

A STUDY OF THOUGHT, LANGUAGE AND COMMUNICATION (T.L.C.) DISORDERS IN SCHIZOPHRENIA*

PRALAY KUMAR MAZUMDAR¹
S.K. CHATURVEDI²
P.S. GOPINATH³

SUMMARY

This study examines in detail – i) the magnitude, nature and severity of thought disorder in schizophrenia, ii) the correlations between type and severity of thought disorder with socio-demographic and clinical variables, and iii) differences between different subtypes of schizophrenia. Forty five schizophrenics (Research Diagnostic Criteria) were assessed by 'live' interview as well as tape recorded interviews. Instruments used for assessment were (a) Scale for assessment of Thought, Language and Communication (Andreasen 1978), (b) Brief Psychiatric Rating Scale (Overall & Gorham 1962), (c) Mini Mental State (Folstein 1975), and (d) Clinical and demographic data recording proforma. The Schizophrenic patients were subdivided as (i) Acute and chronic (R.D.C.), (ii) Paranoid and non-paranoid; and (iii) Negative, positive, mixed (Andreasen's criteria) and intragroup and intergroup differences were computed.

Poverty of speech, tangentiality, derailment, loss of goal, perseveration were found to be the commonest thought disorders. Positive and negative thought disorders were seen in equiproportion in both positive and negative schizophrenics. Significant differences were noted between thought disorders and education as well as habitat. Rural patients more often had negative formal thought disorders. Literates had more often clanging, neologism, circumstantiality and echolalia. This study provides ample information on the nature of thought disorder in Indian schizophrenic subjects.

Introduction

Thought disorder can be viewed as an inability to perform meaningful logical operations, an inability to conceptualize and a loss of goal directedness in its formal characteristics. Ever since the concept of thought disorder was given preeminence in Bleuler's (1911) conceptualization of schizophrenia, the study of this important symptom (or sign) has been plagued by the absence of a common ground of agreement concerning its definition or the best method of assessing it. The concept of 'Formal Thought Disorder' has also been misused and misunderstood. First, it has often been treated as if it were unitary, but in fact it is composed of a number of

different language behaviours which are conceptually divergent and not always correlated in the same patient such as 'poverty of thought' and 'loose association'. Second, it has been assumed that 'formal thought disorder' is pathognomonic of schizophrenia. Clinical experience contradicts both assumptions. Language behaviour such as associative loosening, clanging, blocking etc., occur in mania, depression and even in normal people when they are fatigued or stressed. Furthermore, some schizophrenics speak and think normally with only delusion or hallucination as schizophrenic manifestation (Andreasen 1986). Two impediments have slowed the investigation of cognitive and

1. Senior Resident, Department of Psychiatry, NIMHANS, Bangalore

2. Lecturer, Department of Psychiatry, NIMHANS, Bangalore

3. Professor, Department of Psychiatry, JIPMER, Pondicherry

* Based on paper presented at 40th Annual Conference of I.P.S. at Varanasi, 1988, and awarded the BHAGWAT AWARD

thinking disorder. The first is the tendency of many investigators to search for a single quality of thinking that would encompass all of schizophrenic thinking. The second impediment was the absence of appropriate tools for the measurement of thought disorder. Now, however, reliable scales have been constructed, and a significant progress has been made in designing increasingly precise and subtle methods as is evident in the scale for the assessment of Thought, Language and Communication (T.L.C.) (Andreasen 1978), Thought Disorder Index (T.D.I.) (Johnston and Holzman 1979) and Thought Disorder Assessment (T.D.A.) (Harrow and Marengo 1986). This study is an attempt to understand, both qualitatively and quantitatively, the various forms of thought disorder which may be collectively called as 'formal thought disorder' or 'Thought, Language and Communication' disorder in schizophrenia.

Rating of Thought Disorder

Scale for the Assessment of Thought, Language and Communication (T.L.C.) (Andreasen 1978):

The scale for the assessment of thought, language and communication (T.L.C.) was originally developed in order to clarify the then existing confusion of thought and its measurement and to provide a consistent set of definitions that could be used clinically and that would have high reliability (Andreasen 1979a, 1979b). These definitions rely on naturalistic observation of language behaviour as a way of evaluating thought disorder. The instrument contains definitions of 18 subtypes of thought disorder often described or observed in psychiatric patients. This scale contains both the definitions and instructions for rating severity of a 0 to 3 or 4 scale (depending on the item). The rating

scale for severity of each subtype has been made as specific and operational as possible: usually, judgements as to severity depend on the frequency with which a particular phenomenon has been observed. The variety of subtypes include a wide range of linguistic and cognitive behaviour, some of which are sometimes considered specific to schizophrenia such as derailment or neologism and others like circumstantiality or loss of goal may occur in a broad range of diagnostic groups. This set of definition is clinical, empirical and atheoretical and so can be used to determine the relationship between 'thought disorder' and diagnosis, like frequency of its occurrence and specificity in different diagnostic groups.

Ratings for severity, since they tend to be quantitative, are based on a standard 45 minutes interview and appropriate corrections are made if the actual evaluation interview is longer or shorter. Ratings are done by live interviews, taped interviews, transcribed interviews or a combination of any of the three. In addition to the 18 subtypes of thought disorder, the scale also contains instructions for making a global rating. The author also distinguishes between 'positive' and 'negative' thought disorder as discussed earlier. She has also divided 18 subtypes into two major groups: more pathological, (subtype 1 to 11) and less pathological (subtype 12 to 18). The global assessment of the overall severity of the T.L.C. disorder is approached in two ways. It may literally be related globally using the rating scale. An alternative method is to summate the scores on each of the T.L.C. rating. Using this method, the rating for each T.L.C. variable should be multiplied by 2 in case of more pathological variables and by 1 in case of less pathological; summing of the resulting scores would give a quantitative measure

of the severity of the T.L.C. disorder. The interrater reliability for most of the items is excellent (Andreasen 1979a).

Brief Psychiatric Rating Scale (B.P.R.S.) (Overall and Gorham 1962).

This is a scale to measure psychopathology both quantitatively and qualitatively in a psychiatric patient. The scale contains both definitions and instructions for rating severity on a 0 to 6 scale. It has four thought disorder items, viz., conceptual disorganization, grandiosity, suspiciousness and unusual thought content. It is easy to administer and has high validity and inter-rater reliability.

There are other scales which have thought disorder items among other psychopathological items as in Thought Disorder Index (T.D.I.) (Johnston and Holzman 1979), Thought Disorder Assessment (T.D.A.) (Harrow and Marengo 1986) and Comprehensive Psychopathology Rating Scale (C.P.R.S.) (Asberg et al. 1978).

Recent Studies:

Andreasen (1979b) studied T.L.C. disorders in 113 patients with the diagnosis of mania, schizophrenia and depression and reported that some thought disorders, considered important in past, occur so infrequently as of little diagnostic value such as neologism or blocking. Loosening of association is found equally in mania and schizophrenia and so cannot be considered as pathognomonic of schizophrenia. They propose the concept of positive and negative thought disorder to differentiate between mania and schizophrenia, and stresses that instead of writing simple 'thought disorder', its subtypes should be mentioned clearly for clinical practice and research.

Davis et al. (1986) assessed the reliabilities of Andreasen's thought, language and communication disorder scale in 98 psychiatric patients. Interrater reliability ranged from 0.35 to 0.80 (Weighted Kappa) on 18 subtypes and global rating. It strongly correlated with the Andreasen study (1979a). While the BPRS thought disorder scale was significantly related to the global rating of thought disorder on the T.L.C. ($r = 0.71$), only half of the variance in thought disorder measured by the T.L.C. was accounted for by the B.P.R.S. factors. Thus, this study supports Andreasen's contention that T.L.C. is a reliable scale.

Harvey et al. (1984), Berenbaum et al. (1985), Simpson et al. (1985), Davis et al. (1986) have explored the usefulness of T.L.C. They have found it to be highly reliable in a variety of different setting and have supported the distinction between positive and negative formal thought disorders. Grove and Andreasen (1985) studied 'formal thought disorder' in schizophrenics, schizo-affectives, and manics by examining syntax processing and perception of meaning using the 'embedded click' and 'memory of gist tasks', two paradigms developed by psycholinguists. They concluded that psychotic patients have no specific language perception deficit but do have a short term memory deficit. This deficit tends to remit for manics and schizo-affectives, but not for schizophrenias. However, They found poverty of speech and poverty of content (negative F.T.D.) quite high. They opine that schizophrenia and autism were best discriminated by derailment.

Sass et al. (1984) found that schizophrenics who manifested definite and severe F.T.D. had parents with much communication deviance (C.D.) in their

speech (especially the disorganised type). In contrast, male paranoid schizophrenics with constricted form of thinking had parents with low C.D. they suggest that a parental C.D. may be better understood as specifically associated with cognitive disorganization in the offspring, rather than in overall criteria of schizophrenia. Romey (1984) found F.T.D. in first degree relatives of schizophrenics. Meloy (1984) suggested that dream constriction could be a regressive marker in the heritability of schizophrenia. Lanin-Kettering and Harrow (1985) argue the traditional position that schizophrenia is a thought disorder. Chaika and Lambe (1985) counter that it is a speech disorder at the syntactic-discursive level, and not a thought disorder. On the basis of state-of-the-art research in linguistics, it is suggested that the symptoms of schizophrenia are evidence of neither a thought disorder, nor a syntactic-discursive disorder but a semiotic disorder. Semiotic structures have the form of saying something about something to someone and involves speech act, reference, pragmatics and interpretation. Therefore, it appears that schizophrenic disorder is located in this structure.

Andreasen and Grove (1986) measured thought disorder by the scale for the assessment of Thought, Language and Communication. They reported that manic patients showed disorganization, incoherence and illogicality in a context of verbal fluency, which corresponds to Andreasen's category of 'positive thought disorder'. The hebephrenic schizophrenic patients were typically disorganized, incoherent and illogical in a context of poverty of speech and content, an indication of 'negative thought disorder'. Paranoid schizophrenic patients showed similar kinds of thought disorder as hebephrenic patients, but with less poverty of content and less

incoherence. Schizo-affective patients also resembled the schizophrenics. At follow up, thought disorder in the manics tended to be significantly reduced, even to normal levels, while schizophrenics continued to show disorganized thinking. Andreasen and Grove suggested that the fluency dimension may be a critical one for distinguishing between affective psychoses and 'core schizophrenia'. They also note that while the thought disorder shown by the schizo-affective patients resembles that of the schizophrenics, at follow up it appears to normalize, suggesting the more benign course of the manics. Andreasen and Grove suggest that the different qualities of thought disorder represent 'different mechanism' in the different psychoses. It is clear from their data, that the thought disorder of schizophrenic patients appears not only as impoverishment of content of speech, but as incoherence and illogicality, which suggest that the negative-positive dichotomy does not capture the richer yield of Andreasen's scale.

Harrow and Marengo (1986) using their thought disorder assessment techniques, reported a longitudinal examination of thought disorders in schizophrenic, psychotic nonschizophrenic and nonpsychotic patients. They observed that most of the thought disorder occurred in the schizophrenic and manic groups. The schizophrenic patients, however, generally showed the most severe kinds of thought disorder, a finding also reported by Holzman et al. (1986). Interestingly, at followup 1/2 - 2 years after discharge and again 2 years after the first followup it was the schizophrenic patients who typically showed persistent or episodic thought disorder. The appearance of very severe thought disorder during hospitalization was associated with significantly poorer general functioning outside the hospital.

Although thought disorder was measurably present in all psychotic groups, it appeared to be a 'key-symptom' in the schizophrenic patients.

Spohn et al. (1977) report the effects of neuroleptic treatment on the thought disorder of 100 chronic schizophrenic patients, all of whom showed a therapeutic response to drug therapy. Using the Thought Disorder Index as the measuring instrument, they found that compared to bipolar patients and normal controls, the schizophrenic and schizo-affective patients showed significantly more thought disorder, a finding consistent with those of Andreasen and Grove (1986) and Holzman et al. (1986). The total thought disorder of schizo-affective patients is similar to that of schizophrenic patients, and both groups resemble 'Bleulerian thought disorder'. In general, thought disorder in chronic schizophrenia is not reduced to normal levels by drugs, although, the most severe levels of thought disorders are affected.

The credit for the most important contribution in the field of inter relatedness of language and thought goes to Benjamin Lee Whorf (1950). Whorf (1961) hypothesised that language and thought go together, that language limits (and facilitates) particular concepts and perpetuates a particular world view. Brown and Lenneberg (1954) share the same view. Varma (1982) stresses that language is the vehicle through which the schizophrenic thought is expressed. He proposed the hypothesis that linguistic competence importantly determines the phenomenology of schizophrenia and that greater linguistic competence is responsible for systematization and elaboration of delusion making them more entrenched and less amenable to

therapeutic change thus giving rise to a poorer prognosis. Varma et al. (1985) opine that 'although the contribution of language to thinking process is immense, the same language which permits logical and realistic deductions can cause, if some basic disturbance exists in the brain processes, a derailment of thinking which can create a vicious cycle to produce and perpetuate psychopathology'. The paranoids show paranoid feature because of their high linguistic competence, as they compensate for their high anxiety (psychotic) by explaining the anxiety on the basis of paranoid ideation. Although this reduces the anxiety high linguistic competence takes over for sustenance and further systematization of the delusions'. The other schizophrenics show catatonic features and somatic symptoms because of low linguistic competence which does not permit to elaborate the psychotic anxiety into delusional symptoms. The syntactic processes are intact in schizophrenia, the language is deviant purely on semantic point of view. The language dysfunction in schizophrenia is more of a cognitive sort rather than linguistic (Clemmen 1980). Chomsky (1965) also held the same view point. In schizophrenia, the linguistic competence is not impaired (Koplin 1968). Varma et al. (1985) further suggest that the chronic schizophrenics have low linguistic competence which does not allow them to develop a 'delusional solution' to their anxiety or crystallization of a specific psychopathology. So they have a mixed symptomatic presentation of somatic symptom, catatonic symptom, perplexity and have a better prognosis. Thus the linguistic competence importantly determines the manifestation and outcome of schizophrenia within and across the different linguistic groups (Varma et al. 1985).

Aims and Objectives

1. The aim of the present study was to determine the magnitude, nature and severity of thought pathology in schizophrenia.
2. To examine the differences in nature and severity of thought disorder in acute and chronic schizophrenics.
3. To study the correlation between type and severity of thought pathology with demographic and clinical variables.

Material and Methods

The present study included 45 cases of schizophrenia. An attempt was made to have equitable representation of acute and chronic types of schizophrenia in the study. Patients with informants from Psychiatry Out-patient Department and in-patient of NIMHANS, Bangalore, were included for this purpose. The initial pool of patients were screened and those fulfilling the Research Diagnostic Criteria (RDC) (Spitzer et al. 1978) for acute and chronic schizophrenia were included in the study. Only the definite cases were included in the study.

Inclusion Criteria

1. Diagnosis of schizophrenia by Research Diagnostic Criteria (Spitzer et al. 1978).
2. Age 18-45 years.
3. Sex: Both sex.
4. Duration of illness:
 - i) Less than 3 months for acute Schizophrenia,
 - ii) Two years or more for chronic schizophrenia.

Exclusion Criteria

1. Epilepsy
2. Organic brain disorder of any type
3. Systemic physical diseases

4. Mental Retardation
5. Alcohol and drug addiction
6. Patients who cannot be maintained drug free during the period of research.

Methods of Assessment

Demographic and Clinical Data

A semi-structured proforma to collect the data systematically was used. The following details about demographic variables were recorded: name, age, sex, marital status, religion, date of first contact, educational status, socio-economic status, occupation, background: rural/urban, number of sibs, perinatal complication and milestones of development.

The following clinical details were recorded: age of onset, type of onset, precipitating factor, duration of illness, presenting complaints, family history of psychiatric illness, past history of psychiatric illness, previous hospitalization and course of illness: continuous/episodic.

The mental state was assessed by Brief Psychiatric Rating Scale (BPRS-Overall and Gorham 1962). It is easy to administer and has high validity and high inter-rater and test-retest reliability. The Mini Mental State (MMS) was used for assessment of any cognitive impairment. The reliability and validity of this scale has been demonstrated (Folstein et al. 1975). All subjects in the study were evaluated using the scale for the assessment of thought, language and communication (TLC) (Andreasen 1978). The thought pathology was also evaluated using this Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham 1962).

Procedure:

The staff of the six adult psychiatric units were requested to send cases

fulfilling the specific inclusion and exclusion criteria. After preliminary screening, if the patient and/or patients party were willing for further examination and investigation, an informed consent was taken. Most of the patients were selected from the walk-in-clinic, regular outpatient department and followup clinic and were admitted for the purpose of research. Unmedicated patients were examined immediately, but patients already on medication were made drug free (2 weeks for those on oral medication and 4 weeks for those on depot preparation) before testing current mental state, cognitive impairment and thought pathology. Rapport was established. Demographic and clinical details were recorded on the semistructured data collecting proforma. Later Mental Status Examination was done using Brief Psychiatric Rating Scale and cognition was assessed by using the Mini Mental State Scale. Thought Pathology was elicited in a 45 minute standard interview and the type of thought disorder and its severity were recorded. Both live and tape recorded interviews were rated.

Analysis of Data

The following statistical tests were employed for the analysis of the data.

1. Percentage frequency distribution of T.L.C. items.
2. Chi square test and Fisher's exact test to test the significance of difference between acute and chronic, positive and negative, paranoid and non paranoid types of schizophrenia and frequency of the T.L.C. disorder in these groups- both inter group and intra group.
3. Pearsons Product Moment Correlation and Biserial Correlation to test the correlation coefficient between

demographic variables and the T.L.C. scale.

4. Mean and standard deviation of scales and sub scale scores and students 't' test to detect the significance of difference of means of BPRS score between acute and chronic schizophrenia.

Summary of Results

1. The interrater and test-retest reliability of T.L.C. was found to be good.
2. Acute and Chronic, Positive and Negative, Paranoid and Non-paranoid groups of schizophrenics were comparable (vide table 1, 2, 3).
3. Acute Vs. Chronic Schizophrenia:
 - a) Poverty of speech was more common in acute group ($P < 0.05$)
 - b) Positive formal thought disorders were more in chronic group ($t = 2.45$)
4. Paranoid Vs. Non-paranoid group: No statistical difference.

Table 1
Diagnostic break-up of Patients into sub-types of Schizophrenia

Acute Schizophrenia		Chronic Schizophrenia		Total
n	%	n	%	
22	49	23	51	45

Table 2
Diagnostic break-up of patients into subtypes of schizophrenia

Types	Acute schizophrenia (n=22)		Chronic schizophrenia (n=23)	
	n	%	n	%
Positive schizophrenia	11	50	9	39
Negative schizophrenia	5	23	6	26
Mixed schizophrenia	6	27	8	35

$X^2 = 0.5546$. NS

Table 3
Diagnostic distribution

Type	Acute schizophrenia (n=22)		Chronic schizophrenia (n=23)		Total	
	n	%	n	%	n	%
Paranoid group	13	59.1	8	34.8	21	46.7
Non paranoid group	9	40.9	15	65.2	24	53.3
Total	22	100	23	100	45	100

$\chi^2=2.67$ N.S.

5. Positive Vs. Negative group: No Statistical difference.
6. Demographic correlation.
 - a) Negative thought disorder more common in rural population ($P < 0.05$)
 - b) Preseveration more often in Illiterate group ($P < 0.05$)
 - c) Clanging, neologism, Echolalia, circumstantiality more frequent in literate group. ($P < 0.05$)

Discussion

Reports on systematic comparative studies of thought disorder in acute and chronic schizophrenia are rare till date. Is thought disorder same in acute and chronic schizophrenia or is it different? This study has made an attempt to answer these questions. The assessment of cognitive function by Mini Mental State (Folstein et al. 1975) was essentially a double check for those patients who might have escaped the stringent exclusion criteria for organicity. Brief Psychiatric Rating Scale (B.P.R.S.) (Overall and Gorham 1962) helped both in assessment of T.L.C. disorder and in qualifying the morbidity of thought process. The scale for the assessment of Thought, Language & Communication (T.L.C.) (Andreasen 1979) is objective, precise, easy to administer and is found to have good validity and interrater reliability. It contains 18 subtypes of thought disorder

which is grouped separately under thought, language and communication and also more pathological and less pathological thought disorder. A standard 45 min. 'live' or 'tape recorded' interview is prescribed.

Both 'live' and 'tape recorded' interview were conducted in this investigation to overcome the shortcomings of any single procedure. Interrater and test-retest reliability were found good. Andreasen (1979a), Davis et al. (1986) had similar findings.

The commonest type of thought disorder were poverty of speech, tangentiality, derailment and the rarest type like clanging, neologism and stilted speech found in the study (vide table 4) is similar to findings of Andreasen (1979), Andreasen and Grove (1986).

Poverty of speech was found higher in acute schizophrenia, (table 5). This is probably because the paranoid schizophrenics were represented more in acute groups and their guarded attitude contributed to the poverty of speech. This observation is supplemented when poverty of speech is compared between paranoid and non-paranoid groups of acute schizophrenics where it was 85% and 56% respectively.

The high prevalence of positive formal thought disorder in chronic

Table 4
Frequencies of thought, language and communication abnormalities in schizophrenia

T.L.C. Items	Schizophrenia n=45	
	N	%
Poverty of speech	26	58
Poverty of content of speech	20	44
Pressure of speech	11	24
Distractible speech	11	24
Tangentiality	25	56
Derailment	25	56
Incoherence	10	22
Illogicality	4	9
Clanging	4	9
Neologisms	1	2
Word-Approximation	1	2
Circumstantiality	8	18
Loss of Goal	26	58
Perseveration	26	58
Echolalia	3	7
Blocking	3	7
Stilted speech	3	7
Self-reference	24	53

schizophrenia (table 6) is probably due to the fact that combined representation of positive and mixed groups of schizophrenics was three times (74%) in chronic schizophrenics raising the positive thought disorder score. This is further supplemented by occurrence of positive thought disorder in negative schizophrenics.

The difference of thought disorder between Paranoid and Non-paranoid group was not found to be statistically significant. Though, delusions with systematization and elaboration were found more in Paranoids, probably because of their linguistic competence (Varma 1982; Varma et al. 1985), it is not one of the T.L.C. items and hence was not included in this study.

Similarly absence of any difference between positive and negative schizophrenia in formal thought disorder probably

Table 5
A comparison of frequency and severity of T.L.C. disorders in acute and chronic schizophrenia

Items	Acute Schizophrenia (n=22) Severity			Chronic schizophrenia (n=23) Severity		
	0	1-2	3-4	0	1-2	3-4
	Poverty of speech*	6	9	7	13	7
Poverty of content of speech	15	3	4	10	5	8
Pressure of speech	18	4	0	16	4	2
Distractible speech	19	3	0	15	8	0
Tangentiality	13	8	1	7	12	4
Derailment	11	9	2	9	10	4
Incoherence	18	3	1	17	3	3
Illogicality	21	1	0	20	3	0
Clanging	20	2	0	21	2	0
Neologisms	22	0	0	22	1	0
Word-Approximation	22	0	0	22	1	0
Circumstantiality	19	3	0	18	5	0
Loss of Goal	10	10	2	9	11	3
Perseveration	10	12	0	9	13	0
Echolalia	20	2	0	22	1	0
Blocking	20	2	0	22	1	0
Stilted speech	20	2	0	22	1	0
Self-reference	9	13	0	12	10	1

Fishers Exact test was applied between the two groups for each items presence or absence.

* $P < 0.05$; others were not significant.

Table 6
Thought, language and communication (T.L.C.) scores

Positive and Negative T.L.C. Items

Items	Acute schizophrenia (n=22)	Chronic schizophrenia (n=23)	t	P
	Mean ± S.D.	Mean ± S.D.		
Positive F.T.D.	4.36 ± 5.22	9.22 ± 7.86	*2.45	P<0.05
Negative F.T.D.	4.91 ± 2.81	4.78 ± 2.32	0.16	N.S
Others	4.30 ± 2.84	3.59 ± 2.81	0.93	N.S

* Modified t test.

Thought language and communication item scores

Disorder	Acute schizophrenia (n=22)	Chronic schizophrenia (n=23)	t	P
Disorder of thought	3.36 ± 2.34	2.09 ± 2.45	0.18	N.S
Disorder of language	0.82 ± 1.59	2.22 ± 3.84	*1.61	N.S
Disorder of communication	8.27 ± 7.77	12.48 ± 7.73	1.82	N.S

* Modified t test.

reflects the absence of any clear cut positive negative dichotomy based on thought disorder. Pogue-Geile and Harrow (1986), Lazer and Harrow (1985) support this view point. Bilder and Mukherjee (1985) also support this dichotomy. It is also observed that the severity of thought disorder rather than its mere presence should be the determinant of the positive-negative dichotomy.

No definite explanation can be ascertained for the high loading of perseveration in illiterate group and negative thought disorder in rural population (table 7). However, it might be speculated that lack of education might be associated with decreased verbal sophistication resulting in the above phenomena.

Table 7
Correlation of socio-demographic variables with T.L.C. sub-types

	Global rating	T.L.C. Score	More pathological	Less pathological	Positive thought disorder	Negative thought disorder	Disorder of thought	Disorder of language	Disorder of communication
Age	-.042	.021	-.017	.004	.036	-.081	-.064	-.014	.108
Sex	-.005	.122	.169	-.048	.091	.136	-.015	-.018	.134
Education	.005	.091	.142	-.130	.185	-.075	.016	.186	.051
Marital status	-.008	.042	.092	-.111	.077	-.072	-.065	.089	.040
Religion	-.197	.058	.090	-.173	.207	-.175	.013	.142	-.040
Rural/urban	-.008	-.092	-.030	-.201	.051	*-.359	-.139	-.002	-.012
Socio-economic status	-.038	.000	.043	-.108	.124	-.178	-.038	.005	-.008

* P<0.05

Pearson Product Moment Correlation was applied for variables like Age, Education, Socio-economic status. Biserial Correlation was applied to the rest of the variables.

References

- ANDREASEN, N.C. (1979a). Thought, Language and Communication disorders: I Clinical assessment, definition of terms and evaluation of their reliability. *Archives of General Psychiatry*, 36: 1215-1321.
- ANDREASEN, N.C. (1979b). Thought, Language and Communication disorders: II Diagnostic Significance. *Archives of General Psychiatry*, 36: 1325-1330.
- ANDREASEN, N.C. & GROVE, W.M. (1986). Thought, Language and Communication in Schizophrenia: Diagnosis and Prognosis. *Schizophrenia Bulletin*, 12(3): 348-359.
- ASBERG, M., MONTGOMERY, S.A., PER-RIS, C., SCHALLING, D. & SEDVALL, G (1978). A comprehensive psychopathological rating scale. *Acta Psychiatrica Scandinavica*, Suppl. 271, 5-27.
- BERENBAUM, H., OLTAMANN, T.F. & GOT-TESMAN II (1985). Formal thought disorder in schizophrenics and their twins. *Journal of Abnormal Psychology*, 94(1): 3-16.
- BILDER, R.M., MUKHERJEE, S., RIEDER, R.D. & PANDURANGI, A.K. (1985). Symptomatic and neuropsychological components of defect states. *Schizophrenia Bulletin*, 11(3): 409-419.
- BROWN, R. & LENNEBERG, E.H. (1954). A study in Language and cognition. *Journal of Abnormal Social Psychology*, 47: 454-462.
- CHOMSKY, N. (1965). Aspects of the theory of Syntax: M.I.T. Cambridge, Mass.
- DAVIS, G.C., SIMPSON, D.M., FOSTER, D., ARISON, Z. & POST, M. (1986). Reliability of Andreasen's thought, language and communication disorder scale. *Hillside Journal of Clinical Psychiatry*, 8(1): 25-33.
- FOLSTEIN, M.F., FOLSTEIN, S.E. & McHUGH, P.R. (1975). Mini Mental State - A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12: 189-198.
- GROVE, W.M. & ANDREASEN, N.C. (1985). Language and thinking in Psychosis. Is there an input abnormality *Archives of General Psychiatry*, 42(1): 26-32.
- HARROW, M. (1985). Thought disorder: A function of schizophrenia, mania or psychosis? *Journal of Nervous and Mental Disorders*, 173(1): 35-40.
- HARROW, M., JANNE, T. & MARENGO (1986). Schizophrenic thought disorder at follow up: Its persistence and prognostic significance. *Schizophrenia Bulletin*, 12: 373-378.
- HARVEY, P.D., EARLE-BOYER, E.A. & WIEL-GUS, M.S. (1984). The consistency of thought disorder in mania and schizophrenia. An assessment of acute psychotics. *Journal of Nervous and Mental Disorders*, 172(8): 458-463.
- HOLZMAN P.S., SCHENTON & SOLOVAY (1986). Quality of thought disorder in differential diagnosis. *Schizophrenia Bulletin*, 12: 360-372.
- JOHNSTON, M.H. & HOLZMAN, P.S. (1979). Assessing Schizophrenic thinkers. San Francisco: Jossey-Bass, Publishers.
- KOPLIN, J.H. (1968). Applied psycholinguistics: Aims and current status. In: Development in applied psycholinguistic research (Eds.) Rosenberg, S. and Koplin, J.H. New York: Macmillan.
- LAZAR, B.S. & HARROW, M. (1985). Paranoid and nonparanoid schizophrenia: drive dominated thinking and thought pathology at two phases of disorder. *Journal of Clinical Psychology*, 41(2): 145-151.
- MAZUMDAR, P.K. (1987). A study of thought, language and communication disorder in schizophrenia. Thesis submitted to the department of Psychiatry, NIMHANS, Bangalore in part fulfillment of MD degree.
- MELOY, J.R. (1984). Thought organization and primary process in the parents of schizophrenics. *British Journal of Medical Psychology*, 57: 279-281.
- OVERALL, J.E. & GORHAM, D.R. (1962). the Brief Psychiatric Rating Scale. *Psychological Reports*, 10: 799-812.
- POGUE-GEILE, M.F. & HARROW, M. (1986). Negative and Positive symptoms in schizophrenia and depression: A followup. *Schizophrenia Bulletin*, 10(3): 371-387.
- ROMEY, D.M. (1984). Formal thought disorder among the first degree relatives of schizophrenics: A new look at some old data. *Journal of Clinical Psychology*, 40(1): 51-52.
- SASS, L.A., GUNDERSON, J.G., SINGER, M.T. & WYNNE, L.C. (1984) Parental communication deviance and forms of thinking in male schizophrenic offspring. *Journal of Nervous and Mental Disorders*, 172(9): 513-520.
- SIMPSON, D.M. & DAVIS, G.C. (1985). Measuring thought disorder with clinical rating scales

- in schizophrenic and nonschizophrenic patients. *Psychiatry Research*, 15(4): 313-318.
- SPOHN, H., LACOURSIERE, R., THOMPSON, K. & COYNE, L. (1977). Phenothiazine effects on psychological dysfunction in chronic schizophrenics. *Archives of General Psychiatry*, 34: 633-644.
- VARMA, V.K. (1982). Linguistic competence and psychopathology: A cross cultural model. *Indian Journal of Psychiatry*, 24(2): 107-114.
- VARMA, V.K., AGARWAL, R.K., DAS, K., JILOHA, R.C. (1985). Linguistic competence and psychopathology: Construction of a test of linguistic competence. *Indian Journal of Psychiatry*, 27(3): 183-191.
- VARMA, V.K., DAS, K., JILOHA, R.C. (1985). Correlation of linguistic competence with psychopathology. *Indian Journal of Psychiatry*, 27(3): 193-199.
- WHORF, B.L. (1950). *Four Articles of Meta-linguistics*: Foreign Service Institute, Washington.
- WHORF, B.L. (1961). *Science and Linguistics*: In (Ed.) Saporta, S. *Psycholinguistic: A book of reading*; New York: Rinehart and Winston.