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Tactile working memory in blindness

Abstract:

Working memory, the ability to temporarily hold and process information, is central to human cognition. Assessment tests for evaluating working memory in persons with blindness are very limited and most are not properly validated. In addition, it is still unclear whether the loss of sense itself or the extent of use in everyday life influences working memory in different modalities. Recently, a task called the Tactual Span was developed to assess working memory in the tactile modality, showing proper validity and reliability estimates. In Study 1, we aimed to examine the validity of the Tactual Span in a sample of persons with blindness. Twelve participants with congenital and thirteen with late blindness were compared to eighteen sighted controls. The groups performed the Tactual Span, three additional tasks assessing verbal working memory, and a verbal fluency task. The Tactual Span adequately distinguished the blind from sighted individuals, indicating good sensitivity and specificity values. The blindness groups performed better than sighted controls on the working memory tasks, but not on the verbal fluency task. In Study 2, we aimed at investigating the effect of everyday use on tactile working memory in blindness and deafness. Fourteen participants with congenital blindness and twenty with congenital deafness performed working memory tasks in different modalities, compared to twenty-two healthy controls. Participants with blindness outperformed the other two groups, and the deafness group was better than controls in the visuospatial but not the tactile task. Findings support the feasibility of the Tactual Span for assessing tactile working memory in individuals with blindness. Additionally, the extent of use in everyday life, not the deprivation per se, affects working memory functioning.

Keywords: working memory, blindness, Tactual Span, assessment

Biography: Dr. Heled is a clinical neuropsychologist and rehabilitation psychologist who works in therapy with diverse populations with developmental and acquired disabilities. He supervises interns in their therapeutic and assessment work. Dr. Heled's main research interest is executive functions in individuals with eating disorders, brain damage, and sensory deprivation. As a clinician-researcher, Dr. Heled aims to advance knowledge among rehabilitation professionals to improve care and assessment services.