

Thinking Outside the Box in Merit Selection

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Two Most Vexing Problems

- Adverse Impact
- Ceiling on Validity

Adverse Impact

- Seen with cognitive ability tests
- DOJ sometimes favors random selection
 - Perhaps with a low cut point
- Search for alternative selection procedures has led to innovations in personnel selection

Ceiling on Validity

- Rarely observe validity over .50

New Ideas

- New ways to use test scores
 - Reduce adverse impact
 - Maintain validity
- New selection tools/approaches

New Ways To Use Test Scores

- Wiesen Occupational Diversity Models
 - A family of models
 - Depart from weighted component model
- Greatest Strength Model (SGM)
- Many variations of WODM
 - Greatest Two Strengths Model
 - Drop Lowest Score Model

Wiesen Occupational Diversity Model

- Employees contribute based on strengths
- Cookie-cutter model may be wrong for some jobs

Greatest Strength Model

- Step 1. Give several tests
- Step 2. Put tests on common metric
- Step 3. Determine highest score
- Step 4. Fail candidates with any low score
- Step 5. Rank candidates based on their highest scores

Firefighter Example

- Written (M/C) test of cognitive ability
- Structured oral interview
- Physical performance test (PPT)

Greatest Strength Model: Firefighter Example

Person	Written	Oral	PPT	Highest Grade
A	80	90	95	95
B	90	70	80	90
C	75	65	80	80

Evaluating the GSM

- Adverse Impact
- Validity

Approaches to Evaluation

- Data from the real world
- Simulation study

Simulation Study

- Create imaginary applicants
- Create test/job data with known correlations
- Evaluate data two ways:
 - GSM
 - Conventional approaches

Simulation Study Methodology

- Specify intercorrelations
- Generate data with these intercorrelations
- Create gender and EEO groups
- Create mean score differences
- Evaluate adverse impact in appointments
- Evaluate validity

Specify Intercorrelations

	Oral	PPT	Gender	EEO Gp.	Job Perf.
M/C Cog	.2	0	0	0	.35
Oral		0	0	0	.35
PPT			0	0	.35
Gender				0	0
EEO Gp.					0

Create Mean Score Differences

- Gender: 1.25 s.d. on PPT
- EEO Group: 1 s.d. on written cognitive test

Adverse Impact in Appointments

- Will vary by selection ratio
- Lower selection ratios yield higher impact
- Assume we hire top 3% of applicants
 - Extreme example
 - Realistic for Massachusetts

Adverse Impact in Appointments

M/C Cog Only					
EEO	Gender				
.08	1.04				

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

GSM stands for Greatest Strength Model.

Adverse Impact in Appointments

M/C Cog Only		Composite			
EEO	Gender	EEO	Gender		
.08	1.04	.30	.21		

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

GSM stands for Greatest Strength Model.

Adverse Impact in Appointments

M/C Cog Only		Composite		GSM	
EEO	Gender	EEO	Gender	EEO	Gender
.08	1.04	.30	.21	.73	.75

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

GSM stands for Greatest Strength Model.

Adverse Impact in Appointments

Sample of 1,000	M/C Cognitive Only		Composite		GSM	
	EEO	Gender	EEO	Gender	EEO	Gender
1	.03	1.00	.15	.30	.71	1.67
2	.07	.88	.43	.20	.62	.50
3	.07	.76	.11	.25	.28	.77
4	.03	1.14	.25	.20	.33	.60
5	.11	1.50	.25	.15	.53	.37
6	.00	.88	.50	.30	.56	.79
7	.03	1.31	.15	.43	.71	1.00
8	.03	1.00	.50	.25	1.00	.83
9	.15	.76	.30	.15	.56	.79
10	.15	.76	.30	.15	.56	.79
Average	.07	1.00	.29	.24	.59	.81

Evaluate Adverse Impact

- Much lower adverse impact with GSM

Evaluate Validity

- We have job performance data!
- We have GSM grade
- We can calculate a composite score based on M/C cognitive, oral, and PPT
- Can compute criterion-related validity

Evaluate Validity

M/C Cog Only		
.31		

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

Evaluate Validity

M/C Cog Only		GSM
.31		.40

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

GSM stands for Greatest Strength Model.

Evaluate Validity

M/C Cog Only	Composite	GSM
.31	.52	.40

Note: Based on 50,000 cases.

Key: EEO stands for EEO group.

GSM stands for Greatest Strength Model.

Evaluate Validity

Sample of 1,000	M/C Cog. Only	Composite	GSM
1	.29	.49	.41
2	.33	.52	.42
3	.30	.55	.43
4	.25	.46	.36
5	.34	.53	.43
6	.32	.55	.40
Average	.30	.51	.39

Evaluate Validity

- Higher validity for GSM than M/C cognitive
- M/C cognitive was the standard for generations

Two Most Vexing Problems

- Adverse Impact
- Ceiling on Validity

Ceiling on Validity

- Consider other models of job performance
- New ideas on tests and their uses
- “New” KSAPs may have unexpected relationships with criterion

Models of Job Performance

- Compensatory model
- Wiesen Occupational Diversity Models
 - Greatest Strength Model
 - Drop Lowest Score Model
 - Many other possible models
- Parse abilities more finely and look for non-linear solutions to regression equations

New Ideas on Tests

- New ways to use test scores
 - Reduce adverse impact
 - Maintain validity
- New selection tools/approaches (Wiesen, 2004)

New Selection Tools/Approaches

- Alternate ways to pass the first hurdle
- More use of life/work experience
- Other types of tests
- Consider stability of personality traits
 - 75% of variation in weekly job performance is within person rather than between person. (Stewart and Nandkeolyar, 2006)

More Ways to Pass First Hurdle

- Written cognitive ability test
- High school rank
- Score on statewide HS graduation test
- College degree
- Honorable discharge from military
- Allow retaking test
- Several week course

Life and Work Experience

- Volunteer experience as Firefighter
- Paid experience as Firefighter
- Recommendations from teachers

Other Types of Tests

- Several week course on fire subjects
- Face recognition tests (esp. for police)
- Short term memory test
- Peripheral vision test
- Spatial orientation (esp. for firefighter)
- Balance
- Oral comprehension of various dialects
- Fine motor coordination (e.g., paramedics)

Other Types of Tests

- Mackworth Clock Test
 - Attentional capacity (e.g., Hollenbeck et al. 1995)
- Affect intensity (e.g., Larson, 1987)
- Education & experience evaluations
 - Citizenship behaviors
 - Altruistic behaviors
 - Ability to deal with interruptions

Stability of Personality Traits

- Cognitive ability is stable
- Within-person variability of personality
 - Sociability may vary from day to day
 - Responsibility may wax and wane
 - e.g., Beal et al. (2005), Fleeson et al. (2002)
- Can our current models handle this within person variability?

Summary

- New ways to combine test scores
 - Greatest Strength Model (GSM)
 - Wiesen Occupational Diversity Models
- Reduce adverse impact
- Maintain Validity
- New measurement tools and approaches

Final Thoughts

- Field is still young and developing
- Call for collaboration in simulations
 - Students
 - Researchers
 - Practitioners
- Call for real life applications
 - Police Officer
 - Firefighter

Copies of this presentation are available at:
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References

- Beal, DJ, Weiss, HM, Barros, E & MacDermid, SM (2005) An Episodic Process Model of Affective Influences on Performance. *Journal of Applied Psychology*, 90, 1054-1068.
- Fleeson, W, Malanos, AB & Achille, NM (2002) An Intraindividual Process Approach to the Relationship Between Extraversion and Positive Affect: Is Acting Extraverted as "Good" as Being Extraverted? *Journal of Personality and Social Psychology*, 83, 1409-1422.

References

- Hollenbeck, JR, Ilgen, DR, Tuttle, DB & Segoe, DJ. (1995) Team Performance on Monitoring Tasks An Examination of Decision Errors in Contexts Requiring Sustained Attention. *Journal of Applied Psychology*, 80, 685-696.
- Larsen, R.J. (1987) The Stability of Mood Variability A Spectral Analytic Approach to Daily Mood Assessments. *Journal of Personality and Social Psychology*, 52, 1195-1204.

References

- Stewart, G.L. & Nandkeolyar, A.K. (2006) Adaptation and intraindividual variation in sales outcomes: exploring the interactive effects of personality and environmental opportunity. *Personnel Psychology*, 59, 307-332.
- Wiesen, J. (2004, October) *Adverse Impact: Theory and Practical Approaches*. Paper presented at the Fall meeting of MAPAC, New York, NY.