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# DEVELOPMENT AND VALIDATION OF A PICTURE-PREFERENCE-TEST THOUGHT DISORDER SCALE.

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DEVELOPMENT AND VALIDATION OF A  
PICTURE-PREFERENCE-TEST THOUGHT DISORDER SCALE

by

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B.A. University of Illinois, 1972

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A Dissertation

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## ABSTRACT

In the present study, the author has developed a scale to measure thought disorder, utilizing a picture-preference format. In doing this, he created 31 items, each of which comprised two pictures, one of which would be expected to appeal more to a person suffering from thought disorder than to a person who was not. He also tried out 25 items that had been shown, in a previous study by Ryan (Reference Note 7), to correlate with the Differential Personality Inventory "Psychotic Tendencies" scale. Participants in the studies which constituted this project included 70 acutely-disturbed hospitalized psychiatric patients, 189 university undergraduate students, and 31 adults who were neither patients nor students.

The author administered the thought-disorder picture-preference items, embedded in a picture-preference test (hereafter called PPT) having a total of 210 items, along with the Differential Personality Inventory (DPI), to 70 inpatients and to 51 nonpatients. He also interviewed each of the patients and rated them on the Brief Psychiatric Rating Scale (BPRS). In addition, he gave the PPT to a further 100 nonpatients, who did not also take the DPI.

The 31 items that the author had developed by an a priori approach formed an internally consistent scale, with an alpha coefficient (in the patient group) of .72. The 25 empirically-selected items were not homogeneous; alpha was estimated as -.04.

The 31 item scale had an  $r$  of .38 with a composite

of the Conceptual Disorganization, Hallucinatory Behavior, and Unusual Thought Content scales of the BPRS;  $df = 68$ ,  $p = .001$ . The empirically derived scale had an  $r$  of  $-.07$  with this composite. The 31-item scale correlated significantly with the DPI Psychotic Tendencies Scale;  $r(68) = .26$ ,  $p < .01$ . The empirical scale did not correlate significantly;  $r(68) = .14$ ,  $p = .12$ .

When patients are called "thought-disordered" if they were rated as showing any pathology on any of the three scales used in the composite, and called "non-thought-disordered" when they had no such rating, one can discriminate among thought-disordered patients, non-thought-disordered patients, and non-patients by means of the 31-item PPT scale. An analysis of covariance, controlling for sex, age, social position, and DPI Desirability score, yielded a significant main effect for groups;  $F(2, 114) = 10.34$ ,  $p = .0001$ .

The author concludes that the 31 item PPT thought-disorder scale is reasonably reliable and that it is significantly related to behavioral ratings of thought disorder. If this PPT scale is used to discriminate thought-disordered patients from non-patients, the percentage of correct classifications is 31. The author also concludes that the scale built on an a priori basis was successful, whereas the scale developed by a sheerly empirical approach was not.

#### ACKNOWLEDGMENTS

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## CHAPTER 1

Students of abnormal behavior have long been aware that disturbances of thinking are an important aspect of psychosis. Kraepelin (1919), trying to classify the different kinds of mental disorder, noticed that an incoherence of train of thought went with other symptoms of patients whom he labelled as having "dementia praecox." Bleuler (1951), looking at the same group of patients, was particularly struck by a looseness in association and by an autism in their thinking. He believed that these were the primary symptoms of what he designated as schizophrenia. More recent writers, too, have commented on a connection between disordered thinking processes and severe (i.e., psychotic) psychopathology. Brody and Redlich (1952), Cameron (1963), and Wing (1974) have emphasized disordered thinking as a cardinal manifestation of schizophrenia. Andreasen and Powers (1974) noted that psychiatric researchers have not only accepted disturbed thinking as the single most significant characteristic of schizophrenia, but have also discovered such disordered thought in persons with severe affective disorders. Thus the observation that disordered thought processes are characteristic of certain psychopathological conditions has provoked researchers to develop conceptual models for understanding thought disorder, and to develop clinical measures to identify it.

Those who have constructed the currently available measures of thought disorder have generally derived these from conceptual models for explaining disordered thinking. These models may not be adequate; furthermore, the approaches to measurement may be flawed. Because, in my opinion, these measures have serious limitations -- soon to be discussed -- I attempt, in the present study, to develop a new and better measure of thought disorder.

#### Conceptual Models of Thought Disorder

Von Domarus (1944), attempting to explain thought disorder, proposed that disturbed thinking occurs when the principles of logic are misused. Von Domarus, and subsequently Arieti (1951) argued that the thought-disordered individual draws conclusions in a manner different from that of the non-psychotic, adult of average or above-average intelligence. Specifically, these authors suggested that thought-disordered schizophrenics accept identity on the basis of identical predicates, rather than on the basis of identical subjects. An example of the use of such logic has been represented by Arieti (1951) as follows:

The virgin Mary is a virgin

I am a virgin

Therefore, I am the virgin Mary. (p. 230-231)

Thus authors such as Von Domarus and Arieti have attempted to explicate thought disorder as a defect in reasoning processes.

Goldstein (1944) viewed thought disorder as involving a deficit in abstract thought capacity. He proposed that abstract and concrete attitudes do not represent habits or acquired mental sets, but rather capacity levels of the total personality. Thus when the abstract attitude is impaired, the individual cannot help being influenced by the immediate experience of things or situations in their particular uniqueness. Mature adults who do not demonstrate such an impairment in abstract attitude are, according to Goldstein, able to transcend the immediately given specific aspect or sense impression. Such a normally functioning individual is able to "abstract" concepts from the stimuli in the environment. Goldstein contended that a capacity for abstract attitude was basic to the following abilities:

- (a) the ability to assume a mental set voluntarily,
- (b) the ability to shift voluntarily from one aspect of a situation to another,
- (c) the ability to keep in mind simultaneously various aspects of a situation,
- (d) the ability to grasp the essential from the given whole,
- (e) the ability to detach one's ego from the outer world.

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Goldstein proposed that the normal adult is able to utilize both the concrete and abstract modes of thinking. Individuals with an abstract attitude deficit, on the other hand, were limited to concrete reasoning processes. Goldstein considered the disordered thought of the schizophrenic to represent thought processes which were determined to a pathological extent by the individual's own feelings and experiences. Recently, the explanation of thought disorder offered by Goldstein has been expanded, as a result of research. Shimkunas (1972) has modified Goldstein's model so as to explain thought disorder as resulting from both over- and under-generalization, which he says are alternative manifestations of a deficit in abstract attitude. According to this model, disordered thinking may involve concrete thought or thought which is autistic, idiosyncratic, or overly-general.

Authors have also attempted to explain thought disorder using developmental cognitive theories. Kasanin (1944), for example, proposed three stages of cognitive development consistent with Goldstein's notions. Kasanin claimed that the first stage or level of cognitive developmental functioning involved physiognomic thinking whereby the child animates objects and projects his own ego into objects. (For example: the child playing with sticks may consider them to be alive and to be horses.) Stage two of cognitive development,

according to Kasanin's model, is concrete, literal, realistic thinking on the part of the child. It is only with the onset of adolescence that the individual is able to abstract, to generalize, and to engage in categorical thinking. Thought disorder, as conceptualized by Kasanin, represents cognitive functioning at a stage of development earlier than that which is generally achieved by individuals during adolescent years.

Trunnell (1964, 1965) has made use of Piaget's developmental concepts in explaining thought disorder. He has noted that Piaget described the child at ages 7-11 to be functioning at a "concrete operational stage." During this stage of development, the child's thought is limited to concrete, perceptually-based manipulation of ideas. The child at this stage is unable to apprehend simultaneously more than one initial premise in problem-solving. Thus authors such as Trunnell have attempted to conceptualize thought disorder as a developmentally earlier level of cognitive functioning than that of mature adults not suffering from severe psychopathology.

Turning now to psychoanalytic ideas, we note that Freud (1911, 1947) conceptualized mental functioning as involving two processes of thinking. "Primary process" thought, Freud said, has as its aim the immediate gratification of wishes regardless of the demands of reality. "Secondary process" thinking represents conventional, logical, rational cognitive processing. According to Freud's model, primary process lacks



these properties. Thought disorder, in keeping with this model, Freud conceptualized as the expression of primary process thought emerging as a result of impaired ego functions. He viewed thought disorder in schizophrenia to result from a withdrawal of libido from environmental objects, or rather from representations of objects. Withdrawal from part of reality, Freud proposed, was represented by regression in psychosis.

Cameron (1963), attempting to explain the nature of thought disorder, expanded upon Freud's model. He identified a number of characteristics of disordered thinking, most notably overinclusion, which he viewed as representing an inability to retain boundaries of a problem within appropriate limits. Cameron (1963) characterized overinclusive disordered thinking as:

The result of an unstable ego organization which fails to limit the number and kind of simultaneously effective excitants to a relatively few coherent ones. (p. 613)

Cameron, like Freud, considered thought disorder as a symptom of psychopathology to represent a breakthrough of primary process thinking, and to represent:

regressive attempts to escape tension and anxiety by abandoning realistic interpersonal object relations and constructing delusions and hallucinations. (p. 584)

Authors such as McGhie (1966) have attempted to explain thought disorder utilizing a more physiological, information-processing approach. Thus these authors conceptualize thought disorder as a pathological distractability, a deficit in effective attention. Drawing upon the information-processing model of Broadbent (1958), McGhie (1966) proposed that disordered thinking involves a deficit in the effective selection or filtering of stimuli. However, McGhie has noted that whereas thought disorder may belie a vulnerability to distraction by environmental stimuli, distractability does not adequately explain all manifestations of disordered thinking observed in severely disturbed individuals.

Emphasizing the observations of Bleuler (1951) and others that inappropriate association of ideas is characteristic of thought disorder, a number of authors have offered explanations of disordered thinking based upon learning theory. Mednick (1958), for example, trying to explain loose associations, made use of hypotheses that there are (a) a reduction of stimulus discrimination and (b) excessive stimulus generalization which account for thought disorder. More recently, authors such as Broen and Storms (1966) and Boland and Chapman (1971) have expanded upon Mednick's original model, characterizing thought disorder in terms of relative strengths of associational habits or response tendencies, as exaggerated by increased levels of arousal.

Bannister (1960) has recently offered an explanation

of thought disorder which has stimulated a considerable amount of empirical investigation. His efforts to explain the observation of disturbed associational processes in severely distressed individuals have involved utilization of Kelly's (1955) Personal Construct Theory. Thus Bannister and associates have conceptualized thought disorder as a manifestation of a loosening of relationships among constructs due to the repeated experience of invalidation. "Constructs," according to Bannister, are elements of a system for each individual which the individual used in order to codify his experiences. The disruption of such systems of codified experiences, according to this model, is represented by the observed disordered thought processes of severely disturbed individuals who are traditionally characterized as being psychotic.

These major efforts to conceptualize thought disorder have stimulated the development of a number of tests. The research using these tests has had as its purpose both the testing of hypotheses derived from these explanatory models and the development of a means for effective clinical diagnosis. It is the latter objective -- developing a clinically useful test -- which is the motivation for the present study. As I will point out in the following section, there are serious limitations of the presently existing measures of thought disorder that were derived from models presented above. A review of these measures and of their limitations has prompted

the development of an alternative format for the measurement of thought disorder.

Empirical Evaluation of Test of Thought Disorder:

Evidence for the Need of an Alternative Measurement

Format

Proponents of Goldstein's (1944) and of Von Domarus' (1944) models of thought disorder have used proverb problems and object-sorting-tasks for the purpose of discriminating thought-disordered individuals from individuals without thought-disorder. A number of researchers have found that the discrimination of thought-disordered individuals using these measures is confounded by a number of variables. Reed (1970) and Wright (1975) have found that performance on proverb problems is significantly related to vocabulary-test performance and to level of intelligence. Hemsley (1976) found that performance on object-sorting-tasks is related to intelligence level, to memory ability, and to general level of responsiveness to testing. Siegel et al. (1976) have commented upon the influence of level of responsiveness to testing among severely disturbed psychiatric patients. They've demonstrated the extent to which deviation in responsiveness to testing is characteristic of severely disturbed individuals and the extent to which this variable confounds test interpretation. Other researchers have also provided evidence that intelligence level, memory ability, and level of responsiveness to testing confound the measurement of thought disorder when proverb

tasks and object-sorting-tasks are used.

Cameron (1944) also used an object-sorting-task to measure overinclusiveness of thinking. Subsequently, Payne and associates (1960, 1962a, 1962b, 1971, 1973) have presented evidence supporting the explanation of thought disorder as over- or under-inclusive thinking using the object-sorting-task format. However, other researchers have shown that extraneous influences upon object-sorting-test performance limit its usefulness for measuring over- and under-inclusive thinking. Both Hawks and Payne (1971) and Bromet and Harrow (1973) showed that level of responsiveness to testing is related to object-sorting-test performance and that disturbances in levels of responsiveness are characteristically associated with severity of distress among psychiatric patients. Furthermore these researchers contended that object-sorting-test performance simply reflects behavioral overinclusiveness and not conceptual overinclusiveness. Price (1970) has shown that memory failure of acutely and severely disturbed psychiatric patients effects this group's performance on an object-sorting format test. Thus there is evidence that object-sorting-tests do not adequately measure disordered thinking.

Researchers have also used object-sorting-tasks in attempts to test hypotheses about thought disorder developed from the Piagetian model of cognitive functioning (Andreasen and Powers, 1976). Thus the limitations of the test format I've outlined in the previous paragraph apply also to this approach to measuring disordered thinking. Furthermore

Kilburg and Siegel (1973) have stated that Piagetian-type developmental tasks which have been used in testing hypotheses about thought disorder are not adequately standardized. Researchers such as Trunpell (1964, 1965) have used the combination of a variety of tasks in order to measure thought disorder. However, evidence for the adequacy with which such test combinations measure disordered thinking per se is not available.

The work of Rappaport, Gill, and Shafer (1945, 1946, 1968) exemplifies the psychodynamically-oriented approach to the measurement of thought disorder. These authors applied the concept of pathognomic verbalizations in interpreting performance on such tests as the WAIS and the Rorschach test. Rappaport and associates, for example, have described several Rorschach test response styles which they've interpreted as indicative of disordered thinking processes. "Fabulized responses" on the Rorschach test, according to Rappaport and associates, represent inappropriate elaboration upon a percept with little attention to the limitations of the test stimuli. "Fabulized combinations" represent apparently impossible perceptual combinations which indicate unrealistic thinking (for example: a response such as "two dogs climbing on a butterfly.") "Confabulations" are responses to Rorschach test stimuli in which the subject brings different percepts into a single concept.

Rappaport and associates called responses reflecting an inability to keep percepts and corresponding concepts distinct from one another "contaminations." An example, according to these authors, of fusing ideas together with little regard for reality is calling a red-colored form on a Rorschach card "a bloody island where there had been a revolution." Rappaport and associates called a response such as "it looks like the north pole because it's on the top of the card" an example of "autistic logic."

Silverman and associates (1962) have reviewed studies using the Rorschach test to measure thought disorder. They've concluded that the test is a valuable instrument for detecting formal aspects of primary process thinking. However, level of responsiveness to testing and verbal-expressive proficiency are related to performance on the Rorschach test. Furthermore the test can require an extensive time investment both for the examiner and for the patient.

Bannister and Fransella (1971) developed a Grid Test of Thought Disorder in attempts to measure loosening among the personal constructs of individuals. They have reported some success in discriminating thought-disordered patients from non-thought disordered patients using this test. However, Hemsley (1976) has shown that performance on Bannister's grid test requires substantial memory skills. He has also shown that memory ability is likely to be compromised at the time that psychiatric patients are acutely and severely disturbed.

Thus there are limitations to the adequacy with which Bannister and Fransella's grid test may measure thought disorder.

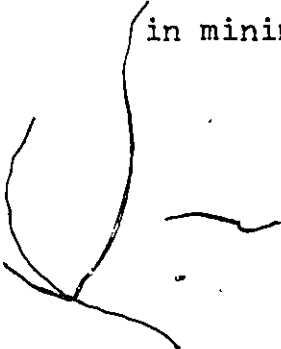
Because thought disorder is a cardinal symptom of schizophrenia, one would anticipate that tests designed to measure this condition should discriminate thought-disordered persons from non-thought-disordered persons. The MMPI, for example, is a widely used test that has a Schizophrenia scale. One might reasonably expect that this scale could serve as a measure of disordered thinking. However, Jackson and Messick (1967) have shown in several factor analytic studies that the confounding effects of response styles seriously limit clinical interpretation of the substantive scales. For samples of university students, of psychiatric patients, and of prison inmates, these authors found that tendencies to respond in a socially desirable manner and to acquiesce in response to item statements best accounted for the performance of these subjects. As a result of their findings, Jackson and Messick have questioned the clinical utility of the MMPI and the item format it exemplifies.

A recently devised pencil and paper test, the Whitaker Index of Schizophrenic Thinking (Whitaker, 1973), shows a degree of effectiveness in discriminating thought-disordered persons from non-thought-disordered persons. The format of this test requires the reading of words and of statements for which a number of alternative responses are



provided. For each item, response alternatives are an appropriate association, a loose association, an association of reference, and a nonsense association. The subject chooses one alternative per item. Thus within-item level of responsiveness to testing is controlled. Nonetheless Whitaker's test does require reading and language comprehension skills and it can potentially require a substantial time investment on the part of patients whose distress may dispose them to be distractable.

In summary, the literature indicates that the current tests of thought disorder have serious limitations. A testing format is called for which minimizes the confounding of performance by factors such as level of responsiveness, deployment of attention, intelligence level, memory skills, reading and verbal-expressive skills. Because patients' distress, their distractability, and the medications that they are taking while in the hospital, may interfere with their performance on a test, we need a measure of thought disorder that demands only a reasonable time commitment and that elicits sufficient interest to ensure cooperation. These observations have led the author to try out a picture-preference test format for a thought disorder scale. In what follows, I present a rationale for the usefulness of such a format in minimizing confounding influences.



The Picture-Preference Test: A Format for the  
Development of a Thought Disorder Scale

The work of Cowan (1967) exemplifies use of a picture-preference test format for measuring psychological characteristics. Test items consist of pictures presented in pairs. The task of subjects is to choose the picture in each pair that they prefer. One picture in each item represents a stimulus that theoretically will appeal to an individual who has the personality characteristic of interest.

Two principles provide the basis for the a priori choice of items and for the utilization of this type of test format. The first of these involves the adequate representation of discriminating features of the psychological characteristic to be measured in items constructed.

Jackson (Reference Note 9) has presented a forceful argument for the importance of a sensitive appreciation of discriminating characteristics of personality in effective test construction.

The use of a picture-preference format is also based upon assumptions about the organization or structuring of experience in psychological functioning. Authors such as Rappaport, Gill, and Shafer (1968) and Henry (1973) have taken the position that behavior can be viewed to be representative of underlying characteristics of psychological functioning. According to Rappaport and associates, the structure of psychological functioning provides the basis for behavior.

The manner in which the individual behaves depends upon the manner in which he structures his experiences. Thus behavior is revealing of the individual's structuring principles, i.e., of his mode of psychological functioning. Henry (1973) has described the individual's behavior as manifestation of the individual's

inclination to see in all outside reality the values and convictions that are already part of the personality. (p. 7)

Accepting such assumptions, one anticipates that choice of a preferred picture will reflect a characteristic of psychological functioning if discriminating features of that characteristic are represented as part of the picture.

There is some evidence for the validity of a picture-preference-format approach to the measurement of characteristics of psychological functioning. Cowan (1967) constructed a Picture-Preference Test of Addictiveness (PPTA). He created 106 pairs of line drawings that were placed into 10 a priori scales. He hypothesized that one picture in each item would appeal to individuals who had the addictive personality traits he attempted to measure. The ten personality characteristics Cowan used in constructing his PPTA scales were: Compulsiveness, Oral-Incorporative Trends, Antisocial Tendencies, Avoidance of Intimacy, Infantile Need for Security, Poor Self Concept, Weak Defensive Structure, Low Tolerance for Frustration, Narcissistic Orientation.

Morrison (1973) revised the original PPTA of Cowan and presented the test to a group of alcoholics, a group of neurotics, and a group of normals. This revised test included the following scales: Impulsiveness, Oral Dependency, Magical Omnipotence, Antisocial Impulses, Avoidance of Intimacy, Infantile Need for Security, and Masochistic Tendencies. The alcoholics obtained the highest scores on these scales. The neurotics and the normals obtained lower scores. Differences between the alcoholics on the one hand, and the normals and the neurotics on the other, were significant, for the total of all scales, and for the Impulsiveness scale considered separately.

Amin (1975) has presented evidence for the validity of a Picture-Preference Test "Avoidance of Intimacy" scale. The studies of Morrison and of Amin are cited here only to illustrate the potential utility of a picture-preference format. The previously-developed PPT scales are not used in this author's study. The reader who is interested in the development and the validation of the PPT is referred to Ryan (1977), Berek (1975), and Begin (1972).

Ryan's (1977) discussion of the features of a picture-preference format is relevant to the present study. He's commented upon the potential interest value of such a format for subjects and upon its potential for eliciting sustained

attention during testing. Reading and verbal-expressive skills are not required in order to take the test. According to Ryan, the reliability of scoring such a test format is likely to equal or to better that of most projective measures.

Administration via slide presentation is relatively simple and is not time-consuming. The format allows group testing.

It is this author's opinion that a picture-preference format may minimize confounding factors that researchers have attributed to the current tests of thought disorder. Using a PPT format, the subject chooses between pictures while they are presented. Thus memory ability may not substantially affect test performance. The subject chooses only one picture per item and thus level of general responsiveness may not affect test performance. In contrast to this, the subject taking an object-sorting-test or the Rorschach test can make a variable number of responses to each item presented. Performance on a picture-preference-format test does not depend upon reading skills, upon writing skills, or upon verbal-expressive language skills.

Because persons suffering from thought disorder are also often observed to be severely distressed, consideration of the demands picture-preference test-taking makes upon the subject is warranted. Completing a picture-preference test item may require less sustained concentration than would interpreting a proverb or sorting objects into categories. Because a picture-preference-test involves a timed slide

presentation, it is possible to show a large number of items in a short period of time. This may be of advantage when testing psychiatric patients who are quite distressed, distractable, and pre-occupied with other concerns.

The author believes that the limitations of current tests of thought disorder warrant an attempt to devise a better clinical measure. The advantages of a picture-preference-test format have led the author to use this format in creating a thought disorder scale.

## CHAPTER 2

Theoretical Basis for Test Item Construction

Reed (1970), Arieti (1974), Hemsley (1976), and others have observed that manifestations of thought disorder are multifaceted and varied. There is general agreement among researchers that disordered thinking cannot be characterized exclusively as a logical reasoning deficit, as a conceptual overinclusiveness, as a deficit in the ability to think abstractly, or as a tendency toward over-personalization in thinking. For example, Hemsley (1976) presented a number of the current thought disorder tests to a group of psychiatric patients. He found that various manifestations of disordered thinking may to a degree be independent of one another. According to Reed (1970), the current tests of thought disorder do not adequately tap the multifaceted manifestations of the disorder. Thus in creating a Picture-Preference Test thought disorder scale the author attempted to represent the varied characteristics of disordered thinking researchers have identified.

The author created 62 pictures and arranged them into 31 pairs. He designed one picture in each pair to reflect a characteristic that on a theoretical basis might be meaningful and appealing to a person suffering from thought disorder. The author attempted to represent the following

concepts of thought disorder in these pictures:

- (a) overinclusive thought; Cameron (1963); Payne (1960); Shimkunas (1972).
- (b) idiosyncratic, over-personalized thought; Goldstein (1944); Trunnell (1964); Whitaker (1973); Watson (1973).
- (c) clang associations; Bleuler (1951); Whitaker (1973).
- (d) regressive, autistic thought; Andreasen and Powers (1976); Freud (1911, 1947); Rappaport et al. (1968).
- (e) confabulation and fabulized combinations; Rappaport et al. (1968).

For example, picture "A" of item 71 is a drawing of a saw and a screwdriver. Both are tools. Picture "B" of that item is a drawing of a saw and of a set of dentures. Both have teeth. The keyed "thought-disorder" picture is "B." The author hypothesized that this picture would appeal to persons whose thinking was overinclusive. Items 86, 114, 116, 120, 140, and 206 similarly each have one picture representing an overinclusive combination of objects.

Picture "A" of item 75 is a drawing of a pair of sox and a pair of shoes. Both are footwear. Picture "B" of this item is a drawing of a box and of a pair of sox. Names of the objects have a similar sound. Picture "B" is the keyed "thought-disorder" alternative of this item. The author hypothesized that a thought-disordered person who tends



to produce clang associations might choose the keyed picture. Items 103, 125, 112, and 136 similarly each have one picture representing objects grouped on the basis of a clang association.

Picture "B" of item 110 shows a girl watching television. Picture "A" of this item shows the figure on the tv screen reaching out of the set to the viewer. Picture "A" is the keyed "thought-disorder" alternative. The author hypothesized that this keyed alternative would appeal to persons whose thinking is over-personalized and idiosyncratic. Items 14, 38, 54, 98, 110, 116, 119, 128, 133, and 136 similarly each have one picture representing overpersonalized or idiosyncratic scenes or object-arrangements.

Picture "A" of item 109 shows an adult female. Picture "B," the keyed "thought-disorder" alternative, shows a teddy-bear doll. The author hypothesized that persons whose object choices tend to be autistic and regressive would prefer Picture "B" of this item. Items 1, 60, 127, and 208, similarly each have one picture that represents a regressive object choice.

Finally, Picture "A" of item 210 shows a telephone receiver. Picture "B," the keyed alternative, shows a telephone receiver with lips attached to one end. Here the author attempted to represent a fabulized combination of objects and hypothesized that persons who employed such inappropriate combinations in their thinking would prefer the keyed picture.

Thus 31 items comprise the a priori PPT thought-disorder scale. Additionally, Ryan (Reference Note 7) empirically identified 25 items already existing in the Picture-Preference Test that are considered part of the thought-disorder item pool in the present study. These are items Ryan found to correlate with university students' scores on the Differential Personality Inventory "Psychotic Tendencies" scale of Jackson and Messick (1964).

The author presented these 56 items embedded within the larger Picture-Preference Test described by Ryan (1977). Ryan, studying the construct validity of the PPT, found 53 items that did not correlate with university students' scores on any of the DPI scales. In the present study, the author dropped these items from the PPT and randomly assigned the new thought disorder items to the consequently available item positions. Thus the PPT including the new thought disorder items contains a total of 210 items. Appendix A presents descriptions of these 210 items. Appendix B presents reproductions of photographs of the 31 a priori PPT thought disorder items. Appendix C presents a description of the 25 empirically-derived items.

#### The Present Study: Hypotheses to be Tested

In order to provide evidence for the validity and for the reliability of a Picture-Preference Test thought-disorder

scale, the author tested the following hypotheses.

Hypothesis I: Psychiatric patients' choices of keyed PPT thought-disorder pictures will correlate with scores on a composite of the Conceptual Disorganization, Hallucinatory Behavior, and Unusual Thought Content scales of Overall and Gorham's (1962) Brief Psychiatric Rating Scale (BPRS).

Hypothesis II: When patients are called "thought-disordered" if they show any pathology on any of the three scales used in the BPRS composite, and called "non-thought-disordered" when they have no such rating, scores on the PPT scale will discriminate "thought-disordered" patients from "non-thought-disordered" patients and from non-patients. The "thought-disordered" patients will obtain PPT scores higher than those obtained by "non-thought-disordered" patients and by non-patients.

Hypothesis III: There will be evidence showing the reliability of a Picture-Preference Test thought disorder scale. The PPT items will form an internally consistent scale.

Hypothesis IV: Patients' PPT thought-disorder scores will correlate with their scores on Jackson and

Messick's (1964) Differential Personality Inventory (DPI) "Psychotic Tendencies" scale.

Hypothesis V: There will be evidence of the reliability of the BPRS scores that the interviewer assigns to psychiatric patients. Specifically, there will be a correlation between scores that two interviewers will assign to those patients rated by both interviewers on the BPRS.

## CHAPTER 3

Design of the StudiesA Preliminary Study of Social Desirability

Upon completing creation of the a priori PPT thought-disorder items, the author conducted a preliminary study of the social desirability of the pictures. He did not assume that desirability ratings obtained from an initial sample would represent the desirability of the pictures for all possible samples. Rather he viewed these initial ratings as estimates of possible differences in desirability between the keyed and the non-keyed pictures which comprise the PPT items. The author decided at a later date to also subject the empirically-identified PPT items to such an analysis. Thus two separate samples viewed the PPT pictures and rated them on the social desirability dimension.

Subjects. There were 32 University of Windsor undergraduate psychology students who viewed and who rated a priori PPT pictures. Of this sample, 18 were female and 14 were male. The mean age of this group was 31.3 years and subjects ranged in age from 20 to 59 years. At a later date, 37 other undergraduate psychology students viewed and rated the empirically-derived PPT pictures. Of this group, 12 were male and 25 were female. The mean age of this group was 30.1 years and subjects ranged in age from 20 to 59 years.

Procedure. Subjects viewed the PPT pictures in groups. The author randomized the order of picture presentation. Following procedures outlined by Edwards (1957), subjects received a handout containing the following instructions.

Please rate each of the pictures as to how socially desirable or undesirable you consider it to be for a person to choose this picture in preference to other pictures. We are not interested in whether or not you yourself like the pictures. Just rate each picture according to how socially desirable or undesirable you consider it to be if another person should choose this picture as the one he prefers. Use the scale below to make your ratings.

Subjects read these instructions individually. The author then read the instructions aloud. Appendix D shows a reproduction of the handout given to students. Subjects viewed each picture shown via slide presentation for 10 seconds. Both of the student groups received the same instructions.

### The Main Study

#### Social desirability considered as a response style.

Edwards (1957) and Jackson and Messick (1967) showed that a tendency to endorse socially desirable test item alternatives can confound measurement of other psychological characteristics. Edwards presented evidence that there are individual differences in this tendency to present oneself in a desirable manner.

He also showed the stability of this characteristic for individuals across a number of different tests. Edwards viewed this response style as a characteristic of personality.

In the present study subjects who viewed PPT pictures in pairs in order to indicate their preferences did not also view pictures individually in order to rate picture desirability. The author reasoned that if an individual's tendency to present himself favorably when taking tests is a stable characteristic of personality, then scores obtained on a social desirability scale could be used as estimates of this response style for each subject. Thus it would be possible to control the influence of this response style when analyzing subjects' PPT data. The author used subjects' scores on the DPI Desirability scale as estimates of their tendency to present themselves favorably. Kavanaugh (Reference Note 1) and Trott and Morf (1972) have presented evidence that the DPI Desirability scale measures this response style among psychiatric patients and among university students seeking psychological counseling.

Acquiescence considered as a response style. Jackson and Messick (1967) showed that a tendency to acquiesce or to agree with test statements, regardless of their content, can confound measurement of other characteristics of personality. Thus the wording and arrangement of test items can effect performance.

Since the Picture-Preference Test does not involve written statements, the individual's tendency to agree with test statements should not confound PPT performance. In order to minimize exaggerated scores attributable to an individual's tendency to consistently endorse pictures on the basis of their positioning within items, the author assigned half of the keyed thought-disorder pictures to the "A" position and assigned half to the "B" position. With the exception of the empirically-derived items which were already part of the test, use of a random numbers table guided assignment of the particular a priori pictures to either the "A" or "B" positions.

Subjects. Comprising the psychiatric patient sample were 70 individuals consecutively admitted to wards at Windsor Western Hospital Centre and at St. Thomas Psychiatric Hospital. Ward staff initially approached patients inviting their participation in this study. Only patients judged by hospital staff to be too distressed to cooperate with testing were excluded from consideration. Table 1 presents a summary of characteristics of the patient sample. The youngest patient in the sample was age 18 and the oldest participants were between the ages of 50-59 years. The mean age of the patient sample was within the 20-30 year category. The author obtained the following information for each subject after all testing was completed: date of admission to hospital, diagnosis, medications schedule, educational and occupational levels.



Table 1  
 Characteristics of Psychiatric Patient and  
 Non-Patient Samples

		Psychiatric Patients <sup>a</sup>	Non-Patients <sup>b</sup>
Sex: Percentage who are male	Mean	50	45
	S.D.	50	50
Age: Age group code <sup>c</sup>	Mean	2.81	1.94
	S.D.	1.10	.96
Educational level <sup>d,e,f</sup>	Mean	4.10	2.82
	S.D.	1.10	.55
Occupational level <sup>d,g</sup>	Mean	4.81	2.67
	S.D.	1.45	1.24
Index of Social Position <sup>h,i</sup>	Mean	50.55	29.37
	S.D.	11.60	10.88

<sup>a</sup>n = 70

<sup>b</sup>n = 151

<sup>c</sup>Code for age groups is as follows: less than 19 years, 1, 20 to 29, 2; 30 to 39, 3; 40 to 49, 4; 50 to 59, 5.

<sup>d</sup>n = 56 for patients group, because of missing data.

<sup>e</sup>n = 31 for non-patient group, because of missing data.

<sup>f</sup>Code for educational level is as follows: graduate professional training, 1; standard university graduate, 2; partial college training, 3; high school graduate, 4; partial high school, 5; junior high school, 6; less than 7 years of school, 7.

<sup>g</sup>Code for occupational level is as follows: executives and major professionals, 1; managers and minor professionals, 2; administrative personnel and semi-professionals, 3; owners of small businesses, clerical, and technicians, 4; skilled workers, 5; semi-skilled workers, 6; unskilled workers, 7; students, 8; unemployed or retired persons, 9.

## Characteristics of the Samples

<sup>h</sup>ISP scores were computed for every subject, regardless of missing data on occupation or education, by estimating missing values on occupation or education, or both from values on any of the following variables that were available: sex, age, educational level, occupational level. The ISP scores were computed by the following formula:  $7(\text{occupation}) + 4(\text{education}) = \text{Index}$ .

<sup>i</sup>Social class levels correspond to ISP scores as follows:  
upper class, 11 to 17; upper middle class, 18 to 27;  
lower middle class, 28 to 43; upper lower class, 44 to 60;  
lower lower class, 61 to 77.

This information was collected after testing was completed in order to minimize potentially biasing BPRS scores the author assigned to patients after interviewing them.

There were 151 individuals comprising the non-patient sample. Of this group, 120 persons were University of Windsor undergraduate psychology students. Additionally, the test data of 31 adult, non-students collected by Noel (Reference Note 5) were part of the non-patient data pool. Table 1 shows a summary of the characteristics of this sample. There were 68 males and 83 females in the non-patient group. The ages of subjects ranged from 18 to 59 years. The mean age of this sample was approximately 19 years. Of the total non-patient sample, 51 persons took the PPT and the DPI. There were 100 individuals who took only the PPT. Obtaining a large sample of PPT data for item analyses and for group comparisons motivated the presentation of this test to these additional 100 subjects.

An examination of Table 1 indicates that the non-patients were better educated and of a higher social level than were the psychiatric patients. This observation necessitated consideration of the potential effects of age, sex, educational level, occupational level, and social position upon PPT scores obtained by subjects in subsequent data analyses. The author discusses the procedures used for this purpose in the following chapter.

Because subject-characteristic data were used in analyses of PPT performance, the author obtained estimates of unavailable subject educational and occupational information. He computed estimates of missing data using a series of regression equations derived from data which were available. Dixon (1977) describes the procedure and computer program that was used for this purpose. Among the patient sample, there were 14 cases of missing educational and/or occupational level data for which values were estimated. Among the non-patient sample occupational level data were unavailable for all but 31 subjects. In order to ensure that inclusion of estimated data did not misrepresent PPT performance differences between sample groups, the author separately analysed data with no missing values and then compared the results with the analyses using the total data pool (which involved missing values.)

Procedures. Subjects took the PPT in groups. The viewing time for each item was 10 seconds. Total viewing time for the 210 PPT items was 35 minutes. The author gave the following instructions to subjects 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 on the left of the lamp, 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.

Subjects given the Differential Personality Inventory took this test immediately upon completing the PPT. The author gave the following instructions to these subjects.

You now have a test booklet entitled the Differential Personality Inventory. There are a number of statements contained in the booklet to which you are asked to respond either "true" or "false." On the answer sheet fill in "T" for true and "F" for false. Please answer all questions carefully and honestly.

The author arranged to see psychiatric patients for individual interviews when the subjects had completed the PPT

and the DPI. Each interview took approximately 20 minutes. The author interviewed patients on the same day that they took the other tests. Immediately after the interview, he rated them on the BPRS. The following statement indicates roughly what the interviewer said as he explained the purpose of the interview:

We are trying to learn about how people make choices between the pairs of pictures that you have seen. In order to understand the choices that people make, we need to learn a little about you. Please tell me about yourself.

Subjects and procedures: an interrater reliability study of BPRS ratings. The author and Dr. Auld simultaneously interviewed 19 of the subjects who comprised the psychiatric patient sample. After seeing each patient, these interviewers independently completed the Brief Psychiatric Rating Scale of Overall and Gorham (1962). The purpose of this was to evaluate the reliability of the scoring of the BPRS scales. This was of importance because when all data was collected the author separated patients into "thought-disordered" and "non-thought-disordered" samples on the basis of BPRS scores. When both interviewers met with a patient, they explained the procedure to the subject as follows:

We are trying to learn about how people make choices between the pairs of pictures you have seen. We would both like to talk to you since we are both

working on this project, and since we want to make sure that we both do our work the same way. We would like to learn a little about you. Please tell us about yourself.

There were no changes in the subject-selection procedures used when both interviewers were available to see patients. Table 1 shows the summary of patient characteristics.

The Brief Psychiatric Rating Scale. Overall and Gorham's (1962) BPRS is a symptom- or behavior-rating format designed to provide standardized interview information. The behavioral constructs these authors represented were retained from a larger set of descriptive items because a series of factor analyses had shown these dimensions to be reasonably independent of each other and to be replicable from one sample to another. Ratings are made on a 7-point scale that ranges from "symptom not present" to "symptom extremely severe." The BPRS scales are: Somatic Concerns, Anxiety, Emotional Withdrawal, Conceptual Disorganization, Guilt Feelings, Tension, Mannerisms and Posturing, Grandiosity, Depressive Mood, Hostility, Suspiciousness, Hallucinatory Behavior, Motor Retardation, Uncooperativeness, Unusual Thought Content, and Blunted Affect. For use as a criterion in the present research, I added together scores on the Conceptual Disorganization, Hallucinatory Behavior, and Unusual Thought Content scales to create a composite measure of thought disorder.

There were a number of reasons for using the BPRS composite score as the behavioral criterion of thought disorder. The author believed that the structured format of the BPRS would enhance the reliability of scores assigned to patients. Also, the literature on psychiatric diagnosis suggests that its usefulness is limited. Although a number of psychiatrists diagnosed the patients who took part in the study, the criteria these psychiatrists used in making their diagnoses were not known. Thus the author believed that the potential unreliability of patient diagnosis was quite great. Finally, by using a behavioral criterion of thought disorder, the author attempted to minimize the effects of factors confounding performance on any existing test of disordered thinking.

The Differential Personality Inventory. Jackson and Messick's (1964) test consists of 300 statements requiring "true" or "false" responses. These authors devised twenty scales on an a priori or rational basis, attempting to minimize limitations of the MMPI. Jackson and Messick (1967) showed that the MMPI scales have limited internal consistency, that response biases figure prominently in test performance, and that inclusion of items on more than one scale confounds interpretation of scores. The original DPI consists of the following scales: Infrequency, Cynicism, Depression, Family Discord, Health Concerns, Hostility, Impulsivity, Irritability, Neurotic Disorganization, Psychotic Tendencies, Rebelliousness, Socially Deviant Attitudes, Defensiveness, and Desirability.



Jackson and Carlson (Reference Note 4) showed that the DPI items form internally consistent scales and that effects of response styles have been successfully eliminated. They provided evidence for the validity of the test scales based upon a study of 370 university students.

Kavanaugh (Reference Note 1) obtained DPI data from a sample of 60 hospitalized psychiatric patients. Among other findings, he presented evidence for the validity of the Psychotic Tendencies and the Desirability scales. Within his sample of psychiatric patients, the Psychotic Tendencies scale correlated significantly,  $r(58) = .42$ , with the Hostile Belligerence scale of the Lorr-Vestre Psychiatric Inpatient Profile. Kavanaugh also reported that psychiatric patients obtained scores on the Psychotic Tendencies scale that were significantly higher than those obtained by Jackson and Carlson's student sample. Trott and Morf (1972) studied the validity of the DPI scales for a sample of university students seeking psychological counseling services. The author discusses the relevant findings of Trott and Morf in a later chapter of this paper.

The use of the DPI in the present study provides an opportunity for cross-validation of the 25 PPT items that Ryan (Reference Note 7) found to correlate with students' scores on the Psychotic Tendencies scale. The author also anticipated that study of the relationships among the PPT, the DPI, and the BPRS scales would contribute to the validation of a PPT thought-disorder scale.

## CHAPTER 4

ResultsThe Preliminary StudySocial desirability ratings of thought disorder

pictures. Table 2 shows the results of the  $t$ -tests of mean social desirability ratings between the individual pictures of each of the new, rationally-derived PPT items. Mean social desirability ratings differed significantly between the two pictures for 24 of the 31 items,  $t(31) > 2.08$ ,  $p < .05$ .

As can be seen from examination of Table 2, for 23 of the 24 items on which ratings of the pictures in the pairs differed significantly, the undergraduate students judged the pictures that were designed to reflect thought-disorder to be less desirable socially than the alternative pictures with which they are paired. The intraclass correlation coefficient between the thought-disorder pictures and the paired non-thought-disordered pictures is .003.

Table 3 lists the results of the  $t$ -tests comparing mean social-desirability ratings of pictures belonging to the same items, for the empirically-derived PPT thought-disorder items. Social desirability ratings were obtained for only 36 of the 50 pictures, since 14 of the pictures were available only in item form (in pairs), and thus the author could not present them separately for rating. The undergraduate university students who made the social desirability ratings, gave significantly different ratings for the two pictures

Table 2  
 Comparisons of Social Desirability  
 of Pictures in the Same Items  
 (31-item A Priori Scale)<sup>a</sup>

Item	$\bar{X}$	Standard Deviation	$t$	2-tailed probability
1. Shoes and purse (TD) <sup>b</sup> Lady with purse	5.53 4.65	1.54 1.63	1.97	.058 <sup>c</sup>
38. Broken lamp Eyes and lamp (TD) <sup>b</sup>	3.09 2.37	1.82 1.77	2.08	.046
54. Woman and boy Girl yelling (TD) <sup>b</sup>	6.40 3.34	1.36 2.07	7.10	.000
14. Boy standing Boy falling (TD) <sup>b</sup>	6.50 2.53	2.03 1.83	7.30	.000
60. Figure of boy Photo of boy framed (TD) <sup>b</sup>	6.12 5.75	1.26 1.81	1.07	.290 <sup>c</sup>
71. Tools Saw/dentures (TD) <sup>b</sup>	5.68 3.25	1.37 1.54	6.64	.000
75. Socks/shoes Socks.box (TD) <sup>b</sup>	5.28 4.68	1.70 1.60	1.45	.155 <sup>c</sup>
86. Needle/thread Needle/eye (TD) <sup>b</sup>	5.06 4.75	1.56 1.90	.95	.340 <sup>c</sup>
98. Flowers Dying flower (TD) <sup>b</sup>	6.93 2.78	1.39 1.80	9.07	.000
103. Cake/glass Cake/snake (TD) <sup>b</sup>	6.50 2.90	1.72 2.13	6.41	.000
109. Teddybear (TD) <sup>b</sup> Woman	6.09 7.25	1.89 1.50	-2.84	.008
110. Girl on tv screen Girl reaching out of screen (TD) <sup>b</sup>	5.46 3.70	1.74 2.17	3.14	.004
112. Ball/child crawling (TD) <sup>b</sup> Bat/ball	4.40 6.70	2.29 1.95	-5.35	.000
114. Lamp/bulb Lamp/umbrella (TD) <sup>b</sup>	5.87 4.50	1.66 1.34	4.10	.000

<sup>a</sup>n = 32 undergraduate students

<sup>b</sup>TD = picture keyed for thought-disorder

Table 2: Continued  
 Comparisons of Social Desirability Ratings  
 (31-Item A Priori Scale)

Item	$\bar{X}$	Standard Deviation	$t$	2-Tailed Probability
115. Boy holding sun(TD) <sup>b</sup> Boy sitting in sun	5.93 6.93	2.34 1.58	-2.44	.020
116. Milk/bowl Milk/razor(TD) <sup>b</sup>	6.56 4.65	1.56 1.99	5.13	.000
119. Clock/watch Clock/"8"ball(TD) <sup>b</sup>	5.37 4.18	1.01 1.78	3.17	.003
120. Boat/oars Boat/faucet(TD) <sup>b</sup>	6.40 4.46	1.47 1.98	5.20	.000
125. Hammer/nails Nails/pail (TD) <sup>b</sup>	5.50 4.06	1.54 1.62	3.49	.001
127. Man's face Childlike drawing (TD) <sup>b</sup>	5.59 3.68	1.29 2.00	4.74	.000
128. Girl Girl in pieces(TD) <sup>b</sup>	6.21 3.59	1.86 1.86	4.98	.000
133. Tree/apple Apple/saw (TD) <sup>b</sup>	6.68 4.09	1.60 1.80	5.11	.000
136. Chair Broken chair (TD) <sup>b</sup>	4.62 2.59	1.43 1.73	4.92	.000
138. Lock/key Key/tree (TD) <sup>b</sup>	5.65 5.06	1.80 1.31	1.74	.092 <sup>c</sup>
140. Mop/broom Mop/ice cream(TD) <sup>b</sup>	4.31 4.03	.31 .34	.58	.564 <sup>c</sup>
142. Woman Woman-puppet(TD) <sup>b</sup>	6.46 3.53	1.52 2.18	6.39	.000

<sup>c</sup>This pair does not differ significantly at the .05 level, on social desirability.

Table 2: Continued  
 Comparisons of Social Desirability Ratings  
 (31-Item A Priori Scale)

Item	$\bar{X}$	Standard Deviation	$\bar{t}$	2-Tailed Probability
202. Train/car Train/chain(TD) <sup>b</sup>	5.93 3.25	1.36 1.95	4.58	.000
205. ABCD ME (TD) <sup>b</sup>	5.65 6.12	1.70 2.10	-1.06	.290 <sup>c</sup>
206. Spoon/knife Spoon/sword (TD) <sup>b</sup>	6.28 4.18	1.57 1.49	5.90	.000
208. Girl-boy talking Girl talking to tree (TD) <sup>b</sup>	4.59 6.43	1.75 1.50	-4.04	.000
210. Phone receiver Phone receiver with lips (TD) <sup>b</sup>	5.56 3.53	1.34 2.28	4.58	.000

Table 3  
 Comparisons of Social Desirability of  
 Pictures in the Same Item  
 (25-Item Empirical Scale)<sup>a</sup>

Item	$\bar{X}$	Standard Deviation	$t$	2-tailed Probability
22. Bottle tilted down (TD) <sup>b</sup> Bottle upright	5.29 5.40	1.89 1.58	-.54	.593 <sup>b</sup>
23. Cabinet with pill bottles (TD) <sup>b</sup> Cabinet with brushes and toothpaste	5.30 4.08	2.12 1.86	2.40	.022
27. Lifesaver thrown to drowning man Man swimming to rescue drowning man (TD) <sup>b</sup>	5.70 5.54	2.75 2.73	.36	.720 <sup>b</sup>
32. Chairman of board Man with treasure (TD) <sup>b</sup>	6.18 5.48	1.57 2.02	2.14	.039
41. Scene with hills (TD) <sup>b</sup> Scene with town	5.83 5.97	1.75 1.96	-.45	.658 <sup>b</sup>
50. Detour sign on road Rocky Road (TD) <sup>b</sup>	3.51 3.02	1.50 1.78	1.61	.116 <sup>b</sup>
63. Buxom woman (TD) <sup>b</sup> Less buxom woman	6.70 6.64	2.14 1.79	-.24	.812 <sup>b</sup>
51. Boy and man (TD) <sup>b</sup> Boy and woman	7.00 6.94	1.58 1.45	.21	.838 <sup>b</sup>
141. Cactus (TD) <sup>b</sup> Palm tree	4.59 6.56	1.45 1.50	-5.48	.000
143. Boy chewing gum (TD) <sup>b</sup> Boy buttoning shirt	5.40 5.94	1.18 1.29	-1.82	.077 <sup>b</sup>

<sup>a</sup>  $n = 37$  undergraduate students

Table 3: Continued  
 Empirically-Derived Thought Disorder Items:  
 Comparisons of Social Desirability Ratings

Item	$\bar{X}$	Standard Deviation	$t$	2-Tailed Probability
147."M"s of one size "M"s of varied sizes (TD) <sup>b</sup>	4.73 5.37	1.53 1.58	-2.33	.026 <sup>b</sup>
160.Baseball team (TD) <sup>b</sup> Football team	6.20 5.78	1.59 1.61	1.84	.074 <sup>b</sup>
174.Woman Young girl (TD) <sup>b</sup>	6.27 5.02	2.03 1.65	4.00	.000
162.Dog on leash(TD) <sup>b</sup> Dog not on leash	5.75 6.21	1.53 1.60	-1.96	.058 <sup>b</sup>
169.Buzzards (TD) <sup>b</sup> Swans and a buzzard	3.24 4.00	2.00 1.94	-2.09	.044 <sup>b</sup>
170.Hens and chicks(TD) <sup>b</sup> Ducks	6.21 6.78	1.63 1.65	-2.30	.027
175.Boxers Wrestlers(TD) <sup>b</sup>	4.51 4.56	1.99 1.59	-0.20	.813 <sup>b</sup>
201.Boy with bat broken Boy with puzzle(TD) <sup>b</sup>	3.29 5.70	1.28 1.56	-8.38	.000

<sup>b</sup>This pair does not differ significantly, at the .05 level, on social desirability.

in 6 of the 18 items which were presented,  $t(36) > 2.09$ ,  $p < .05$ . For 4 of the 6 items on which ratings of pictures differed significantly, the students judged the keyed thought-disorder alternatives to be less socially desirable than the pictures with which they are paired. However, for 2 of the items on which desirability ratings between pictures differed significantly, the keyed thought-disorder alternatives were judged to be more desirable than the pictures with which they are paired. The intraclass correlation coefficient between the thought-disorder pictures and the paired non-thought-disordered pictures is .58.

#### The Main Study

Internal consistency of PPT scales. The author separately analyzed the internal consistency of the 31-item a priori scale, of the 25-item empirical scale, and of the total, 56-item combined scale. Item analyses were done separately for the patient and for the non-patient samples. Tables 4, 5, and 6 present alpha coefficients and item-to-scale-remainder point-biserial correlation coefficients for the rationally-derived items (Table 4), for the total item pool (Table 5), and for the empirically-derived items (Table 6).

As Table 4 shows, for the patients the alpha coefficient of the a priori scale is .72. Turning to Table 5 we find that the comparable coefficient of the empirically-derived scale is -.01. The alpha for the 56-item pool is .51.



Table 4

Item Analyses of 31 New, Rationally-Derived  
Thought-Disorder Scale

Item	70 patient sample	151 non-patient sample
	Point-biserial item-to-scale- remainder correlations	Point-biserial item- to-scale-remainder correlations
1.	-.06	-.08
14.	.09	.37
38.	.21	.33
54.	.27	.24
60.	.31	.28
71.	.49	.44
75.	.22	.29
86.	.15	.30
98.	.29	.45
103.	.50	.38
109.	.14	-.02
110.	.35	.50
112.	.35	.42
114.	.21	.45
115.	.13	.40
116.	.43	.14
119.	.05	.14
120.	.23	.04
125.	.17	.16
127.	.38	.10
128.	.23	.47
133.	.33	.18
136.	.22	.29
138.	.47	.35
140.	.27	.20
142.	.18	.25
202.	.20	.38
205.	.21	.17
206.	.35	.42
208.	.01	.23
210.	.23	.25
alpha reliability	.72	.75

Table 5

## Item Analyses of 56-Item Thought-Disorder Scale

Item	<u>70 patient sample</u> Point-biserial item-to-scale- remainder correlation	<u>151 non-patient sample</u> Point-biserial item- to-scale-remainder correlation
1.	.04	-.04
14.	.14	.35
38.	.21	.27
54.	.23	.21
60.	.22	.30
71.	.47	.38
75.	.20	.24
86.	.03	.23
98.	.29	.36
103.	.49	.29
109.	.11	-.05
110.	.21	.39
112.	.18	.33
114.	.21	.28
115.	.15	.33
116.	.34	.23
119.	.08	.11
120.	.24	.03
125.	.11	.15
127.	.36	.14
128.	.18	.31
133.	.23	.08
136.	.20	.22
138.	.34	.25
140.	.25	.18
142.	.10	.20
202.	.17	.29
205.	.14	.15
206.	.24	.39
208.	.09	.22
210.	.17	.14
22.	-.03	-.04
23.	.04	-.05
27.	.36	.13
28.	.11	-.18
32.	-.13	-.06

Table 5: Continued  
 Item Analyses of 56-Item Thought-Disorder Scale

Item	<u>70 patient sample</u> Point-biserial item-to-scale- remainder correlation	<u>151 non-patient sample</u> Point-biserial item-to-scale- remainder correlation
41.	.02	-.11
50.	.36	.17
51.	-.18	-.05
63.	-.08	-.01
65.	-.08	-.03
92.	-.09	-.06
107.	-.03	-.03
113.	.26	-.01
141.	.06	.19
143.	-.08	-.23
147.	-.24	-.26
153.	.08	-.01
160.	.09	.05
162.	-.09	.13
169.	-.22	.01
170.	-.09	.03
174.	-.34	-.12
175.	.12	-.20
200.	-.03	-.08
201.	-.06	-.13
alpha reliability	.51	.47

- Table 6

Item Analysis of 25 Empirically-Derived  
Thought-Disorder Scale Items

Item	<u>70 psychiatric patients</u> Point-biserial item-to- scale-remainder correlation
22.	-.08
23.	-.06
27.	-.05
28.	-.04
32.	.05
41.	.02
50.	.01
51.	.09
63.	-.14
65.	.03
92.	.01
107.	-.10
113.	.22
141.	.02
143.	.05
147.	-.22
153.	.00
160.	.19
162.	.12
169.	-.01
170.	.11
174.	-.20
175.	-.01
200.	-.15
201.	.03
alpha reliability	-.01

The pattern of internal consistency coefficients within the 151 non-patients is the same. The 31 rationally-derived items have an alpha of .75. The 56-item pool has an alpha of .47.

Because the rationally-derived items, taken as a scale, demonstrated a degree of internal consistency which was not demonstrated by the empirically-derived items, or by the total item pool, the author decided to keep the rational scale and the empirical scale separate in all of the subsequent analyses.

Relationships among PPT thought-disorder scales, among items, and between scales and the Brief Psychiatric Rating Scales criteria. In order to evaluate the reliability of the BPRS ratings that were to be used as criteria, the author computed Pearson correlations of the ratings made by Auld and by Rudzinski for those patients both had rated. The results of this analysis are presented in Table 7.

Significant agreement between the raters ( $p < .05$ ) was obtained for the following BPRS scales: Anxiety, Emotional Withdrawal, Conceptual Disorganization, Guilt Feelings, Depressive Mood, Hostility, Suspiciousness, Motor Retardation, Uncooperative Behavior, Unusual Thought Content, and Blunted Affect. Significant interrater agreement was not reached for the Somatic Concerns and Tension scales. However, since

Table 7  
Interrater Reliability  
for the  
Psychiatric Rating Scale<sup>a</sup>

BPRS Scale	r	Level of Significance
Composite Thought-Disorder	.77	.001
Somatic Concerns	.32	.09
Anxiety	.50	.01
Emotional Withdrawal	.76	.001
Conceptual Disorganization	.56	.006
Guilt Feelings	.46	.02
Tension	-.05	.41
Mannerisms and Posturing	b	b
Grandiosity	b	b
Depressive Mood	.70	.001
Hostility	.79	.001
Suspiciousness	.77	.001
Hallucinatory Behavior	b	b
Motor Retardation	.40	.04
Uncooperative Behavior	.69	.001
Unusual Thought Content	.79	.001
Blunted Affect	.78	.001

<sup>a</sup> n = 19

<sup>b</sup> Correlation coefficients for the categories Mannerisms and Posturing, Grandiosity, Hallucinatory Behavior, were unable to be computed since these symptoms/behaviors were not demonstrated by the sample of 19 patients interviewed by both Auld and Rudzinski.

few of the patients jointly interviewed by Auld and by Rudzinski demonstrated these behaviors., judgments made on these scales were quite restricted.

Interrater reliability correlations for the Mannerisms and Posturing, the Grandiosity, and the Hallucinatory Behavior scales were unable to be computed because the patients that both interviewers rated did not demonstrate these behaviors.

The criterion for the separation of patients into "thought-disordered" and "non-thought-disordered" groups was the score obtained when their Conceptual Disorganization, their Hallucinatory Behavior, and their Unusual Thought Content scale-scores were summed. As shown in Table 7, there was significant interrater agreement for the two of these scales on which the interviewers were able to rate patients.

The author analyzed the relationships between the patient sample's BPRS scores and their PPT scores. Table 8 shows the Pearson correlations between patients' PPT scale-scores and their scores on the BPRS scales that the author believed were theoretically related to thought-disorder. As was hypothesized, patients' rationally-derived PPT scale-scores correlated significantly ( $p < .05$ ) with behavioral-criteria scores of thought disorder (i.e., with scores on the Conceptual Disorganization, the Hallucinatory Behavior, the Unusual Thought Content, and the Composite Thought Disorder scales.)

Pearson Correlations between  
PPT Scales and BPRS Scales  
for which a Theoretical  
Relationship was Predicted<sup>a</sup>

BPRS Scales	31-item new Rationally-Derived TD Scale	level of significance	25-item Empirically Derived TD Scale	level of significance
Composite Thought Disorder Scale	.38	.001	-0.07	.25
Conceptual Disorganization	.34	.002	-0.10	.18
Hallucinatory Behavior	.28	.008	-0.01	.48
Unusual Thought Content	.22	.03	-0.04	.34

Note. The Composite BPRS Thought Disorder scores were derived by summing scores obtained on the Conceptual Disorganization, Hallucinatory Behavior, and Unusual Thought Content scales.

<sup>a</sup><sub>n</sub> = 70 patients



Table 9

Pearson Product Moment Correlations between PPT Thought  
Disorder Scale Scores and Brief Psychiatric  
Rating Scale Scores<sup>a</sup>

BPRS Scale	31-item Rationally- Derived Scale	significance level	25-item Empirically Derived Scale	significance level
Somatic Concerns	-.08	.23	.10	.19
Anxiety	-.22	.03	.07	.28
Emotional Withdrawal	.25	.01	-.10	.19
Conceptual Disorganization	.34	.002	-.10	.18
Guilt Feelings	-.10	.19	-.04	.34
Tension	-.05	.31	-.10	.19
Mannerisms and Posturing	.22	.03	.02	.41
Grandiosity	.28	.008	-.08	.23
Depressive Mood	-.30	.006	.15	.10
Hostility	-.24	.02	-.08	.23
Suspiciousness	.01	.45	-.09	.22
Hallucinatory Behavior	.28	.008	-.01	.48
Motor Retardation	.10	.20	.05	.31

<sup>a</sup><sub>n</sub> = 70 patients

Table 9: Continued

Pearson Product-Moment Correlations between PPT  
Thought Disorder Scale Scores and Brief  
Psychiatric Rating Scale Scores

BPRS Scale	31-item new Rationally- Derived Scale	significance level	25-item Empirically Derived Scale	significance level
Uncooperative Behavior	.08	.25	-.11	.16
Unusual Thought Content	.22	.03	-.04	.34
Blunted Affect	.30	.005	-.11	.16
Composite Thought Disorder Scale	.38	.001	-.07	.25

Table 10

Pearson Correlations of A Priori PPT  
Items with BPRS Composite Thought-  
Disorder Scores and with DPI  
Desirability Scores<sup>a</sup>

Item	Point-biserial Item-to-Scale Remainder Correlation	BPRS Composite Thought Disorder Scale	DPI Desirability Scale
1.	-.06	-.29	-.04
14.	.09	.01	.02
38.	.21	.22	-.04
54.	.27	.42	-.03
60.	.31	.15	-.25
71.	.49	.23	-.29
75.	.22	.37	-.02
86.	.15	-.07	-.17
98.	.29	.50	.18
103.	.50	.54	.01
109.	.14	-.10	-.20
110.	.35	.39	-.08
112.	.35	.24	.00
114.	.21	.15	-.09
115.	.13	.00	-.03
116.	.43	.24	-.02
119.	.05	-.08	.06
120.	.23	.20	-.12
125.	.17	.20	-.16
127.	.38	.20	-.26
128.	.23	.42	.04
133.	.33	.21	-.13
136.	.22	.15	.14
138.	.47	.46	-.01
140.	.27	-.05	-.25
142.	.18	.21	-.12
202.	.20	-.04	-.14
205.	.21	.14	.07
206.	.35	.36	-.09
208.	.01	-.14	-.11
210.	.23	.25	-.08

<sup>a</sup>n = 70 patients

However, correlations between patients' scores on the empirical PPT scale and their scores on the BPRS criterion scales did not reach the .05 level of significance. Table 9 shows the correlations of patients' PPT scores and their scores on all of the BPRS scales.

Table 10 lists the correlations between the patients' scores on the rational PPT items and their scores on the BPRS composite thought-disorder scale. This table also shows the item-level correlations with the DPI Desirability scores which the author will discuss later in this chapter. For 18 of the 31 rationally-derived PPT items, patients' scores correlated significantly ( $p < .05$ ) with their scores on the composite thought-disorder scale. However, patients' scores on only 2 of the empirically-derived PPT items correlated significantly ( $p < .05$ ) with their scores on this composite scale. Appendix E lists the correlations between patients' scores on the empirically-derived items and their scores on the BPRS composite scale. These results support the hypothesis of a relationship between the a priori PPT items and a behavioral criterion of thought-disorder among the patient sample. The results do not support the hypothesized relationship between the empirically-derived PPT items and the behavioral criterion of disordered-thinking.

The author also analyzed the effects that characteristics of the patients had upon their PPT and BPRS scores. Table 11 shows the Pearson correlations between patients' PPT scores and their age, sex, educational level, occupational level, and DPI Desirability scores.

Table 11.

Pearson Correlations of PPT Scale Scores  
with Patients Characteristics<sup>a</sup>

Patient Characteristics	Rationally Derived TD Scale	p	Empirically Derived TD Scale	p
Sex	-.28	.009	.17	.07
Age	.01	.44	.23	.02
Occupational Level	-.04	.34	-.05	.32
Educational Level	-.16	.08	.01	.46
DPI Desirability Scale	-.06	.28	-.15	.09

<sup>a</sup>n = 70 patients

Table 12

Correlations of PPT Scores with Brief Psychiatric Rating Scale Scores, Controlling for the Effects of Age, Sex, Educational and Occupational Levels<sup>a</sup>

RPRS Scale	Rationally Derived Scale	p	Empirically Derived Scale	p
Composite Thought Disorder Score	.33	.003	.01	.44
Conceptual Disorganization	.29	.007	-.04	.35
Hallucinatory Behavior	.25	.02	.04	.35
Unusual Thought Content	.17	.07	.05	.33
Somatic Concerns	-.12	.15	.002	.49
Anxiety	-.18	.07	-.002	.49
Emotional Withdrawal	.18	.06	-.02	.42
Guilt Feelings	-.04	.36	-.08	.24
Tension	-.06	.30	.11	.17
Mannerisms and Posturing	.20	.05	.08	.25
Grandiosity	.28	.01	-.03	.38
Depressive Mood	-.21	.04	.04	.40
Hostility	-.17	.08	-.14	.13
Suspiciousness	-.02	.42	-.03	.40
Motor Retardation	.08	.24	.04	.35
Uncooperativeness	.005	.48	.05	.33
Blunted Affect	.24	.02	-.02	.41 <sup>b</sup>

<sup>a</sup>n = 70 patients

Patients' scores on the a priori scale correlated significantly ( $p < .05$ ) with their sex. Male patients had higher PPT scores than did female patients. None of the correlations of patients' PPT scores with their other characteristics reached the .05 level of significance.

As shown in Table 11, patients' scores on the empirically-derived PPT scale correlated significantly ( $p < .05$ ) with their ages. Older patients had higher PPT scores than did younger patients. None of the correlations of patients' scores on this PPT scale with their other characteristics reached the .05 level of significance.

The author also computed partial correlations between patients' PPT scores and their BPRS scores, controlling for the effects of age, of sex, and of educational and occupational levels. Table 12 shows the results of this analysis.

Patients' scores on the a priori PPT scale correlated significantly with their scores on the composite thought-disorder scale when the effects of age, of sex, and of educational and occupational levels were controlled statistically,  $r(64) = .33$ ,  $p = .003$ . When controlling for the effects of these variables, the correlation between patients' scores on the empirically-derived PPT scale and their composite-thought-disorder scores did not reach the .05 level of significance.

The author used patients' scores on the DPI Desirability scale as a measure of subjects' tendencies to present themselves in a socially favorable way when responding to test items. Thus it was possible to evaluate the effects this response style had upon the picture choices that patients made.

As reported in Table 11, patients' scores on the a priori PPT scale did not correlate significantly ( $p < .05$ ) with their scores on the Desirability scale of the DPI. As shown in Table 10, patients' scores on only 5 of the 31 a priori items correlated significantly ( $p < .05$ ) with their Desirability scores. Examination of the significant correlations indicates that on these 5 items patients who obtained high desirability scores tended not to choose the pictures that were keyed as the "thought-disorder" alternatives.

Table 13 lists the correlations between patients' scores on the a priori PPT items and their scores on the composite-thought-disorder scale, when the effects of their Desirability scores are controlled statistically. Comparison of the results presented in Table 13 and in Table 10 shows that controlling for this response style did not significantly alter the relationships between patients' scores on the a priori items and their scores on the BPRS thought-disorder scale.

Thus, among this patient sample, there is support for the hypothesis of a relationship between the a priori PPT items and the behavioral criterion of thought-disorder when the effects



Table 13

Correlations of PPT-A Priori-Item Scores with  
 BPRS Composite Thought Disorder Rating,  
 Controlling for Effects of DPI Desirability<sup>a</sup>

Item	BPRS Composite Thought Disorder Rating	Significance Level
1.	-.29	.007
14.	.01	.45
38.	.21	.03
54.	.42	.000
60.	.14	.11
71.	.22	.03
75.	.36	.001
86.	-.07	.27
98.	.52	.000
103.	.53	.000
109.	-.10	.19
110.	.39	.000
112.	.24	.02
114.	.14	.11
115.	.001	.49
116.	.24	.02
119.	.07	.27
120.	.19	.05
125.	.19	.05
127.	.19	.05
128.	.42	.000
133.	.20	.04
136.	.15	.09
138.	.45	.000
140.	-.06	.30
142.	.21	.04
202.	.05	.33
205.	.14	.11
206.	.36	.001
208.	.14	.11
210.	.25	.01

<sup>a</sup><sub>n</sub> = 70 patients.

of sex, of age, of educational and occupational levels, and of socially-desirable responding are controlled statistically.

Analyses of patients' and of non-patients' performance on the PPT scales. The author hypothesized that scores on the a priori PPT scale would discriminate thought-disordered patients from non-thought-disordered patients and from non-patients, when the presence of thought-disorder was defined on the basis of a behavioral criterion. More specifically, the author hypothesized that patients judged in this manner to be thought-disordered would choose more of the keyed PPT pictures than would patients judged not to be thought-disordered and non-patients. Because the 25 empirically-derived PPT items did not form an internally consistent scale, the analyses to be described involved only the a priori scale-scores of subjects.

The author assigned patients to either a "thought-disordered" or a "non-thought-disordered" subgroup. The criterion for assignment to one or another of the subgroups was the rating for each patient on the three scales of the BPRS that are believed to indicate thought-disorder. Patients who obtained ratings indicating pathology on any of these three scales -- Conceptual Disorganization, Hallucinatory Behavior, Unusual Thought Content -- were considered to be thought-disordered for the purposes of this study. On the other hand, patients who obtained "not present" ratings on all three of the scales included in the behavioral criterion, were considered, for the purposes of this study, not to be

x

thought-disordered. Thus two patient subgroups were formed. The thought-disordered group consisted of 22 patients and the non-thought-disordered group consisted of 48 patients.

The 22 thought-disordered patients obtained a mean score of 12.5 on the rationally-derived PPT scale, a score that is significantly higher than the mean score (8.9) of the non-thought-disordered patients;  $t(46.15) = 3.67, p = .001$ . The 22 thought-disordered patients also obtained a mean score on the PPT scale that was significantly higher than the mean score of the 151 non-patients; for this group,  $\bar{X} = 6.9, t(29.95) = 6.64, p < .001$ . Table 14 presents a summary of these results. The table shows that the mean score of the non-thought-disordered patients on the a priori scale was also significantly higher than the mean score of the non-patients on this scale,  $t(80.57) = 2.95, p = .004$ . Appendix F lists the proportion of patients and of non-patients who endorsed the pictures in the a priori items that were keyed to indicate disordered-thinking.

As shown in Table 1, there were differences between the patient and the non-patient samples on the following variables: age, sex, index of social position. Thus it was necessary to control statistically the possible effects of these variables upon subjects' PPT scores when making comparisons of the groups' performance. In a similar manner, it was

Table 14  
 Comparisons of Patients' and Non-Patients'  
 Mean Scores on the PPT-A Priori Scale <sup>a</sup>

Groups Compared	$\bar{X}$	$t$	Significance Level
Thought-disordered patients <sup>a</sup>	12.5	6.64	.001
Non-patients <sup>b</sup>	6.9		
Thought-disordered patients <sup>a</sup>	12.5	3.67	.001
Non-thought-disordered patients <sup>c</sup>	8.9		
Non-thought-disordered patients <sup>c</sup>	8.9	2.95	.004
Non-patients <sup>b</sup>	6.9		
All patients <sup>d</sup>	10.10	5.11	.001
Non-patients <sup>b</sup>	6.9		

<sup>a</sup><sub>n</sub> = 22

<sup>b</sup><sub>n</sub> = 151

<sup>c</sup><sub>n</sub> = 48

<sup>d</sup><sub>n</sub> = 70

necessary to control for the possible effects of the desirability-response-style upon subjects' scores when making these comparisons. As described previously, subjects' scores on the DPI Desirability scale served as estimates of individuals' tendencies to present themselves favorably when answering test items. The author did an analysis of covariance in order to control for the effects of the four variables discussed upon the differences in mean PPT scores among the thought-disordered patients, the non-thought-disordered patients, and the non-patients. The 70 patients and 51 of the non-patients who had taken the DPI constituted the samples for this analysis.

Table 15 presents the results of the analysis of covariance. Mean scores on the PPT a priori scale for the three sample groups adjusted for the effects of the covariates were as follows: thought-disordered patients,  $\bar{X} = 12.3$ ; non-thought-disordered patients,  $\bar{X} = 8.5$ ; non-patients,  $\bar{X} = 6.2$ . The difference among adjusted group means was significant,  $F(2, 114) = 10.3, p = .0001$ . The adjusted mean of the thought-disordered patient group on the a priori PPT scale was significantly higher than that of the non-thought-disordered patient group,  $t(114) = 3.49, p = .0007$ . The adjusted mean score of the thought-disordered patient group on the PPT scale was also significantly higher than that of the non-patient group;  $t(114) = 4.27, p < .0001$ . Controlling

Table 15

Comparison of Thought-Disordered Patients,  
 Non-Thought-Disordered Patients, Normals on A Priori  
 PPT Scale Controlling for Sex, Age, Social Position,  
 and DPI Desirability Scores

Group Means		
Group	$\bar{X}$	Adjusted $\bar{X}$
Thought-disordered patients <sup>a</sup>	12.5	12.3
Non-thought-disordered patients <sup>b</sup>	8.9	8.5
Non-patients <sup>c</sup>	5.8	6.2

## Analysis of Covariance

Source	df	Sums of Squares	Mean Square	F	p
Equality of Adj. Cell Means	2	350.1504	175.0752	10.3440	.0001
Zero Slope Error	4 114	112.8633 1929.4819	28.2158 16.9253	1.6671	.1625
Equality of Slopes Error	8 106	92.7339 1836.7480	11.5917 17.3278	.6690	.7177

## T-Tests

Groups Compared	t	p
Thought-disordered patients vs. non-thought-disordered patients	-3.49	.0007
Thought-disordered patients vs. non-patients	-4.27	.0000
Non-thought-disordered patients vs. non-patients	-1.73	.08

<sup>a</sup>n = 22

<sup>b</sup>n = 48

<sup>c</sup>n = 51

for the effects of the covariates sex, age, social position, and DPI Desirability score, the difference in the adjusted mean scores on the a priori PPT scale of the non-thought-disordered patients and of the non-patients was not significant,  $t(114) = 1.73$ ,  $p = .08$ . Thus there was support for the hypothesis that scores on the a priori PPT scale would discriminate thought-disordered patients from non-thought-disordered patients and from non-patients when the effects of sex, of age, of social position, and of the desirability response style were controlled statistically.

The author has noted that there were missing educational and occupational-level data for a number of the subjects who comprised the samples. Missing values were estimated from regression equations that were derived using available data of subjects. In order to ensure that use of such estimated values did not misrepresent the significance of differences in performance on the a priori PPT scale among groups, the author did an analysis of covariance using groups composed only of subjects for whom initially no data were missing. There were 56 patients and 31 non-patients included in this analysis. Appendix G presents a summary of the results of this analysis. The results were comparable to those the author obtained when the larger sample pools of patients and of non-patients were used.

In the present analysis, the effects of sex, of age,

of social position, and of the desirability-response-style were controlled. Mean scores on the a priori PPT scale adjusted for the effects of covariates were as follows: thought-disordered patients,  $\bar{X} = 13.15$ ; non-thought-disordered patients,  $\bar{X} = 9.09$ ; non-patients,  $\bar{X} = 5.09$ . The differences among these adjusted means were significant,  $F(2, 80) = 9.07$ ,  $p = .0003$ . The adjusted mean score of the thought-disordered patients on the a priori scale was significantly higher than that of the non-thought-disordered patients,  $t(80) = 3.08$ ,  $p = .002$ , and was also significantly higher than that of the non-patients,  $t(80) = 4.15$ ,  $p = .001$ . Thus there was support for the hypothesis that scores on the rationally-derived PPT scale can distinguish thought-disordered patients from non-thought-disordered patients and from non-patients when the effects of the four covariates are controlled, and when only subjects' for whom no data were missing formed the samples.

Appendix G also lists the results of the comparable analysis of covariance comparing the three samples' scores on the 25-item empirical PPT scale. The adjusted mean scores on this scale did not differ significantly ( $p < .05$ ) among the three groups.

The author also separately analyzed differences in the a priori scale-scores among the three groups for male and for female subjects. The larger pools of patients and of non-patients, including those for whom missing data were estimated, formed the samples for these analyses.



Table 16 shows the results of the analysis of covariance of the male samples' PPT scores controlling for the effects of age, of social position, and of the desirability-response-style. Mean scores on the a priori scale for the three sample groups were as follows: thought-disordered patients,  $\bar{X} = 13.10$ ; non-thought-disordered patients,  $\bar{X} = 9.04$ ; non-patients,  $\bar{X} = 6.02$ . The differences among the adjusted scale means of the male groups was significant,  $F(2, 53) = 8.19$ ,  $p = .0008$ . The adjusted mean score of the thought-disordered patients on the a priori scale was significantly higher than that of the non-thought-disordered patients,  $t(53) = 2.27$ ,  $p = .008$ . The adjusted mean score of the thought-disordered patients on this PPT scale was also significantly higher than that of the non-patients,  $t(53) = 3.73$ ,  $p = .0005$ . The difference between the adjusted mean scores of the non-thought-disordered males and of the non-patient males was not significant,  $t(53) = 1.52$ ,  $p = .134$ .

Table 17 shows the results of the comparable analysis of covariance of female samples' a priori PPT scale-scores, controlling for the effects of age, of social position, and of the desirability-response-style. The adjusted mean scores for the three groups were as follows: thought-disordered patients,  $\bar{X} = 11.07$ ; non-thought-disordered patients,  $\bar{X} = 7.77$ ; non-patients,  $\bar{X} = 6.77$ . The differences among these mean scores were not significant,  $F(2, 56) = 2.30$ ,  $p = .1094$ .

Table 16

Comparisons of Male Thought-Disordered Patients,  
Non-Thought-Disordered Patients, and Non-Patients  
on the A Priori PPT Scale Controlling for Effects  
of Age, Social Position, and DPI Desirability

<u>Group Means</u>		
Group	$\bar{X}$	Adjusted $\bar{X}$
Thought-disordered patients <sup>a</sup>	13.20	13.10
Non-thought-disordered patients <sup>b</sup>	9.75	9.04
Non-patients <sup>c</sup>	5.37	6.02

\* Analysis of Covariance

<u>Source</u>	<u>df</u>	<u>Sums of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>p</u>
Equality of Adj. Means	2	297.55	148.77	8.19	.0008
Zero Slope	3	81.67	27.22	1.49	.2252
Error	53	962.09	18.15		
Equality of Slopes	6	71.55	11.92	.62	.7059
Error	47	890.54	18.94		

T-Tests

<u>Groups Compared</u>	<u>t</u>	<u>p</u>
Thought-disordered patients vs. non-thought-disordered patients	2.72	.008
Thought-disordered patients vs. non-patients	3.73	.0005
Non-thought-disordered patients vs. non-patients	1.52	.134

<sup>a</sup>  $n = 15$

<sup>b</sup>  $n = 20$

<sup>c</sup>  $n = 24$

However, of the three female samples, the thought-disordered patients had the highest mean PPT score. There were only seven subjects comprising the thought-disordered female patient group. This small sample size, of course, decreased the precision of estimating differences between means.

Appendix H shows the results of the analyses of covariance computed separately for the male and for the female samples, when the dependent variable was performance on the empirically-derived PPT scale. The covariates in these analyses were age, social position, and the desirability-response-style. The differences among the male samples' adjusted mean scores on the empirical scale were not significant,  $F(2, 53) = 1.15$ ,  $p = .32$ . Similarly, the differences among the female samples' adjusted mean scores on this scale were not significant,  $F(2, 56) = 2.82$ ,  $p = .067$ . However, examination of Appendix H shows that both the female thought-disordered patients and the female non-thought-disordered patients chose more of the keyed pictures on the empirical PPT scale than did the female non-patients. The author presents an interpretation of these findings in the next chapter.

Concluding this section is a final analysis of the relationship between subjects' scores on the a priori PPT scale and their scores on the DPI Desirability scale. As shown in Table 10, the patients' scores on only 5 of the 31 a priori items correlated significantly ( $p < .05$ ) with their scores.

Table 17

Comparisons of Female Thought-Disordered Patients, Non-Thought-Disordered Patients, and Non-Patients on the A Priori PPT Scale Controlling for Effects of Age, Social Position, and DPI Desirability.

<u>Group Means</u>		
Group	$\bar{X}$	Adjusted $\bar{X}$
Thought-disordered patients <sup>a</sup>	11.00	11.07
Non-thought-disordered patients <sup>b</sup>	8.35	7.77
Non-patients <sup>c</sup>	6.18	6.77

Analysis of Covariance

Source	df	Sums of Squares	Mean Square	F	p
Equality of Adj. Means	2	70.94	35.47	2.30	.1094
Zero Slope	3	81.83	27.27	1.77	.1632
Error	56	862.66	15.40		
Equality of Slopes	6	115.91	19.32	1.29	.2774
Error	50	746.74	14.93		

T-Tests

Groups Compared	t	p
Thought-disordered patients vs. non-thought-disordered patients	1.95	>.056
Thought-disordered patients vs. non-patients	1.93	.058
Non-thought-disordered patients vs. non-patients	.57	.56

<sup>a</sup> n = 7<sup>b</sup> n = 28<sup>c</sup> n = 27

on the DPI-Desirability scale. The author similarly evaluated the relationships between PPT-item scores and Desirability scores of the 51 non-patients who took the DPI. As shown in Table 18, the 51 non-patients' scores on only 6 of the 31 a priori items correlated significantly ( $p < .05$ ) with their scores on the DPI-Desirability scale. Thus there is evidence that a desirability-response-style, as measured by Desirability scores on the DPI, is not significantly related to the picture choices of patients and of non-patients on the majority of the a priori PPT items.

In summary, as hypothesized, it was possible to discriminate a group of thought-disordered patients from a group of non-thought-disordered patients and from a group of non-patients on the basis of their scores on the a priori PPT scale. Scores on the empirically-derived PPT scale, however, did not significantly discriminate among these three groups. The author obtained this pattern of results for the a priori scale and for the empirical scale when the effects of subjects' ages, their sex, their social position, and their tendencies to present themselves favorably when answering test items were controlled statistically.

Relationships between PPT scores and DPI scores of patients. The author tested the hypothesis that patients' scores on the PPT scales would correlate with their scores on the Psychotic Tendencies scale of the Differential Personality Inventory. Table 19 shows the results of the Pearson correlations

Table 18

Rationally Derived PPT Thought Disorder Item  
 Correlations with DPI Desirability  
 Scores <sup>a</sup>

Item	<u>r</u> with DPI Desirability Score
1.	.22 <sup>b</sup>
14.	-.13
38.	-.14
54.	-.30 <sup>b</sup>
60.	-.08
71.	-.20
75.	.03
86.	-.05
103.	-.01
109.	-.15
110.	-.09
112.	-.28 <sup>b</sup>
114.	-.08
115.	-.36 <sup>b</sup>
116.	-.16
119.	.17
120.	-.02
125.	-.02
127.	-.06
128.	-.01
133.	-.14
136.	.03
138.	.02
140.	-.11
142.	.01
202.	-.12
205.	.40 <sup>b</sup>
206.	-.25 <sup>b</sup>
208.	-.15
210.	-.04

<sup>a</sup> n = 51 non-patients

<sup>b</sup> r significant at the .05 level.

that were computed between patients' scores on these scales. Patients' scores on the rationally-derived PPT scale correlated significantly with their scores on the Psychotic Tendencies scale,  $r(68) = .26$ ,  $p = .01$ . Patients' scores on this PPT scale also correlated significantly ( $p < .05$ ) with their scores on the Socially Deviant Attitudes and the Somatic Complaints scales of the DPI.

However, patients' scores on the empirically-derived PPT scale did not correlate significantly with their scores on the Psychotic Tendencies scale,  $r(68) = .14$ ,  $p = .12$ . Patients' scores on this PPT scale did correlate significantly ( $p < .05$ ) with their scores on the Depression, on the Hostility, and on the Impulsivity scales of the DPI.

Table 20 shows the correlations of patients' scores on the 31 a priori items with their scores on the Psychotic Tendencies scale, and Table 21 shows the correlations of patients' scores on the 25 empirical items with their scores on the Psychotic Tendencies scale. This sample's scores on 10 of the 31 a priori items correlated significantly ( $p < .05$ ) with their scores on the Psychotic Tendencies scale. On the other hand, patients' scores on only 4 of the 25 empirical items correlated significantly ( $p < .05$ ) with their scores on the DPI scale. Appendix I shows the mean scores of the patient group on the fifteen DPI scales.

Table 19

Pearson Correlations between the Differential  
 Personality Inventory Scale Scores and Rationally Derived  
 and Empirically Derived PPT Thought Disorder Scale Scores<sup>a</sup>

DPI Scale	Rationally Derived PPT Scale	Significance Level	Empirically Derived PPT Scale	Significance Level
Infrequency	.06	.30	-.16	.08
Cynicism	.08	.24	.01	.46
Depression	-.04	.34	.19	.05
Family Discord	-.13	.13	-.004	.48
Health Concerns	.10	.20	-.06	.30
Hostility	-.01	.44	.19	.05
Impulsivity	.13	.13	.22	.02
Irritability	-.04	.36	.05	.31
Neuroticism	.14	.11	.15	.10
Psychotic Tendencies	.26	.01	.14	.12
Rebelliousness	.09	.21	.18	.06
Socially Deviant Attitudes	.24	.02	-.07	.27
Somatic Complaints	.20	.05	.09	.22
Defensiveness	.04	.35	.03	.38
Desirability	-.06	.28	-.15	.09

<sup>a</sup><sub>n</sub> = 70 patients



Table 20

Rationally Derived PPT Thought Disorder  
 Item Correlations with DPI Psychotic  
 Tendencies Scores<sup>a</sup>

Item	DPI Psychotic Tendencies Scale
1.	-.12
14.	.04
38.	.03
54.	.07 <sup>b</sup>
60.	.39 <sup>b</sup>
71.	.23 <sup>b</sup>
75.	.18 <sup>b</sup>
86.	.20 <sup>b</sup>
98.	-.05
103.	.04
109.	.07
110.	.09 <sup>b</sup>
112.	.25 <sup>b</sup>
114.	.18
115.	-.06
116.	.13
119.	.04
120.	.14 <sup>b</sup>
125.	.33 <sup>b</sup>
127.	.31 <sup>b</sup>
128.	.03
133.	.18
136.	.07
138.	.25 <sup>b</sup>
140.	.31 <sup>b</sup>
142.	-.08
202.	.18
205.	.06 <sup>b</sup>
206.	.19 <sup>b</sup>
208.	-.02 <sup>b</sup>
210.	.28 <sup>b</sup>

<sup>a</sup><sub>n</sub> = 70 patients

<sup>b</sup><sub>r</sub> = significant at the .05 level.

Table 21  
 Empirically Derived PPT Thought Disorder  
 Item Correlations with DPI Psychotic  
 Tendencies Scores <sup>a</sup>

Item	DPI Psychotic Tendencies Scale
22.	-.03
23.	.02
27.	.16
28.	.12
32.	-.04
41.	.00
50.	.26 <sup>b</sup>
51.	.04
63.	.00
65.	-.15
92.	.03 <sup>b</sup>
107.	-.20 <sup>b</sup>
113.	.19 <sup>b</sup>
141.	-.02
143.	-.14
147.	-.15
153.	-.02
160.	.14
162.	-.08
169.	-.07
170.	-.05
174.	-.16
175.	-.10
200.	.19 <sup>b</sup>
201.	-.03

<sup>a</sup>n = 70 patients

<sup>b</sup>r significant at the .05 level.

Thus there was evidence supporting the hypothesis of a relationship between patients' scores on the a priori PPT scale and their scores on the Psychotic Tendencies scale of the DPI. However, the results did not provide support for the hypothesized relationship between patients' scores on the empirically-derived scale and their scores on the Psychotic Tendencies scale.

Further analyses of PPT items: studies of internal consistency and relationships with the behavioral criterion of thought-disorder. The author has previously presented the results of item analyses of the a priori scale (Table 4), of the empirical scale (Table 6), and of the scale that included the entire 56 items (Table 5). Here he presents the results of further analyses of the PPT items that were done with the intention of composing the most internally consistent scale of thought-disorder. Two item pools provided the bases for the separate analyses that were done. The author analyzed the 31-item a priori scale that initially had an alpha of .72, and analyzed the 56-item combined scale that initially had an alpha of .51. These are the results of analyzing the patient sample's data. The 25-item empirical scale initially had an alpha of -.01. Because these items did not form an internally consistent scale, the author did not further analyze them as a separate scale.

The procedures for the present item analyses were as follows. The author used a program of Specht (Reference Note 8)

that computed the alpha coefficient of the items composing the scale. This program also computed for each item the alpha that would result if the item was deleted from the remaining items comprising the scale. The author then deleted items from the scale if their inclusion would lower the internal consistency of the scale. After doing this, he subjected the items that were retained to another item analysis. He then deleted items from this revised scale if their inclusion lowered the internal consistency of the scale. The author followed this procedure until the resulting item-pool included no items that lowered the internal consistency of the scale. Table 22 shows the items that were retained to form a scale from the initial 31-a priori items when this procedure was followed. Table 23 shows the resulting scale when this procedure was applied to the combined 56-item pool. The patient sample's performance on the PPT items provided the data for these analyses.

There were 20 of the initial 31-a priori items that were retained following the procedures described above. These 20 items formed a scale that had an alpha of .783. The author recognizes the capitalization upon chance that resulted from using the original patient sample's data in deriving this coefficient. However, he suggests that for this sample group, the 20 items listed in Table 22 comprise the "best" or most internally internally consistent scale.

Table 22

Retained Rationally Derived PPT Thought Disorder  
 Items from Initial 31-Item Pool and Pearson  
 Correlations with BPRS Composite  
 Thought Disorder Scale Scores<sup>a</sup>

Retained Item	Correlation of Item with Remaining Item Scale	Correlation with BPRS Composite Thought Disorder Scale Scores
38.	.26	.22 <sup>b</sup>
54.	.36	.42 <sup>b</sup>
60.	.29	.15
71.	.50	.23 <sup>b</sup>
75.	.22	.37 <sup>b</sup>
98.	.34	.50 <sup>b</sup>
103.	.51	.54 <sup>b</sup>
110.	.41	.39 <sup>b</sup>
112.	.41	.24 <sup>b</sup>
116.	.41	.24 <sup>b</sup>
125.	.26	.20 <sup>b</sup>
127.	.44	.20 <sup>b</sup>
128.	.22	.42 <sup>b</sup>
133.	.36	.21 <sup>b</sup>
136.	.22	.15
138.	.52	.46 <sup>b</sup>
140.	.24	-.05
202.	.26	-.04 <sup>b</sup>
206.	.40	.36 <sup>b</sup>
210.	.33	.25 <sup>b</sup>

Alpha reliability = .783

<sup>a</sup>  $n = 70$  patients

<sup>b</sup>  $r$  significant at the .05 level.

Table 23

Retained PPT Thought Disorder Items Selected  
 from Initial Item Pool of All 56 PPT Items,  
 and the Pearson - Correlations with BPRS  
 Composite Thought Disorder Scale Scores <sup>a</sup>

Retained Item	Correlation of Item with Remaining Item Scale	Correlation with BPRS Composite TD Scale Scores
38.	.27	.22 <sup>b</sup>
54.	.34	.42 <sup>b</sup>
60.	.28	.15
71.	.51	.23 <sup>b</sup>
75.	.23	.37 <sup>b</sup>
98.	.34	.50 <sup>b</sup>
103.	.54	.54 <sup>b</sup>
110.	.42	.39 <sup>b</sup>
112.	.42	.24 <sup>b</sup>
116.	.42	.24 <sup>b</sup>
125.	.26	.20 <sup>b</sup>
127.	.46	.20 <sup>b</sup>
128.	.22	.42 <sup>b</sup>
133.	.35	.21 <sup>b</sup>
136.	.21	.15
138.	.51	.46 <sup>b</sup>
140.	.26	-.05
202.	.26	-.04
206.	.39	.36 <sup>b</sup>
210.	.34	.25 <sup>b</sup>
153.	.33	.13
170.	.44	.03
Alpha Reliability =	.802	

Note. When all 56 PPT thought disorder items were considered as the initial item pool for item analysis, only 2 of the empirically derived items were retained on the basis of providing contributions to the internal consistency coefficient of the scale. These were items #153 and #157.

<sup>a</sup><sub>n</sub> = 70 patients

<sup>b</sup><sub>r</sub> significant at the .05 level.

In order to determine whether any of the 25 empirical items might enhance the internal consistency of a PPT-thought-disorder scale, the author analyzed the total 56-item pool. When the procedures outlined in the previous paragraphs were followed, 22 of these 56 items formed the most internally consistent scale ( $\alpha = .802$ ). There were 2 of the empirical items in this scale. The a priori items formed the remainder of the scale.

The author then examined the relationships between patients' scores on these 22 items and their scores on the composite thought-disorder scale of the BPRS. Table 22 shows these Pearson correlations between the patients' composite BPRS scores and their scores on the 20 a priori items. Table 23 shows the Pearson correlations between the patients' BPRS scores and their scores on the 2 empirical items that were retained on the basis of item analysis. Patients' scores on 16 of the 20 a priori items that were retained correlated significantly ( $p < .05$ ) with their scores on the composite thought-disorder scale. However, the patients' scores on the 2 empirical items that were retained did not correlate significantly ( $p < .05$ ) with their scores on this composite scale. Thus, in general, patients' scores on the a priori PPT items that formed the most internally consistent scale were related to their scores on the behavioral criterion of thought-disorder.

The author recognizes that the selection of PPT items that reliably and validly tap disordered-thinking requires cross-validation of the present study using other samples. His intention here was to identify those PPT items that were useful in measuring thought-disorder among the patient sample that was tested in this study.



## CHAPTER 5

Discussion

The author evaluated the reliability and the validity of 56 items as measures of thought-disorder using a psychiatric-patient and a non-patient sample. He created 31 of these items on an a priori basis. The remaining 25 items Ryan (Reference Note 7) had found empirically to relate to the Psychotic Tendencies scale of the DPI. Because of the different ways in which these items were derived, the author separately analyzed the two item-pools and separately discusses the results of these analyses below.

The 31-a priori items formed an internally consistent scale when the performance of the patients and the performance of the non-patients were analyzed. Patients' scores on this scale were related significantly to their scores on the behavioral criterion of thought-disorder that resulted from summing their scores on the BPRS Conceptual Disorganization, the Hallucinatory Behavior, and the Unusual Thought Content scales.

The author assigned patients to either a "thought-disordered" subgroup or to a "non-thought-disordered" subgroup based upon whether they showed pathology on any of the three BPRS scales believed to indicate thinking-disorder. When this was done, scores on the a priori-PPT scale significantly discriminated the patients called "thought-disordered" from

both the patients called "non-thought-disordered" and from the non-patients.

The results of a preliminary study showed that a group of university undergraduates judged the a priori pictures to be less socially desirable than the pictures with which they are paired. In view of this, the author evaluated the effects of the subjects' desirability-response-tendencies upon their PPT scores in the main study. Subjects' scores on the Desirability scale of the DPI provided a measure of their tendencies to present themselves favorably when answering test items. The patients' and the non-patients' scores on the a priori PPT scale did not relate significantly to their scores on the Desirability scale. These groups' scores on the individual items comprising the a priori scale, with only a few exceptions, also did not correlate significantly with their scores on the DPI scale. Thus there was evidence that subjects' tendencies to present themselves favorably when answering test items did not significantly relate to their preferences on the a priori scale.

There were differences between the patient and the non-patient samples in age, in social status, in educational and occupational levels, and in the proportion of males and females represented. There was also a difference between these samples' mean Desirability scale scores. Thus the author compared performance of the samples on the a priori scale using an analysis of covariance, controlling for the effects of these

variables. When this was done, scores on the a priori scale significantly discriminated the thought-disordered patients from the non-thought-disordered patients and from the non-patients. Thus differences between patients and non-patients in age, in social status, in sex, and in the desirability-response-style did not account for the effectiveness with which a priori-PPT scores discriminated between the thought-disordered group and the non-thought-disordered groups.

The author also compared the mean scores of these three groups on the a priori-PPT scale separately for male and for female subjects. When the effects of age, of social position, and of the desirability-response-tendency were controlled, scores on the a priori scale significantly discriminated the thought-disordered males from the non-thought-disordered males and from the male non-patients. However, among the female subjects, a priori-scale scores did not discriminate significantly the thought-disordered group from the non-thought-disordered groups. The thought-disordered females did obtain scores on the a priori scale that were higher than those of the two non-thought-disordered female groups. However, only 7 subjects were in the thought-disordered female group. The author believes that the unsuccessful discrimination of this group from the non-thought-disordered female groups may be accounted for by the limited size of the sample.

A cross-validation study comparing the scores on the a priori-PPT scale of larger samples of thought-disordered and of non-thought-disordered subjects is needed in order to elucidate potential performance differences of males and of females on this scale.

In the present study, the author also evaluated the relationship between the 70 patients' scores on the a priori scale and their scores on the DPI scales. As hypothesized, patients' scores on this PPT scale significantly correlated with their scores on the Psychotic Tendencies scale of the DPI. This relationship, however, was not as strong as was the relationship between patients' a priori-scale scores and their scores on the behavioral criterion of thought-disorder. The author suggests that this may be the case since the Psychotic Tendencies scale appears to measure other dimensions of psychological functioning, in addition to measuring disordered-thinking. The results of Trotter and Morf's (1972) factor analysis of the DPI scales provide support for this contention. These authors stated that the Psychotic Tendencies scale appears to measure

bizarre mentation, social alienation, extreme and pathological interpersonal sensitivity, and a lack of achievement associated with several psychopathology. (p. 101-102)

We turn now to a discussion of the empirically-derived PPT items. These items did not form an internally consistent scale, nor did patients' scores on this scale successfully discriminate the thought-disordered group from the non-thought-disordered groups. There was a tendency, especially among females, for both the thought-disordered and for the non-thought-disordered patients to obtain higher scores on this scale than did the non-patients. This observation, in addition to the poor internal consistency of the scale, suggests that these items may tap rather diverse dimensions associated with psychiatric-patient-status or with psychological distress.

The scores of students on the 25 empirical items, in Ryan's study (Reference Note 7), correlated with their scores on the Psychotic Tendencies scale of the DPI. This was the basis for inclusion of these items in the present study. However, the author found that patients' scores on these items did not correlate significantly with their Psychotic Tendencies scores. Thus these results demonstrate the importance of cross-validation studies when constructing tests; as discussed by Auld (1953) and by others.

The results of the present study clearly indicate that the PPT items derived on a rational basis far surpassed those derived on an empirical basis in the effective measurement of thought-disorder. This observation is consistent with Jackson's (Reference Note 9) statement that an appreciation for the

discriminating manifestations of psychological characteristics that one intends to measure contributes to construction of an effective test. As he has stated:

Personality measures will have broad import and substantial construct validity to the extent, and only to the extent, that they are derived from an explicitly formulated, theoretically based definition of a trait. (p.4)

The author does not view the present study as a comparison of the effectiveness of the empirical and of the a priori approaches to test construction. Rather, he believes that the results of the study lend support to the utility of a rational approach to the construction of test scales.

While there was support for the hypothesis that the a priori scale is a measure of thought-disorder, there was also evidence that it may also be a measure of other psychological characteristics. The results of analyses that are not reported in detail in the present paper suggest, for example, that picture-choice on item 208 may tap a preference for human or for non-human objects, in a sense reflecting the subject's capacity for sound interpersonal relationships. The pictures comprising this item show a girl standing alone next to a tree, and a girl talking with a boy next to a tree. Similarly, there is some preliminary evidence that choice on item 98 may measure irritability or hostility. The pictures comprising

this item show a group of thriving flowers and show a single, dying flower. There are items of the a priori scale that may also measure depressive affect. These examples are offered here to illustrate the need for further evaluation of the psychological correlates of picture-preferences on the new PPT items.

Some final comments about the effectiveness of the a priori items in measuring thought-disorder are appropriate. The author believes that the successful use of these items in the present study is due, in part, to the characteristics of the picture-preference format. Subjects taking the PPT appeared to be interested in the pictures. The entire 210 items were presented in only 35 minutes. This may be of importance when testing hospitalized patients who may be prone to distractability and fatigue.

Language skills and reading skills are not required in order to take the PPT. The absence of the latter requirement, namely reading skills, may be relevant to the testing of severely-distressed persons whose visual acuity may be reduced as a result of the medications they are taking while hospitalized. The lack of sustained concentration needed to make a picture choice, the interest-value of the format, and the quickness with which the test may be taken, may encourage the persistence in test-taking of patients who have a temporary visual-acuity impediment.

Subjects may also perceive a picture-choice task as less threatening than a task which requires them to endorse statements about their own behaviors, as does the MMPI and the DPI for example. This may contribute to less defensive response tendencies.

A final comment addresses more directly the issue of the nature of thought-disorder. One of the limitations of the current tests of thought-disorder, according to Reed (1970) and Hemsley (1976), is the tendency in these tests to represent very narrowly the manifestations of the disorder. So, for example, an object-sorting-task may measure a deficit in appropriate skills of categorization. A task requiring the explanation of the meanings of proverbs may measure a deficit in logical-reasoning skills. However, Arieti (1974), Reed (1970), and others have observed that such deficits, in thinking, taken individually, do not adequately encompass the range of disordered-thinking an individual may show. Thus any one of the tests that measure only a limited manifestation of disordered-thinking may fall short when used to discriminate an individual suffering from thought-disorder. In constructing the a priori-PPT items, the author attempted to represent in pictures a range of characteristics that have been called "disordered-thinking." This may, in part, have contributed to the success in discriminating thought-disordered patients



from groups of non-thought-disordered persons on the basis of their a priori-PPT scores that was shown in this study. Support for this hypothesis, however, requires further study of the new PPT items.

The initial effort to develop and to validate a PPT thought-disorder scale has yielded results which encourage cross-validation and further analysis of the new, a priori items.

## REFERENCE NOTES

1. Kavanaugh, P. A validation study of the Differential Personality Inventory (DPI). University of Windsor Unpublished Dissertation, 1975.
2. Burnett, D. Cluster analysis program, test 07. University of Alberta, Division of Educational Research Services, Computer Program Documentation. August, 1969.
3. Morf, M. Revision of the Vanderbilt item analysis program written by R.L. Gorsuch. Revised January, 1972.
4. Jackson, D., and Carlson, K. Convergent and discriminant validation of the Differential Personality Inventory. Research bulletin No. 29, University of Western Ontario, 1969.
5. Noel, C. Development of a Picture-Preference Test depression scale. University of Windsor master's thesis project in progress. January, 1979.
6. Rudzinski, D. What is thought disorder, and what are the means by which it has been measured. Unpublished paper. University of Windsor, 1978.
7. Ryan, P. Regarding PPT items correlating with DPI scales potentially reflecting thought disorder. Personal communication, 1977.
8. Specht, D. SPSS Reliability subprogram. SPSS Batch Release 7.0. Update Manual, March, 1977. Addition to Nie, N., et al., Statistical package for social sciences. New York: McGraw-Hill Publishers, 1975.
9. Jackson, D. Dynamics of structured personality tests: 1970. Research bulletin no. 132. U. of Western Ontario, 1969.

## REFERENCES

- Auld, F. The use of Rorschach scores to predict whether patients will continue therapy. Journal of Consulting Psychology. 1953, 17, 104-109.
- Amin, S. A picture-preference test to measure the trait of avoidance of intimacy in females (Doctoral Dissertation, University of Windsor, 1974). Canadiana, June 1976, 67. (National Library of Canada order no. 23852)
- Andreasen, N., et al. Overinclusive thinking in schizophrenic and manic patients. British Journal of Psychiatry. 1974, 125, 452-456.
- Andreasen N., and Powers, P. Psychosis, thought disorder, and regression. American Journal of Psychiatry. 1976, 133, 522-526.
- Arieti, S. The cognitive transformation. In Interpretation of schizophrenia. New York: Basic Books, 1974.
- Bannister, D. Conceptual structure in thought-disordered schizophrenics. Journal of Mental Science. 1960, 106, 1230-1249.
- Bannister, D. The nature and measurement of schizophrenic thought disorder. Journal of Mental Science. 1962. 108, 825-842.
- Bannister, D., Fransella, F., et al. Characteristics and validity of the grid test of thought disorder. British Journal of Social and Clinical Psychology. 1971, 10, 144-151.

- Begin, P. An oral dependency trait scale for the picture preference test of addictiveness (Doctoral Dissertation, University of Windsor, 1975). Dissertation Abstracts International, 1975, 36, 1911-B. (National Library of Canada order no. 23859)
- Bromet, E., and Harrow, M. Behavioral overinclusiveness as prognostic index in schizophrenia. Journal of Abnormal Psychology. 1973. 82, 345-349.
- Broadbent, D.E. Perception and communication. New York: Oxford University Press, 1958.
- Boland, T. and Chapman, L. Conflicting predictions from Broen's and Chapman's theories of schizophrenic thought disorder. Journal of Abnormal Psychology, 1971, 78, 52-58.
- Broen, W., and Storm, L. Lawful disorganization: process underlying a schizophrenic syndrome. Psychological Review, 1966, 73, 579-582.
- Brody, E. and Redlich, F. Psychotherapy with schizophrenics. New York: International Universities Press, 1952.
- Berek, J. A factor reliability study of a picture-preference test (Doctoral Dissertation, University of Windsor, 1975). Dissertations Abstracts International, 1976. 36, 4677-B. (National Library of Canada order no. 29112)
- Blatt, S., and Ritzler, B. Thought disturbance and boundary disturbance in psychosis. Journal of Consulting and Clinical Psychology. 1974, 42, 370-381.

- Bleuler, E. Textbook of psychiatry. New York: Dover, 1951.
- Cameron, N. Experimental analysis of schizophrenic thinking.  
In J. Kasanin, Ed., Language and thought in schizophrenia.  
Berkeley: University of California Press, 1944.
- Cameron, N. Personality development and psychopathology.  
Boston: Houghton-Mifflin, 1963.
- Cowan, L. A picture-preference test to measure the trait of  
addictiveness in personality (Doctoral Dissertation,  
Wayne State University, 1967). Dissertation Abstracts  
International, 1971, 31, 6894-B. (University Microfilms  
No. 71-12,024)
- Collins, P. et al. The object sorting test and differential  
diagnosis. Comprehensive Psychiatry, 1975, 16, 391-397.
- Dixon, W. BMDP Biomedical computer programs. P-Series. Berkeley:  
University of California Press, 1977.
- Domarus, E. von. The specific laws of logic in schizophrenia.  
In J. Kasanin, Ed., Language and thought in schizophrenia.  
Berkeley: University of California Press, 1944.
- Edwards, A. The social desirability variable in personality  
assessment and research. New York: Dreyden, 1957.
- Freud, S. Formulations regarding the two principles in mental  
functioning. In S. Freud, Collected Papers, Vol.4, 13-21.  
London: Hogarth Press, 1925. (Original publication, in  
German: 1911.)
- Freud, S. The unconscious. In S. Freud, Collected Papers, Vol.4,  
98-136. London: Hogarth Press, 1925. (Original publication,  
in German: 1915.)

- Gottesman, I., and Chapman, L. Syllogistic reasoning errors in schizophrenia. Journal of Consulting Psychology, 1960, 24, 250-255.
- Goldstein, K. Methodological approach to the study of schizophrenic thought disorder. In J. Kasanin, Ed., Language and thought in schizophrenia. Berkeley: University of California Press, 1944.
- Hemsley, D. Problems in interpretation of cognitive abnormalities in schizophrenia. British Journal of Psychiatry, 1976, 129, 32-35.
- Henry, W.E. The analysis of fantasy. New York: Krieger, 1973.
- Hawks, D. and Payne, R. Overinclusiveness in thought disorder. British Journal of Psychiatry, 1971. 118, 663-670.
- Jackson, D. and Messick, S. Response styles in the assessment of personality. In Problems in human assessment. New York: McGraw-Hill Book Co., 1967.
- Jackson, D., and Messick, S. Differential Personality Inventory. Form L. Goshen, N.Y.: Research Psychologists Press, 1964.
- Kelly, G. The psychology of personal constructs. 2 vols. New York: Norton, 1955.
- Kasanin, J. Language and thought in schizophrenia. Berkeley: University of California Press, 1944.
- Kraepelin, E. Dementia praecox and paraphrenia. Edinburgh: Livingstone, 1919.

- Kilburg, R., and Seigel, A. Formal operational thought in reactive and process schizophrenia. Journal of Consulting and Clinical Psychology, 1973, 40, 475-482.
- Loro, B. The confusing area of disturbed thinking. Journal of Personality Assessment, 1976, 40, 475-482.
- Morrison, B. Evidence for distinctive personality traits in alcoholics using a picture-preference test for addictiveness (Doctoral Dissertation, University of Windsor, 1973). Canadiana, Sept. 1975, 75. (National Library of Canada order no. 19939)
- Mednick, S. A social learning theory approach to schizophrenia. Psychological Bulletin, 1958, 55, 316-328.
- Myers, J., and Bean, L. A decade later: a follow-up of social class and mental illness. New York: Wiley, 1968.
- Overall, J., and Gorham, D. The brief psychiatric rating scale. Psychological Reports, 1962, 10, 799-812.
- Payne, R. An object sorting classification task as a measure of overinclusive thinking in schizophrenic patients. British Journal of Social and Clinical Psychology, 1962, 1, 213.
- Payne, R., and Friedlander, D. A short battery of single tests for measuring overinclusive thinking. Journal of Mental Science, 1962, 108, 362-367.

- Payne, R., et al. Measurement and significance of overinclusiveness. In P. Hoch and J. Zubin, Eds. Psychopathology in schizophrenia. 1966. Gruen and Stratton Co. N.Y.
- Price, H. Task requirements in a test of schizophrenic overinclusion. British Journal of Social and Clinical Psychology. 1970. 2, 60-67.
- Rappaport, D. et. al. Diagnostic psychological testing. Ed. by R. Holt. New York: International Universities Press, 1968.
- Reed, J. Schizophrenic thought disorder: a review and hypothesis. Comprehensive Psychiatry, 1970, 11, 403-432.
- Reed, J. The proverb test in schizophrenia. British Journal of Psychiatry, 1968, 114, 317-321.
- Ryan, P. A construct validation study of a picture-preference test (Doctoral Dissertation, University of Windsor, 1976). Dissertation Abstracts International, 1977, 38, 1903-B.
- Seigel, A., et al. Loose associations and disordered speech patterns in chronic schizophrenia. Journal of Nervous and Mental Disease, 1976, 162, 105-112.
- Shimkunas, A. Cognitive deficit in schizophrenia: a reappraisal. British Journal of Medical Psychology, 1972, 45, 149-157.
- Silverman, L., et.al. Manifestations of primary process thinking in schizophrenia. Journal of Projective Techniques, 1962, 26, 117-127.



Strauss, L. The clarification of concreteness by Piagetian tasks. Psychiatry, 1967, 30, 294-301.

Trunnell, T. Thought disturbance in schizophrenia.

Archives of General Psychiatry, 1964, 11, 128-136.

Trunnell, T. Thought disturbance in schizophrenia. Archives of General Psychiatry, 1965, 13, 9-18.

Trott, D., and Morf, M. A multimethod factor analysis of the Differential Personality Inventory, Personality Research Form, and MMPI. Journal of Counseling Psychology, 1972, 19(2), 94-103.

Wing, J. K., Cooper, J. E., and Sartorius, N. The measurement and classification of psychiatric symptoms.

London: Cambridge University Press, 1974.

Wright, D. Impairment in abstractive conceptualization in schizophrenia. Psychological Bulletin, 1975, 1, 120-127.

Whitaker, L. The Whitaker index of schizophrenic thinking. Los Angeles: Western Psychological Services, 1973.

VITA AUCTORIS

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APPENDIX A

DESCRIPTION OF THE ITEMS IN THE PICTURE PREFERENCE TEST  
INCLUDING NEW ITEMS FOR A THOUGHT DISORDER SCALE

DESCRIPTION OF ITEMS IN THE PICTURE PREFERENCE TEST  
INCLUDING NEW ITEMS FOR A THOUGHT-DISORDER SCALE

A star (\*) placed beside the item number designates a new, thought-disorder-scale item.

Two stars (\*\*) placed next to a picture description designates the anticipated keyed choice reflecting thought disorder.

<u>Item no.</u>	<u>Picture A</u>	<u>Picture B</u>
X.	Lamp on table	Tree
Y.	Triangle	Square
1.*	Woman with shoulder bag	Handbag and pair of shoes **
2.	Marquee advertizing "Love Story" movie	Marquee advertizing the "Godfather" movie
3.	Woman in shower	woman watering shrubs
4.	Frustrated boy sitting in front of math problems	Same boy being reprimanded by mother
5.	Cwl on tree branch	Woman being fitted for shoes by shoe salesman
6.	Young man, arm-in-arm with woman	Same man walking hand-in-hand with parents
7.	A conservative appearing man	A masked man
8.	A male sword swallower	A male fire-eater
9.	couple just married, in a car	couple being married
10.	Rear view of tenement and alley	a fun-house mirror with distorted reflection
11.	Boy climbing tree	boy with pie on face
12.	A man and woman kissing	Scene inside theater
13.	Father reprimanding boy in a loving manner.	son kicking family cat
14.*	child walking under sun	same child falling-- cloud across sun **

Item no.	Picture A	Picture B
15.	A wheelchair	A pair of crutches
16.	A skinny man	A fat man
17.	Man sweeping floor	Man walking tight rope
18.	Refrigerator with door open	Refrigerator with door closed
19.	couple entering motel	Secretary at desk
20.	Christmas tree with presents	Santa Claus with bag of presents
21.	A boy being treated by a doctor	Boy escaping from scene of crime via window
22.	An upright baby bottle	Same bottle tilted down
23.	Medicine cabinet filled with toothbrushes, bandages, etc.	Medicine cabinet filled with pill boxes, bottles, etc.
24.	A stack of cans on table in a heap	hand adding can to poorly- balanced cans stacked up.
25.	Mother feeding son	Father feeding son
26.	A girl thinking about a grave	Same girl thinking about husband and child
27.	Figure going down into a whirlpool with man diving in to save him	same scene, but man throwing life-preserver
28.	couple looking at album	Couple dancing
29.	Modern Art figure representation--close up	Same figure at a distance
30.	Figure giving injection in man's arm	Same man receiving injection from an arm
31.	Bedroom with two figures in bed	same picture with one figure in bed
32.	Man finding full treasure chest	Same man as "Chairman of the Board"

Item no.	Picture A	Picture B
33.	A group of people standing, talking	Same group with one person standing away from group
34.	Couple in motorcycle with sidecar	couple on motorcycle
35.	A drunk being laughed at	Same man with family
36.	A man hanging from cliff, holding branch with one hand	Same man crumpled on ground at bottom of cliff
37.	A masked man with gun	A policeman
38.*	Two eyes behind a broken lamp **	Broken lamp on floor beside table
39.	A rose with thorns	A dead tree
40.	An escalator	An express elevator with door closed
41.	A road leading to town in the distance	Same scene with no town in sight...
42.	A double bed	twin beds
43.	Superman	A muscular stevedore
44.	A car parked by side of road with hood up	Same car being driven on mountain road
45.	A woman holding a baby	Same woman playing with baby
46.	Boy putting candy into his mouth	Boy looking thru telescope
47.	Stewardess greeting passengers	Man and woman reading from same paper
48.	Sleeping Beauty and Prince Charming	Snow White and Seven Dwarfs
49.	Man driving big car	Male graduate in cap and gown
50.	A car going over a bumpy road	Road showing "detour" sign



Item no.	Picture A	Picture B
51.	Boy holding hands with mother.	Same boy holding hands with father
52.	Statue of man and woman embracing	Statue of a woman
53.	Woman in bathing suit	Woman cooking at stove
54.*	Woman talking with child	Woman with raised arm yelling at child **
55.	A very thin woman	a Fat woman
56.	Stethoscope	package of dynamite
57.	Baby in crib	couple in bed
58.	Car being pulled by tow truck	Car being pushed by tow truck
59.	Young child being spanked	Same child washing dishes
60.*	Full length vie of boy	Framed picture of same boy**
61.	Wizard giving person magical potion--person drinking it becomes a king	same person studying and then scene of him graduating
62.	picture of mouth	Picture of eyes
63.	A buxom woman	A less buxom woman
64.	Couple at a zoo	Couple walking arm-in-arm
65.	Man walking across tattered rope bridge	Man moving heavy rock
66.	Couples dancing closely	square dance
67.	Empty Garage--open door	A handgun
68.	Long line of people waiting to get into restaurant	an automat
69.	Young child sucking his thumb	Same child playing with pots and pans
70.	A hospital (outside view)	Line of traffic waiting for train to pass

Item no.	Picture A	Picture B
71.*	Saw and screwdriver	Saw and set of false teeth**
72.	Union picketers outside office building	Negotiating men at table
73.	A medical journal	A detective magazine
74.	Window with shade pulled	Same, with shade up showing and outdoor scene
75.*	Pair of shoes and pair of sox	Pair of sox and a box **
76.	Woman talking to priest	Woman talking to man
77.	A secluded tree	A family house
78.	Men walking down street approaching a man walking on opposite side of the street	Same scene with man walking on same side of street as is group coming toward him
79.	Two men arguing	Same picture with men, backs toward each other
80.	Boy pulling girl's pigtails	girl reading
81.	Man drinking out of a bottle	Man drinking out of glass
82.	Woman viewed at eye level	Woman being viewed from below
83.	Couple in drive-in	couple planting trees
84.	Boy jumping off high rock with rubble below	Boy sitting and reading
85.	Couple receiving award	Woman giving message to man
86.*	Spool of thread with threaded needle	eye of needle and an eye of a person **
87.	baby with pacifier	baby looking at mobile
88.	Young bird pulling worm from ground	mother feeding worm to bird in nest
89.	Boy and girl playing "doctor"	Boy and girl coloring in book

Item no.	Picture A	Picture B
90.	Roller coaster seen from first car	Baby kangaroo in mother's pouch
91.	A teddy bear	A duck pull-toy
92.	Woman with two other women	Woman with two men
93.	Man piloting airplane	same man, flying himself
94.	Beggar sitting on sidewalk holding cup	Man struggling to lift heavy weight
95.	Boy and girl drinking from same container with straws	Two girls sitting on swings
96.	Princess kissing frog-- he changes into prince	Man proposing to woman
97.	Woman in bed being examined by male doctor	Same scene with female doctor
98.*	Drooping flower **	three upright flowers
99.	Man and woman passing on street	Same scene, man turns head to look at woman passing
100.	Mouse watching cat from his hole in wall	Mouse approaching cheese in baited trap
101.	a neatly arranged room	Same scene, but room in disorder
102.	A man wearing a mask with a smiling facial expression	Same man--no mask--no expression on his face
103.*	Birthday cake, fork, glass	Birthday cake, snake **
104.	man in jail cell reading	same man, sawing bars of cell
105.	couple watching tv from separate chairs	couple embracing on couch
106.	Seaman being whipped	Seaman scrubbing floor
107.	Woman in "roman bath"	lone woman under sun-lamp
108.	Masked man stealing money out of telephone box	man reading at desk

Item no.	Picture A	Picture B
109.*	Young girl	Teddy bear **
110.*	girl watching tv screen from which arm is extended **	same picture without arm extending out of tv
111.	Boy throwing rock thru window	Same boy being caught by policeman
112.*	Baseball and bat	ball, and child crawling**
113.	Couple playing tennis	Women playing volleyball
114.*	lamp and light-bulb	lamp and umbrella **
115.*	Child touching sun with hand **	same scene but child is not touching sun
116.*	Milk carton, shaving cream, and razor **	Milk carton, coffee cup, spoon
117.	A clock showing 10 a.m.	Clock showing 12 noon
118.	Boy standing in front of father saying "I promise" with fingers crossed behind his back	Landscape scene
119.*	and "eight-ball" and a clock showing 8 o'clock**	Clock showing 8 o'clock, and a watch showing 8:30
120.*	Boat and a leaking faucet**	Boat and two oars
121.	Young boy feeding himself	Infant suckling at mother's breast
122.	Young boy and girl	Man and woman kissing
123.	Man smoking	Man whittling
124.	Woman in doctor's office	Woman being helped into bed by a nurse
125.*	Nails and a pail**	Hammer and nails
126.	Construction worker staring at woman	Woman at bank* talking to a female teller

Item no.	Picture A	Picture B
127.*	Simplified, childlike drawing of a figure **	Well drawn head of a man
128.*	Girl standing, intact figure	Same picture of girl split into segments **
129.	Couple at art gallery	Couple embracing on couch
130.	Man walking thru field	Man running thru field
131.	Woman in short skirt fitting man for suit	Woman alone
132.	Crime figure	A horse
133.*	Saw and apple **	Tree and apple
134.	A dagger	Pair of Scissors
135.	Number of men fishing	Couple on way to hay-loft
136.*	Chair	Same chair broken **
137.	Couples playing cards	Woman sitting on man's shoulder
138.*	Tree and a key **	Key and a lock
139.	Couple on beach blanket	Family picnic
140.*	Mop and broom	mop and ice cream cone that is dripping **
141.	A palm atree	A cactus plant
142.*	Figure of a girl	Girl attached to puppet strings
143.	Boy buttoning shirt	Boy blowing bubble
144.	Snow White asleep	Girl reading
145.	Hand cutting knot with knife	Hand untying knot
146.	Roast turkey on platter	Baby chick emerging from shell
147.	Four letter "M"s-- increasing in size from small to large	Four uniformly-sized letter "M"s

Item no.	Picture A	Picture B
148.	A news magazine	A movie magazine
149.	Large "plus" sign and circle	Two large "plus" signs
150.	A man	A boy
151.	A man watching tv	Man sitting in chair thinking
152.	Older man feeding self	Older man being fed
153.	Shower room with several nude men	Woman ironing with child on floor
154.	Person looking into mirror --indistinct reflection	Wagon with one wheel missing
155.	Large cactus, desert scene	Large clock showing 4:15
156.	View from shoulder of a man who is giving a speech to audience	Man with arm in cast
157.	Man being whipped	Woman being whipped
158.	A painting	A mirror
159.	Pice of paper with small figure at the bottom.	Paper with figure filling page
160.	Boys about en years old playing football	Same boys playing baseball
161.	A beaver	A butterfly
162.	Dog standing with no leash	Dog on leash
163.	A human heart	A human brain
164.	Woman buying cake at bakery shop	Same woman baking cake
165.	A strung bow	A bow, unstrung
166.	People throwing things at man carrying "peace" sign	Group of soldiers in combat

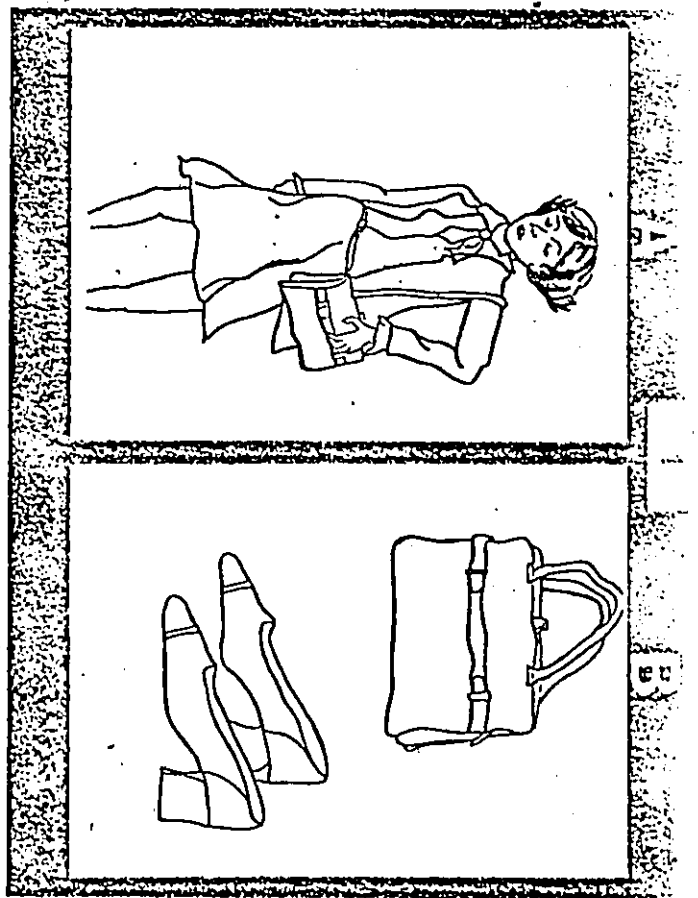
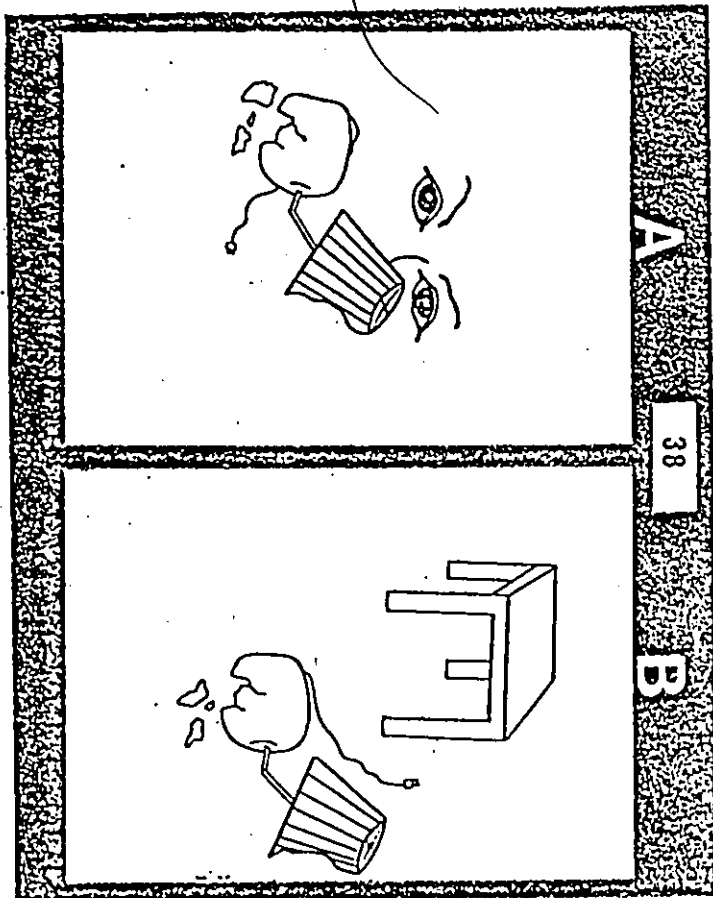
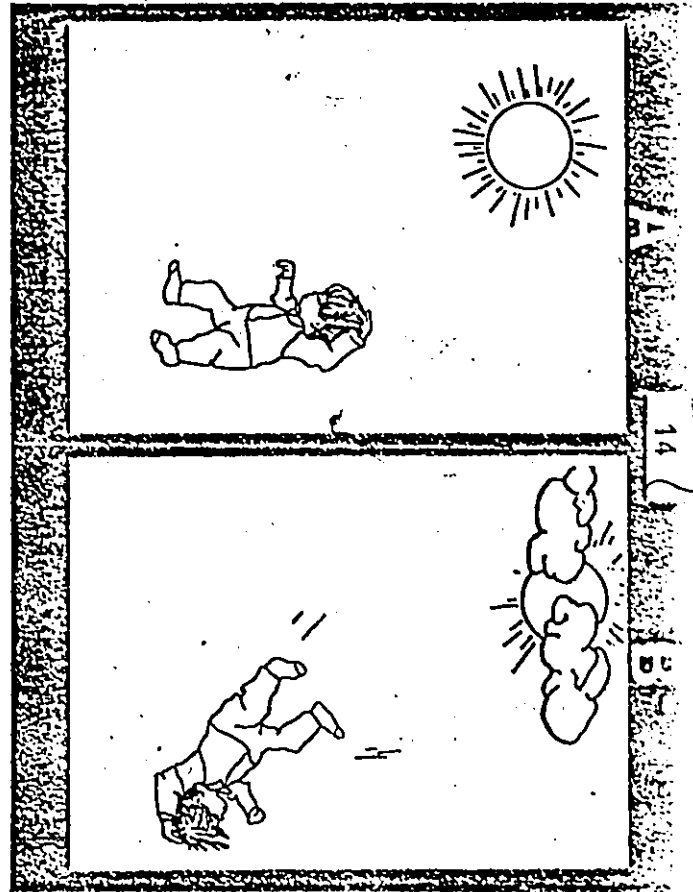
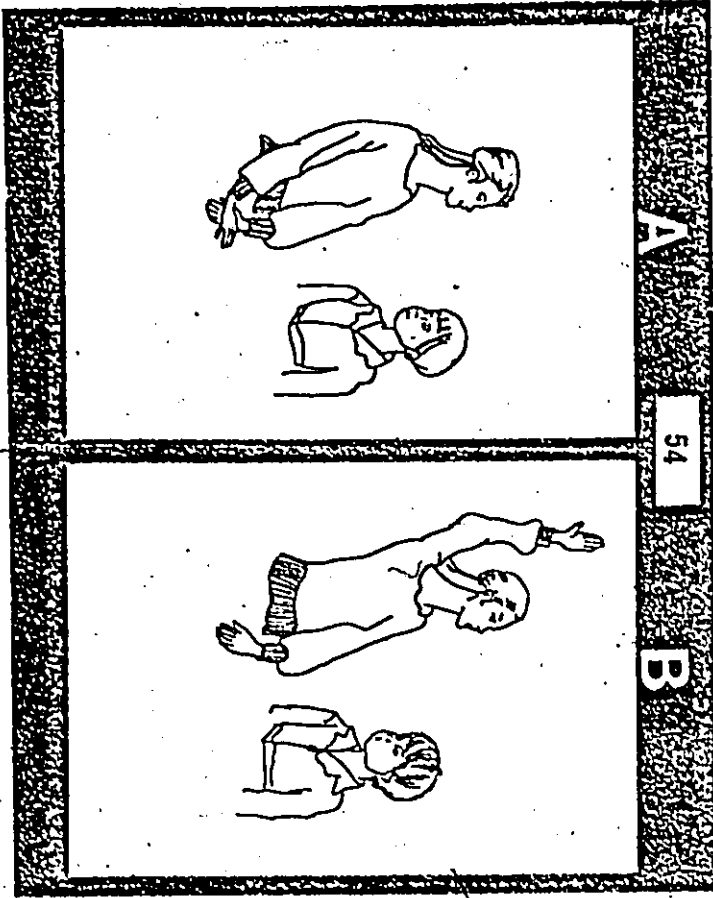
Item no.	Picture A	Picture B
167.	Small dog running thru the woods	Cat curled up by fire
168.	Scarecrow	Robot
169.	Swans and a vulture	Group of vultures
170.	Mother duck with young ducks following	Mother hen which chicks under her wings
171.	A crib	A playpen
172.	Circle with square next to it	Circle and square overlapping
173.	Row of numbered telephone poles	Same poles without numbers
174.	Ten year old girl	Grown woman
175.	Two men wrestling	Two men boxing
176.	Football player catching a pass	Football player bent over ready to hike the ball
177.	Person sleeping-- dream cloud shows non-descript scene	Same scene with no dream cloud
178.	Baby being fed bottle by happy mother	baby being breast fed by mother with expressionless face
179.	Numbers: 13,14,15,16	Numbers: 2,4,8,16
180.	Apple with bite out	Orange with section removed
181.	Toy top spinning	Large ball
182.	Roaring fireplace	Hot bath
183.	Person lying in sick-bed	Doctor with stethoscope
184.	Organ grinder and monkey	Freak show at circus
185.	Car wash--dirty car going in--clean car coming out	Caterpillar crawling into cocoon, and butterfly emerging
186.	Soldiers in combat	Line of men getting injections
187.	Man climbing rope with end of rope visible	Same scene with rope disappearing at top of picture
188.	Woman trying on shoes with male saleclerk	Woman being fitted for dress by female seamstress

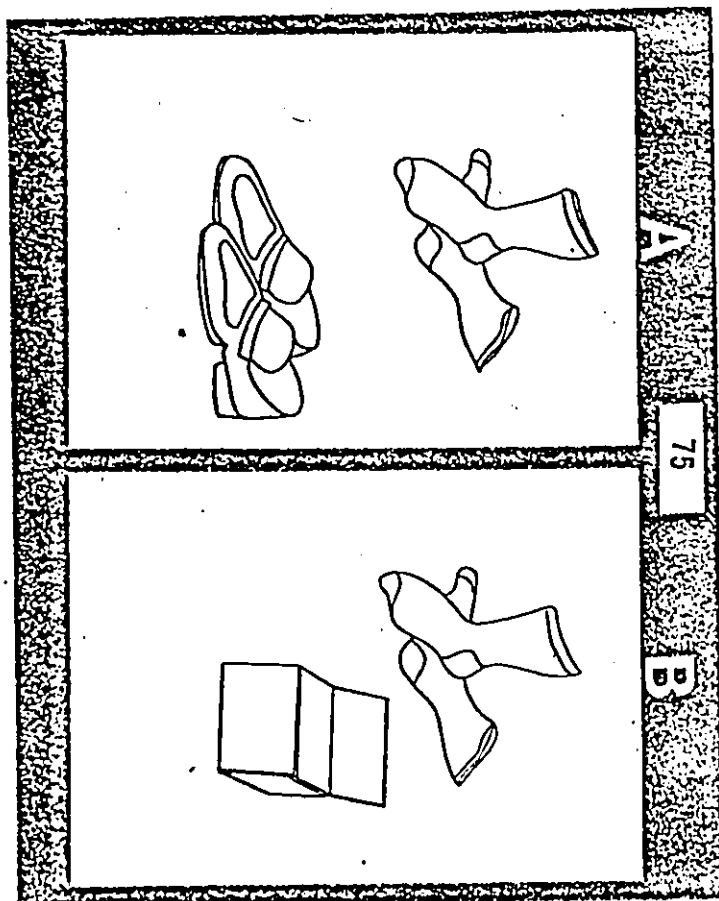
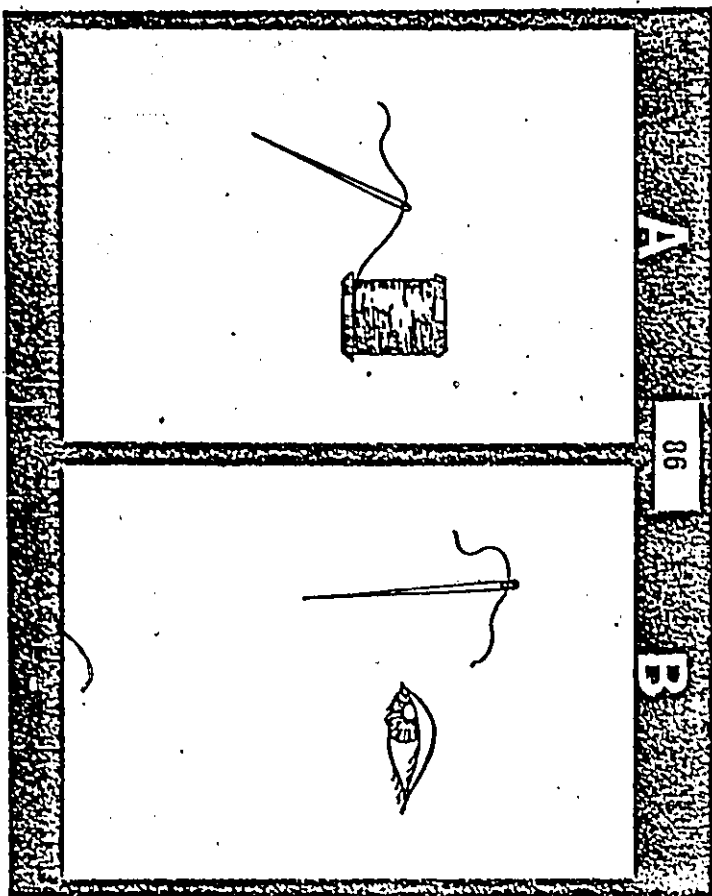
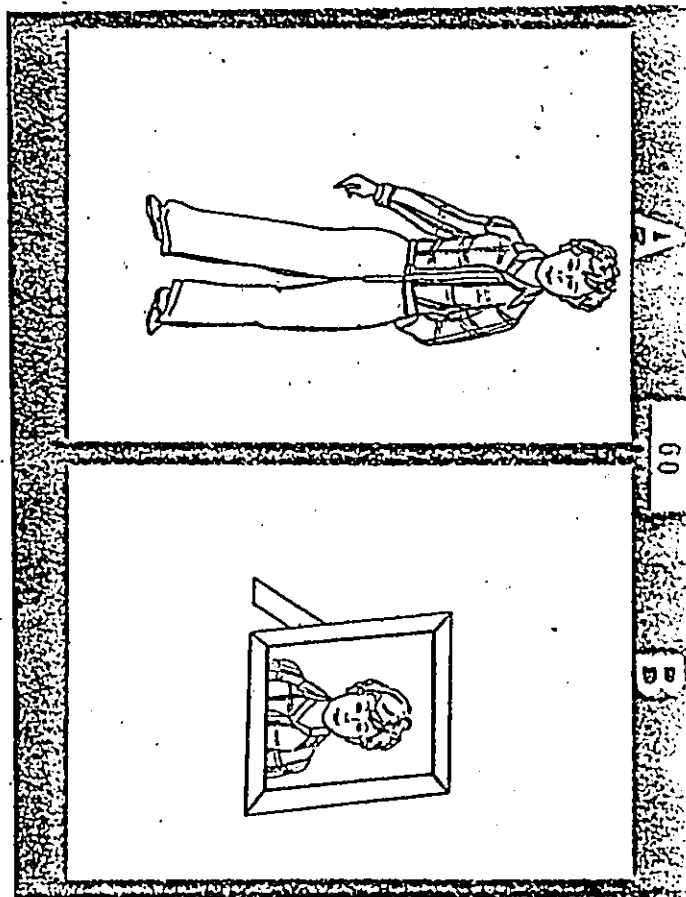
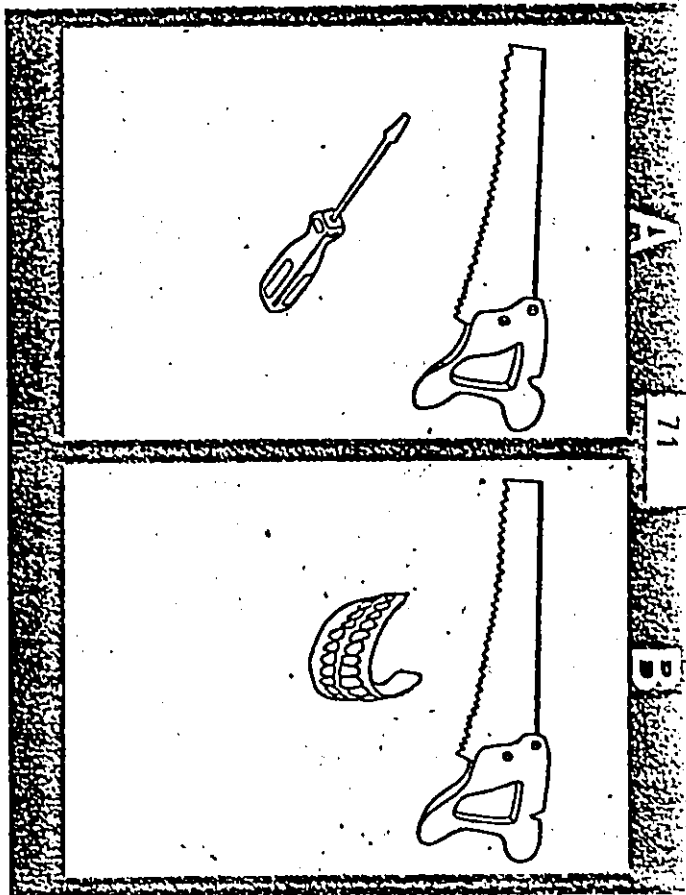
Item no.	Picture A	Picture B
189.	Child playing in sandbox	Child climbing tree
190.	Man sitting throwing cards into a hat	Man resting on hammock
191.	Man holding his forearm	Man with both hands on table
192.	Cocktail lounge and bar	Amusement park
193.	Man racing bike down hill	Man on exercycle
194.	Hamster in cage running wheel	Hamster climbing slope to ledge in cage
195.	Woman sitting on rock looking at reflection in pond below	Person sitting on log in woods looking down
196.	Christmas tree with presents	Birthday table with presents
197.	A ten dollar bill	Two five dollar bills
198.	Mother bottle feeding baby	Mother breast feeding baby
199.	Three men in shower room	Soldier peeling potatoes
200.	Man playing trumpet	Man playing drums
201.	Boy working on puzzle	Boy with broken bat
202.*	Train, chain, rain **	Train and car
203.	Tennis player	three men playing volleyball
204.	Middle aged car	Sick man in bed
205.*	Letters: A,B,C,D,	Letters: M,E **
206.*	Spoon, fork, Sword **	Spoon, fork, knife
207.	Boy dressing himself	Boy being dressed by mother
208.*	Girl speaking to tree**	Girl speaking to boy by tree
209.	Man entering bar	Man entering business building
210.*	Telephone receiver	Telephone receiver with mouth on listening end of receiver **



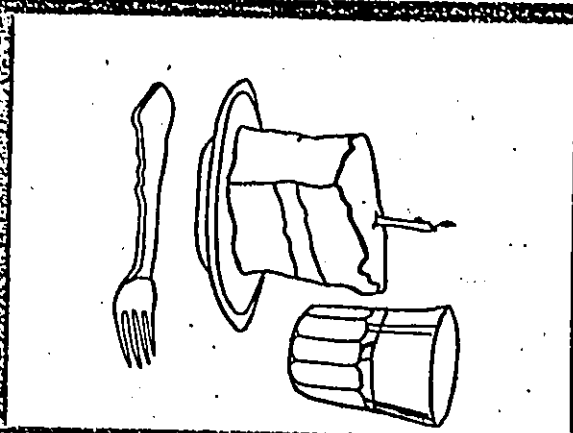
APPENDIX B

REPRODUCTION OF 31 NEWLY-DEvised PICTURE-PREFERENCE  
TEST ITEMS INTENDED TO CONSTITUTE A THOUGHT-DISORDER  
SCALE



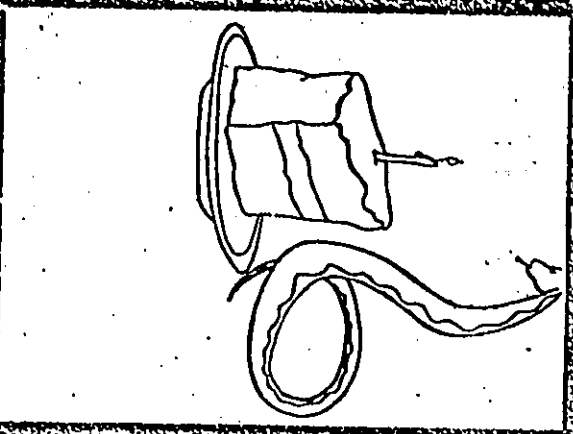


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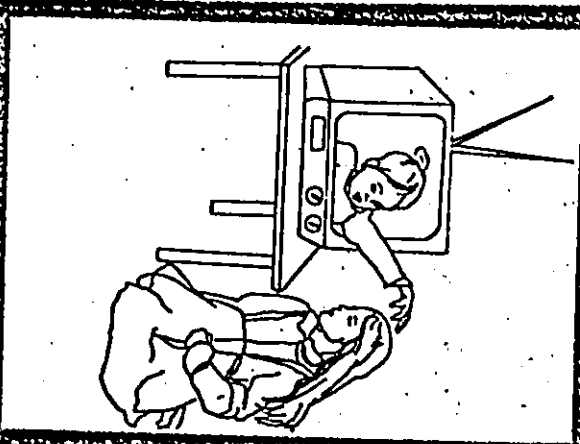
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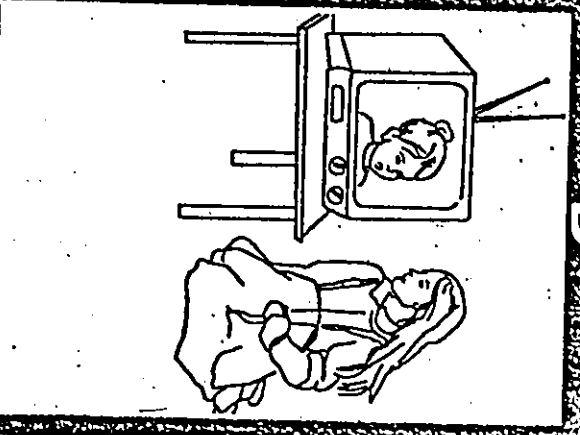


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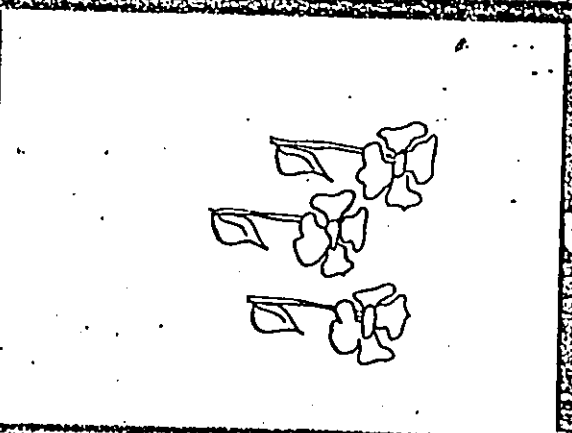


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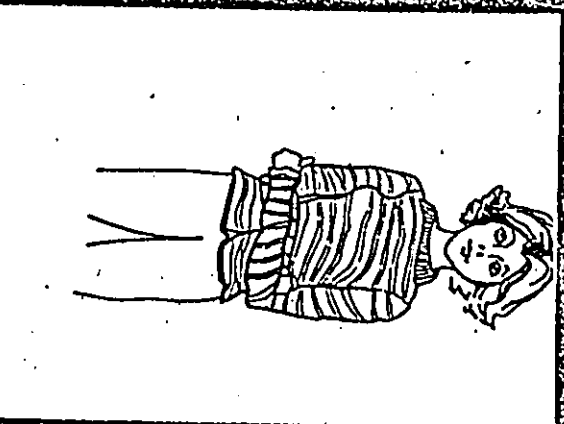
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B

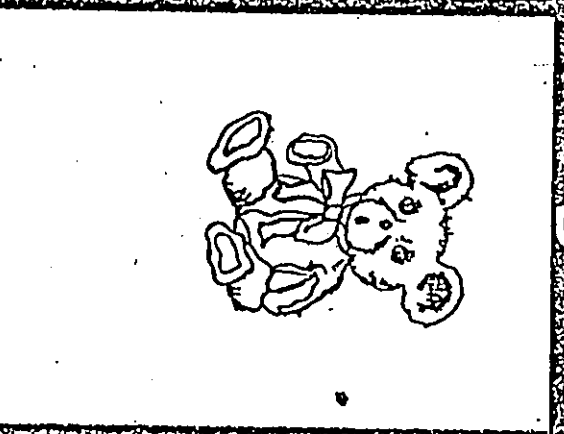


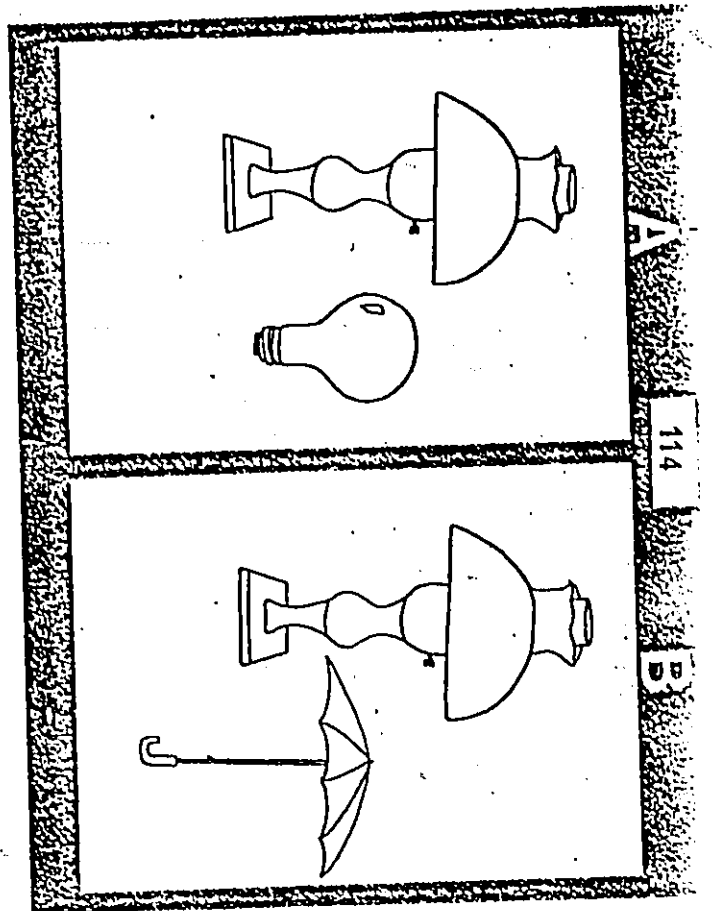
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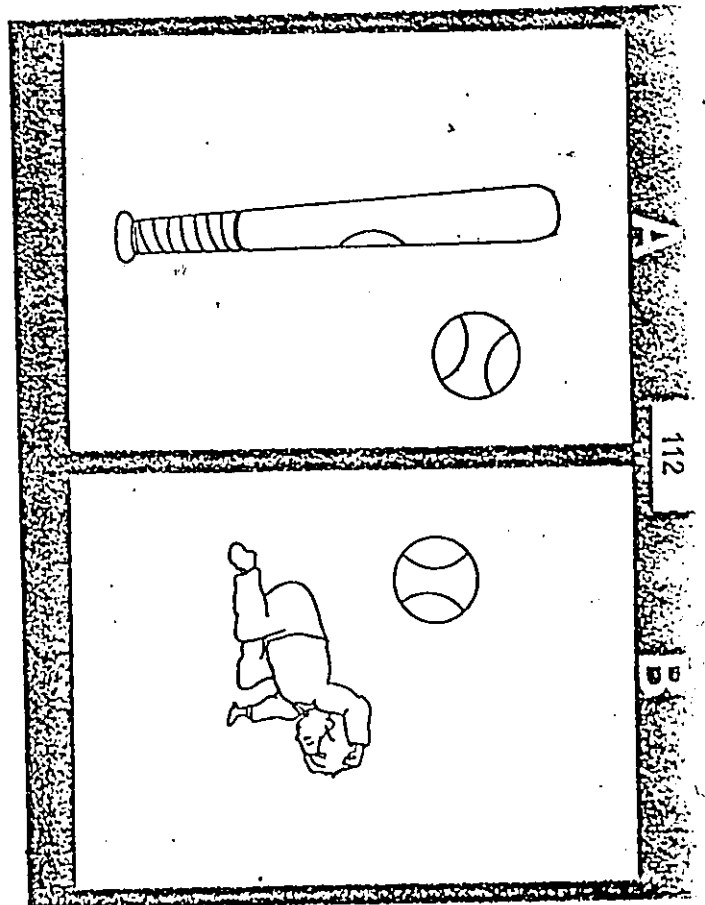




A

114

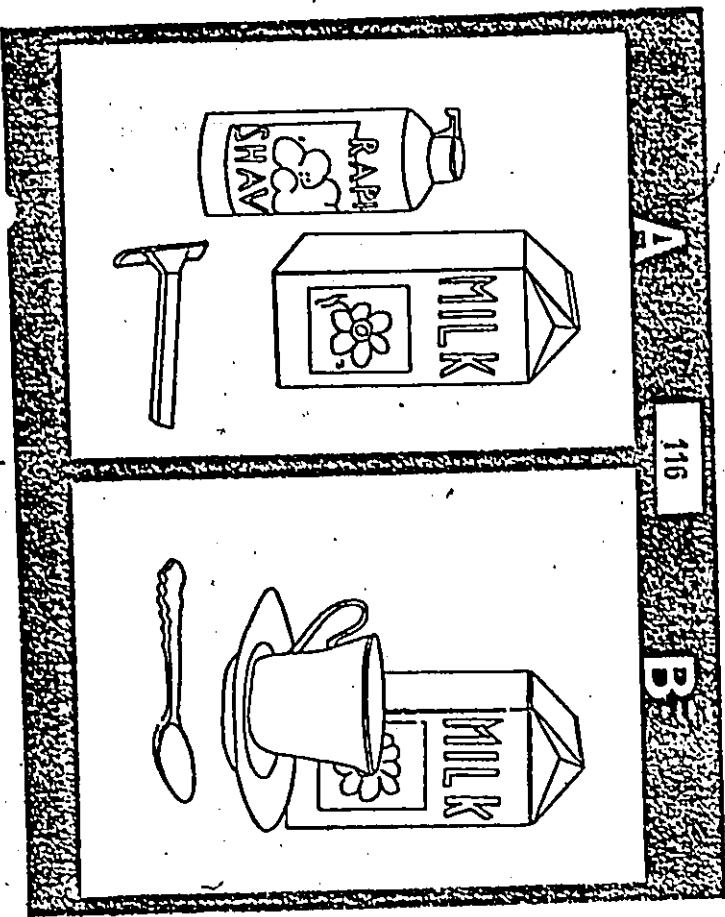
B



A

112

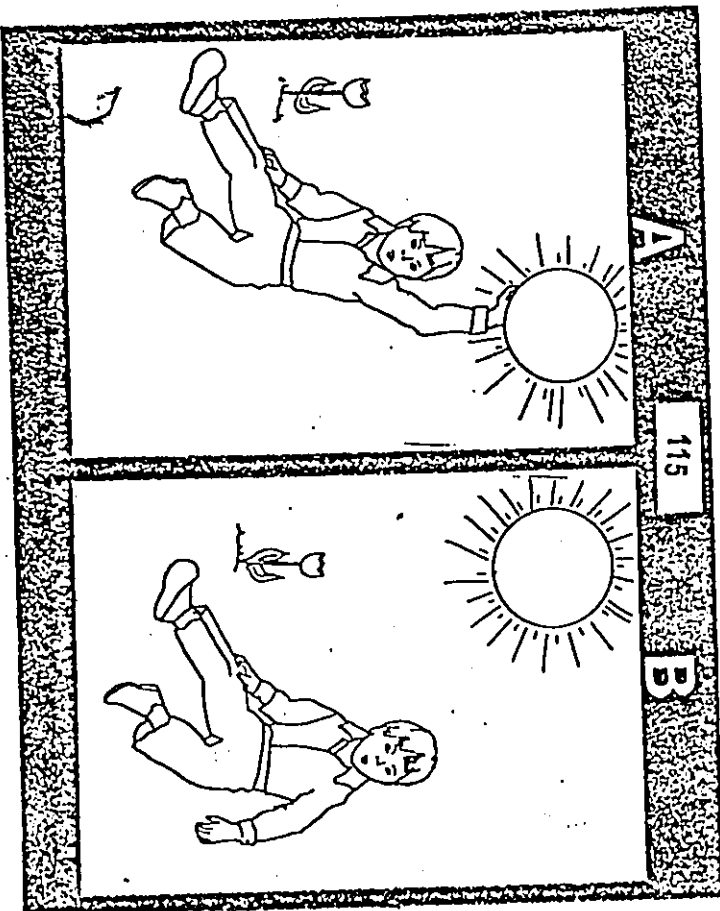
B



A

116

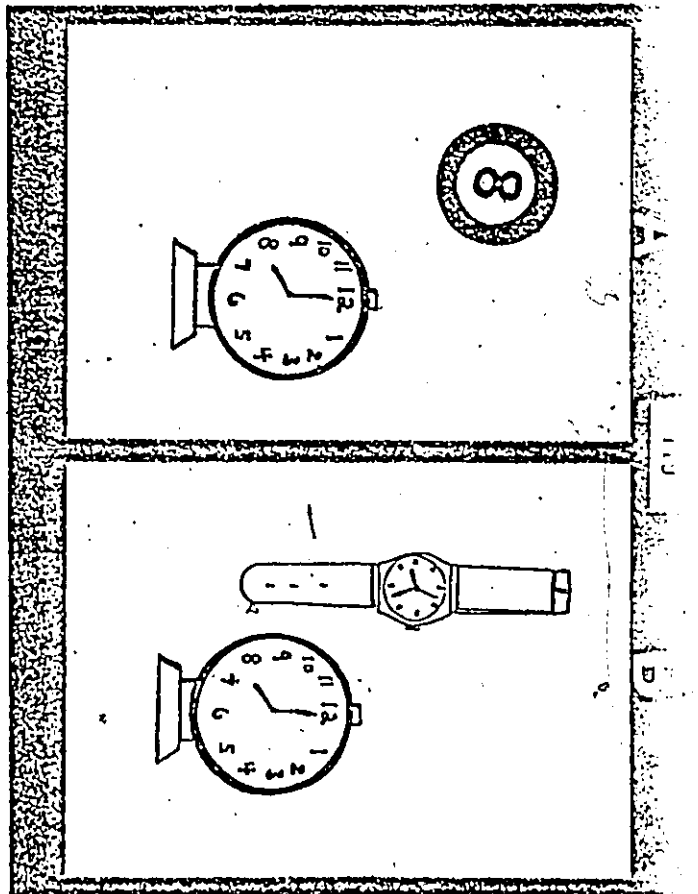
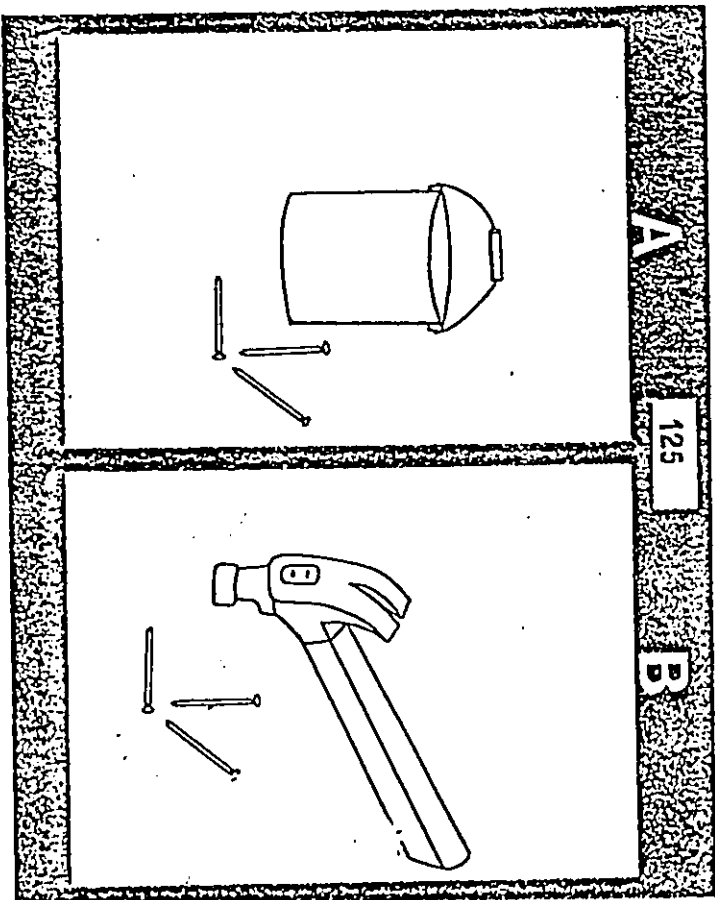
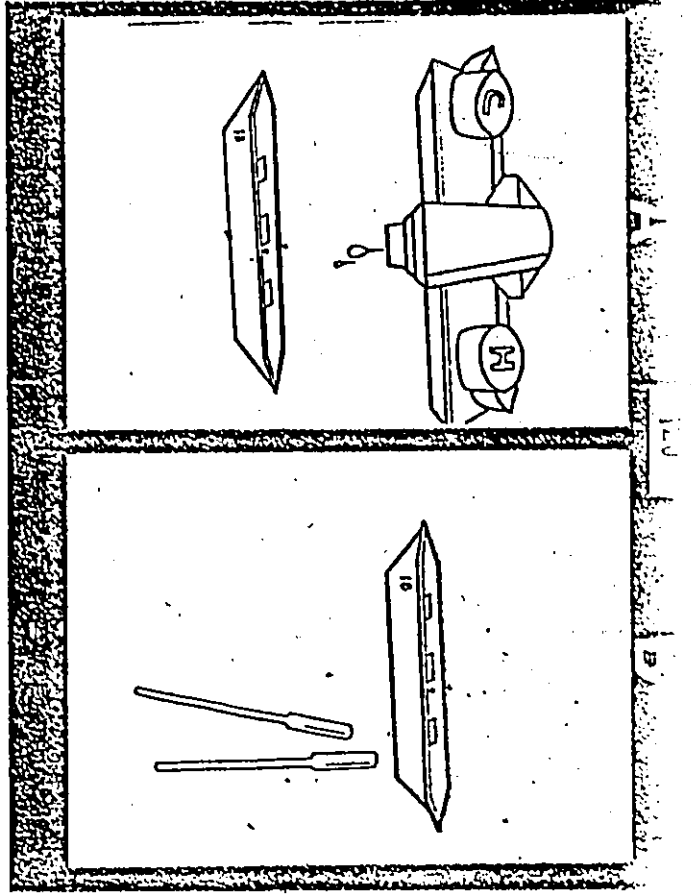
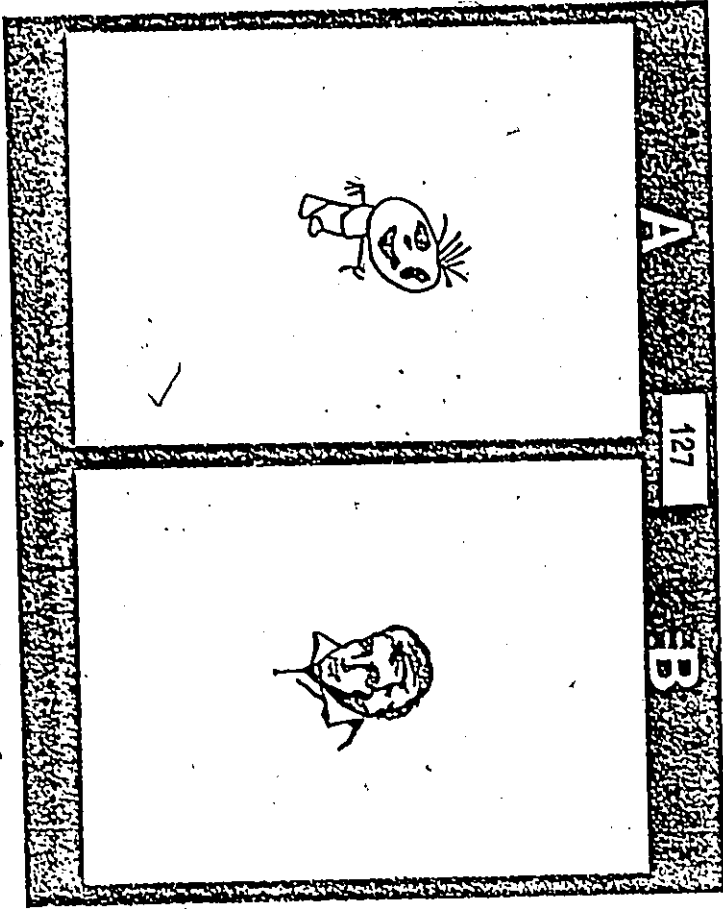
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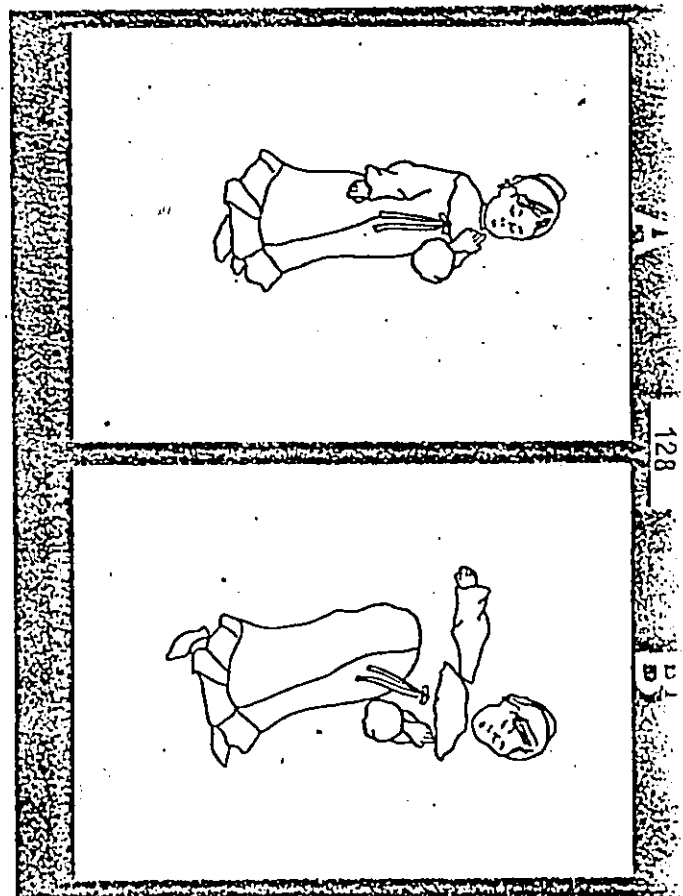
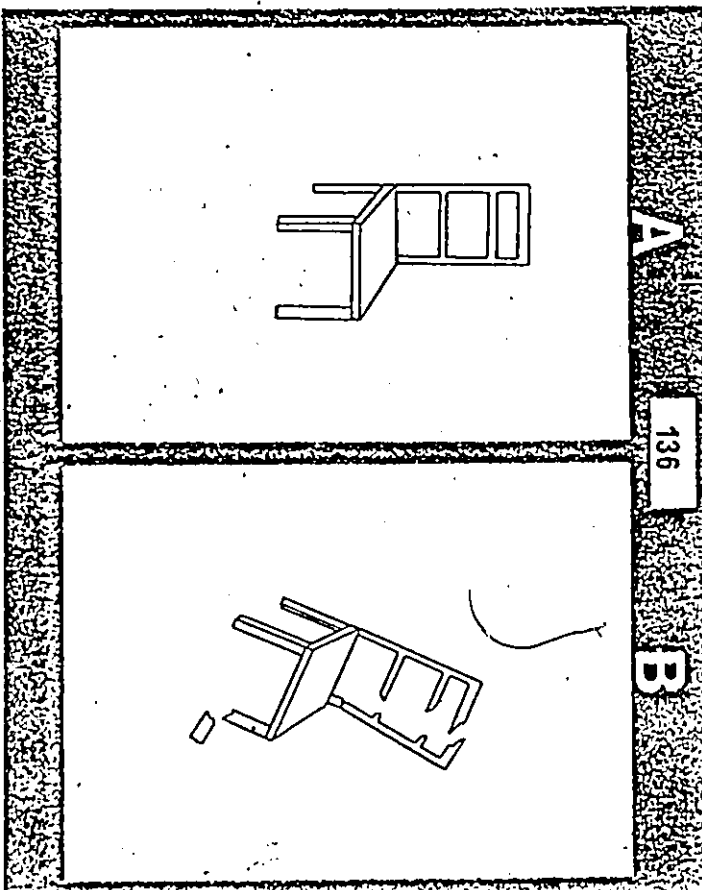
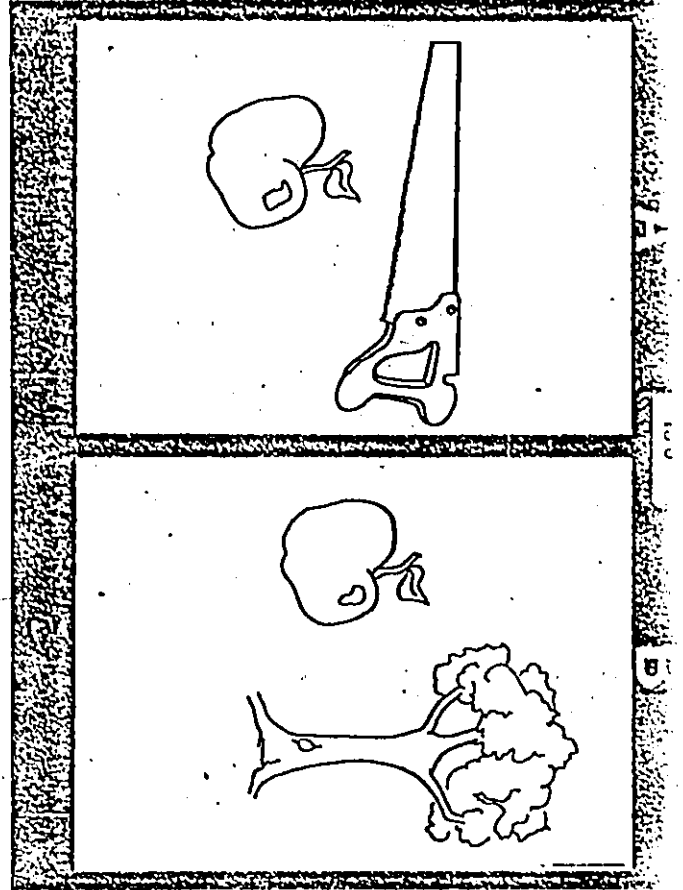
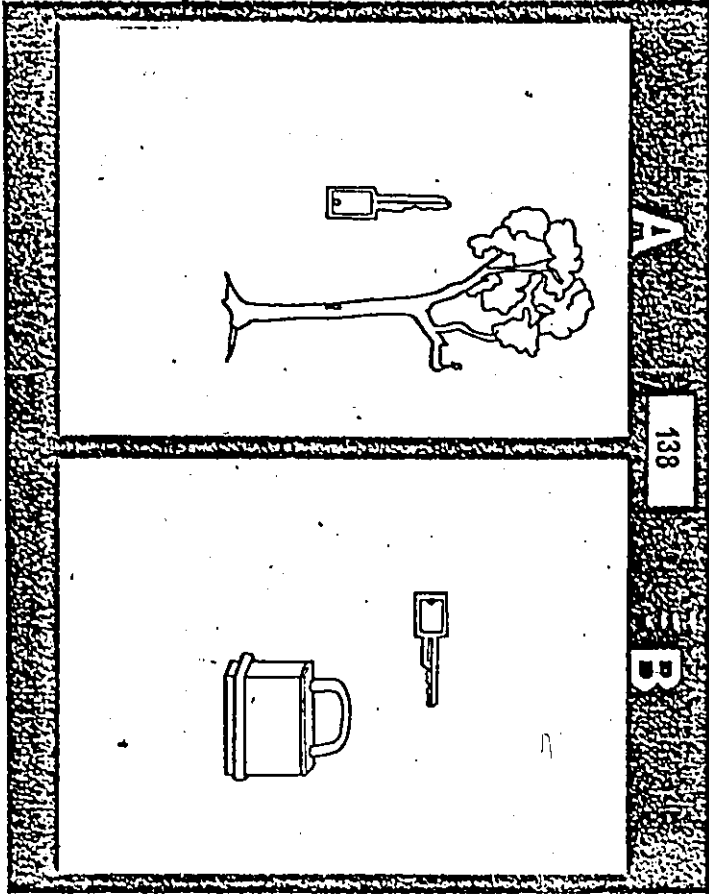


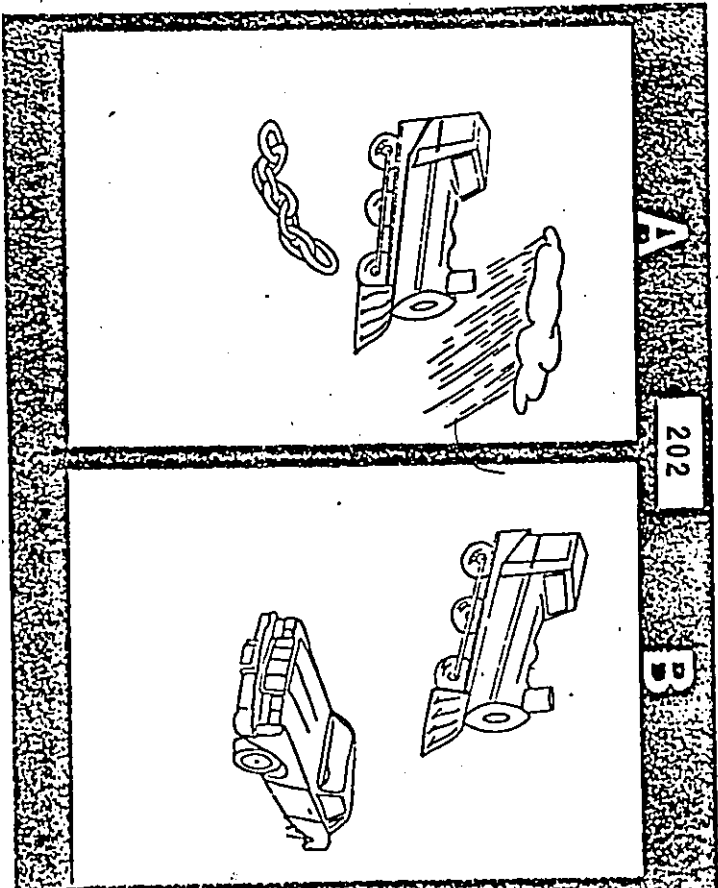
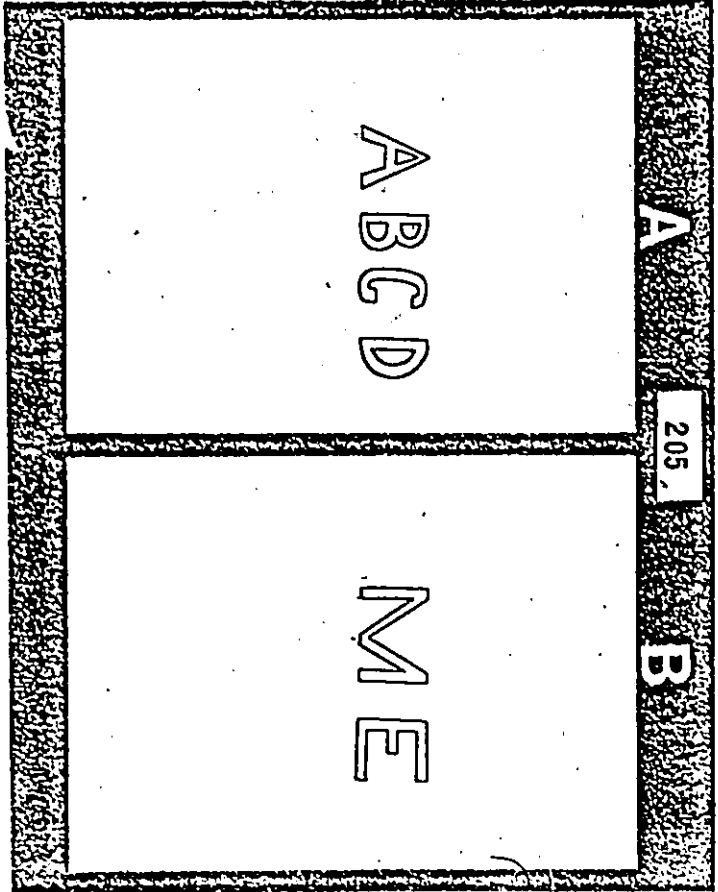
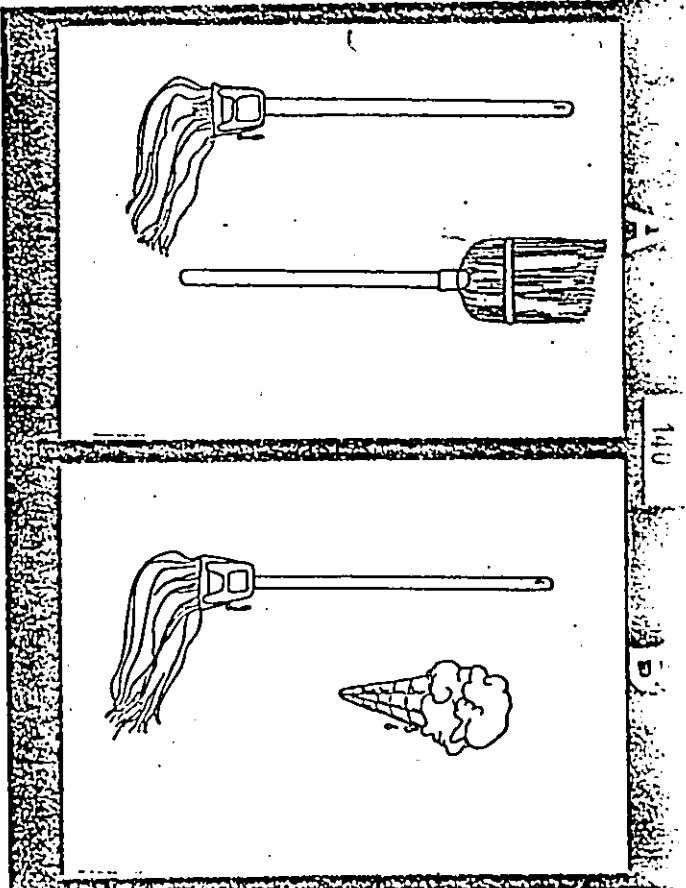
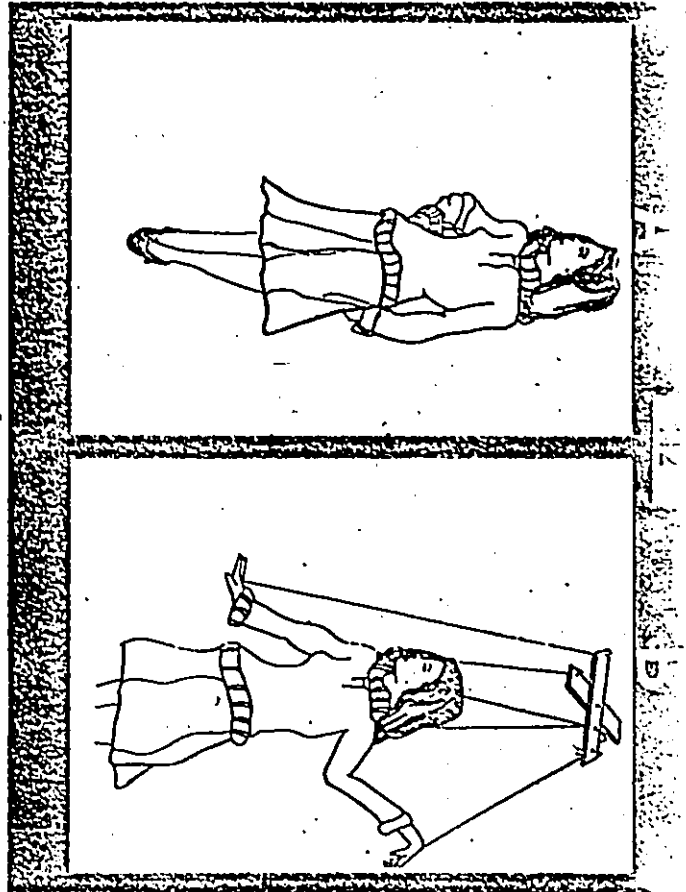
A

115

B



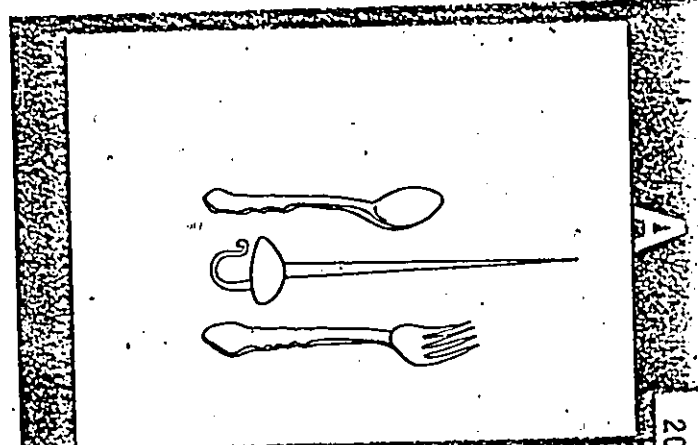
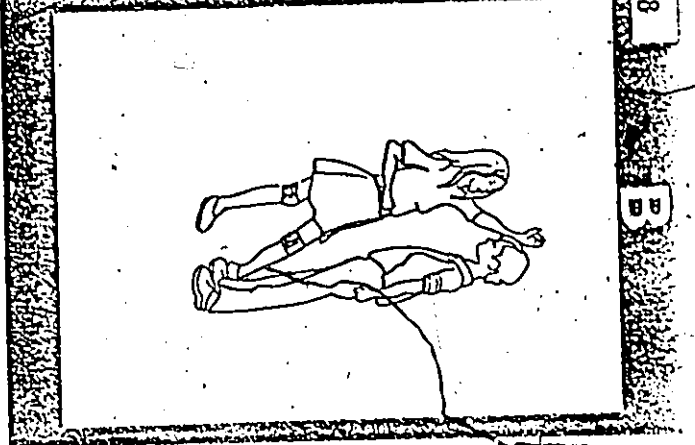




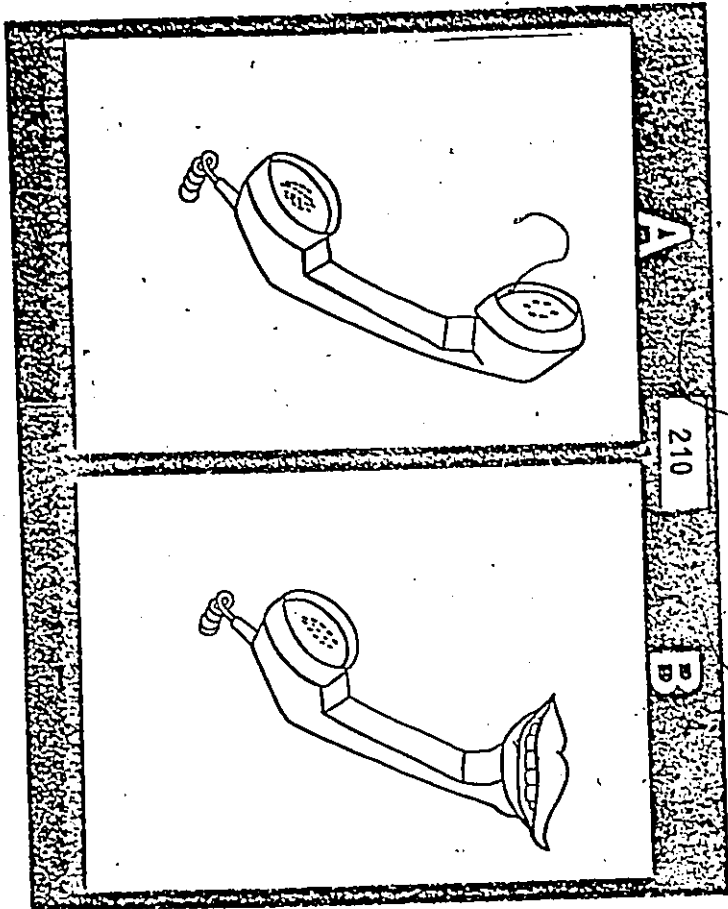
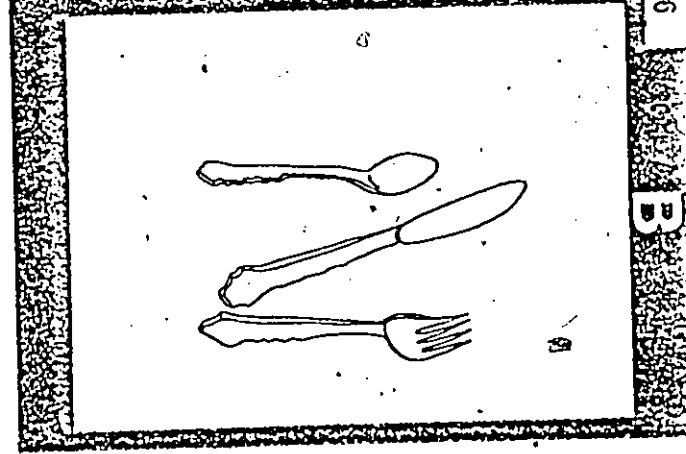




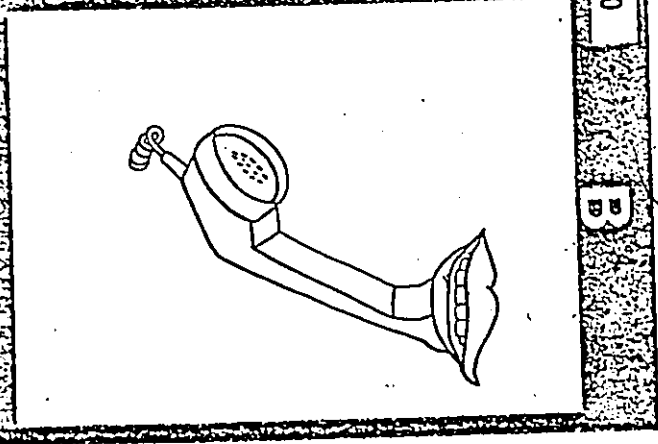
208



206



210



APPENDIX C

DESCRIPTIONS OF 25 ITEMS IDENTIFIED BY RYAN (1977)  
AS RELATED TO DPI SCALES POTENTIALLY REFLECTING  
THOUGHT DISORDER

DESCRIPTION OF PPT ITEMS IDENTIFIED BY RYAN (1977) AS  
RELATED TO DPI SCALES POTENTIALLY REFLECTING THOUGHT  
DISORDER

A star (\*) placed next to the item description indicates the keyed (scored) choice potentially reflecting thought disorder.

<u>Item no.</u>	<u>Picture A</u>	<u>Picture B</u>
22.	*An upright baby bottle	Same bottle tilted down and out
23.	*Medicine cabinet filled with toothpaste, brushes	Medicine cabinet filled with pill boxes and bottles
27.	*Figure going down into whirlpool with man going in water to save him	Same picture, but man throwing life-preserver.
28.	*Couple looking at album	couple dancing
32.	Man finding full treasure chest	*Same man as "chairman of the board"
41.	*A road going into a distance with town in background	Same scene with no town in sight
50.	*Car going over bumpy road	Road showing detour sign
51.	Boy holding hands with mother	*Boy holding hands with father
63.	*A buxom woman	A less buxom woman
65.	*Man walking across tattered rope bridge	Man moving heavy rock
92.	Woman with two other women	*Woman with two men
107.	Woman in Roman Bath	*Lone woman under sun lamp
113.	Couple playing tennis	*Groups of women playing volleyball
141.	A palm tree	*A cactus plant
143.	*Boy buttoning shirt	Boy blowing bubble

Item  
no.

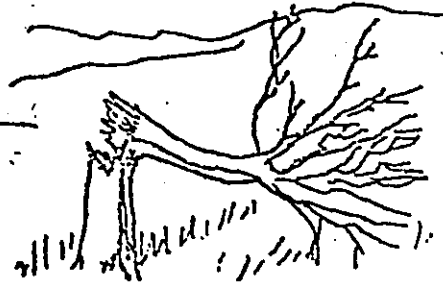
Picture A

Picture B

- |      |  |   |
|------|--|---|
| 147. | Four letter "M"s--<br>increasing in size | *Four same-sized letter "M"s                  |
| 153. | Shower room with several<br>nude men     | *Woman ironing with child playing<br>on floor |
| 160. | Boys about ten playing<br>football       | *Boys playing baseball                        |
| 162. | Dog standing without<br>leash            | *Dog standing with leash<br>on.               |
| 169. | Group of swans with one<br>vulture       | *Group of vultures                            |
| 170. | *Mother duck followed by<br>baby ducks   | Mother hen with chicks under<br>her wings     |
| 174. | Girl about age 10                        | *Grown woman                                  |
| 175. | *Two men wrestling                       | Two men boxing                                |
| 200. | Man playing trumpet                      | *Man playing drum                             |
| 201. | *Boy working on jig-<br>saw puzzle       | Boy with broken baseball bat                  |

APPENDIX D

SOCIAL DESIRABILITY RATING INSTRUCTION SHEET



Here are three pictures which a person might say he liked in preference to other pictures.



Directions:

Please rate each of the pictures as to how socially desirable or socially undesirable you consider it to be for a person to choose this picture in preference to other pictures.

We are not interested in whether or not you yourself like the picture.

Just rate it according to how socially desirable or undesirable you consider it to be if another person should choose the picture as one he prefers. Use the rating scale below to make your rating.

rating

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

meaning of rating

- extremely undesirable
- strongly undesirable
- moderately undesirable
- mildly undesirable
- NEUTRAL
- mildly desirable
- moderately desirable
- strongly desirable
- extremely desirable

APPENDIX E  
CORRELATION OF EMPIRICALLY DERIVED PPT  
ITEMS AND BPRS COMPOSITE TD SCORES

## Appendix E

Pearson Product Moment Correlations of Empirically Derived  
 PPT Thought Disorder Items with BPRS Composite Thought  
 Disorder Scores<sup>a</sup>

Item	Point-biserial Item-to-Scale Remainder Correlation	BPRS Composite Thought Disorder Scale
22.	-.08	.08
23.	-.06	.06
27.	.05	.22
28.	-.04	.11
32.	.05	.00
41.	.02	.11
50.	.01	.32
51.	.09	-.20
63.	-.14	-.02
65.	.03	-.01
92.	.01	.07
107.	-.10	-.15
113.	.22	.03
141.	.02	.17
143.	.05	-.09
147.	-.22	-.23
153.	.00	.13
160.	.19	-.13
162.	.12	-.10
169.	-.01	-.21
170.	.11	.03
174.	-.20	-.11
175.	-.01	.02
200.	-.15	-.07
201.	.03	-.13

<sup>a</sup><sub>n</sub> = 70 patients



APPENDIX F

ENDORSEMENT PROPORTIONS OF THOUGHT-DISORDER  
ITEMS

Appendix F  
 The Proportion of Subjects Endorsing  
 Thought Disorder Pictures from the 31 New Rationally  
 Derived PPT Thought-Disorder  
 Items

Item	<u>Proportion of Sample Group Endorsing Keyed</u> <u>Thought Disorder Picture</u>	
	70 Patients	151 Non-Patients
1.	.39	.31
14.	.09	.13
38.	.53	.41
54.	.16	.19
60.	.27	.19
71.	.21	.18
75.	.17	.17
86.	.40	.36
98.	.09	.05
103.	.11	.09
109.	.40	.37
110.	.26	.38
112.	.19	.14
114.	.30	.18
115.	.17	.28
116.	.16	.08
119.	.30	.38
120.	.27	.49
125.	.09	.05
127.	.23	.26
128.	.16	.15
133.	.14	.07
136.	.06	.08
138.	.09	.19
140.	.34	.37
142.	.24	.19
202.	.20	.13
205.	.46	.52
206.	.16	.19
208.	.37	.26
210.	.20	.23

## Appendix F: Continued

Proportions of the Patients and of Non-Patients who  
 Endorsed Keyed Thought Disorder Pictures From the  
 25-Item Empirically Derived PPT Thought Disorder  
 Scale

Item	<u>Proportion of Sample Group Endorsing Keyed Thought Disorder Picture</u>	
	70 Patients	151 Non -Patients
22.	.54	.42
23.	.54	.39
27.	.27	.33
28.	.39	.26
32.	.47	.42
41.	.70	.56
50.	.30	.26
51.	.50	.51
63.	.61	.69
65.	.63	.49
92.	.44	.56
107.	.41	.46
113.	.64	.51
141.	.11	.11
143.	.56	.47
147.	.60	.45
153.	.44	.31
160.	.66	.56
162.	.51	.37
169.	.50	.34
170.	.59	.68
174.	.83	.86
175.	.37	.47
200.	.53	.50
201.	.81	.76

APPENDIX G  
ANALYSES OF COVARIANCE INVOLVING SUBJECTS  
FOR WHOM NO DATA WERE MISSING

## Appendix G

Comparisons of Patient Groups' and Non-Patient Group's  
 Rationally derived PPT Thought Disorder Scale Scores  
 Controlling for Variables Sex, Age, Index of Social  
 Position, DPI Desirability where No Data were Missing

Group Means

Group	$\bar{X}$	Adjusted $\bar{X}$
Thought-disordered patients <sup>a</sup>	13.15	13.12
Non-thought-disordered patients <sup>b</sup>	9.09	8.89
Non-patients <sup>c</sup>	5.09	5.38

Analysis of Covariance

Source	df	Sums of Squares	Mean Square	F	p
Equality of Adj. Means	2	327.38	163.69	9.07	.0003
Zero Slope	4	108.85	27.21	1.51	.2076
Error	80	1443.17	18.04		
Equality of Slopes	8	76.18	9.52	.50	.85
Error	72	1366.98	18.98		

T-TestsGroups Compared

	t	p
TD Patients vs. Non-TD Patients	-3.08	.002
TD Patients vs. Non-Patients	-4.15	.001
Non-TD Patients vs. Non-Patients	-2.20	.03

<sup>a</sup>n = 13

<sup>b</sup>n = 43

<sup>c</sup>n = 31

## Appendix G: Continued

Comparison of Thought-Disordered Group, Non-Thought Disordered Groups on Empirical PPT Thought Disorder Scale When Controlling for Variables Sex, Age, Index of Social Position, DPI Desirability where no Data were Missing

<u>Group Means</u>	$\bar{X}$	Adjusted $\bar{X}$
Group		
TD Patients <sup>a</sup>	12.92	12.79
Non-TD Patients <sup>b</sup>	13.02	12.80
Non-Patients <sup>c</sup>	12.74	13.09

Analysis of Covariance

<u>Source</u>	<u>df</u>	<u>Sums of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>p</u>
Equality of Adj. Means	2	.66	.33	.05	.946
Zero Slope Error	4 80	7.84 475.98	1.96 5.94	.32	.850
Equality of Slopes Error	8 72	68.14 407.84	8.5 5.66	1.50	.17

T-Tests

<u>Groups Compared</u>	<u>t</u>	<u>p</u>
TD Patients vs. Non-TD Patients	.01	.98
TD Patients vs. Non-Patients	.28	.77
Non-TD Patients vs. Non-Patients	.32	.74

<sup>a</sup> $n = 13$

<sup>b</sup> $n = 43$

<sup>c</sup> $n = 31$

APPENDIX H  
ANALYSES OF COVARIANCE OF MALES' AND OF  
FEMALES' PERFORMANCE ON EMPIRICALLY  
DERIVED TD SCALE ITEMS

## Appendix H

The Comparisons of the Male Thought-Disordered, Non-Thought-Disordered, and Non-Patients' Empirically-Derived PPT Scale Scores Controlling for Effects of Age, Index of Social Position, and DPI Desirability

<u>Group Means</u>		
Groups	$\bar{X}$	Adjusted $\bar{X}$
Thought-Disordered Patients <sup>a</sup>	12.60	12.29
Non-Thought Disordered Patients	12.75	12.15
Non-Patients <sup>c</sup>	13.20	13.89

Analysis of Covariance

<u>Source</u>	<u>df</u>	<u>Sums of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>p</u>
Equality of Adj. Means	2	15.74	7.89	1.15	.3226
Zero Slope Error	53	361.11	6.81	.79	.5037
Equality of Slopes Error	47	304.24	6.47	1.46	.2111

T-TestsGroups Compared

	<u>t</u>	<u>p</u>
TD Patients vs. Non-TD Patients	.15	.87
TD Patients vs. Non-Patients	1.37	.17
Non-TD Patients vs. Non-Patients	1.43	.15

<sup>a</sup>  $n = 15$

<sup>b</sup>  $n = 20$

<sup>c</sup>  $n = 24$



## Appendix H: Continued

Comparisons of the Female Patients' and the Female Non-Patients' Empirically Derived PPT Thought Disorder Scale Scores Controlling for Effects of Age, Index of Social Position, and DPI Desirability Scores

<u>Group Means</u>	$\bar{X}$	Adjusted $\bar{X}$
Thought-Disordered Patients <sup>a</sup>	13.71	13.86
Non-TD Patients <sup>b</sup>	13.39	13.49
Non-Patients <sup>c</sup>	11.62	11.48

Analysis of Covariance

<u>Source</u>	<u>df</u>	<u>Sums of Squares</u>	<u>Mean Square</u>	<u>F</u>	<u>p</u>
Equality of Adj. Means	2	23.09	11.54	2.82	.0678
Zero Slope	3	3.55	1.18	.28	.8327
Error	56	228.85	4.08		
Equality of Slopes	6	20.63	3.43	.82	.5565
Error	50	208.22	4.16		

T-Tests

<u>Groups Compared</u>	<u>t</u>	<u>p</u>
TD Patients vs. Non-TD Patients	.42	.673
TD Patients vs. Non-Patients	2.07	.042
Non-TD Patients vs. Non-Patients	2.24	.028

<sup>a</sup>n = 7<sup>b</sup>n = 28<sup>c</sup>n = 27

APPENDIX I

MEAN SCORES OF 70 PATIENT GROUP ON THE  
PPT THOUGHT DISORDER SCALES AND ON THE  
DPI SCALES

## APPENDIX I

Mean Scores of the Patient Group on the PPT  
Thought-Disorder Scales and on the DPI  
Scales<sup>a</sup>

Scale	$\bar{X}$	Standard Deviation
Rationally-derived PPT Thought Disorder Scale	10.05	4.3
Empirically-derived PPT Thought Disorder Scale	13.07	2.3
DPI Scales		
Infrequency	1.28	1.6
Cynicism	8.72	3.7
Depression	10.72	5.1
Family Discord	9.20	5.1
Health Concerns	9.70	3.6
Hostility	7.18	3.6
Impulsivity	10.41	3.7
Irritability	12.85	3.7
Neuroticism	9.38	4.1
Psychotic Tendencies	8.67	3.9
Rebelliousness	10.17	3.0
Socially Deviant Attitudes	5.62	3.6
Somatic Complaints	7.68	4.2
Defensiveness	8.17	3.5
Desirability	9.82	3.7

<sup>a</sup><sub>n</sub> = 70 patients