

Speech Perception in Schizophrenia

Amani El-Rashidi, E. Hamdi, Sanaa S. Salem, M. M. Ahmed,
M. Arafa, and Fatma A. Moussa

This work was conducted with aim of studying disorders of speech perception in Egyptian schizophrenic patients. Thirty schizophrenic patients, fifteen patients with major depression and thirty non-psychiatric patients were subjected to an assessment that included full psychiatric examination, block design, similarities and picture - completion subtests of WAIS, the tool matching test, and the speech Perception Test (A modified version of Miller and Selfridge technique). The results indicate - that the performance of schizophrenic and depressive patients on a speech perception test is generally inferior to that of normal controls. However, the two patient groups showed no evidence of an inability to make use of contextual constraint.

(Egypt. J. Psychiat., 1994, 17: 17-23).

Introduction

The importance of this research field is shown in the Fact that the study of speech perception may shed light on the schizophrenic's underlying psychopathology, whether an associational deficit as hypothesized by Bleuler (1950), an actual organic deficit (Kirk, 1968), or otherwise. It also gains an importance due to the intimate relation between speech perception and speech production (Broadbent, 1964), the latter being usually regarded as a reflection of the schizophrenic's thought process.

Amani El-Rashidi, M.D., Psychiatry department, Faculty of Medicine, Cairo University.

E. Hamdi., M.D., Psychiatry department, Faculty of Medicine, Cairo University.

Sanaa S. Salem., M.D., Psychiatry department, Faculty of Medicine, Cairo University.

M. Arafa., M.D., Psychiatry department, Faculty of Medicine, Cairo University.

Fatma A. Moussa., M.D., Psychiatry department, Faculty of Medicine, Cairo University.

Disorders of speech perception have been hypothesized to lie at the syntactical (grammatical) or semantic (meaning) levels. As regards syntax, one of the methods used to investigate syntactical competence is by studying contextual constraint i.e. the extent to which the choice of a particular word depends upon the words that precede it (Raulin & Chapman, 1976). Several studies have utilized increasing levels of contextual constraint to assess speech perception in schizophrenics as compared to normals or other psychiatric patients. Lawson et al., (1964) and Moher et al., (1980) found that schizophrenics were less able than normals to make use of increasing levels of contextual constraint. Levy and Maxwell (1968) found that this inability did not appear to be specific to schizophrenics, as differences between acute untreated schizophrenics and depressives, in their study, were small.

Other studies, showed that the poor performance of schizophrenics on such tests was due to an overall poor verbal ability rather than a specific deficit

(Lewinsohn & El Wood 1961; Raeburn & Tong 1968).

Aim of the work

The aim of this work is to study disorders of speech perception in Egyptian schizophrenic patients.

This is attempted through investigating the following issues:-

-Is there any difference found between schizophrenics and normals specific to schizophrenia or do similar differences exist between normals and other psychiatric patients?

Subjects and Method

Thirty schizophrenic patients, fifteen patients with major depression and thirty non-psychiatric patients were studied. To ensure relative homogeneity of all subjects, the following criteria were chosen to govern selection of these subjects: All subjects were males to eliminate the possibility of sex differences in performance. The age of the subjects was between 16 and 35 years. The mean age of schizophrenia group was 25.3 The mean age of the depressive group was 27.7 years and that of the non psychiatric patients was 21.3 years. The subjects were of any educational level up to, and not exceeding, the first year of higher education, whether university or higher institute. I.Q. of the subjects was evaluated by Wechsler Adult Intelligence Scale sub tests; block design and similarities. Subjects included in this research obtained a minimum raw score of 7 on each subtest i.e. one standard deviation below average I.Q. Social status was controlled by selecting subjects only from state-run hospitals. It can be assumed that patients treated at such hospitals belong to some what similar socioeconomic strata. The diagnosis of the patients was done by two senior psychiatrists (M.D. qualified with 8 years experience). These patients were diagnosed according to DSM III.

Tools

(A) Clinical sheet.

(B) Hamilton scale for depression: was administered to the depressive patients.

(C) Block design and similarities subtests of WAIS: These two subtests were chosen because they have been found to have especially high correlation with total score and individual Subtests (Wechsler, 1944).

(D) Picture completion subtest of WAIS: It measures the individual's basic perceptual and conceptual abilities.

(E) Tool matching test: The subject was asked to match the picture of a tool with that identical to it among other tools. This test also explores accuracy of visual perception as well as speed of processing since it is a timed test. The score represents the number of correct responses attained in 4 minutes.

(F) Test for speech perception: The test was devised by using and modifying the Miller and Selfridge (1950) technique (El Rashidi., 1987). Psychiatrists, psychologists and Arabic linguists participated in the procedure with the ultimate aim of producing eight sequences of ten words each with increasing contextual constraint, these sequences were arranged in hierarchical order starting from that with the lowest level of contextual constraint as follows:

The test was administered by the researcher's reading loudly each set of words, once only, in a monotonous way and at the rate of one word per second approximately.

The subject was required to repeat as many words as possible regardless of the word closely related to the original word was given a score, regardless of the order of the words.

Statistical Analysis

(A) t- test: to compare between the results obtained by schizophrenics and controls (depressives and normals) on the test for speech perception.

(B) Pearson's product-moment correlation coefficient was used to correlate between results of the test for speech perception and those of the WAIS picture completion subtest and the tool matching test for each group.

Results

From table (1) we can notice that:-

(1) Schizophrenics performed worse than normals on all sets. The difference was significant only on the 1st, 2nd and 7th sets. Also both groups performed better with increased degrees of organization.

(2) There was no significant difference between schizophrenics and depressives. In fact the differences were slight, with schizophrenics obtaining better scores on sets 4 and 5, and depressives obtaining better scores on the remaining sets.

(3) Normal group performed better than the depressive group on all sets, but significantly only on the 5th set. The depressive group also improved in performance with increasing degrees of organization. Comparisons were made between means of 1st and 2nd 4 scores for the test and the means of the difference between them, for schizophrenics, depressives and normals (table 2). It can be observed that differences between schizophrenics and normals were significant as regards 1st 4 scores.

From table (3) all groups had better results for the 2nd 4 scores, significantly so in the case of schizophrenics and normals.

As regards the results of the tool - matching & picture completion tests,

table 4 shows that: The difference between schizophrenics' and normals in the tool matching test is significant, showing that schizophrenic's performance on this test was inferior to that of normals. The schizophrenics scores were also worse than those of depressives but not significantly so. There was no significant difference between the groups on picture completion test.

From table (5) we find that:

There was no correlation in the case of schizophrenics and normals between results of speech perception and those of tool matching. The depressives, however, showed a remarkably high correlation between the results of the two tests. No significant correlation for schizophrenics, depressives and normals between speech perception and picture completion.

Table 1
Values of "t" Between Corresponding
Means of No. of Recalled Words

Sets of Words	"t" Values (Normal vs. Schizc.)	Deps. Vs. Schizc.	Normals vs. Deps.
Set 1	3 ***	0.93	1.28
Set 2	2 *	0.31	1.1
Set 3	1.8	0.43	1.04
Set 4	1.13	0.41	1.43
Set 5	1.37	0.73	2.03*
Set 6	0.35	0.0	0.3
Set 7	2.5**	0.4	1.59
Set 8	1.6	0.58	0.36

* Significant at 0.05 level

** Significant at 0.02 level

*** Significant at 0.01 level

Table 2
Values of "t" Between Corresponding
Means on 1st 4 and 2nd 4
Scores and Difference Between Them

Normals vs. Schizs.	2.39*	1.66	-0.5
Deps vs. Schizs.	0.33	0.1	-0.27
Normals vs. Deps.	1.54	1.2	-0.13

* Significant at 0.002 level

Table 3
Values of "t" Between Corresponding Means of 1st 4
Versus 2nd 4 Scores in Different Subject Groups.

Subject Group	t Values
Schizophrenics	-2.95*
Depressives	- 1.96
Normals	- 3.31

* Significant at 0.002 level

Table 4
Values of "t" Between Corresponding
Means Obtained by Subject Groups on Tool
Matching Test and Picture Completion Test

Subject Groups	"t" of Tool Matching	"t" of Picture Completion
Normals vs. Schizs.	2.17*	0.68
Deps. vs. Schizs.	1.79	1.85
Deps. vs Normals	0.53	0.68

* Significant at 0.05 level

Table 5
The Correlation Between the Results of Speech
Perception and Those of Tool
Matching and Picture Completion Tests.

Subjects Group	Speech Perception vs. Tool Matching	Speech perception vs. Picture completion
Schizophrenics	0.006	0.008
Depressives	0.88	0.08
Normals	0.283	0.197

Discussions

The results of this study indicate that the performance of schizophrenics and depressives on a speech perception test is generally inferior to that of normal controls, significantly so at certain levels of organization these results, however, failed to support the hypothesis that schizophrenics are less able to make use of contextual constraint than normals. The conflicting findings in various studies may be attributed to variations in the definition of speech perception, choice of subjects and the test used.

Disorder in speech perception in schizophrenics have been explained in different ways. Many authors believe that it may be due to a disturbance of attention (Lawson *et al.*, 1964 Broen & Storms, 1966, Cromwell & Docecki, 1988, Chapman *et al.*, 1976, Frith, 1979). Our study did not permit the validation of such an explanation since the design of the task did not include any measure of attention.

Rakhawy's (1979) postulation that multiple part-organizations are present in the schizophrenic patient may be a factor behind the deficit in speech perception. If different organizations process information independently and consequently interfere with each other's processing, this may lead to disturbance of attention, speech perception, & other cognitive processes. Chapman & Chapman (1973) postulated that schizophrenics failed to regenerate the sentence fully from the words stored in short-term memory. Yates (1966) hypothesized slowness in processing relevant information. In our study slow processing was found to be a likelihood in the light of the results of the tool matching test, for which speed of performance, & subsequently speed of processing is required. The difference between schizophrenics and normal controls was statistically signifi-

cant. Kirk (1968) hypothesized the presences of a basic perceptual deficit which may be traced to some organic pathology. The results of the WAIS picture completion subtest which assesses perceptual performance do not indicate the presence of such a deficit in schizophrenics. There was no significant difference between schizophrenics & control groups. Low motivation does not seem a likely explanation for our results since all patients were cooperative enough to comply with test instructions and even anxious to do well. Presence of a general cognitive deficit is also unlikely since the schizophrenics performed comparably with controls on the two WAIS subtests: block design and similarities.

Another issue addressed by this work is the specificity of disordered speech perception as revealed by our test, to schizophrenics. The results of our depressive patients were similar to those of the schizophrenics, and generally inferior to the normal control subjects. Such a finding has been previously reported by Levy & Maxwell (1968), and Caudrey & Kirk (1974). The implication of such a result is that a deficit in performance on a speech perception test is one which may be found in patients belonging to different psychiatric categories. This raises questions as to whether these two diseases, and perhaps other psychiatric disorders, actually lie on the same spectrum rather than being totally discrete entities. Crow (1985) hypothesized that manic depressive psychosis and schizophrenia have the same basic etiology.

No plausible explanation can be offered for our finding of a very high correlation between the results of the tool matching test & the test for speech perception for the depressive group but not in the two other groups.

In conclusion the present research has shown that Egyptian, male schizophren-

ics and depressives are inferior to normals on a speech perception task. The two patient groups showed no evidence of an inability to make use of high contextual constraint. Explanations of these findings can be attributed to possibilities such as impaired attention, slow processing or presence of multiple organizations. Other possibilities such as overall cognitive deficit, a general perceptual defect, lack of motivation seem less plausible. The similarity in results obtained by schizophrenics and depressives points to the possibility of a pathology or deficit common to both groups.

References

- American Psychiatric Association, (1980) Diagnostic & Statistical Manual of Mental Disorders. 3rd ed, DSM-III. Washington D.C.: A.P.A. Washington.
- Bleuler E. (1950) Dementia Praecox. New York International Universities Press.
- Broadbent D.E., (1964) Perceptual and response factors in the organization of speech. In A.U.S. De Renck, M.D. Connor (eds.) Disorders of Language. London: J. & A. Churchill Ltd.
- Broen W.E. and Storms L.H. (1966) Lawful disorganization: The process underlying a schizophrenic syndrome. *Psychological Review* **73**: 265 - 274.
- Caudrey D.J. and Kirk K. (1974) The perception of speech in schizophrenia and affective disorders. In J. Gruzelier, P. Flor - Henry (eds.) Hemisphere Asymmetries of function in psychopathology. Elsevier North Holland Biomedical Press.
- Chapman L. J. and Chapman J.P. (1973) Disordered Thought In Schizophrenia New Jersey: Prentice - Hall.
- Chapman L.J., Chapman J.P. and Daut R.L. (1976) Schizophrenic inability to disattend from strong aspects of meaning. *J. Abnormal Psychol.* **85**: 35 - 40.

- Cromwell R. L. and Docecki P.R. (1988) Schizophrenic Language: A disattention interpretation. In S. Rosenberg, J.H. Koplin (eds.) *Developments In Applied Psycholinguistics Research* New York: Macmillan.
- Crow T. J. (1985) The two syndrome concept origins and current status. *Schizophrenia Bull* **11**: 471 - 485.
- El Rashidi A. (1987) Disorders of Perception in Egyptian schizophrenics (with special reference to speech perception). M.D. thesis. Cairo Univ.
- Frith C.D. (1979) Consciousness, information processing & schizophrenia *British J. Psychol* **134**: 225 - 235.
- Kirk R. (1968) Perceptual defect and role handicap: Missing links in explaining the etiology of schizophrenia, *British Journal of Psychiatry* **114**: 1509 - 1521.
- Lawson J.S., Mc Ghie A. and Chanpan J. (1964) Perception of speech in schizophrenia. *British J. Psychiat* **110**: 375 - 380.
- Levy R. and Maxwell A.E. (1968) The effect of verbal context on the recall of schizophrenics and other psychiatric patients. *British J. Psychiat* **114**: - 316.
- Lewinsohn P.M. and EL Wood D.L. (1961) The role of contextual constraint in the learning of language samples in schizophrenia. *J Nerv Ment Dis* **133**: 79 - 81
- Moher B.A., Manschreck T.C. and Rucklos M.C. (1980) Contextual constraint and the recall of verbal material in schizophrenia: The effect of thought disorder. *Brith J Psychiat* **137**: 69 - 73.
- Miller G.A. and Selfridge J.A. (1950) Verbal context and the recall of meaningful material. *American Journal of psychology*. **63**: 176 - 185.
- Raeburn J.M. and Tong J.E. (1968) Experiments on contextual constraint in schizophrenia. *British Journal of psychiatry* **114**: 43 - 52.
- Raulin M.L. and Chapman L.J. (1976) Schizophrenic recall and contextual constraint. *Journal of Abnormal Psychology* **85**: 151 - 155.
- Wechsler D. (1944) *The Measurement of Adult Intelligence*. 3rd ed. Baltimore: Williams and Wilkins.
- Yates A.J. (1966) Psychological deficit. *Annual Review of Psychology*. **17**: 111 - 144.

المراجع العربية

يحيى الرخاوى ١٩٧٩. دراسة فى علم السيكوباثولوجى القاهرة دار الغذ للثقافة والنشر.

Perception Du Language Dans la Schizophrenie

Ce travail a été conduit en ayant pour but d'étudier les désordres de la perception du langage dans les patients Égyptiens schizophréniques.

30 Patients schizophréniques, 15 patients de dépression majeur et 30 non - psychiatrique ont été sujet à un assesement qui a inclu une examination psychiatrique complète, similarités et images - des subtestes de completion de WAIS, et le teste de la perception du langage (une version modifiée du technique de Miller et Selfridge).

Les résultats ont indiqué que la performance des patients schizophréniques et dépressifs dans le test de la perception du langage est généralement inférieure a celle des controles normaux.

Malgré, tout les deux groupes de patients n'ont démontré aucune évidence d'inabilité dans l'usage du constraint contextuel.

إدراك الكلام فى الفصام

أجرى هذا البحث على ٣٠ مريضاً بالفصام و ١٥ مريضاً بالاكتئاب وبالإضافة إلى ٣٠ مريضاً غير نفسي (كعينه ضابطة، واهتم هذا البحث بدراسة إدراك الكلام عند الفصامين وهو ما يوضح السيكيوباتولوجى المرضى الفصام وكذلك أهمية العلاقة بين إدراك الكلام وإنتاج الكلام والتي تعكس عملية تفكير الفصامى.

وقد أسفرت النتائج عن أن أداء الفصامين والاكتئابيين على اختبار الكلام أقل من العينة الضابطة وله دلالة احصائية وكانت نتائج اختبار وكسلر الذى يقيس الاداء الادراكى لم يوضح أى اضطراب لدى الفصامين وليس هناك أهمية احصائية بين الفصامين والعينة الضابطة.

ولم يكن أيضاً هناك دلالة احصائية بين المرضى والعينة الضابطة من حيث الاضطراب المعرفى على اختبار وكسلر وكانت نتائج الفصامين والاكتئابيين متشابهة.