Intersectionality in Personnel Selection: Gaining a Full Picture of the Applicant Pool

NATIONAL TESTING NETWORK

ERGO METRICS

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Welcome!

Agenda

- About Us
- What is Intersectionality?
- Brief History of Racial and Gender Subgroup Differences in Testing
- Current Literature on Intersectionality
- Why Evaluate for Intersectionality?
- Analysis Methodology
- Research Findings
- Discussion and Questions

About Us

- For over 40 years Ergometrics has been developing employment exams
  - Video based, human relations exams
  - Entry level and promotional
  - Fire, police, corrections, emergency communications, transit
- NTN was founded in 2006 for recruitment and exam administration
  - Job Posting
  - Exam Scheduling
  - Data Collection
  - Candidate Support
  - Reporting

Literature Search and Review

Definition

- **Intersectionality:** The recognition of an individual's status within multiple social categories (e.g., race, gender, religion, sexual orientation, socioeconomic status) as uniquely important to their personal experience within society (Cole, 2009).

Brief History

- Race Differences:
  - Human Relations (SJTs):
    - There tend to be moderate racial subgroup differences on SJTs favoring white candidates. Video testing has been found to reduce some subgroup differences (Ployhart & Holtz, 2008; Ryan & Tippins, 2004)
  - Math, Reading, and Mechanical Reasoning:
    - Research on racial differences in cognitive ability have found that black-white subgroup differences tend to be larger g-loading assessment (Outtz & Newman, 2009)
    - Hispanic and black children tend to display lower levels of reading ability in comparison to white children (Merolla & Jackson, 2017)
    - These discrepancies have been regularly theorized to be due to a variety of factors including disparity in social economic status and unequal access to education (Outtz & Newman, 2009; Merolla & Jackson, 2017)

Brief History

- Gender Differences:
  - Human Relations (SJTs):
    - Women tend to perform better on both written and video SJTs, with a larger advantage on video (Ployhart & Holtz, 2008; Ryan & Tippins, 2004)
  - Math, Reading, and Mechanical Reasoning:
    - Differences in performance have been observed on subsets of cognitive ability (Feinberg, 1988; Lindenberg et al, 2010; Voyer & Voyer, 2014)
    - Overall, women tend to have higher academic performance across all course topics (Voyer & Voyer, 2014)

Current Literature

- Intersectionality:
  - **Women in STEM:** The literature on women in STEM programs has pointed to potentially unique challenges faced by women of color that are not faced by their white peers (Blackburn, 2017; Bloodhart, 2020)
  - **Example:** Recent Developments in Personnel Selection (Derous & Pepermans, 2019)

Why assess Intersectionality?

- The simple effects of gender and race across test scores may draw different conclusions than the interaction effects
- Evaluating interaction effects can paint a more fine-grained picture of “double-jeopardy” scenarios related to both gender and racial subgroup differences

Research Question

- How does the relationship between education level and performance on the four components of the FireTEAM Entry-Level Exam vary across race, gender, and the interaction between race and gender (i.e., intersectionality)?

Methodological Approach

Participants

- NTN’s entry-level fire candidates
- Tested 2018 – 2022
- Candidates are from across the US
- Total N = 41,978

Overall Sample N by Category

	N	%
Sex		
Male	35873	85.46%
Female	3605	8.59%
Ethnicity		
Native American	502	1.20%
Asian	1021	2.43%
African American	3808	9.07%
Caucasian	25019	59.60%
Hispanic	6912	16.47%
Other	2014	4.80%
White	46261	0.63%
Education		
High School/GED	6995	16.66%
Some College	17409	41.47%
2 Year College Degree	6651	15.84%
Bachelor's Degree	7835	18.66%
Advanced Degree	743	1.77%
Total	**41978**	**100.00%**

Measures

- Entry-Level Fire Exam Performance (Swander et al., 2021):
  - Human Relations (SJT)
  - Mathematics
  - Mechanical Reasoning
  - Reading
- Demographics
  - Education
  - Ethnicity
  - Gender

Research Findings

Main Effects and Interactions

Source	Sum of Squares	df	Mean Square	F	p-value
Intercept	860.61	1	860.61	7579.65	0.00
Gender	2.22	1	2.22	19.56	0.00
Ethnicity	11.26	5	2.25	19.83	0.00
Education	4.38	4	1.10	9.65	0.00
Gender * Ethnicity	3.30	5	0.66	5.81	0.00
Gender * Education	1.57	4	0.39	3.46	0.01
Ethnicity * Education	7.85	20	0.39	3.45	0.00
Gender * Ethnicity * Education	3.71	19	0.20	1.72	0.03
Error	4434.26	39054	0.11		
Total	33916.00	39113			

Post-Hoc Analysis

Ethnicity	Education	Male		Female	
		Mean	Std. Error	Mean	Std. Error
Asian	High School/GED	0.93	0.03	0.8	0.14
	Some College	0.91	0.02	0.85	0.05
	2 Year College Degree	0.91	0.02	1	0.1
	Bachelor's Degree	0.92	0.02	0.95	0.05
	Advanced Degree	0.93	0.06	1	0.18
African American	High School/GED	0.76	0.01	0.61	0.03
	Some College	0.85	0.01	0.8	0.02
	2 Year College Degree	0.85	0.02	0.91	0.04
	Bachelor's Degree	0.88	0.01	0.78	0.04
	Advanced Degree	0.85	0.04	0.5	0.09
Caucasian	High School/GED	0.9	0	0.85	0.02
	Some College	0.91	0	0.88	0.01
	2 Year College Degree	0.9	0	0.89	0.02
	Bachelor's Degree	0.9	0	0.88	0.01
	Advanced Degree	0.87	0.02	0.85	0.03
Hispanic	High School/GED	0.85	0.01	0.83	0.04
	Some College	0.89	0.01	0.88	0.02
	2 Year College Degree	0.9	0.01	0.83	0.03
	Bachelor's Degree	0.89	0.01	0.81	0.03
	Advanced Degree	0.88	0.04	0.78	0.07

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Takeaways

Summary of Findings

- Significant interactions for socio-demographic variables with pass
- Largest effects for African American women

Potential Limitations

- Sample size for minority groups
- More direct comparison to other predictors of test performance

Key Takeaways

- More researchers should consider assessing intersectionality when evaluating subgroup differences
- Focus on making testing processes more accessible to people in vulnerable groups

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