

Impaired Abstract Thinking in Some Neurotic Patients

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Abstract

Objectives: The aim of this study is to confirm the main hypothesis of this work indicating that impairment of abstract thinking is met with in non psychotic psychiatric patients more than is usually believed. **Method:** The study group consists of 60 subjects; 20 non psychotic psychiatric patients (10 obsessives and 10 conversion), 20 schizophrenic patients and normal subjects. Impaired abstract thinking was measured with the Goldstein Sherrer and Rakhawy's proverb test. Degree of neuroticism and psychoticism were measured by Eysenck personality questionnaire. **Results:** Analysis indicated that obsessives, have superior degree of abstraction than normals. Conversion patients are the nearer group to schizophrenia. No correlation was found between degree of impaired abstract thinking and psychoticism and neuroticism of EPQ. **Conclusion:** Formal thought disorder is not pathognomonic of schizophrenia. Formal thought disorder could be mixed in normals with a certain degree of tolerance of vagueness and malleability, if not finely assessed.

Introduction

Many authors have described the sequential stages that lead to the appearance of thinking or symbolic activity. Freud (1901) has described two forms of cognitive mental activities namely the primary process thinking and the secondary process thinking. Piaget (1952, 1954, 1956) viewed that there is a continuous interaction between basic developmental processes assimilation and accommodation. He postulates a series of stages: sensori-motor, pre-operational, concrete operations and formal operations. Ostergoud (1967) assumed that the evolution of concept divided into three different stages, the first is characterized by diffuse overlapping concepts, in the second thinking is more concrete, and in the third the capacity for abstraction appear. Arieti (1974) has adopted the term *endocept*, Hamilton (1978) stated that formal thought disorder is a disorder of conceptual thinking in someone who has previously been able to think conceptually and may be negative

when the patient is unable to form concepts or it may be positive when the patient produces false concepts by means of condensation, displacement or the misuse of symbols. Andreasen (1986) assumed that formal thought disorder can occur in speech of people who do not meet the criteria for any psychiatric diagnosis particularly when they are fatigued or stressed.

Andreasen (1986) has specified eighteen different types of formal thought disorder according to the definition of formal thought disorder as "disorders of thought, language and communication". Formal thought disorder would be due to associative defect in abstract ability and loss of central determinative ideas.

Concrete thinking is the most common sign of impaired conceptual functions and could be assessed by interpretation of proverbs, use of words, use of sorting tests and concept attainment experiments.

Proverb tests include Benjamin proverb, Graham's proverb tests, and Rakhawy's proverb test.

Aim of the work

The main hypothesis of this work is that impairment of abstract thinking could be met with in non-psychotic psychiatric disorders more than usually believed.

The aim of this study is to verify such hypothesis through:

1. Using different tools including culture free test and culturally loaded tests as well as direct and indirect clinical assessment.
2. Comparing the degree of impairment of abstraction among different studied groups (normal, schizophrenic, conversion and obsessive patients).

Subjects and Methods:

Subjects:

The study group consists of 60 subjects: 20 non-psychotic psychiatric patients, 20 schizophrenic patients and 20 normal subjects.

Inclusion criteria include age between 15 and 40 years, both sexes, good reading and writing abilities.

Exclusion criteria: age below 15 and above 40 years, mental subnormality, illiteracy and organic mental diseases.

The non-psychotic patient group included only 2 diagnoses: obsessive compulsive disorder and conversion disorder and of the 20 patients 10 were males and 10 females.

The schizophrenic patients were of the undifferentiated and disorganized types. Diagnoses were according to DSM IV criteria. The normal subjects were selected according to the following criteria: absence of previous psychiatric or neurologic

disease, absence of psychiatric consultation, absence of any psychiatric disorder in the family and not to be a psychiatrist or psychologist.

Methods

Impaired abstract thinking was measured with the Goldstein Sherrer Test and Rakhawy's Proverb Test. Degree of neuroticism and psychoticism were measured by Eysenck Personality Questionnaire (EPQ).

The Goldstein Sherrer Colour Sorting Test (Goldstein and Sherrer, 1941, 1953).

Consists of 12 token or blocks colored red, blue, yellow or green on top and all white underneath which come in one of three shapes, square, circle, or triangle.

The subject is first asked to sort the test material. On completion of his first sort, he is told to group them again but in a different way. On completion of each sorting, the examiner asks "why have you grouped them this way?"

Rating of the test is as follows:

1. Abstract level: which means responses rightly or correctly on the two possible dimensions, color and can report the principle he successfully arranged the pieces upon.
2. Partial abstract level: ability to group the pieces but without reporting the principle he successfully group them or if he succeeds to group part rather than the whole collection on one or more of the principles of classifications.
3. Concrete level: inability to abstract as well as arranging the pieces chaotically or haphazardly or on some other principles which is concrete in nature or on part

perception of certain aspects rather than the rest of particles.

4. Zero level: complete failure of abstraction and failure to grasp the possible principle.

Rakhawy's Proverb Test:

The test consists of five Egyptian proverbs arranged in order hierarchically increasing difficulty as regards their understandability.

After reading the proverb the examiner asks the following questions: What does this proverb mean? Can you give a situation from everyday's life where this proverb can apply? Can you find another proverb, maxim or a popular saying or poetry verse that may connote a similar meaning? and if he reads and writes he is given a card containing the stimulus proverb and three other proverbs and asked to designate which explain the meaning of the proverb.

Rating of the Proverb Test:

1. Abstract and Concrete Thinking:

Abstract thinking is scored in the following steps:

1st question (1st step, 1st order abstraction): Giving an abstract meaning seem to require a higher degree of pulling back from the proverb as an immediate stimulus than the search for a concrete example representing such abstract meaning in the 2nd question (2nd order abstraction). The verbal response of the 1st question is rated for the abstract thinking along scale of 4 points.

2nd question (2nd step, 2nd order abstraction): The verbal response to the 2nd question that is the concrete situation, from every day life where the stimulus proverb can apply are scored for two criteria the thematic content of the situation and its logical coherence. Each criterion is rated along score of 4

points. The final score is obtained by calculating the mean of both scores (range 0-4). By such a way we aim to measure both the relation to reality in addition to the 2nd order abstraction.

3rd question (pseudo-abstraction): The ability to give an elaborate symbolic statement whose meaning coincides with the stimulus proverb seems to measure a higher order of abstraction. Compared to 1st or 2nd order abstraction the verbal responses of the third question are categorized either correct or incorrect.

4th step (correlation with verbal explanations): This step also scores the abstract-concrete dimension. The responses of the subjects are categorized either abstract (Ab) or concrete (Co) or abstract/concrete (Ab/Co). This step is helpful specially if the patient fails to respond properly in the previous 4 steps.

2- Other Phenomena, such as

Pathological associative processes (4th step) the question has been designed to explore the patterns of pathological associative processes on an abstract level.

Personalized responses: along a scale of 4 points.

Bizarre responses: responses to questions no 1,2 and 3 are to be rated along a 4 points scale for this character.

Poverty of speech and thought: from responses throughout the whole test and to be rated along a 4 point scale.

The scoring scale of some proverb items namely explanation correlation, personalized responses and bizarre responses have been modified into 3 point scale for simplification and quantitative assessment.

Results

1. Measures of abstract thinking

A- Goldstein Sherrer Test (Table 1)

There was a statistically significant difference between obsessive, normal groups and schizophrenics but not as regards the conversion group.

B- Proverb Test: 1st Order Abstraction (Table 2):

There was a statistically significant difference between obsessive group and schizophrenic group on the dimension of 1st order abstraction. While conversion patients and normal subjects showed statistically insignificant difference.

C- 2nd Order Abstraction (Table 3): The data comparing the different groups on the index of 2nd order abstraction show that the obsessive patients tend to score high whereas the schizophrenic patients tend to score low. There was a statistically significant difference between obsessive patients, normal subjects and schizophrenic patients while conversion patients showed a statistically nonsignificant difference.

D- Relation to Reality (Table 4): There was a statistically significant difference between the obsessive and schizophrenic groups.

E- Hyperabstraction (Table 5, 6): There was no statistically significant difference among different studied groups on the index of hyper abstraction taking schizophrenics as base line. On the Proverb Correlation's, Explanation Correlation and Personalized Responses, there was no statistically significant difference among different studied groups.

F- Bizarre Responses (Table 7): The data comparing the different groups on the index of bizarre responses showed a statistically highly significant difference among obsessive and normal groups and a statistical difference among conversion groups.

G- Correlation Between Degree of Neuroticism and Psychoticism and 1st Order Abstraction (Table 8): The correlation between degree of neuroticism and psychoticism, as measured by EPQ and scores of 1st and 2nd order abstraction of proverb test globally without diagnosis and with diagnosis, is statistically insignificant.

Table (1): Mean Scores of the Different Studied Groups on "the Goldstein Sherrer Test"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	1.1	± 0.316	1.6	±0.724	0.009**
Conversion	1.3	± 0.483	1.6	±0.724	0.225
Normal	1.2	± 0.410	1.6	±0.724	0.017*

P< 0.05 = significant, * Statistically significant, ** Statistically highly significant

Table (2): Mean Scores of the Different Studied Groups on "First Order Abstraction"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	13.80	± 2.04	7.70	± 4.87	0.006 **
Conversion	9.50	± 3.27	7.70	± 4.88	0.123
Normal	12.35	± 3.90	7.70	± 4.89	0.185

** Statistically highly significant

Table (3): Mean Scores of the Different Studied Groups on "Second Order Abstraction"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	14.00	± 2.94	5.60	± 4.95	0.049 *
Conversion	9.50	± 4.70	5.60	± 4.96	0.831
Normal	11.89	± 3.18	5.60	± 4.97	0.045*

* Statistically significant

Table (4): Mean Scores of the Different Studied Groups on "Relation to Reality"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	14.80	± 3.12	5.90	± 5.90	0.047 *
Conversion	9.90	± 4.36	5.90	± 5.90	0.275
Normal	11.25	± 5.95	5.90	± 5.90	0.821

*Statistically significant

Table (5): Mean Scores of the Different Studied Groups on "Hyperabstraction"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	1.60	± 1.58	3.00	± 2.03	0.693
Conversion	2.70	± 2.87	3.00	± 2.03	0.158
Normal	1.90	± 1.58	3.00	± 2.03	0.830

Table (6): Mean Scores of the Different Studied Groups on "Hyperabstraction"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	1.60	± 1.58	1.90	± 1.59	0.723
Conversion	2.70	± 2.87	1.90	± 1.59	0.048*
Normal	3.00	± 2.03	1.90	± 1.59	0.830

* Statistically highly significant

Table (7): Mean Scores of the Different Studied Groups on "Bizarre Responses"

Group	Mean	S.D.	Schizophrenia		Rim Area
			Mean	S.D.	
Obsessive	0.30	± 0.48	4.30	± 2.89	0.001 **
Conversion	1.11	± 1.05	4.30	± 2.89	0.015 *
Normal	0.85	± 0.93	4.30	± 2.89	0.000 **

* Statistically significant, ** Statistically highly significant

Table (8): Correlation between Degree of Neuroticism and Psychoticism and 1st and 2nd Order Abstraction in Different Groups

	Obsessive		Conversion		Normal		Schizophrenic	
	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd
	order	order	order	order	order	order	order	order
	P		P		P		p	
Neuroticism	0.531	0.514	0.165	0.616	0.199	0.934	0.976	0.575
Psychoticism	0.073	0.144	0.261	0.212	0.961	0.731	0.394	0.560

Discussion

1. Goldstein-Sherrer test:

Goldstein-Sherrer test is claimed to be culture free using non-verbal stimuli. Taking schizophrenia as the base line for comparison the results show highly statistical significant difference between the obsessive and schizophrenic groups in favor of the obsessive one (obsessive mean 1.1, schizophrenic mean 1.6 and $p < 0.01$) i.e. the later has no or least degree of formal thought disorder. There is also significant difference between normals and schizophrenics which is still less than those observed with obsessive (normal mean 1.2 and $P < 0.05$) while the conversion group shows no significant difference with schizophrenic group.

The intact thought process in obsessive patients seems to be not only intact but exaggerated towards what could be called anti-formal thought disorder mechanism. In

other words the obsessive patients show exaggerated tendency to abstract perhaps as a mechanism of over control, however, this over control should not be considered as a healthy or superior mechanism since it is simply liable to be exhausted sooner or later, it is known to be the basic psychopathology in obsessive patients (Wegner et al., 1994).

2. Rakhawy's Proverb test:

This test is claimed to be culturally related. It is designed in order to assess many different aspects of thought processing as well as the relation to object and reality. Results of the present study as regards each level revealed the following:

a. First order abstraction : At this level it is shown that we have got the same results mentioned with Goldstein test in relation to obsessive patients, that is better scoring than normals taking the schizophrenic score

as the base line, i.e. towards more solid abstraction. The difference noted with Goldstein test is not noted in the proverb test between normal and schizophrenic groups. However, the row scores show definite difference (schizophrenic mean 7.70, conversion mean 9.30, normal mean 12.35 and obsessive mean 13.80). The difference between obsessive and normal groups is just 1.45 but the scores of the normals are statistically insignificant. This does not devalue the statistical manipulation but refers to the need for further elaboration of the introduced results. This may need to recommend reinvestigation with larger groups matched on wider scales, assuming that verbal tests e.g. (proverb test) assess different aspects of thought process and give different results.

Obsessive patients seem to respond with the same over compensation mechanism for both verbal and non-verbal tests. However, taking the normal as the base line no difference is observed in all groups.

b. Second Order Abstraction: Taking the second order abstraction of the proverb test, both obsessive patients and normal individuals show statistically significant differences (obsessive mean 14.00. $p < 0.05$, normals mean 11.48. $p < 0.05$) while conversion group is just nearer to the schizophrenic group in spite of the difference in the row scores (schizophrenic mean 5.60 and conversion mean 9.50). This again reinforces our previous comment that conversion is the nearest group to schizophrenics.

c. Relation to Reality: Using proverb test to assess relation to reality, it is shown that when taking schizophrenic scores as base line (obsessive mean 14.80, schizophrenic mean 5.90 and $p < 0.05$), the obsessive score remains at moderately significant level

while there is no significant differences between schizophrenics, conversion and normals (conversion mean 9.90 and normal mean 11.25). This is again to be taken cautiously; first since the use of proverb test for assessing this ego function dimension needs further elaboration and standardization, second, statistical procedure refers to the need for a larger sample, since, the row score shows that the normal sample is more or less double as much the row score of the schizophrenics, but still does not show statistically significant difference. When taking the normal scores (normal mean 11.25) as a base line, no significant difference between the three groups is observed. The row scores show that the schizophrenics as indicated before is about half the normal (schizophrenic mean 5.90), while the conversion is the nearest to the normal, but still low (conversion mean 9.90) and the obsessive is relatively superior (obsessive mean 14.80). Does this mean that the obsessive could relate to reality in a better way than normals? The answer should be a matter of controversy. It seems that there is some mixing between the sense of reality and reality testing as ego functions as described by Bellak et al. (1973) with the expression "relation to reality" as literally as reality testing conceived. So, revision of the criteria assessing this dimension is needed and the use of the term reality testing instead of "relation to reality" may be recommended.

d. Hyperabstraction: Hyperabstraction may indicate a negative significance if it denotes some sort of bypassing basic steps, the normal logic and realistic responsibilities in the process of abstraction. This is why it is sometimes called "pseudo-abstraction", as described by Arieti (1974). Taking the schizophrenics group as base line in the

assessment of hyper-abstraction, they tend to score high (schizophrenic mean 3.00) denoting a tendency for bypassing normal abstraction and reality of life through connecting apparently superior metaphorical thinking (Arieti, 1974).

There is no marked difference between the other groups looking to the row scores (obsessive mean 1.60, conversion mean 2.70, and normal mean 1.90). The nearest to the schizophrenic is the conversion which is in harmony with the assumption that there is some similarity between the hysterical patients and schizophrenic patients where both are inclined to have verbal fantasy at their disposal. Taking the normal score as a base line the conversion and schizophrenic group showed exaggerated hyperabstraction which goes rightly with the previous interpretation.

e. Proverb Correlation: At the level of testing the ability to abstract through multiple choice device as suggested by the proverb test used, we find no statistical difference neither when taking the schizophrenic mean score (6.80) nor when taking the normal mean score (7.35) as base line. This may refer to the possibility that this level of assessment is either less fine to assess such level of correlating or that the sample should be extended and re-tested in the light of what this level intends to measure.

The same applies to multiple choice tool of assessing abstraction providing alternative interpretation of each proverb (explanation correlation). We can add here that our culture is not acquainted to such multiple-choice technique of interpretation.

f. Personalized Responses: By "personalized responses" it is assumed that they include the responses in which the first

person pronouns "I" and "me" are more used rather than the more neutral second or third person as well as the responses in which the subjects give over involved responses which seems to indicate a non neutral person attitude. Taking the personalized response level of assessment, no significant differences were found between whole groups in spite of the fact that looking in the row scores, one can see that it is strange enough to notice that the conversion patients have the highest row score of personalized responses (1.80) then comes the obsessive response (1.55) then schizophrenic response (1.05), and the least is the normal response (0.95). This should mean that both schizophrenics and normals are less personalizing, but one tends to interpret the row scores provisionally. The lack of personalization in schizophrenia may be due to loss or hazy ego boundaries and loss of identity, it could be interpreted as exaggerated autistic thinking rather than personalization in normals. That is how the score observed in schizophrenic patients could be interpreted. On the same basis the highest score observed in conversion and obsessive in patients refer to the assumed self centerdeness and egoistic stand on intellectual level.

g. Bizarre Responses: The word "bizarre" is used in Psychiatric literature in a redundant fashion (Rakhawy, 1997). However, revising the criteria used to assess the "bizarre responses" (Rakhawy's proverb test) in this study, we found that there is definite emphasis on oddity, lack of association, past pointing and irrelevancy without any reference to particular content such as delusions or thought insertion, broadcasting and withdrawal. Taking the schizophrenic scores as base line, there was a high statistical difference between normal and schizophrenics who are showing much

more bizarreness in their responses. There is still great difference of bizarreness between schizophrenic and conversion groups and the difference is statistically significant ($P < 0.05$) but relatively at a moderate level than with normals and obsessive patients. These responses, go in harmony with the known clinical observations that schizophrenics show more bizarre behaviour and responses than normal individuals and other groups. The more the schizophrenic symptoms are understandable even on psychopathological level the less the symptoms are bizarre.

Strange enough the obsessive patients are less bizarre than normals. This goes first, with previous hypothesis claiming that obsessive overabstract (verbally) than normals do (Wegner et al., 1994). Second, the so called bizarreness of the normal may be reinterpreted as being as of healthy permeability and malleability of the units of the thought process, that it could be inclined to differentiate further research between positive vagueness and odd chaotic bizarreness. The lack of tolerance of such positive vagueness characterizes the obsessive ordering (Purdon et al., 1994).

Eysenck Personality Questionnaire: As regards the E.P.Q. test, there is no statistically significant difference in any of the samples as compared with each others as well as compared to normals. This might be due to that the sample is too small to show any significance. Also, it goes with the assumption that this test is not fine enough to delineate the psychoticism and neuroticism level of abnormality at thought process. The test looks more concerned with overt quantitative behaviour rather than with the how of thinking. Moreover, E.P.Q. is a translated test and said to be standardized on a more representative

sample before admitting its ultimate validity. The absence of significant correlation between neuroticism and psychoticism of E.P.Q. and Goldstein-Sherrer and proverb tests indirectly reinforces this point of view interpreting the results of the E.P.Q.

Conclusions

- 1- Formal thought disorder is not pathognomonic of schizophrenia.
- 2- A certain degree of formal thought disorders is present in normal subjects.
- 3- The so called formal thought disorder in normals could be mixed with some tolerance of vagueness, ambiguity and permeability of units of thought.
- 4- Normal individuals may not automatically assess preexisting metaphorical mappings during comprehension of different testes, so not to equate, as a rule, the failure, as deficit in abstract thought.
- 5- Rakhawy's proverb test focuses part of its dimensions toward interaction between different cognitive abilities and ordinary proverb understanding.
- 6- Clinical evaluation and rating is the basic tool for assessment of formal thought disorder.

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اضطرابات التفكير التجريدي لدى بعض المرضى العصائيين

يهدف البحث إلى إثبات وجود اضطراب تجريدي في التفكير عند مرضى الوسواس القهري والهستيريا والأسوياء وان كان بدرجات أقل منه لدى الفصامين . وتكونت عينة الدراسة من ٦٠ شخص مقسمين كآلآتي : ١٠ مرضى غير ذهانيين (١٠ وسواس قهري) ، ١٠ مرضى بتشخيص هستيريا تحويلية ، ٢٠ مريض فصامي ، ٢٠ شخص من الأسوياء . وقد تم تقييمهم إكلينيكيًا وباستخدام المقاييس النفسية الآتية :

- ١ - اختبار جولدشتين لتصنيف الألوان ،
 - ٢ - اختبار الرخاوى للأمثال العامة واختبار ايزنك للشخصية
- وقد نوقشت النتائج وانتهيت إلى الاستنتاجات التالية:
- ١ - الاضطراب الجوهرى للتفكير ليس خاصا بالمرضى الفصامين دون سواهم .
 - ٢ - قد توجد بعض درجات الاضطراب في جوهر التفكير لدى الأسوياء .
 - ٣ - ما يبدو اضطرابا جوهريا في التفكير عند الأسوياء بالقياس المبدئي يمكن ألا يكون اضطرابا لكنه اقرب إلى حالة من تحمل الغموض ومرونة في وحدات الفكر .
 - ٤ - قد لا يصل الأسوياء تلقائيا إلى المعنى التجريدي أثناء تطبيق الاختبارات السيكلوجية وبالأخص الأمثال العامة وهذا لا يعنى وجود اضطراب في التفكير التجريدي .
 - ٥ - ركز أحد أبعاد اختبار الرخاوى للأمثال على التداخل بين القدرات العقلانية المختلفة ومنها الأمثال ، وان لم يتمكن من التمييز الدقيق بين النواحي الأخرى .