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Associative Disturbance in Schizophrenia, Schizoaffective Disorders, and Major Affective Disorders: Comparisons between Hospitalization and One-Year Followup

Francine R. Rattenbury
Loyola University Chicago

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ASSOCIATIVE DISTURBANCE IN SCHIZOPHRENIA, SCHIZOAFFECTIVE
DISORDERS, AND MAJOR AFFECTIVE DISORDERS:
COMPARISONS BETWEEN HOSPITALIZATION AND ONE-YEAR FOLLOWUP

by

Francine R. Rattenbury

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of

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VITA

The author, Francine Ruth Rattenbury, is the daughter of Bartrum Lynn Rattenbury and Peggy (Kojima) Rattenbury. She was born April 24, 1953, in Fukuoka, Japan.

Her elementary education was obtained at United States Air Force schools in Japan, and public schools of Syracuse, New York and Victorville, California. She obtained her secondary education at Suitland Senior High School, Suitland, Maryland and at Plano High School, Plano, Illinois, where she graduated in 1971.

She attended Northern Illinois University from September, 1971 until May, 1974. In September, 1975, she entered Loyola University of Chicago, and in February, 1977, received the degree of Bachelor of Science with a major in psychology.

She was employed as a Clinical Research Assistant at Michael Reese Medical Center until September, 1979 when she entered the Clinical Psychology program at Loyola University of Chicago. She has been granted assistantships in the Department of Psychology and the Graduate School. She has completed clinical externships at the Illinois State Psychiatric Institute and at Michael Reese Medical Center, and is currently an intern at the Loyola University Counseling Center.

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REVIEW OF RELATED LITERATURE AND STATEMENT OF PROBLEM

Literature Review

Contemporary empirical research in psychopathology indicates that traditional assumptions regarding the diagnostic specificity of thought disorder may be in need of revision. In the traditional view of schizophrenic cognition, first presented by Bleuler (1911/1950), associative thought disorder is regarded as the single primary defect from which all other symptoms of schizophrenia are secondarily derived. According to Bleuler, associative disturbance is fundamental as well as primary, to be found in every case of schizophrenia but not present in other types of psychopathology, and thus a pathognomonic indicator of schizophrenia.

In his listing of associative abnormalities characteristic of schizophrenia, Bleuler included: Irregularities in association time due to pressure of thought and blocking; association to previous stimulus words or answers; stereotypy of answers; echolalia; poverty of ideas; greater frequency of uncommon responses; bizarre associations; apparently unrelated responses; and a marked tendency to respond to an intermediate but un verbalized association. Regarding the nature of the underlying associative disturbance, Bleuler asserted that associative threads are inter-

rupted and lose their continuity. As a result, thinking becomes illogical and often bizarre. In its extreme form, all associative threads are torn so that the train of thought is totally interrupted and blocking results.

The results of recent systematic observations of the relationship between diagnosis and thought disorder have been mixed, and appear to vary with the diagnostic criteria used, composition of the nonschizophrenic comparison groups, time period of assessment, and type of thought disorder assessed. Harrow, Tucker, Himmelhoch, and Putnam (1972) compared DSM II-diagnosed schizophrenics with a control group of primarily nonpsychotic, nonschizophrenic patients in a longitudinal study of conceptual overinclusion and idiosyncratic thinking, rated from performance on the Goldstein-Scheerer Object Sorting Test. At the initial testing, conducted shortly after hospital admission, as well as the second testing approximately seven weeks later, the differences in group means indicated that the schizophrenics were significantly more pathological on both measures of thought disorder.

The results of a study of similar design, but with a longer interval between initial and followup testing, indicated that at 11 months after initial testing the schizophrenics did not differ from the nonschizophrenics on either measure (Harrow, Harkavy, Bromet, & Tucker, 1973).

These results suggest that thought disorder, when measured as conceptual overinclusion and idiosyncratic thinking, is a phase-specific phenomenon in schizophrenia which does not persist at appreciable levels beyond the acute and post-acute psychotic states.

Harrow and Quinlan (1977) assessed three types of thought disorder in a sample of DSM II-diagnosed, recently admitted psychiatric patients. Schizophrenics were compared with a group of primarily nonpsychotic nonschizophrenics on levels of conceptual overinclusion, idiosyncratic thinking, and deviant thought quality. The findings of Harrow et al. (1972) were partially replicated, as the schizophrenic group showed significantly greater levels of conceptual overinclusion and idiosyncratic thinking when tested within 10 days after admission. When retested six to seven weeks later, however, the difference in conceptual overinclusion was again significant while no difference was found in idiosyncratic thinking, suggesting that the latter type of thought disorder may remit more quickly.

Deviant thought quality, a measure derived from performance on the Rorschach Test, was assessed only at the initial time period. Close examination of this measure revealed that the diagnostic groups did not differ in the frequency with which mild deviant thinking occurred. In

the moderate to very severe range of deviant thinking, the incidence of thought disorder in the schizophrenic group was significantly higher than that of the nonschizophrenics. Even severe disordered thinking, however, was not unique to schizophrenia. For both deviant thought quality and idiosyncratic thinking, Harrow and Quinlan (1977) reported that severe levels of thought pathology were found in patients of other diagnostic categories, including psychotic depression and mania. The authors concluded that the presence of severe thought disorder may be a sign of probable schizophrenic diagnosis, but cannot be considered pathognomonic of schizophrenia because it is also present among some nonschizophrenics as well.

A more recent study conducted by the same senior author, using diagnostic criteria more rigorously defined than those of DSM II, more clearly illustrates the lack of specificity of thought disorder to schizophrenics when they are compared specifically with other psychotic patients rather than with nonschizophrenics in general. Using the Research Diagnostic Criteria, RDC (Spitzer, Endicott, & Robins, 1978), as the basis for formation of diagnostic groups, Harrow, Grossman, Silverstein, and Meltzer (1982) assessed bizarre-idiosyncratic thinking in hospitalized schizophrenic and manic patients, during both the acute phase of disorder and the phase of partial recovery seven weeks later. Their thought disorder measure was comprehen-

sive, derived from the results of three psychological tests and encompassing a wide range of indicators, including disordered logic, odd ideas, and gaps in communication. The authors found that level of disordered thought in the schizophrenic group did not exceed that of the manics at either time period; in fact, the mean for manics was significantly higher at the initial, acute phase of testing.

The results pertaining to longitudinal course of thought disorder showed that a significant reduction occurred between the initial two and one half weeks of hospitalization and the phase of partial recovery. This time-of-testing effect was found for the means of both patient groups combined; diagnosis was not a significant factor, nor was there a significant interaction between time period and diagnosis. Results of the second testing showed no significant difference between the groups. However, even though there was a significant decline in level of thought pathology for all patients in general, a number of them from each group (25% of the manics and 48% of the schizophrenics) still showed evidence of severe thought disorder at the seven-week followup.

The findings of Harrow et al. (1982) clearly contradict the notion that thought disorder occurs only in schizophrenia, and suggest instead that it may be a feature

of mania as well, or perhaps of psychosis in general. The authors, however, point out the limitations of utilizing a global thought disorder measure that may mask unique qualitative features of schizophrenic cognition, as "... human behavior can be the final product of multiple complex processes, and thus the quantitative similarities between the manic and schizophrenic patients could arise in many ways" (p. 670).

Relatively few investigators have addressed Bleuler's (1911/1950) original suggestion of loose associations as the particular type of cognitive disorder that differentiates schizophrenia from other forms of psychopathology. The evidence obtained from attempts to directly measure associative performance has yielded inconclusive results. In a cross-sectional study of hospitalized and discharged DSM II-diagnosed chronic schizophrenics, Siegel, Harrow, Reilly, and Tucker (1976) reported that severe looseness of associations occurred infrequently in both samples during free verbalization interviews. The samples consisted of chronic schizophrenics who, at the time of the study, had been hospitalized continuously for more than two years, or had been out of the hospital for at least one year. Their verbalizations were rated for the presence and severity of eight types of thought disorder, and although the hospitalized group's mean was significantly higher on an overall rating of disordered speech, the difference between

groups in looseness of associations was not significant. These results suggest that chronic schizophrenics, regardless of hospitalization status, uniformly show little evidence of associative disturbance when engaged in an unstructured, free verbalization task.

Silverstein and Harrow (in press) used Moran's (1953) scale of relatedness to assess associative loosening in recently admitted DSM II-diagnosed schizophrenic and primarily nonpsychotic, nonschizophrenic psychiatric patients. Relatedness scores were rated from patients' performance on a continuous word association task, through which a maximum of 10 associations were obtained for each of 20 stimulus words. In analyses of both initial responses and all responses, level of associative loosening was significantly higher in the schizophrenic group. These results, derived from direct assessment of performance on a structured associative task, are consistent with those of earlier investigations (Harrow et al., 1972) that compared schizophrenics with primarily nonpsychotic controls, using other measures of thought disorder.

Andreasen (1976b), using RDC criteria for formation of diagnostic groups, compared recently hospitalized schizophrenics, manics, and major depressives on a variety of types of thought disorder. The data consisted of pooled unstructured and structured interviews. The reliability

of scoring criteria had been assessed previously, using taped and live interviews with patients, and was found to be quite high, with full-scale weighted k of .83 reported for derailment, or loose associations (Andreasen, 1979a). Andreasen reported that frequency of associative loosening was high for the schizophrenic and manic groups, which did not differ on this measure. In the depressed group, associative loosening was rarely observed, and its frequency was significantly lower than those of the primarily psychotic groups. Although longitudinal course was not assessed, Andreasen predicted on the basis of clinical theory that most manics would recover fully from thought disorder.

The studies reviewed above have largely found that in the acute and partial recovery phases of psychopathology, level of thought disorder is significantly greater in schizophrenic groups, when compared with control groups of primarily nonpsychotic psychiatric patients. When compared at the acute phase with groups of primarily psychotic non-schizophrenics, however, the available research has demonstrated that schizophrenic groups are equivalent to, or even less thought disordered than, the control groups. Studies using nonpsychotic controls have utilized a wide range of thought disorder indices, including associative disturbance exhibited on a continuous word association task, while those using psychotic controls have examined only

bizarre-idiosyncratic thinking and associative performance on a free verbalization task.

When schizophrenics were examined at the phases of presumed recovery, eight to twelve months after discharge, the results suggest that thought disorder occurs infrequently and at a level indistinguishable from that found in nonschizophrenic patient controls. The word association technique, however, was not utilized in either report.

Statement of Problem

Overall, results of research conducted thus far appear to clearly contradict the traditional formulation of thought disorder as a unique and consistent feature of schizophrenia. However, as Harrow et al. (1982) have noted, the presence of thought disorder in nonschizophrenics is insufficient evidence for assuming the presence of an underlying associative disturbance as well. Although schizophrenics and certain nonschizophrenics may manifest similarities in performance on complex tasks such as the object sorting and proverbs tests, the cognitive processes that underlie the observed pathology may be quite different. Unless the more basic associative processes receive greater attention in the thought disorder literature, the possibility of its uniqueness to schizophrenia cannot be ruled out.

In order to fruitfully examine the longitudinal course of associative disorder, utilization of word association

techniques may be essential. Bleuler (1911/1950) suggested that associative disturbance is continually present in schizophrenia, though not necessarily with consistent intensity. In recovered or latent schizophrenics, for example, Bleuler believed that only patient and persistent observations, such as those derived from association experiments, may reveal the presence of disturbance.

In the present study, the word association performance of RDC-diagnosed schizophrenic, schizoaffective, and affective disorder patients was assessed shortly after hospital admission in order to evaluate the diagnostic specificity of associative disturbance among these acutely disturbed patients. The same patients were assessed again one year after discharge to investigate the longitudinal course of word association behavior. Thus, several methodological precautions were used: 1) a standardized measure of associative disturbance, 2) a carefully-diagnosed sample, and 3) longitudinal assessment of associative disturbance. In addition, data regarding rehospitalization during the year between discharge and followup were also collected in order to evaluate the relationship between changes in word association performance over time and clinical outcome.

Due to the paucity of directly relevant previous research using the word association technique, the advancement of specific formal hypotheses in the present study was

considered to be premature. Instead, the present research was primarily undertaken in order to gather basic data regarding the longitudinal word association performance of schizophrenics and other psychotic patients.

The present research does, however, provide an opportunity to explore the validity of both traditional and modified formulations regarding the diagnostic specificity of associative disturbance. According to the traditional Bleulerian formulation of schizophrenic pathology, the schizophrenics should exhibit greater looseness of associations when compared with the other diagnostic groups, and this difference should be evident at both time periods. A modification of Bleulerian theory, taking into account the recent findings of apparent similarities in cognitive functioning of schizophrenics and other psychotics at the acute phase of disorder, would predict no differences in associative performance at the initial testing, but would still allow for the finding that the unique feature of schizophrenic cognition is the relative persistence of associative disorder. Thus at followup, associative loosening of schizophrenics, though perhaps not as severe as it was at the acute phase, would nonetheless surpass the followup scores of the nonschizophrenic groups.

METHOD

Subjects

The subjects were 71 patients who volunteered to participate in a longitudinal study of psychopathology conducted by the Mental Health Clinical Research Center (MHCRC), based at the Illinois State Psychiatric Institute, and for whom followup data were available. Patients who showed evidence of alcohol or other drug dependency, or of organic brain pathology, were excluded from the MHCRC study. Diagnoses were determined at the inpatient phase according to the Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1975). The primary sources of diagnostic information were the Social and Psychiatric History Schedule (Note 1) and the Present State Examination (Wing, Cooper, & Sartorius, 1974).

The diagnostic composition of the entire sample consisted of 24 schizophrenics, 16 schizoaffectives, 22 manics, and 9 major depressives. The manic and depressed patients were combined to form a single affective disorders group. Independent simple analyses of variance (ANOVAs) were performed in order to evaluate differences among the three diagnostic groups in mean age, education level, and IQ as estimated by WAIS Information, age-corrected scaled scores. Group means and standard deviations for each of these demo-

TABLE 1

Age, Education in Years, and WAIS Information Scaled Scores
of the Schizophrenic, Schizoaffective, and Affective
Disorder Groups

| DIAGNOSTIC GROUP | AGE ^a | YEARS OF EDUCATION ^b | WAIS INFORMATION SCALED SCORE ^c |
|--|------------------|------------------------------------|---|
| Schizophrenia M (n = 24) SD | 25.67 7.73 | 11.63 1.58 | 7.67 3.77 |
| Schizoaffective M Disorder (N = 16) SD | 29.06 8.86 | 11.44 2.94 | 7.19 3.27 |
| Affective M Disorders (N = 31) SD | 27.71 8.31 | 12.68 3.13 | 9.30 3.61 |

$$^a F(2,68) = .87, \underline{ns.}$$

$$^b F(2,68) = 1.59, \underline{ns.}$$

$$^c F(2,67) = 2.29, \underline{ns.}$$

graphic variables are presented in Table 1. No significant differences were found for either mean age, $F(2,68)=.87$, ns, years of education, $F(2,68)=1.59$, ns, or WAIS Information scores, $F(2,67)=2.29$, ns.

Materials and Procedure

The word list contained 10 familiar nouns of high frequency of occurrence, A or AA in the Thorndike-Lorge (1944) G count (butter, king, ocean, comfort, window, march, interest, temple, race, page). Order of presentation was randomized for each subject. Subjects were instructed to say as many words which the stimulus word brought to mind. The examiner manually transcribed each response as it was given. A stopwatch was used to measure reaction time, which was the time elapsed between presentation of the stimulus word and the subject's first response. Prompting for the initial response was rarely required. If less than three associations were given, the subject was encouraged to continue. A maximum of 10 associations was recorded and scored for each subject.

Subjects were initially tested within two weeks of hospital admission. They were retested one year after discharge as part of a comprehensive, prospective, longitudinal followup protocol that included collection of rehospitalization data.

Word associations were scored according to Moran's

(1953) logical relatedness scale of associative loosening, as modified by DeWolfe (1973). In this 5-point scale, normal associations are rated 3 or 4 and poorly related responses are scored 0, 1, or 2 (see Appendix A for complete scoring instructions). After an initial training period, the two raters established a level of 88% agreement with a matched set of six protocols, using ratings of individual responses. The Cohen (1960) k coefficient of agreement for nominal scales was .85 for interjudge agreement on the Moran scale. Raters were blind to patient diagnosis, time period of test administration, and rehospitalization status.

RESULTS AND DISCUSSION

The main analyses were three-way analyses of variance (ANOVAs) with repeated measures, with diagnosis (schizophrenia, schizoaffective, or affective disorder) and rehospitalization (rehospitalized or not rehospitalized) as between subjects main effects and time of testing (initial or followup) as a within subjects main effect. These analyses were performed using the four dependent measures of cognitive functioning: logical relatedness for all responses; logical relatedness for the initial responses; reaction time; and total number of associative responses.

There were no significant main effects or interactions in the analysis of degree of associative loosening as measured by initial response to the 10 stimulus words (see Table 2). Thus, the patients were not differentiated by diagnostic group, by rehospitalization outcome status, or by initial vs. followup testing with this measure.

In the analysis of degree of associative loosening reflected in all associations given to the stimulus words, the significant main effect was for time of testing, $F(1,65)=7.35$, $p < .01$ (see Table 3). Inspection of the means shown in Table 4 indicated that on this measure,

TABLE 2

Analysis of Variance Results for Mean Logical
Relatedness of Initial Responses

| Source | df | MS | F |
|-----------------------|----|-----|------|
| Between | | | |
| Diagnosis (B) | 2 | .36 | .84 |
| Rehospitalization (C) | 1 | .25 | .58 |
| BxC | 2 | .45 | 1.05 |
| Error (between) | 65 | .43 | |
| Within | | | |
| Time Period (A) | 1 | .21 | 1.38 |
| AxB | 2 | .08 | .50 |
| AxC | 1 | .02 | .14 |
| AxBxC | 2 | .31 | 2.02 |
| Error (within) | 65 | .15 | |

TABLE 3

Analysis of Variance Results for Mean Logical
Relatedness of All Responses

| Source | df | MS | F |
|-----------------------|----|------|-------|
| Between | | | |
| Diagnosis (B) | 2 | .12 | .46 |
| Rehospitalization (C) | 1 | .19 | .74 |
| BxC | 2 | 1.55 | 5.98* |
| Error (between) | 65 | .26 | |
| Within | | | |
| Time Period (A) | 1 | .98 | 7.35* |
| AxB | 2 | .04 | .27 |
| AxC | 1 | .18 | 1.37 |
| AxBxC | 2 | .24 | 1.84 |
| Error (within) | 65 | .13 | |

*p < .01

TABLE 4

Mean Logical Relatedness for all Responses of the Schizophrenic,
Schizoaffective, and Affective Disorder Groups at the
Acute and Followup Assessments

| Diagnostic Group | Acute Stage | | Followup | |
|---|-------------|-----|----------|-----|
| | M | SD | M | SD |
| All Schizophrenics (n = 24) | 2.21 | .52 | 2.37 | .43 |
| Rehospitalized Schizophrenics (n = 12) | 2.17 | .47 | 2.42 | .45 |
| Nonrehospitalized Schizophrenics (n = 12) | 2.25 | .59 | 2.31 | .42 |
| All Schizoaffectives (n = 16) | 2.13 | .59 | 2.47 | .49 |
| Rehospitalized Schizoaffectives (n = 5) | 2.64 | .28 | 2.71 | .12 |
| Nonrehospitalized Schizoaffectives (n = 11) | 1.90 | .56 | 2.35 | .55 |
| All Affectives (n = 31) | 2.29 | .42 | 2.51 | .39 |
| Rehospitalized Affectives (n = 7) | 2.17 | .45 | 2.15 | .57 |
| Nonrehospitalized Affectives (n = 24) | 2.32 | .42 | 2.62 | .24 |

patients showed less associative disturbance in the second testing. The observed decrease in associative loosening may reflect a general decline in symptom severity from inpatient to followup testing (DeWolfe, 1973).

Also significant in the analysis of associative disturbance, as gauged by all associations, was the interaction of diagnosis and rehospitalization, $F(2,65)=5.98$, $p < .01$. Table 4 indicates that associative level across both time periods has different prognostic implications for the three diagnostic groups. In the schizophrenic group, the rehospitalized and not rehospitalized subgroups had equivalent associative disturbance levels and thus, associative disturbance did not differentiate them, $t(22)=.05$, ns. In the affective disorder group, the rehospitalized subgroup showed more associative disturbance than the not rehospitalized group, $t(29)=1.94$, $p < .05$. Since all of the rehospitalized affectives were manics, this effect was primarily associated with mania. The schizoaffective group runs counter to the affective disorder group and counter to expectation, since the rehospitalized subgroup showed less associative disturbance than the subgroup of patients who were not rehospitalized, $t(14)=2.12$, $p < .05$.

Neither the traditional Bleulerian formulation of schizophrenic thought pathology nor its modification was supported by the results of the present study. Schizo-

phrenics and nonschizophrenics exhibited equivalent levels of associative loosening at the acute stage of psychopathology. When measured again one year after discharge, degree of associative loosening was significantly lower for all patients, regardless of diagnosis. Thus, even during a period of relative recovery from acute psychosis, schizophrenics could not be distinguished from other psychotic patients on the basis of persistent associative disturbance.

Among the four dependent variables, the greatest differentiation among diagnostic groups was found in the analysis of average reaction time. In this analysis, main effects for time of testing, $F(1,63)=6.34$, $p < .02$; diagnosis, $F(2,63)=4.00$, $p < .03$; and rehospitalization, $F(1,63)=3.92$, $p < .05$, were all significant (see Table 5). Group means are presented in Table 6. The main effect for diagnosis appeared to be primarily the result of the reaction times of the schizophrenic patients, who were slower to respond than either schizoaffective or affective disorder patients. When the Newman-Keuls method was used to further assess differences among the groups, however, none of the pairs differed significantly.

With respect to the time of testing main effect, Table 6 indicates that reaction times were significantly faster at the second testing, one year after discharge, than they had been at the initial testing on admission to

TABLE 5

Analysis of Variance Results for Mean Reaction Time

| Source | df | MS | F |
|-----------------------|----|-------|-------|
| Between | | | |
| Diagnosis (B) | 2 | 39.75 | 4.00* |
| Rehospitalization (C) | 1 | 38.93 | 3.92* |
| BxC | 2 | .20 | .02 |
| Error (between) | 63 | 9.93 | |
| Within | | | |
| Time Period (A) | 1 | 27.53 | 6.34* |
| AxB | 2 | 11.66 | 2.69 |
| AxC | 1 | 2.05 | .47 |
| AxBxC | 2 | 2.34 | .54 |
| Error (within) | 63 | 4.34 | |

* $p < .05$

TABLE 6

Mean Reaction Times (in secs.) for the Schizophrenic, Schizoaffective,
and Affective Disorder Groups at the Acute and Followup Assessments

| Diagnostic Group | Acute Stage | | Followup | |
|---|-------------|------|----------|------|
| | M | SD | M | SD |
| All Schizophrenics (n = 22) ^a | 6.72 | 4.76 | 4.63 | 1.94 |
| Rehospitalized Schizophrenics (n = 11) | 5.88 | 4.30 | 4.15 | 2.09 |
| Nonrehospitalized Schizophrenics (n = 11) | 7.55 | 5.24 | 5.11 | 1.73 |
| All Schizoaffectives (n = 16) | 4.39 | 1.65 | 3.62 | 1.41 |
| Rehospitalized Schizoaffectives (n = 5) | 3.90 | .60 | 2.72 | .40 |
| Nonrehospitalized Schizoaffectives (n = 11) | 4.62 | 1.95 | 4.03 | 1.53 |
| All Affectives (n = 31) | 4.64 | 2.69 | 4.19 | 1.90 |
| Rehospitalized Affectives (n = 7) | 3.09 | 1.27 | 3.81 | 1.38 |
| Nonrehospitalized Affectives (n = 24) | 5.09 | 2.84 | 4.30 | 2.04 |

^aMean reaction times were not computed for two subjects because of recording errors.

the hospital. This result would seem to indicate that faster reaction times indicate better functioning. On the other hand, regardless of time of testing or diagnosis, rehospitalized patients had faster reaction times than did the patients who were not rehospitalized, suggesting that faster reaction times are associated with poorer functioning. One possible explanation for these apparently contradictory findings would be that although all patients accelerate, for initially slow responders the decreased reaction times may be associated with greater cognitive control (decreased blocking and response interference), while for initially rapid responders, faster reaction times may indicate increased anxiety and impulsiveness due to decreased cognitive control. Further comparisons of rehospitalized initially slow reactors with rehospitalized initially fast reactors, with attention to possible differential effects of anxiety level, cognitive control, and interference mechanisms, may contribute to understanding of these findings.

In the analysis of number of responses as the dependent variable, the main effects of diagnosis, $F(2,65) = 6.33$, $p < .01$, and time of testing $F(1,65) = 5.03$, $p < .05$, were both significant (see Table 7). The means for these results are presented in Table 8. The average number of responses across all patients decreased from inpatient to followup testing. Application of the Newman-Keuls method

TABLE 7

Analysis of Variance Results for Mean
Number of Responses

| Source | df | MS | F |
|-----------------------|----|---------|--------|
| Between | 2 | 2532.19 | 6.33** |
| Diagnosis (B) | 1 | 364.93 | .91 |
| Rehospitalization (C) | 2 | 14.40 | .04 |
| BxC | 65 | 400.18 | |
| Error (between) | | | |
| Within | | | |
| Time Period (A) | 1 | 991.15 | 5.03* |
| AxB | 2 | 558.37 | 2.83 |
| AxC | 1 | 79.97 | .41 |
| AxBxC | 2 | 206.95 | 1.05 |
| Error (within) | 65 | 196.99 | |

* $p < .05$

** $p < .01$

TABLE 8

Mean Number of Responses for the Schizophrenic, Schizoaffective, and Affective Disorder Groups at the Acute and Followup Assessments

| Diagnostic Group | Acute Stage | | Followup | |
|---|-------------|-------|----------|-------|
| | M | SD | M | SD |
| All Schizophrenics (n = 24) | 44.33 | 19.22 | 36.25 | 10.24 |
| Rehospitalized Schizophrenics (n = 12) | 46.00 | 13.79 | 37.00 | 12.30 |
| Nonrehospitalized Schizophrenics (n = 12) | 42.67 | 24.01 | 35.50 | 8.16 |
| All Schizoaffectives (n = 16) | 39.19 | 15.44 | 39.56 | 16.34 |
| Rehospitalized Schizoaffectives (n = 5) | 37.40 | 10.55 | 48.20 | 21.48 |
| Nonrehospitalized Schizoaffectives (n = 11) | 40.00 | 17.62 | 35.64 | 12.71 |
| All Affectives (n = 31) | 58.97 | 21.83 | 46.87 | 15.10 |
| Rehospitalized Affectives (n = 7) | 62.86 | 22.06 | 48.29 | 6.29 |
| Nonrehospitalized Affectives (n = 24) | 57.83 | 22.10 | 46.46 | 16.92 |

to assess differences between pairs of diagnostic groups revealed that the affective disorder group gave more responses than either the schizophrenic or schizoaffective groups, which did not differ from each other on this measure.

The measure of associative loosening derived from all word association responses was more strongly related to the independent variables than was relatedness of the initial response alone. This finding may suggest that cognitive disturbance is assessed more sensitively by the continuous association technique than with a single association paradigm.

The fact that medication was not controlled and that some of the patients were hospitalized at followup should be kept in mind when interpreting the findings of the present study. The effect of medication on the differences found in reaction time, number of responses, and logical relatedness of all responses was examined at each time period in six 3 x 2 ANOVAs with medication status (medicated vs. nonmedicated) and diagnosis as main effects. In each analysis, neither the main effect of medication status nor the interaction of medication with diagnosis was significant. Since in no case did medication have an appreciable effect on the three crucial dependent variables, medication would not appear to be a plausible rival hypothesis

to explain the results of the present study.

The present investigation joins the ranks of studies that have indicated that thought pathology is not distinctively schizophrenic, and that affective psychotics have as much and sometimes more thought pathology than schizophrenics (Andreasen, 1979; Harrow et al., 1982). In the present investigation, associative thought disorder was more clearly associated with rehospitalization for the affective disorder group, than for either the schizophrenic or schizoaffective groups. Not only was associative disturbance not specific to schizophrenia, but it was less associated with prognosis in schizophrenia than in affective disorders. Given the greater proportion of manics in the affective disorder group, however, further research is needed to evaluate the applicability of these findings to depressed patients in particular.

When the schizoaffective group (based on RDC criteria) was compared with the affective disorder and schizophrenic groups, the results seemed to support the use of this diagnostic group as a category separate from both schizophrenia and affective disorders, as in some cases they were more like the schizophrenics and in others more like the affective disorder patients. Of the three dependent variable measures in which significant effects involving groups were found, the schizoaffective group was more like the schizo-

phrenic group in number of responses given to the stimulus words and in the relationship of associative disturbance to rehospitalization. The schizoaffective group was more similar to the affective disorder group in average reaction time. When rates of rehospitalization were compared, the rates of 50% for schizophrenics, 31% for schizoaffective patients, and 23% for affective disorders showed a trend, $\chi^2 (2)=4.67$, $p < .10$, for the relationship of diagnosis to rehospitalization. In this case, the schizoaffective group was closer to the affective disorders than to the schizophrenics. Thus, of the four measures that were significant or neared significance in differentiation of the three groups, in half of them the schizoaffective patients more closely resembled the affective disorders, while in the other half they were more like the schizophrenic patients.

The findings presented here need further investigation using other measures of thought pathology. Additional research also seems strongly indicated on a) the factors associated with rehospitalization, particularly for schizophrenic and schizoaffective patients, and b) the suggested interaction of levels of anxiety or arousal with impulsivity due to decreased cognitive control as influences on rate of response in word association.

REFERENCE NOTES

1. Illinois State Psychiatric Institute, Laboratory of Biological Psychiatry. Social and psychiatric history schedule. Unpublished manuscript, 1977.

REFERENCES

- Andreasen, N.C. Thought, language, and communication disorders: I. Clinical assessment, definition of terms, and evaluation of their reliability. Archives of General Psychiatry, 1979, 36, 1315-1321. (a)
- Andreasen, N.C. Thought, language, and communication disorders: II. Diagnostic significance. Archives of General Psychiatry, 1979, 36, 1325-1331. (b)
- Bleuler, E. [Dementia praecox or the group schizophrenias] (J. Zenkin, trans.). New York: International Universities Press, 1950. (Originally published, 1911.)
- Cohen, J. A coefficient of agreement for nominal scales. Educational and Psychological Measurement, 1960, 20, 37-46.
- DeWolfe, A.S. A word association measure of severity of current symptoms in schizophrenia. Journal of Clinical Psychology, 1973, 29(1), 11-14.
- Harrow, M., Grossman, L.S., Silverstein, M.L., & Meltzer, H.Y. Thought pathology in manic and schizophrenic patients: At hospital admission and seven weeks later. Archives of General Psychiatry, 1982, 39, 665-671.
- Harrow, M., Harkavy, K., Bromet, E., & Tucker, G.J. A longitudinal study of schizophrenic thinking. Archives of General Psychiatry, 1973, 28, 179-182.
- Harrow, M., & Quinlan, D. Is disordered thinking unique to schizophrenia? Archives of General Psychiatry, 1977, 34, 15-21.
- Harrow, M., Tucker, G.J., Himmelhoch, J., & Putnam, N. Schizophrenic "thought disorders" after the acute phase. American Journal of Psychiatry, 1972, 128, 824-829.
- Moran, L.J. Vocabulary knowledge and usage among normal and schizophrenic subjects. Psychological Monographs, 1953, 67, (20, Whole No. 370).
- Siegel, A., Harrow, M., Reilly, F.E., & Tucker, G.J. Loose associations and disordered speech patterns in chronic schizophrenia. Journal of Nervous and Mental Disease, 1976, 162(2), 105-112.

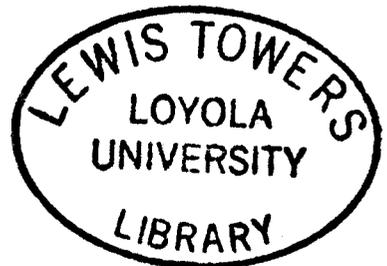
Silverstein, M.L., & Harrow, M. Goal-directed thinking in schizophrenics' associations. Journal of Personality Assessment, in press.

Spitzer, R.L., Endicott, J., & Robins, E. Research diagnostic criteria (RDC) for a selected group of functional disorders (2nd ed.). New York: Biometrics Research, New York State Psychiatric Institute, 1978.

Thorndike, E.L., & Lorge, I. The teacher's handbook of 30,000 words. New York: Bureau of Publications, Teachers College, Columbia University, 1944.

Wing, J.K., Cooper, J.E., & Sartorius, N. The measurement of classification of psychiatric symptoms. Cambridge: Cambridge University Press, 1974.

APPENDIX A



Moran Scale Instructions

| <u>Score</u> | <u>Description</u> |
|--------------|---|
| 4 | synonym, antonym, or common opposite |
| 3 | category, example, function, or attribute |
| 2 | sentence completion, word extension, and other loose relationships, past tense (if not functional relationship) |
| 1 | a single, apparently unrelated word |
| 0 | multiword, repetition, blank |

Other scoring guidelines:

Consider multi-word proper nouns as single words. When a response seems to fall "on the border" between two scores, give the lower score.

APPROVAL SHEET

The thesis submitted by Francine R. Rattenbury has been read and approved by the following committee:

Dr. Alan S. DeWolfe, Director
Professor, Psychology, Loyola

Dr. James E. Johnson
Associate Professor, Psychology, Loyola

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

Date

3/8/83

Director's Signature

Alan S. DeWolfe