

Would Perceptual and Propositional Problem Solving Strategies Effect Creative Problem Solving Differentially?

by

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ABSTRACT

Differential neural correlates and eye-movement data to Raven's advanced progressive matrices (RAPM) challenge the unidimensional general fluid intelligence (gF) assessment. These studies showed two types of reasoning: visuo-spatial/ perceptual and verbal-analytical/ propositional reasoning, indicating distinct cognitive processing. This acknowledgment becomes vital during intelligence and creative thinking prediction, as traditional problem solving test does not predict creative reasoning ability very well. This mismatch could be because of the flawed gF assessment as a precursor for creative thinking. Study evaluating the relation between mental imagery and creative thinking showed that creativity is a task and domain specific thinking, and favors a particular kind of strategy. Therefore, it can be argued that if creative thinking can be favored by a specific thinking strategy, then better creative reasoning score would be expected with verbal-analytical reasoning strategy than visuo-spatial RAPM because of their strategic alignment.

We have conducted a study by asking participants to solve and create similar kind of problem. A between group eye-movement study with 12 naïve participants was conducted with two groups: visuo-spatial and verbal-analytical RAPM. Each condition consisted of two stages: RAPM followed by creative reasoning test (CRT), in which participants were instructed to create a 3x3 Raven's like matrix. Participants' performance was measured by employing behavioral and eye tracking data while solving RAPM. The CRT was scored using Jaarsveld's rules.

The current pilot data shows comparatively larger pupil size with verbal-analytical than visuo-spatial RAPM. The verbal-analytical RAPM took longer time than visuo-spatial RAPM. The CRT preceding verbal-analytical RAPM showed higher score than CRT preceding visuo-spatial RAPM.

Despite encouraging results, we cannot generalize the observation because of the small sample size. We plan to extend this study further with more participants and examine the effect of two strategies on CRT scores, while evaluating the eye-tracking responses.

Ethics statement:

Research was approved by the Local Research Board Committee at IIIT-Hyderabad. Participation in research was carried out in accordance with the American Psychological Association ethical guidelines for conducting behavioral experiment. It was a voluntary participation and participants were paid for their contribution in this research. Participants did sign an informed consent form about the stimuli and response, before beginning the experiment.

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