

LINGUISTIC COMPETENCE IN POSITIVE AND NEGATIVE SUBTYPES OF SCHIZOPHRENIA

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Twenty patients of positive schizophrenia and 20 patients of negative schizophrenia, individually matched for age, sex, place of residence and education were studied to assess their linguistic competence and its relationship with psychopathology and subsequent course of the disorder over a follow-up period of 6 months. It was observed that positive schizophrenics had significantly higher linguistic competence than negative schizophrenics. Linguistic competence was significantly related not only to the type of symptoms (positive or negative) but also to the severity of these symptoms. High linguistic competence was an indicator of poor prognosis in positive schizophrenia whereas in negative schizophrenia it was indicative of good prognosis.

Distinction between positive and negative symptoms as proposed by Jackson (1931) was later revived in the context of schizophrenia by several workers (Fish, 1962; Strauss *et al.*, 1974; Andreasen, 1979, 1985; Angrist *et al.*, 1980; Crow, 1981; Lewine *et al.*, 1983). Because of its heuristic and theoretical appeal, it has attracted research attention particularly in relation to subtyping of schizophrenia.

Though language in schizophrenia has been the focus of many studies, linguistic competence as a variable in schizophrenia has not received much research attention. Chomsky (1965) defined linguistic "competence" as the speaker - hearer's intrinsic knowledge of his language and "performance" as the actual use of language in a given situation. Linguistic competence was seen as an innate attribute of mind, subserved by a neural substrate enabling the developing individual to "know" the grammar or rules of the language of his speech community after only minimal exposure to it. Thus, linguistic competence can be viewed as the tacit rules of a language specifying the set of senten-

ces that could occur in the language. Question can be raised that considering the impairment in the use of language suffered by schizophrenic patients, is it justifiable to study their linguistic competence and to relate it to manifest symptomatology (Koplin, 1968).

Most of the research about language in schizophrenia has been done in relation to linguistic performance rather than linguistic competence. According to Neuringer (1982), language is a superordinate, multilevel phenomenon in which constituent processes operate simultaneously, and are interdependently and constantly affecting each other. These "constituent" processes are often conceived as systems - the phonological, lexical, semantic, syntactic and pragmatic systems. Workers like Kraepelin (1919 translated in 1971), Bleuler (1911 translated in 1950), Morice and Ingram (1982) and Schwartz *et al.* (1982) had focused attention on the "lexical" system of the speech of schizophrenic patients. Some investigators (Andreasen, 1979; Katz, 1972; Gottschalk, 1978; Tucker and Rosenberg, 1975)

have concentrated on "semantic" system and found evidence for semantically deviant utterances. The "syntactic" system was Kleist (1960), Rochester *et al.* (1973), Carpenter (1976), Chaika (1974) and Morice and Ingram (1983) and it was shown that schizophrenic patients produced less complex sentences. Lastly, authors like Rochester *et al.* (1977), Rochester and Martin (1979), and Wykes and Leff (1982) found fewer cohesive ties in thought disordered schizophrenics than thought disordered manics.

From our country, Verma *et al.* (1985a) have developed a test battery to measure linguistic competence in Indian setting. In a study of linguistic competence by these authors (Verma *et al.*, 1985b), it was shown that paranoid schizophrenics scored significantly higher on linguistic competence compared to chronic schizophrenics. Acute schizophrenics did not show any consistent pattern. However, to our best knowledge comparative research data pertaining to linguistic competence as a variable in positive and negative subtypes of schizophrenia do not exist.

The present study was designed to explore the relationship of linguistic competence to this newly emerging concept of positive and negative subtypes of schizophrenia and was undertaken with the following aims:

(1) to study whether or not positive and negative subtypes of schizophrenics differed in their linguistic competence.

(2) to study the relationship between linguistic competence and the type and severity of symptoms, and

(3) to study the prognostic implication of linguistic competence.

MATERIAL AND METHOD

SAMPLE

The sample comprised of 20 positive and 20 negative schizophrenics. Patients were individually matched for age, sex, education and place of origin. The procedure adopted for sample selection was purposive.

INCLUSION AND EXCLUSION CRITERIA

A patient was included in the study on satisfying the following criteria :

1. Age between 18-50 years.
2. Satisfied Research Diagnostic Criteria (RDC) of Spitzer *et al.* (1978).
3. Satisfied Andreasen and Olsen (1982) criteria for positive or negative schizophrenia.

The following were the exclusion criteria:

1. Age below 18 or above 50 years.
2. Patients with colour blindness.
3. Patients with significant medical or psychiatric illness other than schizophrenia.
4. Those who were not co-operative for administration of the tests.

ASSESSMENTS

One of the investigators (PK) interviewed the patients and first formulated diagnosis of schizophrenia according to Research Diagnostic Criteria (RDC) of Spitzer *et al.* (1978) and then categorised them as positive or negative schizophrenic using the criteria of Andreasen and Olsen (1982).

One of the investigators (CG) assessed linguistic competence of both the diagnostic groups by using Test of Linguistic Competence of Varma *et al.* (1985a) at the time of intake only. Assessment of psychopathology was carried out by employing the Scale for the Assessment of Positive Symptoms - SAPS (Andreasen, 1984) and the Scale for the Assessment of Negative Symptoms - SANS (Andreasen, 1981) both at the initial evaluations as well as at the end of 6 months of follow-up. These ratings were done by one of us (CG).

After 6 months of follow-up patients were divided in 2 groups - improved or not improved depending on their summary scores on SAPS and SANS. A summary score of 5 on SAPS in the positive schizophrenia group at the time of follow-up evaluation denoted improvement and thus put the patient in the group designated as "improved". In the negative schizophrenia group, a summary score of 10 on SANS at the time of follow-up warranted categorisation of that patient in the group designated as "improved". It is to be stressed that outcome in positive schizophrenics was based on summary scores of SAPS alone and in the negative group it was based on summary scores of SANS alone.

Patients were also grouped into high or low linguistic scorers depending on their scores in subtests of linguistic competence. Patients who scored more than the median value of a subtest were termed as high scorers in that subtest and patients who scored less than the median value of a subtest were grouped as low scorers in that subtest.

ASSESSMENT TOOLS

(1) Tests of linguistic competence of Varma *et al.* (1985a).

(2) Scale for the Assessment of Positive Symptoms : SAPS :of Andreasen (1984).

(3) Scale for the Assessment of Negative Symptoms : SANS : of Andreasen (1981).

Both SAPS and SANS provide several types of scores. Summary score is the sum of global ratings of each symptom complex. The subscale scores for each of symptom complexes may be obtained by adding the scores on each of the individual items of a particular subscale. The sum of ratings on all individual items gives a competence score. This is done separately for SAPS and SANS.

DATA ANALYSIS

Linguistic competence of positive and negative schizophrenics was compared with each other by using paired "t" test because of "matched design". Fisher's Exact Probability Test using median as a cut off point to differentiate high and low scorers was employed to assess the relationship between outcome and linguistic competence subtest.

Significance of relationship between outcome of positive and negative schizophrenics with linguistic competence was studied by using Chi - Square test.

Correlations between linguistic competence (scores on various subtest of test of Linguistic Competence) and psychopathology (scores on SAPS and SANS) were calculated using Product Moment co-efficient of correlation.

RESULTS

The study sample consisted of 2 groups of 20 patients each of positive and negative schizophrenia. Patients were individually matched on age, sex, education and place of origin. There were 12 males and 8 females in each group and the mean age of the entire cohort was 30.15 (SD 6.15) years.

Comparison of scores on various subtests of Linguistic Competence between positive and negative schizophrenics is shown in Table 1. Positive schizophrenics had significantly higher scores on all of the subtests except subtest of Mean Length of Utterance (MLU) and Story Construction (SC).

Correlations among various subtests of linguistic competence and severity of psychopathology were separately computed for the two subtypes of schizophrenia. Table 2 depicts these correlations for positive schizophrenia. Significant positive correlations among various subtests of linguistic competence and SAPS and predominantly negative

correlations among these subtests and SANS are the two salient findings.

In negative schizophrenics, scores on various subtests of linguistic competence correlated positively with SAPS and negatively with SANS (Table 3).

After 6 months follow-up, outcome was assessment on the basis of summary scores on SAPS and SANS and 2 outcome categories were created (i) improved and (ii) not improved for each group.

As regards positive schizophrenics, 13 were considered to have improved (summary score on SAPS 5). Seven patients were categorised as not improved (Summary score on SAPS 5). On the basis of scores on the subtests of linguistic competence, the patients were divided into 2 groups as either high or low scorers. Patients scoring more than the median value for any subtest were categorised as "high" scorer for that subtest and those scoring less than the median value for any subtest were classed as "low" scorer for that subtest. Using the Fisher's Exact Probability Test, statistical significance of relationship between "high" or "low" score on subtests of linguistic competence and outcome in both the study groups was determined. These results are shown in Table 4. In both groups, scores on subtests of Linguistic competence seem to have reciprocal relationship with outcome i.e. in positive subtype group, low scores on linguistic competence is associated with good outcome and in the negative subtype, high score on linguistic competence is associated with good outcome. On some of the subtests like colour naming, mean length of

utterance and vocabulary the differences do not reach statistical significance in positive subtype of schizophrenia. Similarly, in negative schizophrenics group values on some of the subtests like Filial relations, total morphemes,

story construction and vocabulary subtests do not reach statistical significance. Three subtests i.e. household objects, picture arrangement and similarities were significant in both subtypes of schizophrenia.

Table -1: Comparison between positive and negative schizophrenics on subtests of linguistic competence (n = 20 in each group) *

subtest	mean (SD)	mean difference	SEM	t ratio	p value
Colour Naming (CN)					
Positive	13.6(3.39)	2.25	0.33	6.82	0.001
Negative	11.35(2.39)				
Filial Relations (FR)					
Positive	20.1(3.89)	6.2	0.39	15.89	0.001
Negative	13.9(2.5)				
Household Objects (HO)					
Positive	20.45(8.42)	5.0	0.88	5.65	0.001
Negative	15.45(5.78)				
TAT (MUL)					
Positive	6.06(1.3)	0.61	0.39	1.54	NS
Negative	5.45(1.28)				
Total Morphemes (MOR)					
Positive	63.25(14.7)	12.45	2.31	5.38	0.01
Negative	50.80(10.12)				
Picture Arrangement (PA)					
Positive	3.0(1.2)	0.7	0.28	2.5	0.05
Negative	2.3(0.7)				
Story Construction (SC)					
Positive	3.8(1.1)	0.7	0.87	0.8	NS
Negative	3.1(1.3)				
Temporal & Spatial Relations (TSR)					
Positive	10.2(1.44)	2.55	0.26	9.50	0.001
Negative	7.65(1.66)				
Similarities (SIM)					
Positive	20.45(3.6)	4.1	0.27	15.0	0.001
Negative	16.35(4.16)				
Vocabulary (VOCAB)					
Positive	21.05(3.42)	4.3	0.44	9.76	0.001
Negative	16.75(4.69)				

* paired t test.

Table -2 : Correlation between severity of psychopathology and linguistic competence in positive schizophrenic patients

Subtest	Product Moment Coefficient of Correlation			
	SAPS		SANS	
	summary scores	composite scores	summary scores	composite scores
Colour Naming	0.96	0.96	- 0.72	- 0.47
Filial Relations	0.97	0.96	- 0.68	- 0.48
Household Objects	0.83	0.78	- 0.47	- 0.29
Mean length of utterance	0.91	0.94	- 0.78	- 0.54
Total Morphemes	0.78	0.72	- 0.38	- 0.26
Picture Arrangement	0.86	0.85	- 0.50	- 0.32
Story Construction	0.78	0.76	- 0.60	- 0.60
Vocabulary	0.89	0.86	- 0.55	- 0.47
Temporal & Spatial Relations	0.88	0.84	- 0.58	- 0.45
Similarities	0.92	0.88	- 0.55	- 0.31

d.f. = 18. All r values > 0.44 significant at P < 0.05.

Table -3 : Correlation between severity of psychopathology and linguistic competence in negative schizophrenia patients

Subtest	Product Moment Coefficient of Correlation			
	SAPS		SANS	
	summary scores	composite scores	summary scores	composite scores
Colour Naming	0.86	0.84	- 0.96	- 0.91
Filial Relations	0.83	0.87	- 0.93	- 0.86
Household Objects	0.85	0.65	- 0.95	- 0.90
Mean length of utterance	0.86	0.85	- 0.94	- 0.87
Total Morphemes	0.72	0.72	- 0.92	- 0.94
Picture Arrangement	0.60	0.60	- 0.50	- 0.40
Story Construction	0.77	0.76	- 0.89	- 0.75
Vocabulary	0.92	0.90	- 0.97	- 0.89
Temporal & Spatial Relations	0.68	0.80	- 0.91	- 0.80
Similarities	0.81	0.81	- 0.91	- 0.88

d.f. = 18. All r values > 0.44 significant at P < 0.05.

Table -4 : Relationship between Subtests of linguistic competence and outcome *

Subtest	Positive schizophrenia			Negative Schizophrenia		
	improv- ed	not improved	signifi- cance	improv- ed	not imp- roved	signifi- cance
Colour Naming						
High scorer	5	5	NS	6	4	0.01
Low scorer	8	2		0	10	
Filial Relations						
High scorer	4	6	0.05	5	5	NS
Low scorer	9	1		1	9	
Household Objects						
High scorer	4	6	0.05	6	4	0.01
Low scorer	9	1		0	10	
Length of Utterance						
High scorer	6	4	NS	6	4	0.01
Low scorer	7	3		0	10	
Total Morphemes						
High scorer	3	7	0.005	4	6	NS
Low scorer	10	0		2	8	
Picture Arrangement						
High scorer	4	6	0.05	6	4	0.01
Low scorer	9	1		0	10	
Story Construction						
High scorer	3	7	0.005	3	7	NS
Low scorer	10	0		3	7	
Vocabulary						
High scorer	6	4	NS	6	4	0.01
Low scorer	7	3		0	10	
Temporal & Spatial Relations						
High scorer	3	7	0.005	4	6	NS
Low scorer	10	0		2	8	
Similarities						
High scorer	3	7	0.005	6	4	0.01
Low scorer	10	0		0	10	

* Fisher's Exact Probability Test.Relations

DISCUSSION

The results indicated that positive schizophrenics scored significantly higher on various subtests of linguistic competence compared to negative schizophrenics. As both the diagnostic groups were matched individually on socio-demographic variables, this difference between positive and negative schizophrenics on linguistic competence must be explained otherwise.

Language seems to be an essential prerequisite for the manifestations of schizophrenic symptomatology and outcome of schizophrenia across cultures (World Health Organization, 1973; 1979). It may be that these two are functions of each other. Varma (1982) has speculated on the possible relationship between language and psychopathology. He has hypothesised that linguistic competence importantly determines psychopathology of schizophrenia. Language to illustrate, may take over from intense anxiety or organic defect of schizophrenia and set into motion a reverberating cycle with increasing elaboration of delusions making them more systematised.

Varma *et al.* (1985b) tested his hypothesis by administering test of linguistic competence to 15 patients each of acute, paranoid and chronic schizophrenia; manic-depressive psychosis, and anxiety, hysterical and obsessive compulsive neurosis. This study showed that paranoid schizophrenics scored significantly more on linguistic competence compared to chronic schizophrenics.

In the present work, it appears that positive schizophrenics compensate for their

psychotic anxiety by converting this anxiety into positive symptoms by virtue of their high linguistic competence. Similarly, low linguistic competence of negative schizophrenics does not permit them to develop positive symptoms to channel anxiety into specific psychopathology in terms of hallucinations and delusions. It may be that low linguistic competence leads to alogia and asociality which are considered to be the hallmark of negative symptoms.

The present study, thus supports the hypothesis of a relationship between linguistic competence and psychopathology. It is possible that linguistic competence acts with other variables like socio-economic status, intelligence, religion and life events in determining manifest symptomatology and thereby the subtype of schizophrenia. However, at this point in time, this proposition remains speculative.

It was also observed in the present study that in positive schizophrenics, linguistic competence has positive correlation with severity of illness and negative correlation with outcome. As speculated by Varma (1982), greater linguistic competence may take over from intense anxiety and set into motion a cycle of increasing elaboration of positive symptoms. The positive symptoms may, in turn, cause further anxiety and excitement, thus, adding to the vicious cycle, thereby producing more complex and intractable delusions. This may lead to a severe form of illness and may as well influence prognosis.

In negative schizophrenics, positive correlation was observed between outcome and linguistic competence. High linguistic com-

petence in a patient with negative schizophrenia was associated with low degree of negative symptoms which may have increased chances of recovery, whereas, low linguistic competence in a negative schizophrenic produces high degree of negative symptoms which are not easily amenable to therapeutic change. However, as correlation is a measure of strength of association, it may be erroneous to conclude causality from this.

Thus, to summarise, in the present study it was observed that linguistic competence at least partially, played a role in determining type and severity of symptoms, and outcome in positive and negative subtypes of schizophrenia.

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