

UNPACKING DIVERGENT THINKING AND INTELLIGENCE: HOW FACTORS INFLUENCE CREATIVE PERFORMANCE

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WHAT IS CREATIVITY?

- Generation of novel and useful ideas, solutions, or products (Mumford & Gustafson, 1988)
 - Novelty – originality, uniqueness, newness
 - Usefulness – quality, practicality, appropriateness
- Measurement:
 - Self-reports (e.g., K-DOCS, CPS, etc.)
 - Expert ratings (e.g., solution ratings)
 - Counts (e.g., fluency and uniqueness ratios)
- In the current study: creative problem solving production and ratings

CREATIVE PROBLEM SOLVING

- Type of problem matters
 - Routinized (Dillon, 1982)
 - Ambiguous (Newell, Shaw, & Simon, 1962; Wakefield, 1992)
- Creative problem solving is one process by which individuals solve ambiguous problems (Mumford, Wetzel, & Reiter-Palmon, 1997)
- Cognitive process models (e.g., Mumford et al., 1991)

PROBLEM CONSTRUCTION

- Benefits of problem construction
 - Structures the problem around goals (Mumford, Reiter-Palmon, & Redmond, 1994)
 - Decreases ambiguity (Anderson, 2000)
 - Structures downstream creative processes (Mumford et al., 1991)
 - Problem representations
- Active engagement
 - Often unconscious and automatic
 - Problem restatements (Baer, 1988; Reiter-Palmon et al., 1997)
 - Restatement selection (Mumford et al., 1997)

CREATIVITY INFLUENCERS

- Early conceptual and empirical work concluded intelligence and creativity were distinct yet related (for review see Batey & Furnham, 2006)
 - Positive relationship
 - Threshold Theory
- Divergent Thinking
 - Integral in creativity (Guilford, 1950)
 - Positive relationship with creativity indices (Kim, 2008)
 - Divergent thinking critical in early phases of creative problem solving (e.g., Vincent et al., 2002)

CONCEPTUAL BLIND SPOTS

- We have not examined the mechanisms by which intelligence and divergent thinking influence creativity
- Both factors may be critical in early phases of creative production, specifically problem construction

HYPOTHESIS ONE

- The relationship between intelligence and creativity will be mediated by problem construction quality and originality

HYPOTHESIS TWO

- The relationship between divergent thinking and creativity will be mediated by problem construction originality and quality.

PARTICIPANTS

- 175 students recruited from UNO
- Largely a Caucasian (66%), female (83%) sample
- Represented a range of grade levels
 - Freshman (9%)
 - Sophomore (20%)
 - Junior (29%)
 - Senior (36%)

PROCEDURE

- Participants were presented with two ambiguous stories
 - College student working at a pizza shop whose roommate is stealing from the company
 - College student with a transportation problem and living challenges
- Before solving the problem, participants were asked to restate the problem in as many ways possible
- After restating the problem, participants provided a solution to each situation
- Once the problem solving task was completed, participants completed additional ability measures

MEASURES

- Intelligence – Shortened Raven's Advanced Progression Matrices
- Divergent Thinking – Fluency (i.e., count) of ideas produced
- Ratings
 - Independent teams of students rated the **problem restatements** for originality and quality
 - Independent teams of students rated the **problem solutions** for originality and quality

RESULTS

- Results indicated the relationship between Divergent Thinking and Problem Solution Quality and Originality is fully mediated by Problem Construction Quality and Originality



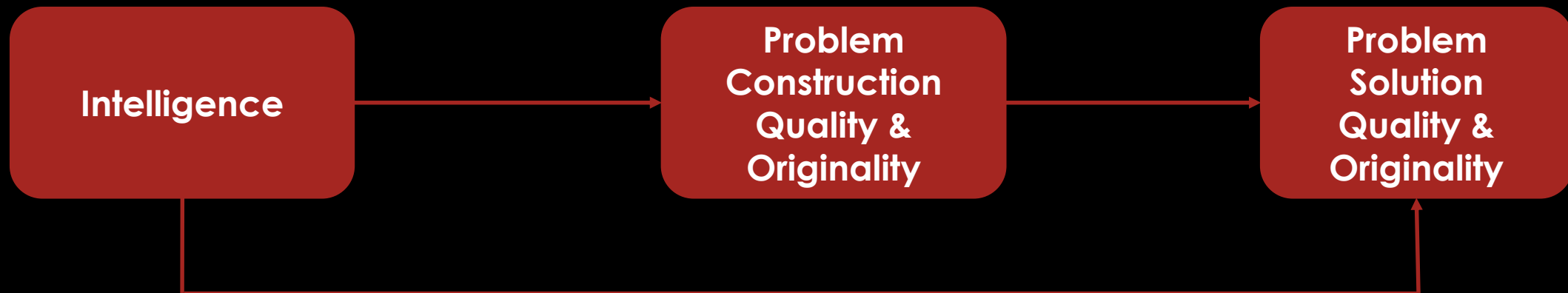
95% Confidence Intervals from Bootstrapping for Indirect Effects:

Problem 1: Originality [0.01, 0.04]; Quality [0.01, 0.04]

Problem 2: Originality [0.01, 0.03]; Quality [0.01, 0.04]

RESULTS

- Results indicated the relationship between Intelligence and Problem Solution Quality is fully mediated by Problem Construction Quality; and Problem Solution Originality is partially mediated by Problem Construction Originality



95% Confidence Intervals from Bootstrapping for Indirect Effects:

Problem 1: Originality [-0.001, 0.03]; Quality [-0.01, 0.02]

Problem 2: Originality [0.001, 0.03]; Quality [0.001, 0.03]

95% Confidence Intervals from Bootstrapping for Direct Effects:

Problem 2: Originality [0.01, 0.10]

IMPLICATIONS

- Results indicate Divergent Thinking is completely mediated by problem construction
 - Additional support that Divergent Thinking is critical in early phases of creative production
 - Better understanding of how Divergent Thinking influences creative problem solving
- Results are mixed for intelligence, indicating possible alternative mechanisms by which intelligence influences creativity
 - Possible task specific influences

THANK YOU!

QUESTIONS?

