UNPACKING DIVERGENT THINKING AND INTELLIGENCE: HOW FACTORS INFLUENCE CREATIVE PERFORMANCE

Kevin Mitchell
Industrial/Organizational Psychology
Advisor: Dr. Roni Reiter-Palmon
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 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]
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?