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Objective measures of prospective memory do not correlate with subjective complaints in schizophrenia

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Abstract

While a number of studies have shown that individuals with schizophrenia are impaired on various types of prospective memory, few studies have examined the relationship between subjective and objective measures of this construct in this clinical group. The purpose of the current study was to explore the relationship between computer-based prospective memory tasks and the corresponding subjective complaints in patients with schizophrenia, individuals with schizotypal personality features, and healthy volunteers. The findings showed that patients with schizophrenia demonstrated significantly poorer performance in all domains of memory function except visual memory than individuals with schizotypal personality disorder and healthy controls. More importantly, there was a significant interaction effect of prospective memory type and group. Although patients with schizophrenia were found to show significantly poorer performance on computer-based measures of prospective memory than controls, their level of subjective complaint was not found to be significantly higher. While subjective complaints of prospective memory were found to associate significantly with self-reported executive dysfunctions, significant relationships were not found between these complaints and performance on a computer-based task of prospective memory and other objective measures of memory. Taken together, these findings suggest that subjective and objective measures of prospective memory are two distinct domains that might need to be assessed and addressed separately.

Keywords: Schizophrenia; Schizotypal personality disorder; Prospective memory; Subjective cognition

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1. Introduction

Cognitive deficits are considered a core feature of schizophrenia. Empirical findings have shown that marked cognitive impairments are common in schizophrenia (Chan et al., 2006a,b; Heinrichs and Zakzanis, 1998) and can be found in up to 75% of patients (Goldberg et al., 1988). Although the majority of patients with schizophrenia are responsive to treatment of positive symptoms, their cognitive impairments are more long term and could lead to poor social and occupational outcomes (Aleman et al., 1999). Memory impairment is considered one of the most pervasive cognitive dysfunctions in schizophrenia (Aleman et al., 1999; Bilder, 1996; Goldberg and Gold, 1995; Heinrichs and Zakzanis, 1998; Pantelis et al., 1996).

Previous studies on memory dysfunction in schizophrenia have been focused on retrospective memory (e.g., Heinrichs and Zakzanis, 1998; Henry et al., 2007). Comparatively, little is known about the nature and magnitude of prospective memory deficits in this clinical group. Retrospective memory is the ability to recall from a past time point, whereas prospective memory is defined as the ability to perform an intended action at a particular point in the future (Craik, 1986; McDaniel et al., 2003). Prospective memory can be further classified into three subtypes: (a) event-based, where a person is required to perform an intended action on meeting certain persons or objects (acting as cues); (b) time-based, where a person is required to perform an intended action at an appropriate time point in the future; and (c) activity-based, where a person is required to carry out certain actions at the end of an ongoing activity (Einstein and McDaniel, 1990).

Prospective memory is considered crucial for patients to achieve and maintain an optimal level of functioning in daily living. Failures in prospective memory may lead to undesirable consequences and poor rehabilitation outcomes for patients with schizophrenia and other related disorders (Kurtz et al., 2001; Shum et al., 2001). For example, forgetting to turn up for a doctor's appointment, forgetting to pay bills, or forgetting to take medication on time can all have serious consequences for patients. A systematic database search (EBSCOhost, PsychINFO, PsyARTICLES, MEDLINE, and ScienceDirect) using the keywords "schizophrenia + prospective memory" and a manual search from the references, indicates that only nine studies of prospective memory in schizophrenia (Elvevag et al., 2003; Henry et al., 2007; Kondel, 2002; Kumar et al., 2005; Ritch et al., 2003; Shum et al., 2004; Twamley et al., in press; Wang et al., in press; Woods et al., 2007) have been published to date. Table 1 summarizes the major findings of these studies and the computed effect sizes of prospective memory deficit in schizophrenia as compared to healthy controls. Three of these studies (Kondel, 2002; Ritch et al., 2003; Twamley et al., in press) did not include a control group for comparison. Therefore, we could not estimate effect sizes for them. Despite the methodological limitations of some of these studies (e.g., including mainly chronic patients who were treated with a wide variety of atypical and typical antipsychotics), the results suggest that the effect size of prospective memory deficits in schizophrenic patients is generally large (Cohen's d ranges from 0.78 to 1.56). Henry et al. (2007) suggested that prospective memory impairment represents a primary deficits rather than a consequence of other cognitive deficits known to be affected in schizophrenia. Wang et al. (in press) demonstrated that these deficits were found in both clinical cases and non-clinical individuals with schizotypal personality features and suggested prospective memory can be considered a potential endophenotype of schizophrenia.

In addition to the performance of objective measures, subjective cognitive complaints can also be important for the early detection of schizophrenia. This is because these complaints precede prodromal symptoms and are therefore useful in predicting onset and relapse of schizophrenia (Klosterkotter et al., 2001; Nuechterlein and Dawson, 1984) as well as long-term symptomatic deterioration (Moritz et al., 2000). Further support comes from findings indicating that, without the corroboration of subjective measures, cognitive deficits detected by objective measures are not sufficient to accurately predict illness onset (e.g., Weiser et al., 2001). Therefore, subjective cognitive impairments can provide additional information for medical practitioners and researchers what conventional objective neuropsychological tests are unable to tell about the severity of clinical and functional outcomes of the patient. Subjective measures of cognitive function such as self-report questionnaires or related scales help to shed light on self-perceived cognitive difficulties in daily-life activities, which are otherwise unobservable behaviorally.

Further to our previous findings (Wang et al., in press), the purpose of the current study was to examine the relationship between computer-based prospective memory tasks and the corresponding subjective complaints in an independent sample of patients with schizophrenia. To achieve this aim, we adopted a comprehensive assessment of prospective memory in terms of time-, event- and activity-based tasks that originated from cognitive psychology. We also examined the subjective complaints of prospective memory using a psychometrically sound self-reported