Cognitive Ability Tilt & Job Performance

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Psychology Research Day
The Graduate Center, CUNY
May 1, 2020
What Is Cognitive Ability?

- The capacity to “reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience” (Gottfredson, 1997)
Cognitive Ability & Job Performance

- Most research on the relationship between cognitive ability and job performance has emphasized $g$

- Recent resurgence of interest in specific cognitive abilities and empirical support for their validity (e.g., Kell & Lang, 2018; Lang et al., 2010; Nye et al., 2018; Wee et al., 2014; Wee, 2018)

- The renewed interest has created opportunities for new research streams
Ability Tilt

- Within-person asymmetry between two specific abilities (e.g., quantitative > verbal)

- Typically explained in terms of investment and differentiation theories (e.g., Cattell, 1987)

- Predicts domain-specific outcomes, including occupational preferences & accomplishments (e.g., Lubinski, 2009; Park et al., 2008; Coyle et al., 2014; Coyle, 2016)
Study Overview

• Examined relations between ability tilt and job performance in a large sample of jobs

• Theory and empirical research suggest that fit between employee abilities and job requirements is positively related to performance (Connell et al., 2003; Edwards, 1991; Kristof-Brown et al., 2005)

• Predictions
  – Ability tilt will differentially relate to job performance based on a match vs. mismatch with job requirements
  – Ability tilt will provide incremental validity over g and specific abilities when the tilt matches job requirements
Method

• GATB dataset
  – N = 23,994
  – 80 jobs in 14 job families

• Variables
  – GATB scores (V, N, S, P, Q)
  – g scores
  – Ability tilt scores
  – Job performance ratings
  – Job tilt scores
    • Computed using O*NET ratings of ability importance & ability level
    • Job tilt = (Importance$_1$ + Level$_1$) − (Importance$_2$ + Level$_2$)
Method

• Job groups
  – **Matched job groups:** Jobs with job tilt scores at least 1 SD higher than sample mean for each type of tilt
  – **Mismatched job groups:** All jobs with negative job tilt scores for each type of tilt

• Analytical strategy
  – Correlation coefficients controlling for $g$
  – Relative weights analyses (Johnson, 2000)
Results

• Matched job requirements
  – Positive correlations for 14 of 18 types of ability tilt, though only 10 reached statistical significance
  – Mean effect size of .07

• Mismatched job requirements
  – Negative correlations for 13 of 18 types of ability tilt, though only 11 reached statistical significance
  – Mean effect size of −.05

• “Reverse” tilt effects mostly quantitative tilts
Results

• Relative weights for ability tilt ranged from 2.8% to 17.7%; mean of 7.1%

• Incremental validities
  – $\Delta R^2$ over $g$ ranged from .000 to .017; mean of .007
    • Comparable to incremental validity of biodata (Schmidt & Hunter, 1998)
  – $\Delta R^2$ over $g +$ specific abilities ranged from .000 to .008; mean of .003

• Supplementary analyses: Is tilt detrimental to performance in “generalist” jobs?
  – Tilt was unrelated to performance in these jobs
Discussion

• Relationship between ability tilt and job performance depends on the requirements of the job

• Ability tilt can be a *relatively* important predictor of job performance and can provide incremental validity over indicators of ability level – plus, it requires no additional measures

• Ability tilt is neither beneficial nor detrimental for “generalist” jobs – other factors may be involved
Future Research

• Examine more complex patterns/profiles of cognitive ability
• Further break down the criterion domain
• Expand to higher complexity jobs, including management jobs
• Test whether the counterintuitive quantitative tilt effects generalize
References


