

BAR-ILAN UNIVERSITY

**The Relationship between thought
processes which lead to creativity and
executive functions:**

**Is it similar for convergent thinking and
divergent thinking?**

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Abstract

Over the past few decades there have been many studies conducted on creativity and upon what it is based. To date, almost all the studies conducted have centered on the means of testing creativity as defined by the pioneers in this field – among them, Mednick, Guilford, and Torrance (Guilford & Hoepfner, 1971; Mednick, 1968; Torrance, 1990). These researchers defined two types of creative thinking: convergent and divergent. In order to understand the characteristics of creativity, many studies seek objective standards. Such indexes reflect, generally, other higher functions such as executive functions, as defined by three components: shifting, inhibition, and updating (Friedman, Miyake, Young, DeFries, Corley & Hewitt, 2008; Miyake et al., 2000). Many of the studies from recent years tend to show positive correlations between creativity and these functions.

The goal of the current study is to look into the relationship between creativity tests based on divergent and convergent thinking and executive function indexes using a fuller and broader range of tests than is customary in existing literature. This is based on previous studies, but with an attempt to overcome the disadvantages of using individual indexes or those which are not circumferential enough.

One hundred and forty one Hebrew-speaking, right-handed adults ages 19-35 participated in the study. Participants underwent creativity testing alongside executive function testing. For divergent thought process indexes, the participants performed the figurative section and the Unusual Use task from the verbal section of the Torrance Tests of Creative Thinking (TTCT). For convergent thinking, the participants performed a Hebrew

version of Mednick's Remote Associates Test. For executive functioning, the following tests were conducted: for updating – a forward and backward numbers memory test, for inhibition – the Stroop Test, and for shifting – drawing a nonexistent object, the Five Point Test, and the Wisconsin Card Sorting test.

The findings confirm the existence of positive correlations between creativity testing and executive functions, with significant differences between creativity tests on the correlation map. The Remote Associates Test, which tests convergent thought, was found to have more and stronger correlations with executive functions than correlations for the tests of divergent thought. Significant correlations were found between the Remote Associates Test and the Five-Point Test, the Wisconsin Card Sorting Test, the forward and backward numbers memory test, and the Stroop Test. The figurative section of TTCT was found to have a significant correlation with the Five-Point Test, which is a graphic test, the Wisconsin Card Sorting Test, and the Stroop test. The verbal section of the TTCT was found to have a significant correlation only with the forward and backward numbers memory test, which relates to phonological memory. A significant correlation was found between the three creativity tests.

The findings corroborate the existence of a multi-dimensional picture of creativity. This picture emphasizes the fact that the processes needed in order to develop creativity are comprised of both convergent and divergent thinking.