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Peculiar word use as a possible trait marker in schizophrenia

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Abstract

Peculiar word use in schizophrenia has been emphasized by many authors, however the definition or the linguistic and clinical correlates of this phenomenon are not clear. We propose a new, standard and reliable method to extract a numerical measure of peculiar word use with operationalized definitions. We applied a modified version of the Controlled Word Association Test (Turkish version) to a pool of healthy subjects ($N=55$) and used the data as norm to compare the degree of peculiarity and patterns of word association among patients with schizophrenia ($N=33$), their healthy siblings ($N=31$) and healthy controls ($N=32$). We also explored the relationship of peculiar word use with patterns of word association (semantic versus phonologic) and formal thought disorder. Patients and their siblings performed worse on measures of verbal fluency. They also generated more peculiar words and relied less on semantic associations, compared to healthy controls. Peculiar word use was associated with the severity of formal thought disorder and the tendency to make use of phonologic associations in the patient group and their siblings, whereas neither of the word association patterns predicted peculiar word use in the control group. Our results provide empirical support to previous observations about the peculiarity of schizophrenic speech. Peculiar word use could be associated with a deficit to employ semantic classifications in verbal fluency tasks and thus relying more on sound-based associations. Excess use of phonologic associations may be playing a mediating role between semantic processing abnormalities and formal thought disorder.

Keywords: Schizophrenia; Schizophrenic language; Siblings; Semantics; Phonetics

1. Introduction

Schizophrenia patients demonstrate multilevel language impairments that have been accepted as one of the fundamental (Bleuler, 1950), and diagnostic (American Psychiatric Association, 1994) signs of schizophrenia. These impairments include phonetic abnormalities (e.g., errors in timing, intonation and quality of speech) (Rieber and Vetter, 1994) and semantic abnormalities such as impaired semantic store (Chen et al., 2000), retrieval (Allen et al., 1993) and deficits in structure of semantic network (Aloia et al., 1996).

Following Crow's (2000) hypothesis about the co-heritability of language and schizophrenia, DeLisi (2001) highlighted that deficits in specifically human aspects of language may be related to the genetics of schizophrenia. In a recent review Covington et al. (2005) addressed the need for studies about the heredity of schizophrenic language impairment that may provide a solid biological basis for the disease. Some language abnormalities (e.g. deficits in verbal fluency [VF]) have been shown in healthy relatives of schizophrenic patients (Laurent et al., 2000) and proposed as possible

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trait markers of predisposition to schizophrenia (Chen et al., 2000).

Peculiar word use is one of the language abnormalities in schizophrenia that has been emphasized by many authors (Harrow and Prosen, 1979; Pinard and Lecours, 1983; Johnston and Holzman, 1979; Holzman et al., 1986; Solovay et al., 1987; Liddle et al., 2002). Despite the fact that it is a common clinical observation, studies involving quantitative assessment of this abnormality are relatively scarce, probably because agreement on the degree of peculiar word use is more difficult compared to other language abnormalities. Pinard and Lecours (1983) observed that schizophasic discourse often included rare words, and interpreted this as evidence of a large and intact vocabulary in schizophrenia. Johnston and Holzman (1979) proposed that the peculiar verbalizations in schizophrenic speech were representations of the underlying thought disorder. Holzman et al. (1986) later highlighted that the thinking of schizophrenic patients was confused and fluid, usually peppered with many idiosyncratic and peculiar words and phrases. Thus, in Johnston and Holzman's Thought Disorder Index (TDI) (1979), peculiar verbalizations represent a very mild qualitative form of thought disorder. They are subjectively identified and rated for frequency of instances during a Rorschach Inkblot Test. Liddle et al. (2002) operationally defined and grounded peculiarity in a continuous spectrum as a weaker form of neologism in the Thought and Language Index (TLI). Peculiarity of speech is rated as a separate item in these two scales — 'peculiar word use' in the TLI and 'idisyncratic verbalizations' in the TDI. It should be noted, however, that both these items have a weak interrater reliability; in fact they achieve the lowest interrater reliability figures among the other items in the TLI and TDI. Low interrater agreement could be due to a higher degree of subjectivity involved in rating peculiarity unless the patient's speech is analyzed quantitatively. This subjectivity is probably a consequence of the difficulty in making an operational definition of peculiarity, compared to other abnormalities in language, which either lend themselves to a more strict definition (e.g., loosening of associations, tangentiality, etc.), or are more readily observable since they are severe by definition (e.g., neologisms or incoherence).

Patients with schizophrenia rarely use words that are obviously peculiar (Cuesta and Peralta, 1999). Rather, peculiarity of schizophrenic speech can be identified through detection of subtle examples that take place on a continuum between 'normal' and 'obviously peculiar'. A unit-by-unit analysis of the patient's speech targeting to extract a relatively accurate numerical measure of peculiarity would address the issue of subjectivity in assessment, however, such a method would be time-consuming, compared to the assessment of other symptoms. Thus a relatively practical method that is capable of identifying slight forms of peculiarity with a higher degree of interrater reliability could prove useful in clinical research.

The first aim of this study is to propose and test the reliability of a method that would achieve the standards mentioned above. We propose a method that involves a modified version of the Controlled Oral Word Association Test COWAT (Lezak, 1995) in rating peculiar word use. This allows the rater to base the rating of the peculiarity of each word uttered by the subject on the frequency of its use by a pool group, rather than making a forced choice between "peculiar" and "non-peculiar".

The second aim of the study is to test the hypothesis that peculiar word use is more common in schizophrenia patients and their healthy relatives compared to healthy controls, in order to study the potential value of peculiarity as a trait marker for schizophrenia.

We were also interested in the relationship of peculiar word use with patterns of association between the uttered words. The relationship of peculiar word use with other forms of thought disorder has been theoretically explained by some authors, but empirical research on this question is scarce. One assumption is that excess use of sound-based (compared to context-based) associations renders schizophrenic speech "difficult to understand". Chaika (1974) speculated that the structure of speech in schizophrenia is disturbed because of a distraction by the sounds of words, so that a discourse becomes a non-informative string of word associations. This was referred to as 'glossomania' by Pinard and Lecours (1983) and later used by Andreasen (1987) for the definition of derailment and clang associations. In fact, verbal fluency (VF) studies point out to a disproportionate impairment of semantic relative to phonetic fluency in schizophrenia patients (Kremen et al., 2003; Phillips et al., 2004; Bozikas et al., 2005). However, the relationship of this language abnormality with peculiar word use has not been empirically tested before.

Thus, the third aim of this study is to test the hypothesis that the degree of peculiar word use is associated with a disproportionate amount of phonetic compared to semantic associations by using operationalized definitions and reliable measures for both peculiarity and word association patterns.

2. Methods and materials

2.1. The groups

The Turkish version of the modified COWAT (Lezak, 1995), as will be described below, was first applied to 55 healthy subjects (relatives or acquaintances of the