Executive Function, Theory of Mind and Mental Representations in Explaining the Communicative Deficit in Schizophrenic Patients

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Introduction

The present research aims to empirically investigate the ability of schizophrenic patients to comprehend different communicative phenomena. We propose that executive functions and theory of mind support communicative performance but specific cognitive processes, as proposed by the Cognitive Pragmatics theory (Airenti, Bara & Colombetti 1993), modulate the capacity to comprehend communicative phenomena.

According to the Cognitive Pragmatics theory in standard communication, that is direct and indirect speech acts, default rules of inference are used to understand one another's mental states. Default rules are always valid unless their consequences are explicitly denied. Indeed, in standard communication what the speaker says is in line with his/her private beliefs. On the contrary, non-standard communication - as for example irony and deceit - involves comprehension and production of communicative acts *via* the block of default rules and the occurrence of more complex inferential processes, involving conflicts between the beliefs the speaker takes as shared with the listener and the speaker's private beliefs.

We expect that schizophrenic patients find it easier to understand communicative standards acts than non-standard acts (irony and deceit). In particular, we expect that the schizophrenic patients are comparable to normal controls when dealing with standard communicative acts, while they perform worse than controls on non-standard ones.

Experiment

The subjects were administered the following tasks.

Communicative abilities: the experimental material comprised 12 videotaped scenes (representing 4 standard communicative acts, 4 deceitful acts and 4 ironic acts). Each scene was controlled by the duration (20-25 seconds) and by the number of words (5 ± 2). At the end of the scene, patients had to show that they understood the speaker's communicative intention. All patients and controls were videotaped. A judge (blind with respect to the aim of the research). assigned a score from 0 to 4 to the subjects responses, based on the correctness of their answers.

Executive functions: Trial Making test and Attentive Matrices for attention abilities, a modified version of the Card Sorting Test and Tower of London for planning abilities, Verbal and the Spatial Span for working memory and Immediate and Deferred Recall test for long-term verbal memory.

Theory of mind: Smartie's Task, Sally-Ann Task and a selection of Strange Stories, excluding those that included communicative acts like metaphors, deceits and ironies.

Participated to the research seven schizophrenic patients (6 males and 1 female), diagnosed by DSM-IV criteria and seven normal matched pairs. Among patients, 6 presented with paranoid type and 1 with disorganized type. Patients had a mean age of 39.3 (ranging from 23 to 56) and a mean education of 10.9 years. All the subjects passed a screening battery, included the Mini-Mental State Examination, Colored Progressive Matrices and the denomination scale of Aachener Aphasie test series.

Results

The results confirm our predictions. There is no significant difference between patients vs. controls in the comprehension of standard communicative acts (mean percentages of correct responses 75% vs. 96%; T Test: t = 1.87; p = .87), whereas patients have more difficulties than controls in non-standard communicative acts both for deceit (89% vs. 100% of correct responses; T Test: t = 3.06; p = .01) and for irony (75% vs. 95% of correct responses; T Test: t = 2.28, p = .042).

As far as the executive functions, we observed differences between patients vs. controls in attention abilities (mean percentages of correct responses 59% vs. 93%; T Test: t = 3.51; p = .004), planning abilities (72% vs. 99% of correct responses; T Test: t = 2.22; p = .046) and long-term memory abilities (39% vs. 56% of correct responses; T Test: t = 2.78; p = .017). On the contrary, there is no significant difference in working memory (36% vs. 62% of correct responses; T Test: t = 1.63; p = .13) and theory of mind (80% vs. 92% of correct responses; T Test: t = 1.60; p = .135) between the two groups.

References

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