

Testing for Cognitive Ability with Reduced Adverse Impact

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June 2008

Key Outcomes for Personnel Selection

- Validity

- Utility

- Adverse Impact

The Story on Cognitive Ability Testing and Personnel Selection

- ✓ High Validity
 - ✓ High Utility
 - ✗ High Adverse Impact
- Search for alternative tests and means of implementation

Based on the Psychometric Theory of Intelligence (Spearman, 1904)

■ We “know”*:

- The nature of intelligence (singular g)
- How to measure intelligence
- Intelligence is the most important predictor of job performance
- Whites possess more intelligence than minorities (e.g., African-Americans, Hispanics)

*Jensen (1998)

Psychometric Perspective

- Single latent variable (Spearman, 1904)
- Positive manifold (Spearman, 1927)
- Factor analysis (Carroll, 1993)
- Validation research (Schmidt & Hunter, 1984)
- ‘Spearman hypothesis’ of racial differences (Jensen, 1998)

Other Perspectives on Intelligence

■ Other

- Definitions
- Structures
- Models/theories
- Rationales for positive manifold and factor analytic outcomes
- Explanations for racial differences
- Views

Construct Validity and Measuring Intelligence

- Construct Relevance
- Construct Deficiency
- Construct Contamination

Designing New Measures

■ Modern techniques:

- Create theory driven measures
- Reduce use of language and prior knowledge (Fagan)
- Un-entrenched approach (Sternberg)

■ Some of the new measures:

- Wechsler's WAIS (Version 3)
- Fagan (Processing Approach)
- Sternberg (Rainbow Project)
- Siena Reasoning Test (SRT)

Siena Reasoning Test (SRT)

- 40 items; 40 minutes
- Items tap
 - processing and manipulating information
 - drawing inferences
 - reasoning
 - making decisions
 - integrating knowledge
- Adapt format
 - Reduction of language
 - Non-entrenched

Demo ©

SRT Validity Studies

<i>Position</i>	<i>r with Perf</i>	<i>Type of Performance</i>
Deputy Sheriff	.27*	OTJ
Emergency Comm Tech	.48*	OTJ
Firefighter	.38*	Training Academy
Deputy Sheriff	.49*	Training Academy
Production Operator	.27*	OTJ
Student	.43*	Learning - GPA

SRT Validity Comparison

<i>Position</i>	<i>r with Perf</i>	<i>r Other Cog Tests with Perf</i>
Deputy Sheriff	.27*	.33* (Math) .35* (Reading)
Emergency Comm Tech	.48*	.32 (General Intell)
Firefighter	.38*	.41* (Math) .41* (Reading)
Deputy Sheriff- Acad.	.49*	.38* (Math)
Production Operator	.27*	.28* (Written)
Student	.43*	.11 (Wonderlic)

Incremental Validity of SRT

Position	Test (r)	SRT (r)	Composite (R)
Firefighter Academy	Biodata (.29*)	SRT (.38*)	.48*
Sheriff OTJ	Biodata (.38*)	SRT (.27*)	.43*
Sheriff OTJ	Situational Judgment (.32*)	SRT (.27*)	.38*

Adverse Impact of the SRT

■ Sex

- No difference

■ Race

- Substantially mitigates adverse impact
(relative to other written cognitive ability tests)
- Allows for a more selective cut score

Black-White Differences of SRT

<i>Position</i>	<i>SD diff</i>
Deputy Sheriff	.35
Emergency Communication Tech	.34
Firefighter	.43
Production Operator	.18
Real Estate Appraiser	.09
Student	-.04

Summary

- Personnel selection must go beyond the psychometric perspective on intelligence
- We have an opportunity to develop cognitive measures that have high validity, high utility, and low adverse impact

QUESTIONS?