PERCEPTUAL RIGIDITY IN PARANOID SCHIZOPHRENIA: THE USE OF PROJECTIVE ANIMAL DRAWINGS

A Thesis

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by

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CHAPTER I

INTRODUCTION TO THE PROBLEM

For some time the psychology staff at Fulton State Hospital, Fulton, Missouri, has made use of the animal and "opposite animal" drawing technique developed by a former member of that department, Lyman M. Riegel.[1] For several years he has been using the technique as a supplement to the usual human figure drawing in diagnostic evaluation. The rationale involved is that a person projects his own characteristics through his choice of animal and the manner in which he produces it.[2] The subject (S) is asked to draw an animal, and then to draw the animal which is the opposite of the first. Assuming that any concept must have a polar opposite, this second drawing may reflect suppressed, denied, or otherwise unavailable facets of the personality. In addition the present author would suggest that this tool

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[1]Now Executive Director, Brown County Mental Health Center, Mt. Sterling, Illinois, 62353.

[2]A. A. Schwartz and I. H. Rosenberg, Observations on the significance of animal drawings. Amer. J. Orthopsychiat., 1955, 25, 729-746.

provides considerable insight into the cognitive processes in use.

I. THE PROBLEM

Statement of the problem. In the present study the experimenter (E) has been interested in the process of animal opposite selection as a diagnostic indicator, rather than the projective applications of this device. This author has attempted to show differences between the choices of opposites made by paranoid schizophrenics (PSs), as compared to nonparanoid psychiatric patients (NPPs) and non-hospitalized normals (NHs), and to relate these choices in some ways to cognitive, perceptual styles. A cross validation sample of consecutively tested hospital admissions provided an independent measure of the adequacy of this technique.

II. HYPOTHESIS OF THE STUDY

On the basis of relevant literature (see Chapter II, REVIEW OF RELATED LITERATURE), E hypothesized that PSs would show considerably more rigidity in their choices of animal

opposites than NPPs, or NHs. This could be taken to reflect an encompassing rigidity in cognitive functioning and in perceptual orientation to the environment.

III. A DEFINITION

Perceptual rigidity. Rigidity has been defined operationally in this study in terms of certain productions of opposite animal drawings (see Chapter III, PARAMETERS OF THE STUDY). In order to deal with related literature concerning rigidity, however, a definition by Adams has been adopted which states that "Rigidity may be defined as decreased variance of responses in stimulus situations for which no definitive response is apparent to the individual."[3]

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[3]H. E. Adams, Statistical rigidity in schizophrenic and normal groups measured with auditory and visual stimuli. Psychol. Rep., 1960, 7, p. 119.

CHAPTER II

REVIEW OF RELATED LITERATURE

I. RATIONALE FOR THE ANIMAL AND OPPOSITE DRAWING TECHNIQUE

The animal and opposite technique relies on the notion of polarity which has been an important aspect of several prominent personality theories. Dolliver and Landfield[1] have recently surveyed "opposites" in the personality theories of Freud, Adler, Jung, Kelly, Chenault, and Maslow.

Freud observed that ". . . the mind is made up of contradictions and pairs of opposites."[2] Impossible alternatives are resolved by means of the defense mechanisms. Dolliver and Landfield cited reaction formation and projection as prominent defense mechanisms in Freud's personality theory which rely heavily upon opposites. Within psychoanalytic theory, fixation at any of the levels of psycho-

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[1]Robert H. Dolliver and Alvin W. Landfield, The place of opposites in psychology. J. Indiv. Psychol., in press.

[2]Sigmund Freud, A general introduction to psychoanalysis. Garden City, New York: Garden City Publishing Company, 1943, p. 68.

sexual development leads to two opposing or bipolar traits such as optimism-pessimism, gullibility-suspiciousness, manipulativeness-passivity. Dolliver and Landfield concluded that Freud used the concept of polarity or opposites in several ways: "(1) antithetic ideas or counter-will, (2) the general paradigm of conflicting forces which requires (3) resolution through mechanisms of defense, and (4) the outcome of fixation at a given psycho-sexual level."[3]

The personality theorization of Adler focused on a basic polarity: superiority versus inferiority. Although Adler used this one central polarity, in general the concept of opposites was of minor importance in his Individual Psychology.[4]

Jung gave a central place in his theory to concepts of opposites. He viewed psychic energy as flowing between opposing poles so that ". . . 'All that lives is energy and is therefore based on antithesis' (Jung, cited by Jacobi, 1951, p 59)."[5] Dolliver and Landfield cited opposition

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[3]Dolliver and Landfield, op. cit., p. 4.

[4]Ibid., p. 5.

[5]Ibid., p. 6.

between ego and shadow, ego and personal unconscious, persona and personal unconscious, and between collective unconscious and persona as some of the polarities in Jung's writings. Also noted were opposed attitudes (e.g., extraversion versus introversion) and opposed functions (thinking versus feeling, and sensing versus intuiting). Jung regarded the fully developed individual as one who could effectively harmonize and coordinate the opposing aspects of his personality.

Kelly's Personal Construct theory[6] of personality examined the way the individual is influenced by the kinds of concepts he employs to deal with the environment. Kelly called these concepts "constructs" and conceptualized them as being dichotomous. Thus an opposite or "contrast" exists for each construct. A shift in behavior may represent a movement from a construct toward its opposite and thus not be real change which would involve forming new constructs.

Chenault employed the concept of "syntony" to

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[6]George A. Kelly, The psychology of personal constructs. New York: Norton, 1955.

describe optimal personal adjustment.[7] She viewed syntony as a process which fosters coexistence of contradictions and paradoxes. It is important in Chenault's system to allow both sides of dichotomies to coexist and to learn to value the "negative" half of dichotomies as being part of a meaningful life.

Dolliver and Landfield indicated that Maslow viewed self-actualizing people as able to merge and coalesce seeming polarities, opposites, or dichotomies.[8] Dichotomies disappear, according to Maslow, in healthy people because their behaviors contain elements of both poles of any relevant dichotomous dimension. Thus a unity arises as both ends of a polarity are encompassed in the individual's behavior.

Dolliver and Landfield concluded, in part, that "Extreme behavioral opposites may be equivalent in that they both represent the same underlying personality structure."[9] They found support among personality theorists for the concept of "the closeness of opposites."[10] This closeness

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[7]Dolliver and Landfield, op. cit., p. 9.

[8]Ibid., p. 10. [9]Ibid., p. 12. [10]Ibid., p. 13.

of opposites has given credence to the animal and opposite technique utilized in the present study.

II. PERCEPTUAL PROCESSES OF PARANOID SCHIZOPHRENIA

There are differences in perceptual responses of various subgroups within the overall classification of schizophrenia. Silverman[11] pointed out the importance of a paranoid-nonparanoid distinction in research on schizophrenia. He cited numerous studies which have empirically demonstrated differences in the responses of paranoids versus nonparanoids on various neuro-physiological, perceptual, thought disorder and personality variables.

Perceptual set

Buss and Lang presented two review articles dealing with psychological deficits in schizophrenia.[12, 13] They

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[11]J. Silverman, The problem of attention in research and theory in schizophrenia. Psychol. Rev., 1964, 71 (5), 352-379.

[12]Arnold H. Buss and Peter Lang, Psychological deficit in schizophrenia: I. Affect, reinforcement, concept attainment. J. Abn. Psychol., 1965, 70 (1), 2-24.

[13]Peter Lang and Arnold Buss, Psychological deficit in schizophrenia: II. Interference and activation. J. Abn. Psychol., 1965, 70 (2), 77-106.

concluded, in part, that "Schizophrenics give a more closed, narrow, stimulus-bound basis for sorting objects, whereas normals give an open, more inclusive, stimulus-free basis for sorting."[14] They found that schizophrenics have difficulty in changing a set that is no longer suitable to the experimental task. Although Buss and Lang did not differentiate schizophrenics on a paranoid-nonparanoid dimension, they did mention the potential value of such a differentiation, and cited a study by Mandl which utilized this dimension and demonstrated results in keeping with Buss and Lang's conclusions. Mandl[15] examined perceptual rigidity as measured by retention of an initial interpretation of a stimulus presented on a series of five cards in which the pictorial stimulus gradually changed shape. She found that paranoid schizophrenics exhibited significantly greater rigidity (inability to shift) than normals on this task.

Goldstein reported a virtually identical finding of perceptual differences between schizophrenics and normals.

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[14]Buss and Lang, op. cit., p. 15.

[15]Billie Sue T. Mandl, An investigation of rigidity in paranoid schizophrenics as manifested in a perceptual task. Diss. Absts., 1954, 14, 2401-2402.

In contrast with schizophrenics, the normal individual ". . . is capable of shifting . . . at will according to the demands of the situation."[16] This ability to shift voluntarily from one aspect of a situation to another was one of Goldstein's criteria for the "abstract attitude."[17] Goldstein's theorization about schizophrenia hinged on the inability of the schizophrenic to assume the abstract attitude. Goldstein referred to the perceptual and cognitive functioning of the schizophrenic as "concrete behavior."[18] Goldstein's conclusions did not involve any differentiation among subgroups of schizophrenia.

The inability to shift perceptions was important in the writings of Buss and Lang, and Goldstein concerning schizophrenia. A study by Mandl showed the usefulness of this concept with paranoid schizophrenics.

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[16]Kurt Goldstein, Methodological approach to the study of schizophrenic thought disorder. In J. S. Kasanin (Ed.), Language and thought in schizophrenia. New York: Norton, 1944, p. 20.

[17]Ibid., p. 19.

[18]Ibid., p. 20.

Overinclusion

Cameron and Magaret[19] postulated that overinclusive thinking is characteristic of schizophrenia. Overinclusion has been defined as ". . . the tendency to include irrelevant and extraneous aspects in responding to stimuli."[20] This aspect of perception has been widely tested with somewhat equivocal results. Some of these studies have differentiated paranoid from nonparanoid schizophrenics, and as such are of interest to the present study. Payne and Caird[21] found that paranoid schizophrenic patients did exhibit overgeneralization or overinclusion. Foulds, Hope, McPherson, and Mayo[22] found a similar relationship between paranoid schizophrenia and overinclusion. Buss and

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[19]N. Cameron and A. Magaret, Behavior pathology. Boston: Houghton Mifflin, 1951.

[20]Buss and Lang, op. cit., p. 16.

[21]R. W. Payne & W. K. Caird, Reaction time, distractibility, and overinclusive thinking in psychotics. J. Abn. Psychol., 1967, 72 (2), 112-121.

[22]G. A. Foulds, K. Hope, F. M. McPherson, & P. R. Mayo, Paranoid delusions, retardation, and overinclusive thinking. J. Clin. Psychol., 1968, 24 (2), 177-178.

Daniell[23], who made use of the paranoid-nonparanoid distinction, found no differences between these groups and additionally found that schizophrenics, regardless of diagnostic subgroup, did not overgeneralize in comparison to normals.

Thus the empirical data regarding the concept of overgeneralization are somewhat equivocal. This concept is probably not sufficient to account for the uniqueness of the perceptual processes of paranoid schizophrenics.

Perceptual scanning

Shakow theorized: ". . . in the scanning process which takes place before the response to a stimulus is made, the schizophrenic is unable to select out the material relevant for optimal response."[24] Various studies led Silverman to postulate that in acute schizophrenic patients extensive scanning (and subsequent size underestimation) may be associated with paranoid pathology and good premorbid adjustment, and that underscanning (and thus size overesti-

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[23]Arnold H. Buss & Edna F. Daniell, Stimulus generalization and schizophrenia. J. Abn. Psychol., 1967, 72 (1), 50-53.

[24]D. Shakow, Segmental set. Arch. Gen. Psychiat., 1962, 6, 1-17.

mation) is characteristic of nonparanoid pathology and poor premorbid adjustment.[25]

Davis, Cromwell, and Held[26] empirically demonstrated that good premorbid paranoid schizophrenics did underestimate object size while poor premorbid nonparanoid subjects overestimated size, as predicted by Silverman's formulations. A later study by Schooler and Silverman[27] cast doubt on the relationship between paranoid schizophrenia and extensive scanning of the environment. This study found that paranoid-type delusions are not necessarily associated with extensive scanning.

A recent study by Spohn, Thetford, and Woodham[28] demonstrated that schizophrenics process visual information

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[25]Dan Davis, Rue Cromwell, & Joan Held, Size estimation in emotionally disturbed children and schizophrenic adults. J. Abn. Psychol., 1967, 72 (5,1), 395-401.

[26]Ibid.

[27]Carmi Schooler & Julian Silverman, Perceptual styles and their correlates among schizophrenic patients. J. Abn. Psychol., 1969, 74 (4), 459-470.

[28]Herbert E. Spohn, Paul E. Thetford, & Fredrick L. Woodham, Span of apprehension and arousal in schizophrenia. J. Abn. Psychol., 1970, 75 (2), 113-123.

less efficiently than normal subjects, controlling for memory and intelligence differences. Thus those differences between schizophrenics and normals in information processing cannot be explained by intelligence and/or memory deficits, according to Spohn, Thetford, and Woodham.

This study has raised further doubts concerning the veracity of the scanning mechanism postulated by Silverman and the overinclusion mechanism of Cameron. The results of Cameron[29], Silverman[30], and Davis, Cromwell, and Held[31] supported a notion of increased perceptual vigilance or hyperattention in paranoid schizophrenics which was not supported by Spohn, Thetford, and Woodham[32] who found that paranoid schizophrenics were inferior in information processing to nonparanoid schizophrenics. Thus extensive scanning, if it does occur, does not effectively aid the paranoid schizophrenic in processing visual information.

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[29]Cameron & Magaret, op. cit.

[30]Silverman, op. cit.

[31]Davis, Cromwell, & Held; op. cit.

[32]Spohn, Thetford, & Woodham; op. cit.

Perceptual constancy and rigidity

Two studies have indicated that paranoid schizophrenics are at least equal to normals in performance at tasks measuring perceptual abilities, although other schizophrenic patients are quite inferior.[33,34] Some perceptual differences have become apparent between the paranoid schizophrenic and the normal individual. A group of studies has dealt with perceptual constancy and rigidity. These studies have utilized visual perception tasks. Visual constancy is a process in which objects of the same size or shape, seen at different angles and distances ordinarily are experienced as very similar. This phenomenon happens in spite of the differences which occur in the actual retinal images which are produced by the stimuli.[35]

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[33]R. T. Saucer & H. L. Deabler, Perception of apparent motion in organics and schizophrenics. J. Consult. Psychol., 1956, 20, 385-389.

[34]R. T. Saucer, A further study of the perception of apparent motion by schizophrenics. J. Consult. Psychol., 1958, 22, 256-258.

[35]Silverman, op. cit., p. 356.

Raush,[36] utilizing a procedure of size estimation, found that paranoid schizophrenic patients exhibited significantly more overconstancy than either normals or nonparanoid psychiatric patients. Weckowitz and Blewett found similar results when paranoids and hebephrenics were compared.[37] Hartman made observations of after-image size estimations of paranoid schizophrenics, nonparanoid schizophrenics, and normals.[38] He found that paranoid schizophrenics showed significantly greater overconstancy than either of the other groups. These three studies have supported the concept of overconstancy. The following studies support the closely allied concept of perceptual rigidity.

Adams[39] did not differentiate between paranoid and

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[36]H. L. Raush, Perceptual constancy in schizophrenia. J. Pers., 1952, 21, 176-187.

[37]T. E. Weckowicz & D. B. Blewett, Size constancy and abstract thinking in schizophrenic patients. J. Ment. Sci., 1959, 105, 909-934.

[38]A. M. Hartman, The apparent size of after-images in delusional and non-delusional schizophrenics. Amer. J. Psychol., 1962, 75, 587-595.

[39]Adams, op. cit.

nonparanoid schizophrenics, but found that in his sample, a mixed group of schizophrenics exhibited greater perceptual rigidity than non-schizophrenics. A previously cited study by Mandl[40] showed paranoid schizophrenics to be more rigid perceptually than a group of normals. In a study elaborating on his previous findings (1952), Raush[41] found that paranoid schizophrenics judged the size of a stimulus object within more narrow limits than nonparanoids or normals. He concluded that rigidity in perceiving reality is characteristic of the paranoid schizophrenic.

Summary

The studies related to perceptual processes in paranoid schizophrenia have considered perceptual set, excessive scanning, overgeneralization, and overconstancy and rigidity as important areas of research. The empirical results concerning excessive scanning and overgeneralization are somewhat equivocal. The concepts of perceptual rigidity

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[40]Mandl, op. cit.

[41]H. L. Raush, Object constancy in schizophrenia: the enhancement of symbolic objects and conceptual stability. J. abnorm. soc. Psychol., 1956, 52, 231-234.

and set have provided the theoretical basis for this study.

The animal and opposite technique, unlike the perceptual tasks used by previous researchers, has other demonstrated utility as a projective device.[42] It is the possible twofold usefulness of this nonverbal technique of personality assessment which differentiates the present study from those which have preceded it. To add an empirically established objective dimension to the more subjective dimension of projective interpretation represents a positive addition to this diagnostic instrument.

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[42]G. P. Koocher & D. W. Simmonds, The animal and opposite drawing technique: implications for personality assessment. International Journal of Symbology, in press.

CHAPTER III

PARAMETERS OF THE STUDY

Subjects. The initial sample included thirty-seven male psychiatric inpatients at Fulton State Hospital, Fulton, Missouri, ranging in age from seventeen to sixty-nine. Also tested were eighteen members of the nursing personnel at the same hospital who served as the non-hospitalized sample.

The cross-validation sample consisted of 133 patients entering the Acute and Intensive Treatment Unit (AIT) of Fulton State Hospital, Fulton, Missouri. These patients received the animal and opposite drawings as part of the admission battery of psychological tests. The drawings were administered by psycho-technicians who had no knowledge of the hypothesis being tested and therefore were free of experimenter bias. The criterion for diagnostic classification of the patients was the established psychiatric diagnosis made by the hospital staff, based on the classificatory nomenclature of the Diagnostic and Statistical Manual of Mental Disorders, Second edition

(DSM II).[1]

Method. All subjects (Ss) were given a drawing booklet containing standard 8½ x 11 inch white unlined paper with the following instructions on the cover sheet: "Some people are often better able to express themselves through pictures than words. On the pages which follow you will be asked to make certain drawings. Do not worry if you have no artistic ability, but try anyway." On the next page was the instruction, "Draw an animal," and on the following page, "Draw the animal which is the opposite of the one you just drew."

Classification of response. All drawings were classified as "rigid" or "non-rigid" by the following criteria: any opposite based on rotation, mirror image reversal, or otherwise repositioning the first drawn animal, or any opposite based on altering the sex of the original animal was considered a rigid opposite. Any other type of opposite was considered non-rigid. Each S was asked by the

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[1]American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders. Second edition. Washington, D. C.: American Psychiatric Association, 1968.

psycho-technician to name the animals he had drawn, and classification was based on this verbal statement in order that artistic differences not be a factor. Some Ss, for example, drew similar looking pictures while indicating that they were attempting to depict two different animals.

The reasons for establishing the above criteria stem from the notion that the most rigid mode of forming an opposite would be simply to retain the original animal concept, while shifting its physical placement or its sex. For these purposes, opposites which were highly stereotyped, but based on other characteristics of the animals (i.e., dog and cat) were considered examples of non-rigid reasoning.

Analysis. Data were analyzed by means of the non-parametric chi-square test. Age and intelligence differences among the initial Ss and the cross-validation Ss were tested by t-test.

CHAPTER IV

RESULTS

Identifying data and the animal and opposite responses of each subject in the initial sample are reported in Table VI (Appendix A). Table VII (Appendix A) contains similar information on the cross-validation sample.

I. INITIAL SAMPLE

As shown by the data summarized in Table I, the hypothesis that PSs would produce more rigid opposite animal responses was supported by the chi square analysis at a highly significant level ($p < .001$) in the initial sample.

Tests for differences between average age and intellectual level of the initial sample groups are summarized in Table II. The PSs and NPPs were not different on either of these dimensions, although the NHs were significantly older and more intelligent than the patient samples. As such the performance of the NHs may not be comparable to the other groups if these dimensions, age and intelligence, are important variables relating to perceptual rigidity.

TABLE I

INITIAL SAMPLE

OPPOSITE CHOICES

Group	Responses: Rigid	Responses: Non-rigid	d.f.	x^2
Paranoid (hospital)	13	7	---	
Nonparanoid (hospital)	1	16	1	13.50*
Control (non-hospitalized)	0	18	2	26.06*

*$p < .001$

TABLE II

INITIAL SAMPLE

AGE AND I.Q. DIFFERENCES

Group	N	Mean Age	Mean I.Q.
Paranoid (hospital)	20	38.7	88.6
Nonparanoid (hospital)	17	36.6	94.2
Control (non-hospitalized)	18	48.2*	107.8**

*Greater than the other two groups at $p < .05$.

**Greater than the other two groups at $p < .01$.

The Paranoid and Nonparanoid groups did not differ significantly from each other.

II. CROSS-VALIDATION SAMPLE

Results of the independent cross-validation sample are summarized in Tables III, IV, and V. The hypothesis that PSs would produce more rigid opposite animal responses was again supported at a significant level ($p < .01$) in the primary chi-square analysis which is reported in Table III. Application of the more conservative Yates' correction for sample size in the chi square analysis yielded significant results ($p < .02$), as is also reported in Table III.

Comparison of age and intellectual levels of PSs and NPPs in the cross-validation sample are reported in Table IV. The results of the t-tests were clearly non-significant, verifying the comparability of the two groups. An additional t-test analysis was performed on the intelligence quotients of those patients who produced rigid opposite animals versus those who produced non-rigid opposites. The difference in intellectual functioning between these groups was non-significant as is shown in Table V. A similar analysis found no sex differences.

TABLE III

CROSS-VALIDATION SAMPLE

OPPOSITE CHOICES

Group	Responses: Rigid	Responses: Non-rigid	d.f.	x^2
Paranoid	11	12		
Nonparanoid	22	86	1	7.584** [a]
			1	6.198* [b]
N=131[c]				

**p < .01
*p < .02

[a] Uncorrected x^2.

[b] x^2 with Yates' Correction for sample size.

[c] Two of the NPPs did not produce opposite animals and therefore have been omitted from this analysis.

TABLE IV

CROSS-VALIDATION SAMPLE

AGE AND I.Q. DIFFERENCES

Group	N		Mean Age	Mean I.Q.
Paranoid	23		40.261	94.478
Nonparanoid	110		40.318	95.127
		t =	0.020*	0.176*

*nonsignificant

TABLE V.

CROSS-VALIDATION SAMPLE

I.Q. DIFFERENCES

	N		Mean Age
Rigid Opposite	33		94.758
Non-rigid Opposite	98		95.020
		t =	0.084*

*nonsignificant

CHAPTER V

SUMMARY AND DISCUSSION

This study has attempted to add another discriminative dimension to an established projective device, the animal and opposite drawing technique. Certain productions on this device of an opposite animal have been hypothesized in this study to be related to the perceptual rigidity of paranoid schizophrenia which has been demonstrated in previous studies (e.g., Mandl[1], Raush[2]).

The present study consisted of the administration of the animal and opposite drawings to an initial sample of PSs and NPPs who were inpatients at the Maximum Security Unit of Fulton State Hospital, Fulton, Missouri. A group of hospital nursing personnel (NHs) served as a sample of "normal" controls. A large number of consecutively tested admissions to the Acute and Intensive Treatment Unit of the same hospital served as the cross-validation sample. The animal and opposite drawings were administered to the cross-validation sample as part of the Psychology Department's initial screening battery of tests.

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[1]Mandl, op. cit. [2]Raush, 1956, op. cit.

Perceptual rigidity has been defined in this study as a response class of productions of the opposite animal drawings. The literature review of this paper has demonstrated the potential importance of opposites as a construct in personality theorization and psychological inquiry. The animal and opposite drawing technique has recognized the importance of the use of opposites in diagnostic evaluation of personality dynamics.

The main hypothesis of this study was that the animal opposite drawings would serve to discriminate between PSs and NPPs on the dimension of perceptual rigidity. This hypothesis was supported in the initial sample of patients tested, but this finding alone was inadequate as a test of the hypothesis under consideration. Many isolated findings such as this have appeared in the literature on projective techniques, but later independent studies have found dissimilar results. For this reason, an independent cross-validation sample of subjects was a necessary test of the validity of the animal and opposite drawings' use as a discriminator of PSs from NPPs.

The second patient sample, herein called the cross-validation sample, also provided significant discrimination

between PSs and NPPs on the basis of the animal opposite drawings. As the data clearly have shown the level of discrimination in the cross-validation sample was somewhat less than that of the original sample. There are several potential reasons for this discrepancy in results.

The subjects in the initial sample had been diagnosed prior to their participation in this study so that this sample, although chosen randomly as to the individual participants, did represent a stratified sample so that the number of PSs and NPPs would be approximately equal. The drawing technique was administered to the initial sample by this E and his colleague, G. P. Koocher. Both persons administering the device were aware of the hypothesis under consideration and may have influenced the performance of the subjects in that sample in keeping with their expectancies generated by the hypothesis being tested.

Experimenter bias was far less likely to influence the results of the cross-validation sample because the drawings were administered by psycho-technicians who had no knowledge of the hypothesis under consideration in the present study. The cross-validation group received the drawings within a few days of admission to the hospital and

in nearly all cases before the psychiatric diagnosis was established. The psycho-technicians who administered the screening battery of tests were not trained to make diagnostic evaluations. The psychiatric diagnosis was not influenced by the results of the drawing technique, as the hospital staff members participating in the diagnostic process were not aware of the hypothesis being tested.

Another source of variance in the results between the initial and cross-validation samples was the diagnosis itself. The initial sample was drawn from a forensic unit where there is considerable emphasis on the diagnostic process, as the diagnosis established by the staff of that unit often provides the basis for discriminations in the judicial system of the state of Missouri. The cross-validation sample was drawn from admissions to a unit which emphasizes intensive treatment programs and short-term maintenance procedures.

The function of the diagnostic process is somewhat different in these two units of the hospital. The diagnosis is perhaps a less critical variable in the AIT Unit than in the Maximum Security Unit of this hospital whose population yielded the two samples used in this study. It is therefore

possible that the initial sample in this study was subjected to more rigorous diagnostic procedures than the cross-validation sample. Thus the cross-validation sample may have been subject to less accuracy in diagnosis than the initial sample. It is feasible that diagnostic "misses" may have been a more frequent occurrence in the cross-validation sample, and this may be an additional factor contributing to the discrepancy which does exist in the findings of the two samples of the study.

The results of this study have supported the hypothesis which differentiates PSs and NPPs on the basis of the animal and opposite drawing technique. These groups have performed in a discernably different manner (rigid versus non-rigid) on the opposite animal drawings at acceptable levels of statistical significance. Given this significant statistical difference, it is nonetheless desirable to consider the adequacy of the procedure as a diagnostic discriminator between PS and NPP hospital inpatients.

The PSs in the initial and cross-validation samples performed in a rigid manner on the opposite animal drawings in about sixty-five and forty-eight per cent of the cases in these respective samples. Thus the drawings have yielded

about thirty-five and fifty-two per cent of misclassifications according to the hypothesis of this study. Such misclassifications may be termed "false-negatives" for paranoid schizophrenia. These percentages for false-negatives must be considered by the clinician whose task is one of differential diagnosis.

The NPPs in the initial and cross-validation samples performed in the predicted nonrigid manner in ninety-four and eighty per cent of the cases in their respective groups. Thus the NPPs showed the rigid performance hypothesized as characteristic of paranoid schizophrenia in six and twenty per cent of the sampled cases. This performance can be characterized as "false-positive" for paranoid schizophrenia.

On the basis of the reported percentages of correct and incorrect classifications of PSs and NPPs, it appears that the animal and opposite technique may provide useful diagnostic hypotheses for the determination of paranoid schizophrenia. Such hypotheses must, however, be considered to be highly tentative. It seems unwarranted, on the basis of the data reported in this study, to make any definitive diagnostic statement based on the animal and opposite drawing performance unless there is other good clinical and test

evidence of the presence of a paranoid process in the individual patient.

The animal and opposite drawings are useful particularly for the patient who is functionally illiterate, as the instructions for the drawing procedure may easily be given verbally to the patient. The inquiry involving the patient's verbal statement of the animal and opposite animal which he has produced is the only verbalization required of the patient.

Thus the animal and opposite drawing technique recommends itself primarily to the clinician who makes use of projective devices and may use the animal and opposite drawings as a projective technique for the assessment of personality dynamics in addition to the dimension of the opposite drawings used for the tentative discrimination of PSs as described in this paper.

The inability of the PS to produce opposite animals along dimensions used by normals has been predicted in accordance with previous findings related to the perceptual and cognitive processes of the PS. Such individuals seem not to be able to shift freely among percepts. The PS is, instead, stimulus-bound, and unable to produce an opposite

which is not obviously associated to the first animal produced. This narrowed range of responding clearly fits the definition of rigidity from Adams which was previously noted in this paper.[3]

It has been a goal of this inquiry to examine the perceptual processes associated with paranoid schizophrenia. In the opinion of this author, it is unlikely that the perceptual processes of the PS represent more than an effect or result of the presently unspecified causes of schizophrenia. Therefore the findings in this paper probably do not directly relate to etiological considerations. The body of literature which demonstrates various effects of the cognitive and perceptual processes of paranoid schizophrenia may prove valuable in eventually understanding the process of causation by more clearly specifying the parameters of the disorder. It is additionally useful to the clinician to attain some comprehension of the perceptions of the PS in order to function more effectively in diagnostic and therapeutic endeavors.

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[3]Adams, op. cit.

This paper has attempted to broaden the present state of knowledge concerning paranoid schizophrenia and to further explore the potentials of the animal and opposite drawing technique. If these goals have been in some part accomplished, both basic and applied knowledge have been gained.

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APPENDIX

TABLE VI

INITIAL SAMPLE

DRAWING DATA ON PATIENTS DIAGNOSED AS PARANOID SCHIZOPHRENIC 295.3

Diagnosis	Case #	I.Q.	Age	Opposite-type
295.3	34957	116	53	direction*
295.3	28989	101	30	direction*
295.3	38070	108	37	direction*
295.3	37342	94	28	direction*
295.3	36958	84	42	direction*
295.3	38726	68	20	sex*
295.3	Pyatt	76	46	direction*
295.3	28984	103	50	sex*
295.3	37229	66	45	sex*
295.3	Slagle	103	47	sex*
295.3	Wells	73	20	sex*
295.3	Melton	106	26	rat/bird
295.3	Roberts	84	40	sex*
295.3	34990	98	50	mule/horse
295.3	37327	84	22	dog/cat
295.3	38709	88	41	squirrel/rabbit
295.3	37718	102	44	horse/dog
295.3	35829	82	57	sex*
295.3	Sauer	84	46	mule/donkey
295.3	Tramel	57	30	dog/mouse

N = 20
Rigid (*) = 13
Non-rigid = 7

DRAWING DATA ON PATIENTS DIAGNOSED AS OTHER THAN 295.3 (HOSPITAL INPATIENTS)

301.7	Nolen	106	17	dog/cat
307.2	39050	104	20	lion/lamb
303.1	28348	80	47	horse/chicken

TABLE VI (continued)

Diagnosis	Case #	I.Q.	Age	Opposite-type
290.0	38544	83	63	hog/goat
293.2	38264	71	19	monkey/man
318	Corbin	99	46	mule/cow
312	Harrison	55	19	octopus/werewolf
307.2	Holmes	85	17	horse/mule
301.7	37474	120	69	dog/cat
302.2	38846	106	48	horse/donkey
307.2	35751	117	20	cartoon direction*
302.6	27754	117	36	dog/cat
301.7	36639	97	24	cat/dog
301.8	39065	80	23	cat/dog
319.9	38917	75	45	horse/dog
303.2	Rector	91	51	horse/bull
301.7	39696	116	58	horse/cow

N = 17
Rigid (*) = 1
Non-rigid = 16

ATTENDANTS (CONTROL)

Case #	Sex	I.Q.	Age	Opposite-type
1	F	101	57	cat/dog
2	F	109	44	pig/lamb
3	F	106	44	dog/cat
4	F	122	61	rabbit/squirrel
5	F	119	46	poodle/cat
6	F	113	44	cat/dog
7	F	117	50	cat/mouse
8	F	109	34	dog/cat
9	F	119	52	cat/dog
10	M	106	35	camel/dog
11	M	99	31	horse/bird
12	M	106	61	horse/mule
13	M	102	57	donkey/horse
14	M	89	49	mule/horse

TABLE VI (continued)

Case #	Sex	I.Q.	Age	Opposite-type
15	M	99	54	dog/cat
16	M	109	58	rabbit/dog
17	M	111	30	cat/dog
18	F	104	60	rabbit/chicken

N = 18
Rigid = 0
Non-rigid = 18

TABLE VII

CROSS-VALIDATION SAMPLE

DRAWING DATA ON CONSECUTIVELY TESTED PATIENTS

Diagnosis	Case #	I.Q.	Sex	Age	Animal and Opposite
295.90	40502	76	F	61	cow/horse
295.3	30924	109	F	62	caribou/caribou (sex)*
298.0	40540	84	M	38	cow/calf (age)*
295.3	40527	87	F	40	cat/cat (size)*
302	40478	137	M	28	dog/cat
301.7	40496	100	M	21	dog/no opposite
318.0	40529	81	M	65	bull/horse
295.3	32191	121	F	47	squirrel/squirrel (placement)*
295.3	40551	91	F	49	pig/cow
303.2	29704	108	M	39	rabbit/dog
304.0	40546	88	M	21	elephant/ mouse
303.1	40576	128	M	63	Mr. & Mrs. Pig (sex)*
295.3	40548	104	M	32	horse/horse (direction)*
301.82	40562	81	M	48	bear/owl
310	40580	68	F	38	dog/dog (size)*
303.2	40555	92	M	30	rabbit/horse
302.5	40594	118	M	49	horse/camel
290.1	40599	79	M	54	horse/dog
295.3	40607	66	F	40	dog/rabbit
301.5	38684	115	F	57	cat/dog
303.5	37133	82	M	68	horse/race horse*
301.0	37264	104	F	47	horse/bird
303.1	38731	92	M	46	horse/cow
310	40637	67	M	40	horse/pig
295.6	36054	81	F	43	duck/drake (sex)*
303.2	38894	78	F	42	cow/horse
296.0	20696	98	M	57	horse/cow
303.2	31774	94	M	57	cow/bull (sex)*
303.2	39306	129	M	51	mule/female mule (sex)*
295.3	37175	78	M	39	horse/horse (sex)*
301.82	40625	125	M	39	horse/cow
301.0	38391	95	M	44	horse/cow

TABLE VII (continued)

Diagnosis	Case #	I.Q.	Sex	Age	Animal and Opposite
300.4	33581	99	M	61	rabbit/dog
303.1	40630	100	F	59	bird/cow
301.7	40631	124	M	24	pussycat/bird
295.90	40641	89	M	45	walrus/pheasant
303.1	40642	92	M	28	horse/mule
303.2	39942	85	M	63	hog/bull
295.3	35318	97	F	25	dog/cat
301.89	29888	102	F	40	dog/cat
295.3	40650	71	M	36	male horse/female horse (sex & direction)*
295.3	40669	88	M	36	rabbit/horse
316.0	50008	98	F	45	donkey/female donkey (sex)*
316.0	36939	104	F	20	horse/horse (direction)*
301.7	40658	84	M	28	snake/worm
318.0	50064	88	M	21	horse/cow
293.2	40660	93	M	35	elephant/dog
295.90	40633	104	F	22	cow/bull, Francis the (sex)*
295.3	40645	106	F	25	rabbit/cat
300.13	40662	75	F	20	dog/cat
300.4	52018	136	M	31	dog/cat
303.2	40646	94	M	38	horse/cow
295.5	40656	118	F	24	dog/cat
301.7	35510	100	M	25	cat/dog
303.0	40661	66	M	25	goat/horse
301.7	40673	93	F	18	horse/dragon
307.3	38873	102	M	39	dog/rabbit
301.82	40683	96	F	40	bird/cat
295.3	40672	92	F	56	rabbit/fox
303.2	40678	95	M	45	dog/cat
295.90	40670	114	F	39	horse/pig
301.81	31519	86	F	30	pig/pig (same)*
295.3	40676	85	M	22	horse/cow
301.7	40693	97	M	25	mule/horse
295.90	40694	65	F	28	horse/cow
293.2	36067	77	M	30	dog/cat
295.3	40684	134	F	46	horse/deer

TABLE VII (continued)

Diagnosis	Case #	I.Q.	Sex	Age	Animal and Opposite
295.3	33742	82	F	21	grand daddy long leg/ grand mama long leg (sex)*
295.3	20810	98	M	52	dog/dog (direction)*
295.90	40705	92	F	29	horse/bird
303.0	40703	108	M	41	dog/dog (same)*
295.3	40698	70	M	34	cow/bull (sex)*
303.1	40713	88	M	62	sheep/hog
295.6	40667	96	F	53	dog/cat
295.3	40706	98	M	31	duck/horse
303.0	40709	110	F	40	female cow/bull (sex)*
303.2	30249	103	M	37	rabbit/fox
295.90	40717	98	F	31	donkey/cow
309.4	40720	93	M	20	cat/dog
295.3	40714	89	M	53	horse/mouse
300.4	40724	97	M	41	cat/dog
301.5	40725	110	F	29	cat/dog
318.0	40726	93	F	63	mule/horse
304.7	40731	102	M	22	horse/centipede
303.0	40742	98	M	22	horse/no opposite
303.1	40702	102	M	28	cow/bull (sex)*
303.1	25941	76	M	46	cat/female cat (sex)*
303.2	31552	94	M	58	goat/sheep
307.3	40738	79	M	20	deer/squirrel
295.90	35027	86	F	26	mole/female mole (sex)*
301.89	34381	91	F	53	mule/dog
300.48	40743	107	F	37	dog/cat
319	40721	88	M	53	dog (male)/dog (female) (sex)*
298.0	40737	110	F	56	rabbit/cat
245.90	40632	92	M	17	elephant/alligator
303.1	40748	86	M	40	horse/cow
303.7	39344	89	M	50	lizard/pig
303.0	40753	102	M	36	dog/cat
303.1	37180	88	M	44	horse/cow
303.1	40758	74	M	56	hog/horse
319	40759	84	M	65	peacock/sheep
301.2	40757	114	M	22	dog/cat
303.1	40760	78	M	27	bird/cat

TABLE VII (continued)

Diagnosis	Case #	I.Q.	Sex	Age	Animal and Opposite
303.2	36796	84	M	63	pig (male)/hog (female) (sex)*
300.4	40761	100	F	38	cat/dog
303.1	40008	87	M	38	hog/bird
303.2	39202	99	M	53	rabbit/squirrel
293.5	40769	91	M	44	mule/horse
295.3	40068	101	F	29	rabbit/cat
303.07	37753	99	F	51	cat/dog
300.0	40771	97	F	61	horse/horse (size)*
295.3	40779	112	M	59	cougar/owl
303.1	40776	106	M	57	horse/goat
295.6	38894	80	F	43	horse/cow
303.0	40783	112	F	40	rabbit (male)/rabbit (female) (sex)*
295.90	40786	76	F	22	dog/cat
304.7	40791	106	M	17	dog/cat
298.0	40789	93	F	55	cat/dog
316.0	40790	89	F	45	dog/cat
295.90	33819	112	M	48	horse (male)/horse (female) (sex)*
303.2	40792	97	M	35	hog/cow
295.3	52137	90	M	57	buck deer/doe deer (sex)*
302.2	40795	92	M	57	horse/cow
301.82	32832	90	M	22	cat/dog
295.6	40495	87	F	26	cat/dog
303.2	38334	110	M	43	dog/cat
303.1	40806	95	M	52	chicken eating wolf/ coyote chicken eater
303.1	40809	92	M	52	horse/mule
303.0	40811	95	M	39	cat/dog
295.3	40802	96	F	35	duck/duck swimming on water (place)*
303.2	40812	90	M	63	race horse/milk cow
303.0	40814	96	M	20	pig/cow
295.90	40816	88	M	33	dog/dog (direction)*

N = 133
*rigid