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 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]
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