Abstract

In the study of human behavior, working memory has been seen as a central construct (Conway, Kane, Bunting, Hambrick, Wilhelm, & Engle, 2005) since the cognitive revolution took place. Working memory refers to those mechanisms or processes that are involved in the control, regulation, and active maintenance of task-relevant information in the service of complex cognition (Miyake & Shah, 1999), and is considered one of the main limiting factors for complex abilities such as reasoning or reading comprehension. Methodologically, the Reading Span Task (Daneman & Carpenter, 1980) has proven to be both a reliable and valid measure of working memory capacity, and is a widely used measure. The purpose of this study was to develop a local adaptation of the Reading Span Task, based on two previous Spanish versions (Gutiérrez, Jiménez, & Castillo, 1996; Elo súa, Gutiérrez, García Madruga, Luque, & Gárate, 1996), whose psychometric properties were not known. In both cases, the Reading Span capacity was significantly correlated with measures of reading comprehension. However, the psychometric properties of the Reading Span Task were not analyzed. The task requires participants to read a set of unrelated sentences, each of which is between 12 and 14 words long, one sentence at a time, at their own pace. Sentences are arranged in 4 sets of 2, 3, 4, and 5 sentences. There are three different trials at each set-size (number of sentences) level. After having read all the sentences in each set, participants try to recall the final word of each sentence. Working memory capacity is both the maximum number of sentences for which the participant can recall the final word (Span) and the total number of sentence-final words recalled (Conway et al., 2005). The task was administered in one session to 132 undergraduates at the University of Buenos Aires (UBA), along with other standardized short-term and working memory tests, Digit Span and Visuo-Spatial Span from the Wechsler Memory Scale - Revised (Wechsler & Stone, 1987), and Letter- Number Sequencing from the Wechsler Adult Intelligence Scale III (Wechsler, 2003). The Reading Span Task showed high reliability ($\omega = .95$). The percentile analysis shows that those participants that obtained a Span of 2 or recalled 6 words fall in the 25th percentile, while those that obtained scores above a Span of 3.5 and recalled more than 24 words fall above the 75th percentile. The correlation analysis shows that the Reading Span Task has positive and significant correlations with verbal memory tasks (measured by Span, Forward Digit Span $r = .408; p < .01$; Backward Digit Span $r = .502; p < .01$; Letter-Number Sequencing $r = .504; p < .01$; measure by Number of sentence-final words recalled, Forward Digit Span $r = .416; p < .01$; Backward Digit Span $r = .496; p < .01$; Letter-Number Sequencing $r = .489; p < .01$), but not with visuo-spatial memory tasks (measure by Span, Forward Visuo-Spatial Span $r = .169; p = n.s.$; Backward Visuo-Spatial Span $r = .018; p = n.s.$; measure
by Number of sentence-final words recalled, Forward Visuo-Spatial Span $r = .189; p < .05$; Backward Visuo-Spatial Span $r = .032; p = n.s.$). A factor analysis showed the separation of the two factors involved in the tasks: a verbal factor whose capacity is affected by the Reading Span Task, Digit Span and Letter-Number.

**Keywords**

Reading Span Task, Working memory, Verbal capacity, Individual differences, Reading.