

# The Function of Context Processing in Episodic Memory Impairment in Children and Adolescents at Risk of Schizophrenia

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## Letter

People with schizophrenia suffer episodic memory abnormalities, which have been linked to processing context deficiencies. Although previous research has found episodic memory problems in young persons at risk for schizophrenia, it is unclear how much of this is due to context processing deficiencies. We investigated whether children and adolescents at risk for schizophrenia had context processing abnormalities during free recall, a memory test with strong contextual demands, to fill this gap in the research. 16 high-risk, unaffected first-degree relatives of patients with schizophrenia, bipolar disorder, and/or schizoaffective disorder, 22 clinical control participants with a comorbid disorder (ADHD and/or an anxiety disorder), and 20 healthy control participants made up our sample (N = 58, 9-16 years old). The participants completed a free recall task before moving on to a recognition memory challenge. We anticipated that context processing was more important in free recall than recognition memory, based on existing theories of episodic memory. As a result, if context processing deficiencies are linked to schizophrenia risk, memory impairment should be seen in free recall assessments that are most sensitive to context processing (i.e., recall accuracy and temporal contiguity). Free recall accuracy and temporal contiguity were poorer in the high-risk group than in the healthy controls, confirming this assumption, although recognition memory was equivalent across groups. These findings show that context processing deficiencies may underpin episodic memory problems in unaffected first-degree relatives with schizophrenia.

Schizophrenia is a serious mental illness that affects one's ability to think clearly. Episodic memory is a type of cognition that is consistently impaired in schizophrenia prodrome, patients with schizophrenia, and adults genetically at-risk for schizophrenia. In certain research, episodic memory deficits in young first-degree relatives have been found to predict schizophrenia diagnosis later on. This shows that people who are most likely to acquire the illness may have memory problems. We investigated the function of context processing in children and adolescents at risk for

schizophrenia to describe this sensitivity to memory impairment and its underlying processes. The capacity to encode and recover associations among event characteristics, such as when, where, and with whom they happened, is referred to as context processing in episodic memory. Disruptions in this processing might be at the root of the episodic memory problems seen in schizophrenia. Free recall and source memory are two types of episodic memory tests that are more vulnerable to schizophrenia-related deficits than tasks that require recognition choices. This differential sensitivity predicts that memory impairment caused by schizophrenia should be more evident in tasks that need more self-initiated creation of contextual cues, such as free recall, than in activities that require less cue generation, such as recognition.

Researchers have used free recall to discover context processing deficiencies, which they believe underpin schizophrenia-related episodic memory problems. Participants in free recall examine a list and then recall things in any order. The amount to which elements are remembered in the studied order, known as temporal contiguity, is thought to suggest good context processing. Patients with schizophrenia and persons with first-episode psychosis recall fewer words and have less temporal contiguity than healthy controls. Similarly, young adults with a high level of negative schizotypy symptoms, which indicate schizophrenia-spectrum illnesses, had lower free recall accuracy and temporal contiguity than those with a normal level of negative symptoms. The new study adds to this body of knowledge by examining whether episodic memory problems in young persons at risk of schizophrenia are due to a lack of context processing. Children and adolescents with differing levels of schizophrenia risk completed activities that required different levels of context processing. They performed a free recall exercise before moving on to a recognition assignment. We predicted impairments associated with high risk for developing schizophrenia to manifest selectively in the free recall tests, based on the context-deficit concept of schizophrenia-related memory impairment.

In conclusion, this is the first study to characterize the similarities and variations in features of episodic memory in children and adolescents at risk for schizophrenia. On recall measures most sensitive to context processing, we investigated the hypothesis that context deficiencies associated with schizophrenia risk would translate to episodic memory deficits in a high-risk group. High-risk, first-degree relatives of patients with schizophrenia and similar illnesses exhibited reduced free recall performance and temporal organization of later recalls, which was consistent with this theory. This is comparable with episodic memory patterns previously seen in schizophrenia patients and young adults with significant negative schizotypy symptoms. However, we found considerable discrepancies, notably in first recall probabilities and inter response delays, suggesting that context-processing deficiencies in this sample affected retrieval patterns in free recall. Using versions of a context-based computational model of free recall, future research might determine the specific nature of context processing deficiencies. This model-based technique might be used to uncover abnormalities in certain environmental systems in participants, allowing schizophrenia development to be predicted.