schizophrenic patients alpha coefficients for the TD Scale similar to the .72 coefficient found by Rudzinski (1979). However, in investigating the other two PPT scales, the author found that although the Conflict and Non-Conflict items produced acceptable reliability coefficients in the mood-disordered patients, they yielded
much lower reliability coefficients in the schizophrenics. The TD Scale was the only scale for which the reliability coefficients of the schizophrenic and the mood-disordered patients were not significantly different. Thus the TD Scale is unique among the three PPT scales in being able to produce responding in schizophrenics equal in reliability to that of the mood-disordered patients in terms of Cronbach's alphas, test-retest, and split-half reliability coefficients. Choosing one bizarre or crazy item on the TD Scale is related to choosing other bizarre items on the TD Scale, and choosing one non-bizarre item on the scale is related to choosing other non-bizarre items on the scale.

As previously stated, schizophrenics tend to choose bizarre items on the scale, and mood-disordered patients tend to choose non-bizarre items on the scale. One might speculate that the reason for this pattern is that schizophrenics are attracted by many of the bizarre pictures that were created with them in mind, and being thought-disordered, they are unable to resist choosing those pictures. Conversely, the mood-disordered patients who by and large are not thought-disordered, do not want to be seen as being psychotic by the investigators, and avoid choosing the bizarre pictures. The TD Scale is thus able to delineate these two groups of patients as Rudzinski (1979) had intended. Because the themes presented in the TD Scale items are very pertinent to psychiatric pathology, psychiatric patients are far more consistent on this scale
than they are on other PPT scales such as the Conflict and Non-Conflict scales included in this study. Thus the greater consistency of all psychiatric patients on the TD Scale than on the other two PPT scales is not likely the result of the TD Scale being less conflictual than the other two scales. Rather, it seems plausible that the greater consistency found on the TD Scale was due to the highly salient themes represented in the thought disorder items. Thus the greater consistency found on the TD Scale does not contradict a conflict interpretation of the results.

In the context of the preceding discussion, the overall pattern of results for Question 4 seems consistent with the notion that psychic conflict may play a role in the manifestation of thought disorder. However, the findings also suggest that this apparent relationship is not exclusive to persons diagnosed as schizophrenic.

Issue 2: Relationship of Inconsistency to Schizophrenia

Question 5: Is inconsistency a response characteristic of schizophrenics regardless of the content of the material to which they are responding? Although the findings related to conflict were not in line with all of author's predictions, the findings related to the inconsistency of responding were unambiguous in their support of the author's expectations. As predicted, schizophrenics were significantly more inconsistent than were mood-disordered patients in choosing pictures on each of the PPT scales.
included in the study (viz., the TD Scale-Revised, Conflict Scale, Conflict-Avoidance Subscale, and Non-Conflict Scale). It was not necessary to use the items on the more diagnostically relevant TD Scale to differentiate schizophrenic from mood-disordered patients. Any set of items used in the study could discriminate between the two groups. Thus Inconsistency on any of these scales could be used to measure schizophrenic responding and to detect schizophrenics. In addition, schizophrenics were significantly less consistent than were mood-disordered patients on measures of both Grid Test Intensity and Consistency.

These findings suggest that inconsistency of responding is a characteristic of schizophrenia and not just the product of how schizophrenics respond to items with a specific type of content or from a specific type of test. They are in concordance with the patchwork of previous studies demonstrating that schizophrenics are more inconsistent than other groups on a variety of measures (e.g., Wilson & Barrett, 1985). Moreover, the present findings concur with Bannister's (1962) notion that schizophrenics possess the characteristic of generally responding inconsistently or loosely, and with Shakow's (1962) postulate that schizophrenics have great difficulty maintaining or consistently using task rules such as "choose the picture you like better."
Measurement Issues

Issue 1: Validity of the TD Scale and Its Inconsistency Score

Question 6: Can the TD Scale and its Inconsistency score discriminate schizophrenic from mood-disordered patients? The author showed that both Rudzinski's (1979) Thought Disorder Scale and the Inconsistency score for the TD Scale-Revised were able to discriminate between schizophrenic and mood-disordered patients. Schizophrenic patients chose a significantly greater number of thought-disorder pictures than did mood-disordered patients on the TD Scale. In addition, schizophrenics were more inconsistent in choosing between pictures, or in other words, exhibited a stronger tendency than did mood-disordered patients to choose a different picture on the second presentation of a TD Scale item than they had chosen on the first presentation of that same item. Moreover, both the TD Scale and the Inconsistency score on the TD Scale-Revised showed a fairly good level of discriminative accuracy. Both measures were able to correctly classify at least two out of three of the patients in the study as schizophrenic or mood-disordered.

Previously, Rudzinski (1979) and Apanasiewicz (1982) had shown that the TD Scale could discriminate between thought-disordered and non-thought-disordered psychiatric patients, and between schizophrenics and university students. As well, Apanasiewicz previously found that the TD Scale-Revised Inconsistency score could discriminate
between schizophrenics and university students, and between thought-disordered and non-thought-disordered schizophrenics. The current demonstration that the TD Scale and the Inconsistency score on the TD Scale-Revised were each sufficiently sensitive to show a reliable difference between schizophrenics and another diagnostic category of patients certainly strengthens the case for the validity of these two instruments as measures of schizophrenic thinking.

Question 7: How do the TD Scale and its Inconsistency score compare to the other measures of thought disorder used in the present study in terms of validity? Considering the issue of convergent validity, the TD Scale was meaningfully correlated with the Schizophrenia and Global Assessment Scale scores of the SADS-C, as well as with the WIST and Grid Test Consistency scores. The Inconsistency score on the TD Scale-Revised was an even better measure of thought disorder, correlating with more of the criterion measures, including the Impaired Understandability (due to thought disorder), Schizophrenia, and Global Assessment Scale scores of the SADS-C, and the WIST and Grid Test Intensity and Consistency scores.

The finding that the Inconsistency score was a better measure of thought disorder than was the TD Scale is consistent with Apanasiewicz's (1982) finding that the Inconsistency score correlated with more of her criterion measures than did the TD Scale. Previously, Rudzinski (1979) had found that the TD Scale correlated with the
Thought Disorder Composite Score on the Brief Psychiatric Rating Scale (Overall & Gorham, 1962) and the Psychotic Tendencies Scale of the Differential Personality Inventory (Jackson & Messick, 1964). Apanasiewicz found that the TD Scale was correlated with the Johnston-Holzman Rorschach Index, but not with the Johnston-Holzman WAIS Index, nor with the WIST. She also found that the TD Scale-Revised Inconsistency score correlated with the Johnston-Holzman Rorschach and WAIS indices, but not with the WIST. The present demonstration that the TD Scale and the Inconsistency score correlate meaningfully with a variety of relevant criterion measures thus provides stronger evidence of the convergent validity of these Picture-Preference instruments as measures of schizophrenic thinking.

One interesting difference between Apanasiewicz's (1982) findings and the findings of the current study is that Apanasiewicz found that both the TD Scale and Inconsistency on the TD Scale-Revised were not related to the WIST, whereas the current author found that both of these Picture-Preference measures were correlated with the WIST. This discrepancy may at least in part be the result of the differences in the diagnostic criteria and composition of the samples in each study.

Apanasiewicz relied upon the diagnoses of the patients' psychiatrists to select patients who were schizophrenic. Different psychiatrists may rely on different diagnostic criteria for defining schizophrenia.
At the time of Apanasiewicz's study in 1981, some of the psychiatrists working at the hospitals at which she collected her data may have been using the International Classification of Diseases (World Health Organization, 1977), some may still have been using DSM-II (American Psychiatric Association, 1968), and some may have switched over to DSM-III (American Psychiatric Association, 1980). This state of affairs may well have introduced unreliability into the diagnoses of the patients in her sample. As well, 36% of Apanasiewicz's sample consisted of paranoid schizophrenics, a schizophrenic subgroup that has been identified by others (see Main Study Method section) as not likely to exhibit much thought disorder.

Noting that he had excluded paranoid schizophrenics from his sample and had employed a consistent set of diagnostic criteria to diagnose all of the patients, the author suspected that the present sample had a greater number of thought-disordered schizophrenics and thus a greater range of scores on the thought disorder measures than did Apanasiewicz (1982) in her sample. As McNemar (1969) has indicated, when the range of scores on any measure is restricted, that measure's correlations with other measures will be attenuated. Apanasiewicz did not include scale ranges in her results, and hence the author could not directly check on his supposition about the possible restriction of range in Apanasiewicz's study. Nevertheless, the author considered it important to investigate the
possibility that the range of scores of Apanasiewicz's subjects on the WIST and Picture-Preference scales may have been restricted relative to the range of scores on these same scales in the present study. To check on this possibility, the author reanalyzed Apanasiewicz's (1982) data; these data were included in the Appendix of her dissertation.

As Apanasiewicz had not transformed any of her score distributions, the author first transformed these scores for the WIST, Thought Disorder Scale, and the Inconsistency score on the TD Scale-Revised. To attain comparability between the author's scores and Apanasiewicz's scores, the author applied the same transformation to her scores that he had applied in the present study (viz., square root transformation). Calculating Pearson product-moment correlations on Apanasiewicz's transformed data, the author found a correlation of .23 between the WIST and the Inconsistency score on the Revised TD Scale, and a correlation of .07 between the WIST and the original TD Scale.

As the author had suspected, Apanasiewicz's sample had a restriction of range in thought disorder scores on the WIST relative to the present sample. The standard deviation of the transformed distribution of Apanasiewicz's WIST scores was 1.12, a standard deviation that is about one-half that of the WIST distribution in the present sample (S.D. = 2.01). On the other hand, the standard deviations of the
transformed distributions in Apanasiewicz's sample for the TD Scale (S.D. = .69) and the TD Scale Inconsistency score (S.D. = 1.01) were similar to those found for the same scores in the present sample (TD Scale: S.D. = .89; Inconsistency score: S.D. = .91).

In summary, Apanasiewicz's sample did not have as great a range of WIST thought disorder scores as did the present sample. To determine if Apanasiewicz's lower correlations involving the WIST and TD Scale were the product of the restriction of range on the WIST in her sample, the author applied McNemar's (1971) correction for the attenuation of correlation due to restriction of range. As previously noted, the author found a correlation of .47 between the WIST and the TD Scale; he found a correlation of .07 between the transformed scores of these two variables in Apanasiewicz's sample. The author found that the correlation between the WIST and the TD Scale in Apanasiewicz's sample corrected for restriction of range was .13. Hence even after correcting for restriction of range, the correlation between these two variables in Apanasiewicz's study is still considerably lower than that found by the author in the current sample. Thus the restriction of range on the WIST in Apanasiewicz's sample cannot fully account for the lower correlation reported in her study. No other obvious explanation for this discrepancy between the author's and Apanasiewicz's findings in this regard is available.
The restriction of range proved to be more relevant to the explanation of Apanasiewicz's finding of a much lower correlation between the WIST and the Inconsistency score than that found by the present author. As noted previously, the author found a correlation of .40 between the WIST and the TD Scale-Revised Inconsistency score in the present sample. When correcting the correlation of .23 found between these two variables in her sample, the resulting corrected correlation between the WIST and the Inconsistency score was .39. It would thus appear that the lower correlation between these two variables reported by Apanasiewicz can be accounted for as the product of the restriction of range of WIST scores in her sample. When Apanasiewicz's correlation was corrected for range restriction, it was virtually identical to the correlation found in the present sample.

Returning now to more general issues, the current findings of convergent and diagnostic validity of the TD Scale and the Inconsistency score on the TD Scale-Revised certainly strengthen the case for the validity of these Picture-Preference measures as indices of thought disorder. Moreover, rather than being a contaminant that should be statistically controlled, as Apanasiewicz (1962) had originally believed, inconsistency is actually a better measure of thought disorder than is the TD Scale.
Issue II: Scoring the Grid Test

Question 8: Are there more elegant and convenient ways of scoring the Grid Test than the methods devised by Bannister? As response inconsistency is most relevant to schizophrenia, and as the Grid Test is the most frequently-used measure of inconsistency in schizophrenia research, the author wished to investigate the possibility of using other means of scoring the Grid Test. In addition to using the Intensity score, the author introduced two measures of within-grid consistency: the Determinant and the Kendall Within-Grid (Perseveration) score. In addition to using the Consistency score, he introduced two measures of between-grid consistency: the Chi-Square index of the goodness of fit between the two grids, and the Kendall Between-Grid score. The Grid Test measures tended to correlate with each other, the most notable correlation being between Bannister's Intensity score and the Determinant score ($r = -0.75$); this correlation suggests that the Intensity score is largely a measure of the generalized variance of the two Grid Test matrices. As in previous studies (e.g., Bannister & Fransella, 1966), the Intensity score correlated significantly with the Consistency score ($r = 0.58$).

The notable findings with these scores were as follows. Considering Bannister's original scores, the Consistency score was a better measure of schizophrenia and thought disorder, as it correlated with more of the diagnostic and
thought disorder variables than did the Intensity score. This finding is corroborated by the results of previous studies that show that Grid Test Consistency scores discriminate more powerfully between groups of patients than do measures of the intensity of construct relationships (Radley, 1974). With regard to the new Grid scores, the Chi-Square score holds some promise as a measure of thought disorder, as it was the only Grid Test score that correlated meaningfully with Impaired Understandability, the scale used to assess the presence of thought disorder in the SADS-C interview. The Kendall Within-Grid, or Perseveration score, also holds some promise as it correlated meaningfully with the WIST and the Global Assessment Scale. As well, it differentiated between the two diagnostic groups. The schizophrenics perseverated more, or in other words, exhibited a stronger tendency than did mood-disordered patients to rank the photographs in the same order regardless of the construct being presented to them.

The observed diagnostic utility of the Perseveration score on the Grid Test is consistent with findings that perseveration is a useful index of thought disorder on other tests (e.g., Johnston & Holzman, 1979). The positive results obtained with the Perseveration and Chi-Square scores in the present study suggest that further research on these scores is warranted. The author included decile norms for the three within-grid scores and the three between-grid scores in Tables 28 and 29, as a reference for future
researchers.

With regard to the meaning of these new Grid Test scores, the Perseveration score taps the degree to which the subject ranks the photographs in the same order regardless of the construct being presented to him. In other words, it assesses the patient's level of stereotypic thinking not taking into account the meaning of the constructs. This contrasts with the original within-grid score, Intensity, which assesses stereotypic thinking that does take into account the meanings of the various constructs. Bannister (Bannister, Fransella, & Agnew, 1971) claimed that the Intensity score measures the variability or looseness among the construct relationships. The determinant measures the total amount of variability or looseness among the construct relationships; it is a more complete measure of looseness than is the original Intensity score. Nevertheless, the Intensity score does tap looseness or variability to a considerable extent, as is evidenced by its correlation of -.75 with the Determinant. The intercorrelations among these scores also show that the Perseveration score is correlated positively with the Determinant ($r = .36$) and negatively ($r = -.49$) with the Intensity score, indicating that as the level of perseveration increases, the degree of looseness among the constructs increases, and the intensity of relationships among the constructs decreases.

Considering the between-grid measures, Bannister (Bannister et al., 1971) created the Consistency score to
measure the degree to which the subject maintains the pattern of relationships among the constructs from Grid 1 to Grid 2. The most direct measure of the consistency of these construct relationships from grid to grid is the Chi-Square score used in the present study. Surprisingly, the Chi-Square score did not correlate meaningfully with Bannister's Consistency score, which may suggest that this Bannister score does not measure exactly what Bannister had intended it to measure. The Chi-Square measure, however, does correlate negatively with the Determinant ($r = -.49$), indicating that as the looseness of construing increases, the consistency of ranking on the constructs from Grid 1 to Grid 2 decreases.

**Issue III: Relationship of the Picture Preference Test to the Grid Test**

**Question 9:** What is the relationship of inconsistency on the PPT to inconsistency on the Grid Test? Regarding the relationship between inconsistency on the Picture-Preference Test and inconsistency on the Grid Test, the current results clearly show that inconsistent responding on the PPT is related to inconsistent responding on the Grid Test. That is, the tendency to be inconsistent in choosing pictures on the Picture-Preference scales is related to the tendency on the Grid Test to rank the photographs on the constructs in an inconsistent or meaningless fashion. To be more precise, inconsistency on the Picture-Preference scales is more
related to within-grid consistency than to between-grid consistency on the Grid Test. Furthermore, of the three within-grid scores, Perseveration is the one most related to PPT Inconsistency.

Conclusions

Thought disturbance plays an important role in psychiatric disorder. In the case of schizophrenia, it is considered a defining feature. It is therefore important to discover factors involved in the etiology of thought disturbance. In testing hypotheses based on Katan's (1960) theory of conflict, the present study provided findings that point to intrapsychic conflict as a likely agent in this puzzling phenomenon. Although some of the author's predictions stemming from Katan's (1960) theory were not substantiated, the data suggest that psychic conflict may be involved in the development and manifestation of thought disorder.

Using response inconsistency as an index of thinking disturbance or disorganization, there was a nonsignificant trend suggesting that criterion measures of thought disorder were related to inconsistency on scales depicting conflictual themes, but not related to inconsistency on a scale depicting non-conflictual themes. Stronger support for Katan's theory (1960) was provided by the finding that patients showed a greater breakdown of thought consistency on the Conflict Scale than they did on the Non-Conflict
Scale. Overall, the data seemed to indicate that conflict may play a role in the development and manifestation of thought disorder, although apparently not the central role that Katan (1960) had envisioned in his theory. The data also suggested that the relationship between conflict and thought disorder is not exclusive to persons diagnosed as schizophrenic.

What does seem exclusive to schizophrenics is the degree of inconsistency that they show in responding to a variety of measures. Inconsistency on each of the PPT scales as well as on the Grid Test was able to discriminate between schizophrenic and mood-disordered patients. Inconsistency thus seems to be a general characteristic of schizophrenics, a finding that fits with Bannister's (1962) notion that schizophrenics possess a general tendency to behave inconsistently, and Shakow's (1962) theory that schizophrenics possess a deficit in the ability to consistently use or maintain a response rule such as "choose the picture you like better."

In addition to shedding light on theoretical issues concerning conflict and inconsistency, the present study provided useful information on the measurement of thought disorder. As the available measures of thought disorder are generally cumbersome and influenced by factors irrelevant to thought disorder, the current findings with the Thought Disorder Scale seem especially promising. The results certainly bolster the case for the scale. Both the Thought
Disorder Scale and the Inconsistency score on the Thought Disorder Scale-Revised discriminated schizophrenics from mood-disordered patients, and correlated with a variety of relevant criterion variables. As well, these PPT measures did not correlate with any of the patient demographic characteristics, whereas the WIST correlated with sex, education, and social status. Further research might include developing this scale as a clinical measure.

Given the demonstration in the present study of the importance of inconsistency to schizophrenia and thought disorder, it is valuable to provide new methods for scoring the most widely-used measure of inconsistency, the Grid Test. Of Bannister's original scores, the Consistency score was related to more of the diagnostic and thought disorder measures than was the Intensity score, which suggests that the Consistency score is a more useful measure than the Intensity score. Of the new scores introduced by the author (viz., Determinant, Kendall-Within, Chi-Square, and Kendall-Between), the two that seem promising are the Chi-Square score and the Kendall-Within score. The Chi-Square score, a between-grid consistency measure, was the only score to correlate with the assessment of formal thought disorder that was made in the SADS-C interview. The Chi-Square score thus seems to have some promise as an indicant of the manifest thought disorder that one can directly observe in an interview. The Kendall Within-Grid or Perseveration score was related to the WIST; it also.
discriminated between the two diagnostic groups. Both of these scores could be used in future research.

In summary, inconsistency seems to be a hallmark of schizophrenia. The presence of conflictual material exacerbates inconsistent thinking in schizophrenics as well as in other patients, a finding that fits with the notion that psychic conflict may play a role in the development and manifestation of thought disturbance. Given the relevance of inconsistency to both schizophrenia and thought disorder, the TD Scale-Revised Inconsistency score and the new Grid Test scores introduced by the author may prove to be valuable instruments in future research and in clinical work with schizophrenics.
APPENDIX A

Description of Items from Rudzinski's Thought Disorder Scale

A star (*) placed next to a picture description designates the keyed choice reflecting thought disorder.

Part I Thought Disorder Scale-Revised (TD-R)

Each of the items in this scale is presented twice to each subject.

<table>
<thead>
<tr>
<th>Item Nos.</th>
<th>Picture A</th>
<th>Picture B</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. &amp; 138.</td>
<td>A tree and a key*</td>
<td>A key and a lock</td>
</tr>
<tr>
<td>17. &amp; 98.</td>
<td>Drooping Flower*</td>
<td>Three upright flowers</td>
</tr>
<tr>
<td>24. &amp; 112.</td>
<td>Baseball and bat</td>
<td>Ball, and child crawling*</td>
</tr>
<tr>
<td>27. &amp; 127.</td>
<td>Simplified, childlike</td>
<td>Well-drawn head of a man</td>
</tr>
<tr>
<td></td>
<td>drawing of a figure*</td>
<td></td>
</tr>
<tr>
<td>30. &amp; 125.</td>
<td>Nails and a pail*</td>
<td>Hammer and nails</td>
</tr>
<tr>
<td>32. &amp; 103.</td>
<td>Birthday cake, fork,</td>
<td>Birthday cake and snake*</td>
</tr>
<tr>
<td></td>
<td>and glass</td>
<td></td>
</tr>
<tr>
<td>33. &amp; 128.</td>
<td>Girl standing; intact</td>
<td>Same picture of girl</td>
</tr>
<tr>
<td></td>
<td>figure</td>
<td>split into segments*</td>
</tr>
<tr>
<td>38. &amp; 104.</td>
<td>Two eyes behind a</td>
<td>Broken lamp on floor</td>
</tr>
<tr>
<td></td>
<td>broken lamp*</td>
<td>beside table</td>
</tr>
<tr>
<td>45. &amp; 140.</td>
<td>Mop and broom</td>
<td>Mop and ice cream cone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>that's dripping*</td>
</tr>
<tr>
<td>55. &amp; 136.</td>
<td>Chair</td>
<td>Broken chair*</td>
</tr>
<tr>
<td>60. &amp; 88.</td>
<td>Full length view of boy</td>
<td>Framed picture of same boy*</td>
</tr>
</tbody>
</table>
Item Nos.  Picture A  Picture B
61. & 116. Milk carton, shaving  Milk carton, coffee 
cream and razor*
cup, and spoon
69. & 110. Girl watching TV screen  Same picture without
from which an arm is  arm extending out of
extended* TV
71. & 154. Saw and screwdriver  Saw and set of false
tooth*
78. & 133. Saw and apple*  Tree and apple

Part II  Items of Rudzinski's Thought Disorder Scale
that are not in the Revised Version.

Each of these items is presented once to each subject.

Item No.  Picture A  Picture B
1.  Woman with shoulder bag  Handbag and pair of
shoes*
14.  Child walking under sun  Same child falling--
cloud across sun*
15.  Spoon, fork, sword*  Spoon, fork, knife
20.  Telephone receiver  Telephone receiver with
mouth on listening end
of receiver*
54.  Woman talking with child  Woman with raised arm
yelling at child*
59.  Train, chain, rain*  Train and car
75.  Pair of shoes and pair  Pair of socks and a
of socks  box*
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Picture A</th>
<th>Picture B</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.</td>
<td>Spool of thread with threaded needle</td>
<td>Eye of needle and an eye of a person*</td>
</tr>
<tr>
<td>109.</td>
<td>Young girl</td>
<td>Teddy bear*</td>
</tr>
<tr>
<td>114.</td>
<td>Lamp and light-bulb</td>
<td>Lamp and umbrella*</td>
</tr>
<tr>
<td>115.</td>
<td>Child touching sun with hand*</td>
<td>Same scene but child is not touching sun</td>
</tr>
<tr>
<td>119.</td>
<td>An &quot;eight-ball&quot; and a clock showing 8 o'clock*</td>
<td>Clock showing 8 o'clock, and a watch showing 8:30</td>
</tr>
<tr>
<td>120.</td>
<td>Boat and a leaky faucet*</td>
<td>Boat and two oars</td>
</tr>
<tr>
<td>142.</td>
<td>Figure of a girl</td>
<td>Girl attached to puppet strings*</td>
</tr>
</tbody>
</table>
**APPENDIX B**

**Description of Items in the Picture-Preference Conflict Scale**

**Part I. Conflict Avoidance Subscale (11 items)**

A star (*) placed next to a picture description designates the keyed choice reflecting the avoidance of conflict.

<table>
<thead>
<tr>
<th>Item Nos.</th>
<th>Picture A</th>
<th>Picture B</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. &amp; 26.</td>
<td>A girl thinking about a grave</td>
<td>Same girl thinking about husband &amp; child*</td>
</tr>
<tr>
<td>7. &amp; 87.</td>
<td>A man hanging from a cliff holding a branch with one hand*</td>
<td>Same man crumpled on the ground at the foot of the cliff</td>
</tr>
<tr>
<td>9. &amp; 152.</td>
<td>A child asleep in a crib*</td>
<td>A man and woman sleeping together</td>
</tr>
<tr>
<td>11. &amp; 106.</td>
<td>Shower room with several men, nude, with partition covering genitals</td>
<td>Soldier in fatigues peeling potatoes*</td>
</tr>
<tr>
<td>12. &amp; 77.</td>
<td>A man and a woman kissing</td>
<td>Scene inside movie theatre*</td>
</tr>
<tr>
<td>13. &amp; 105.</td>
<td>Man and woman watching television, separate chairs*</td>
<td>Man with his arm around a woman sitting listening to music</td>
</tr>
<tr>
<td>31. &amp; 65.</td>
<td>Bedroom, two figures in bed</td>
<td>Same, one figure in bed*</td>
</tr>
<tr>
<td>53. &amp; 132.</td>
<td>A woman in a bathing suit</td>
<td>Same woman cooking at a stove*</td>
</tr>
</tbody>
</table>
Item Nos. | Picture A | Picture B
--- | --- | ---
56. & 97. | A woman in bed being examined by a male doctor* | Same scene with female doctor* |
108. & 137. | Two couples playing cards* | Woman on a man's shoulders in a swimming pool |
126. & 134. | A baby being bottle fed* | Baby being breast fed |

Part II. Additional Conflict Scale Items

42. & 123. | A man being whipped | A woman being whipped |
52. & 121. | "The Kiss" by Rodin | Statue of a nude woman carrying a jug. |
79. & 96. | Two men arguing | Same, with backs to each other, mad |
84. & 99. | A picture of a mouth | A picture of two eyes |

Items that were replaced

7. & 87. | A baby with pacifier in mouth | Same baby looking at mobile |
9. & 152. | An older man feeding himself | Same man being fed by a hand |
42. & 123. | A double bed | Twin beds |
84. & 99. | A man passing a woman in the street not turning to look | Same scene with man glancing back at woman's legs |
126. & 134. | Construction worker whistling at a woman | Woman bank teller taking care of another woman |
<table>
<thead>
<tr>
<th>Item Nos.</th>
<th>Picture A</th>
<th>Picture B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. &amp; 144</td>
<td>Mathematician writing formula</td>
<td>Physician writing prescription</td>
</tr>
<tr>
<td>4. &amp; 148</td>
<td>A news magazine</td>
<td>A movie magazine</td>
</tr>
<tr>
<td>5. &amp; 118</td>
<td>Man looking at birds</td>
<td>Man looking at birds through binoculars</td>
</tr>
<tr>
<td>19. &amp; 35</td>
<td>Poker table with cards and chips</td>
<td>A scrabble board with some pieces displayed</td>
</tr>
<tr>
<td>21. &amp; 130</td>
<td>Flower and stem</td>
<td>Flower and stem in a vase</td>
</tr>
<tr>
<td>25. &amp; 111</td>
<td>One ten dollar bill</td>
<td>Two five dollar bills</td>
</tr>
<tr>
<td>37. &amp; 43</td>
<td>Superman</td>
<td>A muscular stevedore</td>
</tr>
<tr>
<td>40. &amp; 143</td>
<td>An escalator</td>
<td>An express elevator with door closed</td>
</tr>
<tr>
<td>46. &amp; 117</td>
<td>Abstract of open hand with pointed fingers</td>
<td>Armadillo</td>
</tr>
<tr>
<td>50. &amp; 62</td>
<td>A car going over a bumpy road</td>
<td>Road showing a detour sign pointing to another road at right angles</td>
</tr>
<tr>
<td>51. &amp; 85</td>
<td>A dog running through the woods</td>
<td>A cat curled up by fire</td>
</tr>
<tr>
<td>72. &amp; 122</td>
<td>13 14 15 16</td>
<td>2 4 8 16</td>
</tr>
<tr>
<td>Item Nos.</td>
<td>Picture A</td>
<td>Picture B</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>76. &amp; 131.</td>
<td>A roaring fireplace</td>
<td>A hot bath</td>
</tr>
<tr>
<td>80. &amp; 141</td>
<td>A toy top</td>
<td>A large ball</td>
</tr>
<tr>
<td>93. &amp; 145.</td>
<td>A row of numbered telephone poles</td>
<td>Same poles without numbers</td>
</tr>
<tr>
<td></td>
<td>receding numbers into the horizon</td>
<td></td>
</tr>
</tbody>
</table>

**Items that were replaced**

<table>
<thead>
<tr>
<th>Item Nos.</th>
<th>Picture A</th>
<th>Picture B</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. &amp; 111</td>
<td>Priest walking and reading</td>
<td>Priest preaching from the pulpit</td>
</tr>
<tr>
<td>80. &amp; 141</td>
<td>An organ grinder and monkey</td>
<td>A freak show at a circus</td>
</tr>
<tr>
<td>93. &amp; 145</td>
<td>Hand cutting difficult knot</td>
<td>Same with hand-untying knot</td>
</tr>
</tbody>
</table>
APPENDIX D

SADS-C Scales

A. Schizophrenia Items:

1. Distrustfulness 240
2. Presence and severity of delusions 241
3. Presence and severity of hallucinations 242
4. Impaired understandability due to psychopathology 250
5. Inappropriate affect 252
6. Blunted affect 252
7. Bizarre behavior 253

B. Mania Items:

1. Elevated mood 235
2. Needs less sleep due to mania 236
3. More energetic 237
4. Increased activity 238
5. Grandiosity 239

C. Depression Items:

1. Depressive mood 213
2. Worrying 214
3. Self-reproach 215
4. Negative self-evaluation 216
5. Discouragement 217
6. Suicidal tendencies 218
7. Somatic anxiety 219
8. Psychic anxiety 220
9. Insomnia 223
10. Lack of energy 227
11. Poor appetite 228
12. Hypochondriasis 229
13. Loss of interest 230
14. Subjective anger 231
15. Overt irritability 232
16. Agitation 233
17. Psychomotor retardation 234
18. Worse in morning 247
19. Worse in evening 248
20. Weight loss 249

D. Global Assessment Scale

1. Lowest level of functioning in past week 244
APPENDIX E

RESEARCH CONSENT FORM

RESEARCHER: Richard Galgan, M.A.

We are studying how patients choose pictures.

METHOD:

The researcher will talk to you for a while, and then ask you to look at some pictures and fill out a short form.

RISKS / TIME:

There are no risks. The study will take about 1 1/2 to 2 hours.

CONFIDENTIALITY:

Your identity will be kept in strict confidence. Only the researcher will know your name.

BENEFITS:

The results of the study may help us to better understand and treat your illness.

I consent to participate in the study outlined above. The nature of the study has been explained to me.

Patient

Witness

Date
REFERENCES


Katan, M. (1961). Personal communication to Dr. Frank Auld, Wayne County Medical Society Meeting, Detroit, Michigan.


VITA AUCTORIS

Richard Galgan was born in Winnipeg, Manitoba, Canada on February 27, 1960, the son of Norma and Frank Galgan. He graduated from Glenlawn Collegiate, Winnipeg, Manitoba, in June, 1978. He later enrolled at the University of Winnipeg, Winnipeg, Manitoba, and graduated with an Honours Bachelor of Arts degree in October, 1983. He began his studies in the graduate program in clinical psychology at the University of Windsor in September, 1983. He obtained a Master of Arts degree in June, 1985. He was married to Harriett Mable in July, 1986.