PSYCHOMOTOR AGITATION AND RETARDATION IN DEPRESSED PATIENTS

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Psychomotor Agitation and Retardation in Depressed Patients.

by

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ABSTRACT

This study was designed to find differences between Agitated and Retarded depressed patients on objective and subjective tests of psychomotor performance. It was also designed to note patterns of psychomotor performance in depressed patients so as to enable cross-study comparisons with established patterns for schizophrenic patients and normal subjects.

The twenty-four subjects consisted of patients from the Waterford Hospital and from St. Clare's Hospital who had recently been admitted with a diagnosis of depression. All were rated on an Agitation and Retardation Scale by clinical clerks or by a psychologist and were then tested on a Subjective Index of Psychomotor Retardation, on Tapping Speed, Purdue Pegboard and on Reaction Time. For the latter tests, Preparatory Intervals and Sound Intensity were varied under Irregular and Regular conditions.

Agitation and Retardation scores were found to be positively correlated. This finding was discussed in terms of a possible relationship between the two syndromes in depressed patients and/or of a possible lack of rater experience. A Discrimination Function Analysis was applied to the items on both scales and two of the items were shown to be predictive of Agitation and of Retardation scores. When subjects were divided on the basis of these items, however, no significant difference was found between them on objective or subjective tests.

Age was shown to be an important variable in predicting scores on the Subjective Index; when age was partialled out, Purdue Right Hand - Left Hand - Both Hands (RLP) score proved to be the only objective test which had significant predictive value.

Patterns of responding as a function of Preparatory Intervals under Regular and Irregular conditions were found to be similar to those of normal subjects rather than of schizophrenic patients. This would seem to suggest different underlying causes for psychomotor impairment in depressed patients than in schizophrenic patients.

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CHAPTER I

Statement of Problem

The classification of depressive illness is by no means a settled issue. Despite the standard psychiatric classification system, many clinicians and diagnosticians continue to use subcategories based on their own approach to diagnosis, be it phenomenological, etiological, or treatment-outcome oriented (Mowbray, 1972a). The following are examples of the many dichotomous categories in question: endogenous/reactive; typical/atypical; autonomous/reactive; agitated/retarded (Mendels, 1970). This study is concerned with the last dichotomous category.

Psychomotor retardation in depression is described by Mendels as involving:

> "...an apparent inhibition or slowing down of all bodily movements and thinking and a reduction in spontaneous movements and expressive gestures... Spontaneous speech is reduced... little attempt to initiate conversation... answers are sparse... patient becomes mute and almost stuporous and may resemble catatonic schizophrenic."

Agitation, on the other hand, involves:

> "...an extreme restlessness, both physical and psychological...patient paces the floor...sits down, stands up, pulls at her clothes, her hair, wrings her hands, bites her lips... constantly appealing for help and reassurance... frequent in involutional depression" (Mendels, 1970, pp. 9-10).

Phenomenologically, therefore, the two would appear quite different. However, objective evidence is required to support the separation of certain depressed

patients into the mutually exclusive categories of "agitated" vs "retarded". Hamilton and White (1959) factor analyzed psychiatric ratings of depressed patients and found a bipolar factor of agitation and retardation. The former correlated with anxiety (somatic and psychic) and the latter correlated with depressed mood, guilt and suicidal thoughts; these two groups of factors intercorrelated negatively. Hamilton (1960, 1967) in devising his scale for depression again found evidence for separate factors of agitation and retardation. Grinker, Miller, Sabshin, Nunn and Nunnally (1961) in their study of depressives obtained fifteen factors, two of which were retardation and "free anxiety". They found no evidence, however, for the mutual exclusiveness of any of these factors. Friedman, Corwitz, Cohen and Granick (1963), confirmed these findings. Kiloh and Garside (1963) factor analyzed ratings made on depressives and arrived at a bipolar factor of endogenous vs neurotic depression, while Costello and Smith (1963) and McConaghy, Jaffe and Murphy (1967) failed to obtain any bipolar factor at all. Mowbray (1972c) factor analyzed psychiatric ratings of a large group of depressed patients of varying degrees of illness, using the Hamilton Scale, and failed to arrive at any bipolarity between agitation and retardation.

One important variable which may contribute to such contradictory findings is the type of data which has gone into these factor analytic studies. The data have been composed of psychiatric observations and subjective patient

reports - both of which often lack reliability (Zubin, 1967).

A substantial number of studies have investigated psychomotor retardation in depression, and a brief review of the findings and methodology follows.

Psychomotor Retardation in Depressives

Several studies have reported that depressives show more psychomotor retardation than normals. Beck, Feshback and Legg (1962) tested a group of depressed patients using the Digit Symbol test and found their subjects greatly impaired in their performance. Friedman (1964) compared a sample of depressed patients and normals on several measures and found the depressed group significantly slower on Reaction Time and on the Digit Symbol test. Hall and Stride (1954) found a group of depressives over forty years of age to be significantly slower on Reaction Time tests than a comparable group of normals. Seligman (1975), upon reviewing the literature concludes:

> "When depressives are tested in a variety of psychomotor tasks, such as reaction time, they prove to be slower than normals - chronic schizophrenics are the only other patients who are as slow as depressives" (Seligman, 1975, p. 83).

In trying to ascertain whether psychomotor retardation was specific to depressives only, Colbert and Harrow (1968) tested a group of depressives and a group of schizophrenics. They found no significant difference between both groups in their performance on objective tests of Reaction Time. Psychiatric ratings also failed to differen-

tiate between the two groups, although on a Subjective Index (SI), depressives reported feeling slowed down significantly more so than schizophrenics. One major weakness in their study, however, was that items on the SI were to be answered in terms of the patients' feelings one week prior to hospitalization. This may have induced patients to exaggerate their degree of impairment. Another limitation of their study was its restriction of objective measurement to Reaction Time only. Simple auditory Reaction Time is not a representative sample of psychomotor activity. In fact, Seashore, Buxton and McCullom (1940) factor analyzed several components of fine psychomotor movement and found three major factors: speed of initiation, speed of oscillatory movements, and precision. These may be measured by tests of Reaction Time, Tapping Speed, and Finger Dexterity, respectively. Although they used only Reaction Time as a measure, Colbert and Harrow noted a relationship between severity of depression and performance on Reaction Time - a finding parallelled in several studies for various types of psychopathologies. For a review of this literature, see King (1965). An extension of the Colbert and Harrow study using a more representative sample of tests, would seem in line.

Psychomotor Performance in Schizophrenics

Although it seems that depressives suffer psychomotor impairment, little has been done to elucidate patterns of responding in depressives so as to compare them to patterns of responding in other psychotic groups or in normals.

Several investigations of this type, however, have been done on schizophrenics and a brief review of findings is in line since these findings may provide a basis for inter-study comparisons with the depressives in this study.

Schizophrenics perform at a much slower rate than normals, under various tests of fine psychomotor movement (King, 1954, 1962, 1965). Several researchers have sought to investigate the psychomotor impairment of schizophrenics by varying the testing procedures for Reaction Time along a number of dimensions. The particular variables considered here are the Preparatory Interval (PI) and Stimulus Intensity. The PI refers to the time interval between a "Ready" signal and the presentation of the stimulus to which the subject must respond. These stimuli may be auditory or visual. The PI has been varied along the dimension of Regular-Irregular and with respect to its duration. A Regular PI refers to a condition under which the PI is always of the same duration from trial to trial. An Irregular PI exists when the time interval is randomly varied over trials. Huston, Shakow and Riggs (1937) found that schizophrenics perform faster on Reaction Time tests under the Regular than the Irregular condition only for intervals of two seconds or less. As the intervals became longer, they performed better under the Irregular condition. Tizard and Venables (1956) found that schizophrenics performed better under Regular intervals only when they were of four seconds or less and Rodnick and Shakow (1940) extended this finding

to eight seconds or less. Again, as the PI lengthened, subjects in both studies performed better under the Irregular condition. Normal subjects, on the other hand, always performed better when they could predict the length of the time interval from trial to trial (i. e. under the Regular condition). Shakow (1963) interpreted these findings in terms of an attentional deficit in schizophrenics. When long PIs are presented in a Regular fashion, schizophrenics tend to let minor, task-irrelevant stimuli interfere with their performance.

In summary, then, schizophrenics perform faster on Reaction Time tests under Regular conditions when the Intervals are of relatively short duration, whereas normals always perform better under Regular conditions regardless of PI length. Also, schizophrenics significantly improve their performance under Irregular conditions as the length of PI increases.

On the dimension of Stimulus Intensity, King (1962) compared a group of schizophrenics to a group of normal subjects and found that for both groups, as Sound Intensity increased, Reaction time improved. The overall performance of schizophrenics was slower than that of normals.

Purpose of Present Study

The aim of the present study was to find some objective evidence for the diagnostic subcategories of agitation and retardation in depressed patients. It was expected that psychiatric differentiations along a continuum of agi-

tation and retardation would be indicative of differences on objective tests or on subjective reports from the patients themselves.

As an extension to this study, Reaction Time was measured as a function of varying Preparatory Intervals and Sound Intensities under both Regular and Irregular conditions. This part of the study was exploratory, in that it was meant to discern possible variations in response patterns as a function of these variables. This would perhaps offer the possibility of post-hoc speculations as to the mechanisms underlying psychomotor retardation in depressives, by inter-study comparisons with findings on schizophrenics.

CHAPTER II

METHOD

Subjects

The subjects were eighteen females and six males, ranging in age from eighteen to sixty-three years old with a mean of thirty-nine years old. They were chosen on the basis of a psychiatric diagnosis of depression. Eleven had been hospitalized at St. Clare's Hospital, the remainder at the Waterford Hospital. Arrangements were made with the nursing staff at St. Clare's psychiatric unit so that the author would be advised within a day of any new admission of a depressed patient. As a result of a strike at St. Clare's which restricted admissions, arrangements had to be made with the Psychology Department at the Waterford Hospital to continue testing there. A group of thirteen acutely depressed patients, recently admitted and not having received electro-convulsive therapy (ECT) was made available for testing. Patients from both hospitals were under various types of tranquilizers and anti-depressants when tested for this study. Table 1 presents additional demographic and clinical data on the subjects tested. Appendix H shows medications used.

Design

This study was designed to provide for comparisons between Agitated and Retarded depressed patients on objective tests of fine psychomotor movement and on subjective experience of retardation. The Hamilton scale (Hamilton, 1960)

TABLE 1

Characteristics of Depressed Group.

Variable	Number
Sex	
Female	18
Male	6
Age (Mean)	39.5 years
Marital Status	
Single	6
Married	17
Separated, widowed or divorced	1
Educational Level (mean)	Grade 7
Religion	
Roman Catholic	14
United Church	8
Anglican	2
Type of Depression	
Neurotic	17
Psychotic	7
No. of Previous Hospitalizations	
None	14
One	6
More than two	4
Current hospitalization (mean weeks)	3

was originally chosen as the basis for the psychiatric diagnosis of Agitation and Retardation. However, since this scale is lengthy and requires an experienced psychiatrist for proper administration, it became necessary to devise a questionnaire which could circumvent these difficulties. The Anxious Depression Scale and the Retardation Scale from the Psychotic Inpatient Profile (Lorr and Vestre, 1968) were used for this study.

In another part of the study, Preparatory Intervals (2, 8, 16 secs.), Regular vs Irregular presentation, and Sound Intensity (25 vs 50 dbs.)were varied and their effects noted on Reaction Time.

Measures and Apparatus

Agitation and Retardation Scale

A questionnaire pertaining to the Agitation-Retardation factor was devised by abstracting the Anxious Depression and the Retardation scales from the Psychotic Inpatient Profile (Lorr and Vestre, 1968). Items on these scales were descriptive of psychomotor agitation and retardation. The established interrater reliability for the former scale is +.86 and +.81 for the latter. The Psychotic Inpatient Profile has been validated through several investigations. Lorr and Vestre (1966) for example, have isolated the syndromes measured in the Profile in their own interview data. Various factor analytic studies have factored out the twelve syndromes measured by the Profile (Lorr and O'Connor, 1962; Lorr,

Klett and McNair, 1964; Lorr, 1966). These twelve syndromes include Excitement, Hostile Belligerence, Paranoid Projections, Anxious Depression, Retardation, Seclusiveness, Care Needed, Psychotic Disorganization, Grandiosity, Perceptual Distortions, Depressive Mood, and Disorientation. They have been shown to represent twelve independent sources of variation (Lorr and Vestre, 1969). The reliability scores obtained from several psychiatric raters from State hospitals ranged from +.74 to +.99 (Vestre & Zimmerman, 1970.) The Anxious Depression Scale and the Retardation Scale were shown to be factorially independent (Lorr and Vestre, 1969). The scale used in this study contained the seven items pertaining to Agitation and the eight to Retardation (the original item order was preserved). Each item could be scored from 0 (lowest) to 3 (highest) (See Appendix A) Lorr and Vestre (1968) provide percentile conversion tables obtained from State and University hospitals. The conversion tables are in terms of the sex of the subject and of the presence or absence of drugs in the body (see Appendix B).

Subjective Index of Psychomotor Retardation

This scale was essentially identical to the one devised by Colbert and Harrow (1968), which differentiated between their groups of schizophrenics and depressives on subjective experience of retardation. They obtained an inter-rater reliability coefficient of +.93 for their scale derived from their independent ratings of a randomly selected group of patients. In the present study, changes were made so that the items referred to the subjects' present state rather than

that one week prior to hospitalization. For example, the question "Were you feeling tired before you came here?" was changed to "Are you feeling tired a lot of the time?". In this way, biases introduced by requiring subjects to report past experiences could be avoided and the subjective reports could be better compared to the objective measures since both would be taken during the same session. There were eight items on this test, and possible scores ranged from 8 (lowest) to 56 (highest). (See Appendix C.)

Purdue Pegboard

A standard Purdue Pegboard (Tiffin and Asher, 1948) was used to obtain Right Hand and Left Hand and Both Hands (RLB) and Assembly Task Scores (A). These are standardized measures of manual speed and dexterity. The Assembly Task requires the co-ordination of both hands in the assembling of pins, collars and cylinders within a specified time limit.

Tapping Speed

This apparatus was especially built for the study and consisted of a 30.5 cm. x 20 cm. metal plate covered by a perforated 20 cm. x 11 cm. board which had microswitches mounted beneath each end. The microswitches were connected to a mechanical counter which recorded the number of taps made by the subjects within five second intervals. The reaction timer (described below) was used as the timing device.

Reaction Time Apparatus

Binary coded paper tapes ran through a paper tape

reader taken from teletype 33TZ, and placed on a specifically designed logic unit. These paper tapes were programmed to regulate PI, sound Intensity and intertrial intervals automatically.

A pilot red light served as a warning signal and preceded a tone which came from a 3-inch speaker. The speaker was parallel to headphone jacks for 8 ohm mono headphones. The 25 and/or 50 dbs. tones were produced by a 1,000 cycle oscillator which gave sinusidal waves.

A telegraph key stopped the timer when released and triggered the next trial, since it was connected to the paper tape reader.

The reaction timer consisted of a Hunter 1520 series Digital clock counter/timer which measured and displayed RT in milliseconds.

An off/on control box regulated the onset of the paper tape program. One programmed tape was constructed for the Irregular PI intervals, and six different programmed tapes for the Regular PI intervals, to ensure that all possible combination orders of PIs were used on the subjects.

Procedure

Within two days of admission, each subject at St. Clare's Hospital was interviewed by a clinical clerk and was rated on both the Agitation and Retardation scales. At the Waterford Hospital, this scale was administered by a member of the Psychology Department who had been associated with the hospital for approximately two years.

Within a day following ratings on the Agitation and Retardation scales, the patients answered the Subjective Index. (See Appendix C for instructions to the subjects).

Upon completion of the Subjective Index of Psychomotor Retardation, the subject was seated with his elbow resting on a table. The following instructions were given: "For this test, I want you to look at the red light in front of you and to press on the telegraph key with the index finger of your preferred hand as soon as the light is turned on. The red light is a signal that a tone will soon be heard. You are to release the key as fast as possible upon hearing the tone. The interval between the light and the tone may vary and the tone may be either high or low. I will be recording your Reaction Time." Cushioned earphones were placed over his ears and the subject was then given fifteen practice trials before testing began.

Preparatory Intervals varied between 2, 8 and 16 seconds while sound Intensity varied between 25 and 50 decibels. Ten trials under each of the six combinations were presented under a Regular and an Irregular sequence. The order of presentation of the various PIs was randomized under both the Irregular and the Regular procedures. Sound Intensity was also randomized under both conditions (See Appendix F and G). Each trial was preceded by a five second rest interval. Every fifteen trials under the Irregular and every twenty trials under the Regular conditions were followed by a fifteen second rest period. This test lasted approximately forty-five minutes and

was followed by a five minute rest period.

The following instructions were given for the tapping speed task: "For this test, I want you to rest your elbow on the table, and again with the index finger of your preferred hand, to tap alternately on both sides of the perforated board. You must tap as quickly as you can, beginning when I say 'start' and ending when I say 'stop'.". The subject was then given five practice trials, followed by ten testing trials. A counter automatically recorded the number of taps made within five second intervals, manually regulated on the reaction timer.

The Purdue Pegboard was administered in four parts: (1) Right Hand Test: The subject was told: "For the first part of this test you are to pick up pins from the container on the right with your right hand and insert them into these holes along the right column of the pegboard starting at the top. You must handle only one pin at a time. Try to insert as many pins as possible within thirty seconds. You will begin when I say 'start' and end when I stay 'stop'". The subject was then allowed a few practice trials to ensure comprehension of the task. His score consisted of the number of pins inserted within a thirty second interval. (2) Left Hand Test: The procedure here was identical to the Right Hand Test, except that the subject was required to pick up pins from the left container with his left hand and to insert them into the left column of the holes. Procedures were reversed for left-handed subjects. (3) Both Hands Test: The subject

was required to perform both Right Hand and Left Hand Tests simultaneously. (4) Assembly Task: This task required more co-ordination than the previous three. The subject was instructed as follows: "For this test it is important that you work with both hands at the same time. You are to pick up a pin with your right hand from the right container and insert it into the first hole of the right column while you pick up a collar with your left hand from the adjacent container. While placing the collar over the pin, pick up a cylinder with your right hand and insert it over the collar. While doing this pick up another collar with your left hand and place it over the cylinder. This routine will complete one Assembly. You are to start the next Assembly task while completing the previous one. You may have as many practice trials as needed to master the task". When the subject indicated that he understood the task, the test trial was initiated with the signal "Ready". The score was the number of pins, collars and cylinders assembled in sixty seconds.

CHAPTER III

RESULTS

It was expected that the psychomotorly retarded subjects would be slower in their scores on the Reaction Time, Tapping Speed, and Purdue Pegboard tests than the agitated subjects. They were also expected to score higher on the Subjective Index of Psychomotor Retardation than the agitated subjects. The Agitation and Retardation Scales were expected to be either unrelated or related in a negative fashion. It was also expected that high Subjective Index scores would be related to slower Reaction Time, Purdue Pegboard and Tapping Speed scores.

Evidence for Agitation - Retardation Distinction.

Scores on the Agitation and Retardation scales were found to be highly correlated ($r = +.80$, see Fig. 1). This would indicate that contrary to expectations the two factors were neither independent nor mutually exclusive. However, an attempt was made to find subsets of items within each scale that may have been discriminatory. Subjects were assigned to either the Agitation or Retardation group on the basis of a higher percentile equivalent on one scale than on the other. This assignment resulted in a group of eleven "agitated" and a group of thirteen "retarded" subjects (See Appendix D). The mean ages for these groups were 32 and 51 years, respectively. A Discriminant Function Analysis was then done. As shown in Table 2, only items four ("Looks worried and nervous") from

the Agitation scale and ten ("Face shows no expression or sign of feeling") from the Retardation scale discriminated significantly between the groups. These items would seem to be related to Mendels' (1970) description of the agitated depressives as being expressive of their feelings and of retarded depressives as characterized by an inhibition of expression.

Having established that the subjects could be divided into two distinct groups on the basis of items four and ten, it was predicted that differences would exist between these groups on the variables of Reaction Time, Tapping Speed, and Purdue Assembly and RLB. A second Discriminant Function Analysis was done to find which of these dependent variables discriminated between the groups. The variable of age was entered into the Analysis, since it has been shown to be related to psychomotor performance (King, 1961). As shown in Table 3, age was the only factor which discriminated significantly between the two groups. The groups did not differ significantly on any of the other variables.

Relationship between Subjective Index and Objective Tests.

It was expected that differences in scores on a Subjective Index of Psychomotor Retardation would be associated with differences on the objective tests used. A Multiple Regression Analysis was done to assess the predictive value of each of these objective tests on Subjective Index scores. Age was included in the analysis. As shown in Table 4, the total predictive value for the combination of all the variables was significant ($F = 3.369$, $p < .05$). A closer look at

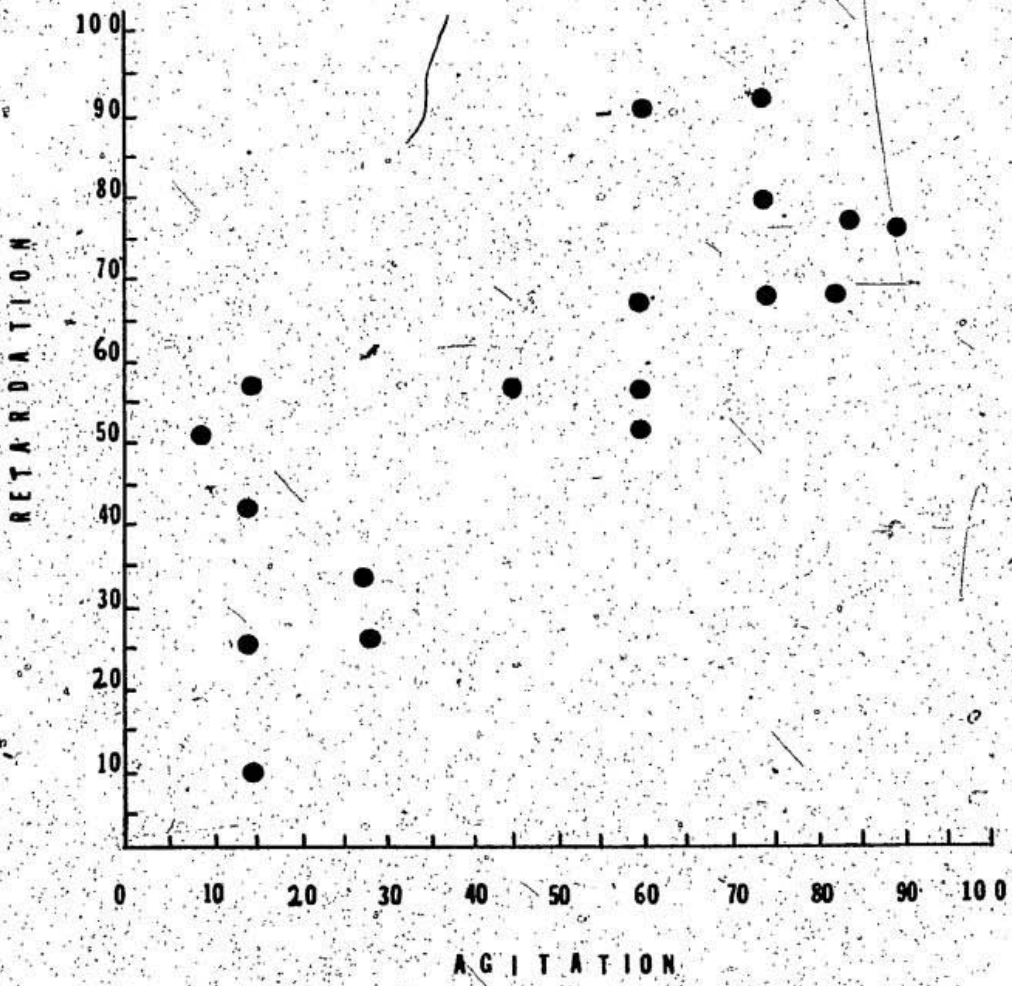

Fig. 1. Relationship between the Retardation and Agitation Scales (r = +.80).

TABLE 2

Discriminant Function Analysis on the 15 Items of the Agitation and Retardation Scale.

Step in Analysis	Scale Item	F Value
1	01	3.746
2	04	8.788**
3	14	3.165
4	10	4.523*
5	13	2.396
6	03	1.408
7	02	3.829
8	11	2.055
9	08	2.634
10	07	0.621
11	05	0.764
12	06	0.336
13	12	0.082
14	09	0.228
15	15	0.071

*p<.05
**p<.01

TABLE 3

Discriminant function Analysis of Age and of the Test Scores on Retardation and Agitation Ratings

Step in Analysis	Variable Entered	F Value
1	Age	11.706**
2	RT, Regular	0.703
3	RT, High Intensity Sound	1.603
4	Purdue Assembly	.884
5	Tapping Speed	.845
6	Purdue RLB	.182
7	Subjective Index	.022
8	RT, Irregular	.002
9	RT, Low Intensity Sound	.001

TABLE 4

Multiple Regression Analysis of Test Scores and Age on Subjective Index Scores.

Variable	F Values for dfs 1, 15	Simple R
Tapping Speed	3.969	-.219
RLB	4.810*	-.491*
Assembly	0.182	-.464*
Age	6.731*	.493*
RT-Low Sound	1.040	.282
RT-High Sound	1.072	.331
RT-Regular Condition	1.049	.308
RT-Irregular Condition	1.047	.284
Total (dfs. 8, 15)	3.369*	

* $p < .05$

* $p < .01$

the individual factors, however, revealed that Purdue RLB ($F=4.81, p < .05$) and Age ($F=6.731, p<.05$) were the only significant predictors of Subjective Index scores. The Simple R shows that the lower the scores were on the Purdue RLB task, the higher were the Subjective Index scores ($r=-.49$, $p<.05$). The same pattern existed for Purdue Assembly scores ($r=-.46$, $p<.05$), although the F ratio for Assembly scores was not significant. Finally, the older the subject was, the higher was his score on the Subjective Index ($r=+.49, p<.05$). In other words, patients rating themselves high on Retardation tended to be older and slower on the Purdue tasks than other patients.

Subjective Index and Psychiatric Ratings

It was expected that high scores on the Subjective Index would be related to high scores of Retardation on the psychiatric rating scale, and that low scores on the Subjective Index would be related to high scores of Agitation on the psychiatric rating scale.

Subjects were grouped on the basis of their score on the Subjective Index, using the median as the cut-off point (see Appendix E). This resulted in twelve Low-Subjective Index subjects and twelve High-Subjective Index subjects. Scores on this scale indicate the extent to which subjects feel slowed down since the onset of their depression. The higher the score, the more slowed down they feel. The above median Subjective Index group was not differentiated from the below median Subjective Index group on mean Psychiatric ratings of Retardation ($t=0.404$) or of Agitation ($t=.155$, see Table 5). Neither was

there a difference in mean Subjective Index scores between the groups formed on the basis of having relatively higher Agitation or Retardation Psychiatric Ratings, (t=1.135, see Table 6).

Commonality of Measures

Correlations were computed for all pairs of the 24 measures on the depressed patients. This was done with the purpose of delineating the relationship between the various tests used, and of indicating the existence of "representative" tests that correlated highly with several others. Such tests could possibly be used in future research of this type as representative of psychomotor performance. Since 16 of these 24 measures were subsets of Reaction Time performance, and since they were all shown to correlate highly with each other and with mean RT, their inclusion would have been redundant, and so they were deleted from the correlational matrix. The mean RT Score was used. Table 7 shows the intercorrelations between the remaining variables.

The Retardation and Agitation Scales correlated highly with each other ($r = +.80$, $p < .01$). Reaction Time did not correlate significantly with either of the Purdue Peg-board tests, but did correlate significantly with Tapping Speed ($r=.41$, $p < .05$). The latter test also correlated with both RLB ($r=+.55$, $p < .01$) and with Assembly ($r=+.49$, $p < .01$) of the Purdue Pegboard. Tapping Speed, then, correlated well with all objective tasks.

TABLE 5

Means of Psychiatric Ratings (Retardation and Agitation) for Subjects with Low and High Subjective Index Scores.

	Low-Subjective Index N=12	High-Subjective Index N=12	
Retardation	$\bar{x}$= .534	$\bar{x}$= .570	t = .404,df22
Agitation	x= .493	x= .510	t = .155,df22

*p <.05

*p <.01

TABLE 6

Means of Subjective Index Scores for Subjects Categorized as Agitated or Retarded on the Psychiatric Rating Scales of Agitation and Retardation.

	Agitation	Retardation	
	N = 11	N = 13	
Subjective Index	x = 36.3	x = 43	t = 1,135, df22

*p < .05

*p < .01

TABLE 7

Correlation Matrix for All Subjects (N = 24), Between the Main Variables in this Study

		Retardation	Agitation	RT-overall	Tapping Speed	Purdue R+L+B	Purdue-A	Subj. Index	Age
		1	2	3	4	5	6	7	8
Retardation	1	—	.80	.11	-.27	-.22	-.58	.34	.19
Agitation	2	.80**	—	.08	-.17	-.16	-.38	.17	-.13
RT-overall	3	.11	.08	—	-.41	-.36	-.26	.30	-.03
Tapping Speed	4	-.27	-.17	-.41*	—	.55	.49	-.21	-.48
Purdue R+L+B	5	-.22	-.16	-.36	.55**	—	.60	-.49	-.19
Purdue-A	6	-.58**	-.38	-.26	.49**	.60**	—	-.46	-.47
Subj. Index	7	.34	.17	.30	-.21	-.49**	-.46*	—	.49
Age	8	.19	-.13	-.03	-.48**	-.19	-.47**	.49**	—

* $p < .05$

** $p < .01$

The Subjective Index correlated significantly only with Purdue Pegboard tasks (RLB:r = -.49, $p < .01$; Assembly:r = -.46, $p < .05$). The Assembly task was the only objective test which correlated with the Retardation Scale ($r = -.58$, $p < .01$).

A Cluster Analysis (Fructer, 1954) was done on the correlation matrix in an attempt to delineate possible factors underlying the pattern of low intercorrelations. As shown in Table 8, two clusters emerged: Cluster I, consisting of Agitation, Retardation and the Assembly task, and Cluster II, consisting of the objective Speed Measures, including the Assembly Task, the Subjective Index, and Age.

Factors Affecting Reaction Time

Reaction time was measured in milliseconds. A 2x2x3 Analysis of Variance was done to determine the effects of the Regular - Irregular sequence, Length of PI, and Stimulus Intensity upon Reaction Time. (See Table 9). Reaction Time was significantly faster under the Regular condition than the Irregular condition ($F = 4.34$, $p < .05$) and under High Intensity Sounds than Low Intensity Sounds ($F = 10.85$ $p < .001$). Reaction Time was also faster as the length of the PI increased ($F = 7.30$ $p < .01$). Figures 2, 3, and 4 represent these main effects. There was a significant interaction between the Regular - Irregular conditions and the Length of PI ($F = 8.88$, $p < .01$), so that the effect on PI on RT occurs only for Irregular presentation. There was also a significant interaction between Sound Intensity

TABLE 8

B- coefficients from a Cluster Analysis of the Main Variables in this Study.

Variables*	Mean Intercorrelations in Clusters	Mean Remaining Intercorrelations	B- coefficients
1, 2.	.80	.233	3.48
1, 2, 6.	.587	.328	1.78
5, 6	.60	.384	1.56
5, 6, 4	.547	.341	1.60
4,5,6,7	.466	.328	1.42
4,5,6,7,8.	.443	.264	1.67
4,5,6,7,8,3.	.386	.233	1.66

* 1: Retardation rating 2: Agitation Rating 3: Reaction Time Average
4: Tapping Speed Scores 5: Purdue R+L+B 6: Purdue Assembly
7: Subjective Index 8: Age.

and the Regular - Irregular procedure ($F=4.47$, $p < .05$). Under High Intensity Sounds, no significant difference was shown as a function of the Regular-Irregular condition. Under Low Intensity Sounds, however, RT was faster when the PI varied in a Regular fashion. Figure 7 represents this interaction.

No significant interaction existed between Sound Intensity and length of PI (see Figure 6), nor was there any 3-way interaction between PI, Regular- Irregular conditions and Sound Intensity.

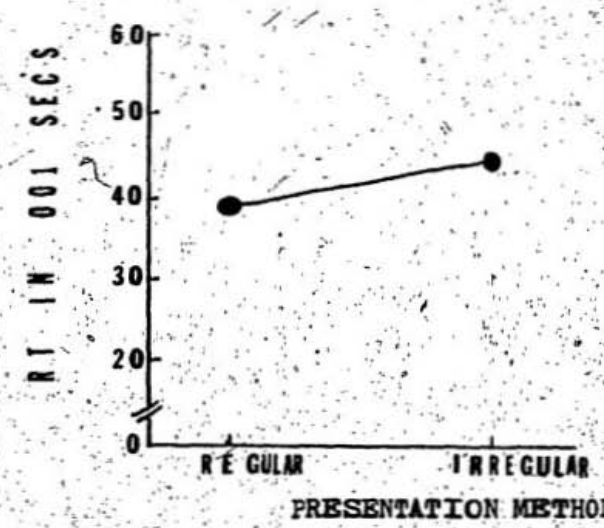

Fig. 2 The Mean RT as a Function of Regular and Irregular Conditions

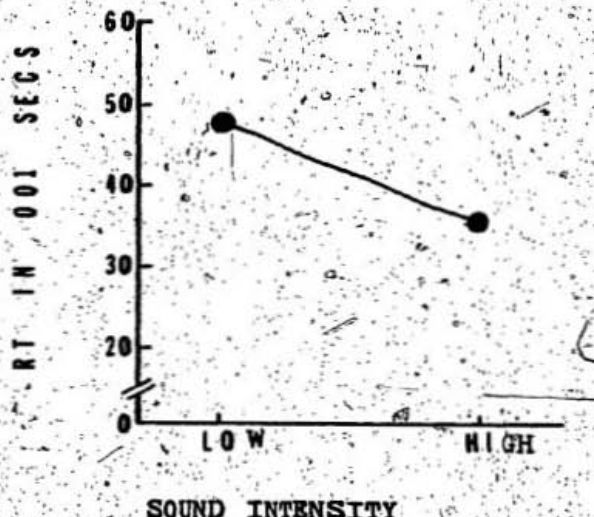

Fig. 3. The Mean RT as a Function of Low and High Sound Intensity.

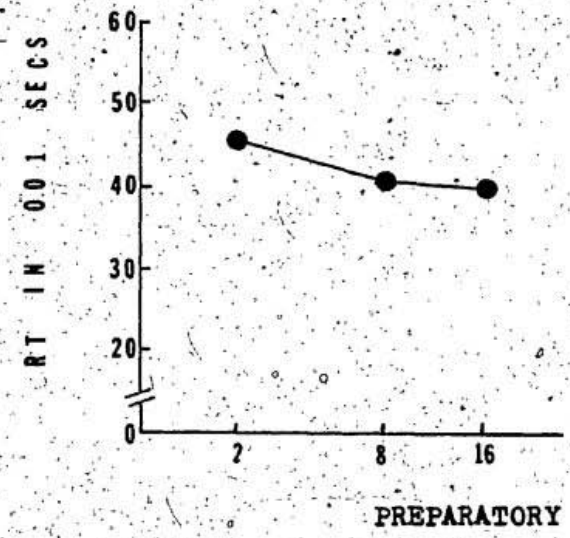

Fig. 4. The Mean RT as a Function of the Length of PI

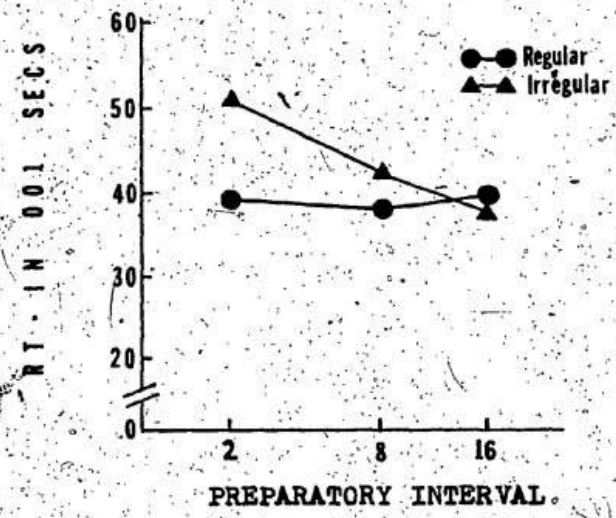

Fig. 5. The Mean RT as a Function of the Interaction between Length of PI and Regular-Irregular Conditions.

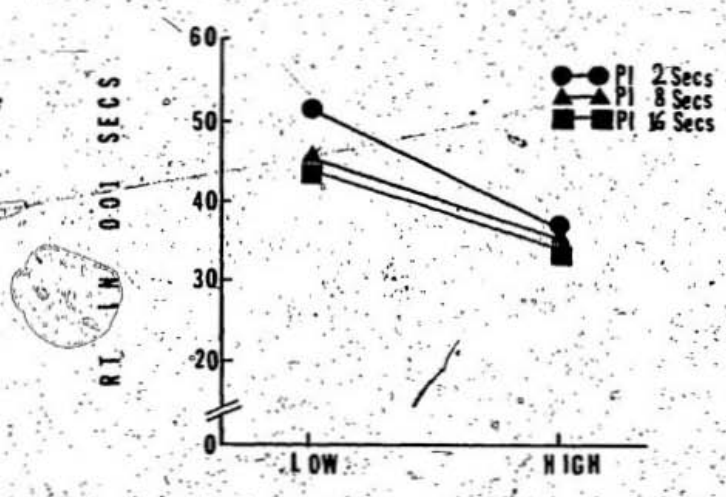

Fig. 6 The Mean RT as a Function of Length of PI and Sound Intensity.

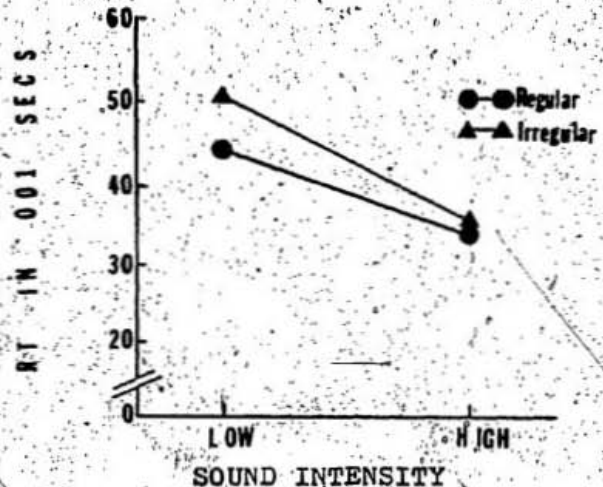

Fig. 7 The Mean RT as a Function of the Interaction between Sound Intensity and Regular-Irregular Conditions

TABLE 9

Analysis of Variance of RT as a Function of PI, Sound Intensity and Regular - Irregular Conditions.

Source of Variation.	Sum of Squares.	Degrees of Freedom	Mean Squares	F
Sound Intensity	.9215	1	.9215	10.85***
Error term	1.9530	23	.0849	
Preparatory Int.	.1761	2	.8805	7.30**
Error Term	.5545	46	.0120	
Reg. vs Irr.	.1577	1	.1577	4.34*
Error Term	.8349	23	.0363	
PI x Reg.-Irreg.	.1612	2	.8061	8.88**
Error Term	.4172	46	.0090	
Sound Int. x Reg. Irreg.	.6829	1	.6829	4.47*
Error Term	.3511	23	.0152	
PI x Sound Int.	.1535	2	.7679	.65
Error Term	.5355	46	.0116	
PI x Sound Int. x Reg. - Irreg.	.5541	2	.2770	.62
Error Term	.2054	46	.0044	
Total	49.4026	1	49.4026	60.83***
Error Term	18.6770	23	.8120	

*** $p < .001$
** $p < .01$
* $p < .05$

CHAPTER 4

Discussion

The present study was an attempt at finding evidence for differences in psychomotor performance between patients classified into Agitated Depression and Retarded Depression. The finding of a high positive correlation between the scores on the Agitation and Retardation scales, however, prevented a simple grouping of the patients into two independent groups. A discriminant Function Analysis done on the scale items, however, permitted a division based on the patients' ratings on two specific items. A second Discriminant Function Analysis showed that the only measure which accounted for differences between both groups was age.

The positive relationship found between patients' ratings on the Agitation and the Retardation scales may be an artifact of the small size of the sample used in this study. The patients studied may not have been representative of depressives in general. A review of the studies by Lorr and Vestre on large groups of various types of psychiatric patients done to validate their scale showed that the Anxious Depression and the Retardation scales were factorially independent. However, these two scales were not shown to be mutually exclusive for depressives as such. The present study may indeed be indicating that Retardation and Agitation tend to occur together in depressed patients, and that the distinction between the two is erroneous. Another factor which may

have contributed to such a high relationship between the scales was that of the raters themselves. The raters were in fact senior medical students doing a three month rotation in psychiatry. Their ratings may be inaccurate because of their lack of experience with behavioral observations. In addition the two scales were not used in the context of the full Lorr Psychotic Inpatient Profile, the lack of which may have contributed to altered rater responses. This lack of experience, however, may have prevented a bias that could lead more experienced raters to artificially create dichotomous categories.

An interesting finding was that Age, Tapping Speed, Purdue RLB, Assembly and Reaction Time measures, when analyzed with a Multiple Regression Analysis, proved to be significant predictors of scores on the Subjective Index of Psychomotor Retardation. When the effect of Age was statistically removed, however, the only objective test which significantly predicted Subjective Index scores was the RLB test of the Purdue Pegboard. This strongly suggests that Age should have been controlled for in the selection of subjects for the Agitation and Retardation subgroups. More informative comparisons between the two groups on objective measures of fine psychomotor movement may then have been possible without the confounding of this factor.

The fact that psychiatric ratings on Agitation and Retardation showed no relationship whatever to Subjective Index scores again points to the lack of a clear dichotomy between the behavioral manifestations of Retardation and Agitation. Again, the small size of the sample used and the lack of rater experience may account for this finding.

Commonality of Measures

Although the correlations between Tapping Speed and RLB, Tapping Speed and Assembly and Tapping Speed and Reaction Time were significant, the actual correlations were only moderately high (+.55, +.49 and -.41, respectively). Reaction Time and Purdue Pegboard tests did not correlate significantly. This finding is consistent with King (1957) who reports low to moderate intercorrelations between tests of fine psychomotor movement for both normal and psychotic subjects. Nevertheless, Tapping Speed was the only objective measure in this study which was closely related to all other objective measures.

Subjective Index was significantly correlated to RLB and to Assembly tasks (r=-.49; r=-.46 respectively). Again, these correlations are only moderately high; however, they may indicate that the Purdue Pegboard test is more a measure of central processes than are the other objective measures. Because more effort is required of the subject in performing Purdue Pegboard tasks, the latter may be more sensitive to motivational deficits which in turn could be related to how the subject is experiencing his condition. It will be remembered that with the Age effect removed, RLB proved to be a significant predictor of Subjective Index scores.

The Cluster Analysis revealed two main groupings: Cluster I consisting of rated Retardation, rated Agitation and the Assembly task, and Cluster II consisting of Reaction

Time, Tapping Speed, both the Purdue Pegboard measures, the Subjective Index and Age. The significance of these factors, however, may be questioned because of the low intercorrelations between the variables involved. It may be noted that the Cluster Analysis failed to show evidence for subgroups of objective measures.

These low intercorrelations may be due to the fact that each objective test of fine psychomotor performance is measuring a somewhat different aspect of psychomotor skill (King, 1957). The low intercorrelations between these tests, however, and the Subjective Index and the Psychiatric ratings are harder to account for since the lack of rater experience and the small sample size may be confounding factors.

Depressives vs. Schizophrenics

Table 1 presents a comparison between objective test scores obtained by groups tested by King (1954) and the group of depressives tested in this study. King's groups of normals and schizophrenics were both 42 years old on the average, while the group tested here had a mean age of 39.5 years. The group of schizophrenics tested by King were chronic and had been hospitalized for an average of nine years. Procedures for obtaining the three types of objective measures were similar for both studies. The comparison made here supports Seligman's (1975) contention that depressed patients are as slow as chronic schizophrenics and not King's (1965) that depressives tend to perform midway between normal subjects and schizophrenics.

TABLE 10

A Comparison of Psychomotor Performance in Depressives from the present Study and in Schizophrenics and Normals from King's 1954 Study.

	Present Study		King's Studies (1954)			
	Depressives		Schizophrenics		Normals	
	Mean	SD	Mean	SD	Mean	SD
RT (.001 secs.)	.414	.260	.449	.263	.209	.035
Tapping Speed (per 5 secs.)	17	7	13	6	25	3
Assembly (per 60 secs.)	25	6	24	8	41	6

It will be remembered that schizophrenic patients have been found to perform faster on RT tests when the Preparatory Intervals vary in a Regular fashion only when these PIs are of a short duration. As the length of the PI increases, they perform better under the Irregular conditions. Normal subjects, on the other hand, always perform better under a Regular condition. These findings have been interpreted by Shakow (1963) in terms of an inability to maintain set in schizophrenics. A look at Figures 2 to 7 suggests that the group of subjects tested here performed in a manner more similar to normal subjects than to schizophrenics. Under the Regular condition, their RT showed no increase as the length of PI increased, and although under the Irregular condition their RT became faster as PI lengthened (as for schizophrenics), this phenomenon also occurs in other psychotic groups and in normals (Court, 1964). Any interpretation of psychomotor retardation in depression in terms of an inability to maintain set may therefore be suspect.

In summary, then, this study failed to show any evidence for an Agitation/Retardation distinction for depressives. The reasons for this, however, may lie with the Scales used and/or with the raters. The Hamilton Scale, if administered properly may have provided a more adequate basis for differentiation. Finally, patterns of Reaction Time responding for the subjects in this study closely resembled patterns previously found with normal subjects. However, the actual mean performance was much slower. This may be an indication

that the factors underlying motor retardation in depressives are different from those at work in schizophrenia.

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APPENDIX A

Agitation and Retardation Scale

INSTRUCTIONS

Read each statement carefully. Consider whether the patient behaves in the manner described. Record your judgment with reference to the following scale, in the space to the right.

Scale	Note
Not at all "0"	Be sure you rate every statement. If you are not certain, record the answer which is mostly true for the patient being rated.
Occasionally "1"	
Fairly often "2"	
Nearly always "3"	

Questionnaire

1. Moves quite slowly ____
2. Shows real sadness in face and posture ___ Agitation #2,4,6,7,8,13,15
3. Whispers when he speaks ____
4. Looks worried and nervous ____
5. Acts as if moving required special effort ____
6. Weeps and wrings his hands ____
7. Looks tired and 'all worn out' ____
8. Appears frightened ____
9. Speaks in a slow, drawn out manner when answering ____
10. Face shows no expression or sign of feeling ____
11. Sits or stands motionless in one place or lies in bed ____
12. Voice is flat and monotonous ____
13. Paces back and forth ____
14. Makes no answer when questioned ____
15. Wears a puzzled expression as if figuring out a problem ____

APPENDIX B

Centile Ranks for the Agitation and Retardation Factor Scores. *

Raw Scores	Drug-Treated Males		Drug-Treated Females	
	Agitation	Retardation	Agitation	Retardation
0-1	9	11	4	9
2-3	27	33	15	25
4-5	46	51	29	41
6-7	61	66	46	56
8-9	74	78	62	68
10-11	85	86	74	76
12-13	94	92	83	83
14-15	98	94	90	90
16-17	99	97	96	94
18-19	99.6	99	98	97
20-21		99.6	99	99.2
22-23				99.7
24-25				99.9
26-27				
28-29				
30-31				
32-33				
34-35				
36-37				
38-39				

* Lorr and Vestre, 1968

APPENDIX C

Subjective Index of Psychomotor Retardation

INSTRUCTIONS

Read each statement carefully and answer each item in terms of how you are feeling now. You must answer by rating each item along a scale of one (1) to seven (7), from "definitely no" to "definitely yes". If you are unsure of the answer, give a rating of four (4).

QUESTIONNAIRE

1. Are you doing things more slowly and with more difficulty now than before you were ill?____
2. Do you feel that something is holding you back from doing as many things as you would ordinarily do?____
3. Is it difficult for you to get started in the things you are doing?____
4. Is it hard for you to make up your mind about what to do or how to do it?____
5. Is it hard for you to get interested in things going on?____
6. Is it hard for you to concentrate on things?____
7. Are you thinking more slowly and with more difficulty now than before you were ill?____
8. Are you feeling tired a lot of the time?____

APPENDIX D

Agitation and Retardation Scores and Percentile Equivalents.

Patient	Retardation		Agitation	
	Rating	Percentile	Rating	Percetile
1	10	76	14	90
2	8	68	13	83
3	5	41	3	15
4	4	51	6	61
5	3	25	3	15
6	6	66	6	61
7	9	78	9	74
8	7	56	6	46
9	8	68	12	83
10	9	78	9	74
11	3	25	5	29
12	0	9	3	15
13	6	56	8	62
14	9	68	11	74
15	7	56	8	62
16	2	25	2	15
17	15	90	9	62
18	4	51	0	9
19	2	33	3	27
20	3	25	4	29
21	12	92	9	74
22	6	56	7	46
23	11	76	12	83
24	6	56	2	15

APPENDIX E

Division of Subjects into Low and High Groups on the Basis of their Raw Score on the Subjective Index Scale, using the Median as cut-off Point.

	Subject	Raw Score on Subjective Index
Low	1	12
	2	18
	3	24
	4	26
	5	28
	6	30
	7	32
	8	36
	9	38
	10	39
	11	40
	12	40
High	13	40
	14	42
	15	44
	16	50
	17	50
	18	50
	19	50
	20	52
	21	54
	22	56
	23	56
	24	56

APPENDIX F

Sequence of trials for the RT task under the Irregular Condition. Both PI and Sound Intensity were Randomized.

Trial No.	Sound Intensity	PI	Trial No.	Sound Intensity	PI
1	Low	8	31	Low	8
2	Low	16	32	High	8
3	Low	2	33	Low	16
4	High	16	34	High	2
5	High	2	35	Low	2
6	High	8	36	High	16
7	High	16	37	Low	2
8	Low	16	38	High	8
9	Low	2	39	High	16
10	High	2	40	Low	16
11	High	8	41	Low	8
12	Low	8	42	High	2
13	High	16	43	Low	8
14	High	8	44	High	2
15	High	2	45	Low	16
16	Low	16	46	Low	2
17	Low	2	47	High	16
18	Low	8	48	High	8
19	High	16	49	Low	8
20	Low	16	50	Low	16
21	High	2	51	High	2
22	Low	8	52	Low	2
23	Low	2	53	High	8
24	High	8	54	High	16
25	Low	16	55	High	8
26	High	16	56	Low	16
27	High	2	57	Low	2
28	Low	8	58	Low	8
29	High	8	59	High	16
30	Low	2	60	High	2

APPENDIX G

Sound Intensity Randomization for RT task under the Regular Condition. The Order of PI Presentation also Varied Randomly from Subject to Subject

PI-2		PI-8		PI-16	
Trial No.	Sound Intensity	Trial No.	Sound Intensity	Trial No.	Sound Intensity
1	Low	21	High	41	Low
2	Low	22	Low	42	High
3	Low	23	High	43	Low
4	High	24	High	44	Low
5	High	25	High	45	High
6	High	26	Low	46	Low
7	High	27	Low	47	High
8	High	28	Low	48	High
9	Low	29	High	49	Low
10	Low	30	Low	50	High
11	High	31	Low	51	High
12	Low	32	High	52	Low
13	High	33	Low	53	Low
14	Low	34	High	54	High
15	Low	35	High	55	High
16	High	36	Low	56	Low
17	Low	37	High	57	Low
18	High	38	High	58	Low
19	Low	39	Low	59	High
20	High	40	Low	60	High

APPENDIX H

Medication of each patient at time of investigation

Patient	Medication
1.	Chloral Hydrate; Valium 10 mg. t.i.d.
2.	Valium 10 mg. t.i.d.
3.	Sodium Amatal 200 mg.
4.	Stelazine 2 mg.
5.	none
6.	Hydro Diuril 25 mg.
7.	Mellaril 40 mg; Elavil 100 mg.
8.	Tophronil 25 mg.
9.	Valium 5 mg t.i.d., Noludal 300 mg.
10.	Valium 10 mg. t.i.d.
11.	Tophranil 50 mg.
12.	none
13.	Valium 5 mg. t.i.d.; Elavil 25 mg.
14.	Valium 5 mg. t.i.d.; Elavil 75 mg.
15.	Serax (quantity unspecified)
16.	Elavil 75 mg.
17.	Tophranil 50 mg.
18.	Elavil 50 mg.
19.	Tophranil 50 mg.
20.	Chloral Hydrate
21.	Elavil 50 mg.
22.	Elavil 50 mg.
23	Librium 10 mg. t.i.d.
24.	Elavil 50 mg.