

## Emotional discomfort and impairments in verbal memory in schizophrenia<sup>☆</sup>

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### Abstract

Research has demonstrated that impairments in verbal memory in schizophrenia are linked with psychosocial deficits. Less is known, however, about their relationship to clinical features of illness. This study explores the hypothesis that impairments in verbal memory, particularly forms of memory requiring deeper levels of encoding, are uniquely linked to symptoms of dysphoria or emotional discomfort. Accordingly, we examined the association between concurrent measures of symptoms and verbal memory for 84 subjects with schizophrenia. Measures of positive, negative, cognitive, excitement and emotional discomfort symptoms were derived from factor scores of the Positive and Negative Syndrome Scale. Verbal memory was assessed using two tests requiring relatively superficial levels of encoding: The Hopkins Verbal Memory Test and the Digit Span subtest; and one test requiring deeper levels of encoding: the Logical Memory subtests I and II. As predicted, multiple regressions controlling for age, education and attention revealed that poorer performance on Logical Memory was strongly associated with greater levels of emotional discomfort ( $R^2 = 0.22$  and  $0.25$ , respectively) while performance on the Hopkins test was related to cognitive symptoms scores ( $R^2 = 0.08$  and  $0.09$ , respectively). Implications for the conceptualization of verbal memory deficits in schizophrenia are discussed. © 2000 Elsevier Science Ireland Ltd. All rights reserved.

*Keywords:* Dysphoria; Neuropsychology; Cognition; Positive and Negative Syndrome Scale

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## 1. Introduction

A large body of evidence has accumulated over the last two decades indicating that impairments in verbal memory are common (Paulsen et al., 1995) and stable (Cantor-Graae et al., 1995) features of schizophrenia. Of particular interest to both researchers and clinicians have been observations that impairments in verbal memory are closely linked with deficits in community functioning (Addington and Addington, 1998; Mueser et al., 1992; Bryson et al., 1998) and are possibly more severe than other neurocognitive deficits (Gold et al., 1992).

While the prevalence and significance of impairments in verbal memory have been well documented, less is understood about how these impairments are related to other features of schizophrenia. In particular, do impairments in verbal memory exist independently of symptoms and are they related to global symptom severity, or are they related to specific domains of symptomatology? Research to date on verbal memory and psychopathology in schizophrenia has failed to find a pattern of consistent associations that might answer these questions. Some studies have found verbal memory tasks were uniquely linked with negative symptoms (e.g. Stirling, et al., 1997; Addington and Addington, 1998; Basso et al., 1998). Others have found that greater levels of impairments in verbal memory were associated with higher levels of hostility (Vinogradov et al., 1997), dysphoria (Brébion et al., 1997) and positive symptoms (Green and Walker, 1985; Berman et al., 1997). Still others have found that symptoms and memory were unrelated (Harvey et al., 1986).

This broad variety of findings suggests that the relationship between memory and symptoms may be mediated by the demands inherent in the verbal memory task. In other words, perhaps symptoms are not linked with global impairments in verbal memory but with deficits in the component processes of verbal memory. One possible component of verbal memory that may mediate the relationship of memory to symptoms is depth of encoding. Encoding generally refers to the acquisition stage of memory, while depth of en-

coding refers to the extent to which the acquired material is closely integrated with other material. For example, the automatic process of storing a single word requires superficial encoding while the effortful process of acquiring a narrative requires deeper level encoding. Evidence that level of encoding mediates the relationship of symptoms and memory impairment includes findings that ratings of depression were related to impairments in deeper level encoding in schizophrenia (Brébion et al., 1997), and that mood and level of encoding are linked in depression (cf. Burt et al., 1995).

The current study attempts to examine whether the relationship between memory and symptoms in schizophrenia is mediated by encoding demands. In particular, it examines whether five orthogonal symptom domains are related to performance on verbal memory tasks requiring either superficial encoding or deeper level encoding. We specifically hypothesized that poorer performance on the deeper encoding tasks would be uniquely linked to greater levels of emotional discomfort (e.g. symptoms of depression and anxiety) while performance on superficial encoding tasks would be related to cognitive symptoms.

We predicted that emotional discomfort would be linked to poorer performance on deeper level encoding tasks because of the potential of impairments in deeper level encoding to disrupt, among other things, information about the complex information that makes up human beings' sense of their daily lives and history. Additionally, with increasing levels of emotional discomfort, the motivation to deeply encode information from daily experience might decrease. If the events of life feel unconnected, perhaps the drive or rationale for deeply encoding information, that is, for more closely integrating information, might be reduced.

We reasoned that cognitive symptoms would predict poorer performance on more superficial encoding tasks because previous research has suggested that cognitive symptoms tend to be closely related to dysfunction in automatic cognitive processes (Bell et al., 1994b). We would also argue that previous findings linking superficial encoding tasks with positive and negative symptoms might have resulted from a failure to parcel

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