Validating the *FireEdge* Assessment

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Background Knowledge

- R&D Team developed the *FireEdge* test for firefighter selection
- Test content based on a job analysis study that identified the skills and abilities needed to succeed in the job
- Those skills and abilities were then translated into test questions
- The result is a cognitive and situation-based reasoning test
  - A total of 150 questions
  - Time limit of 2 hours

Presentation Overview

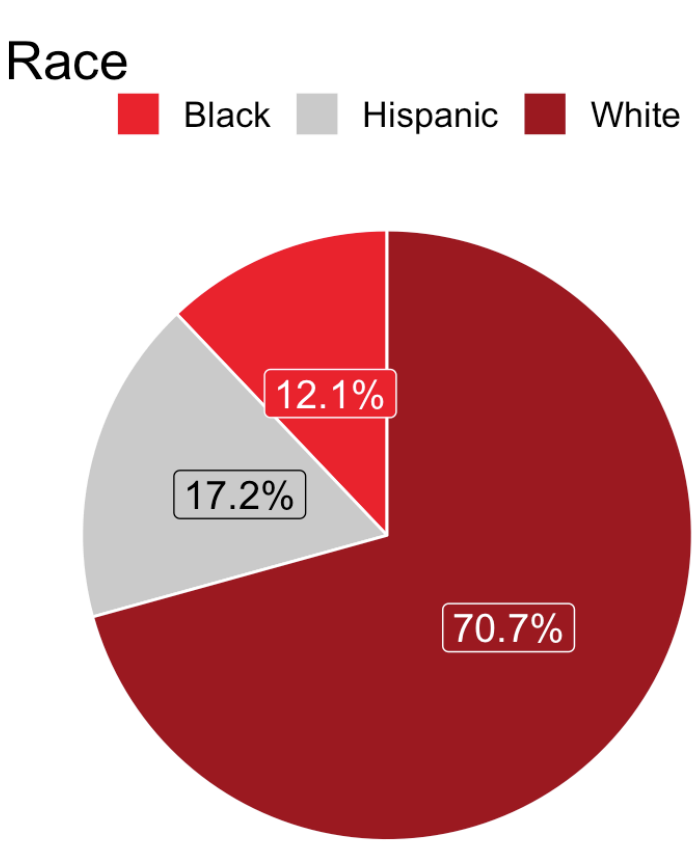
- Overall goal was to establish predictive evidence of job performance from test scores
  - Ideally, a higher *FireEdge* score would accompany a higher job performance rating
- The benefits of a successful research study include:
  - Marketing *FireEdge* as a proven screening device to select talent
  - Provide legal defensibility for using the *FireEdge*
  - Helping minimize bias and adverse impact in score results

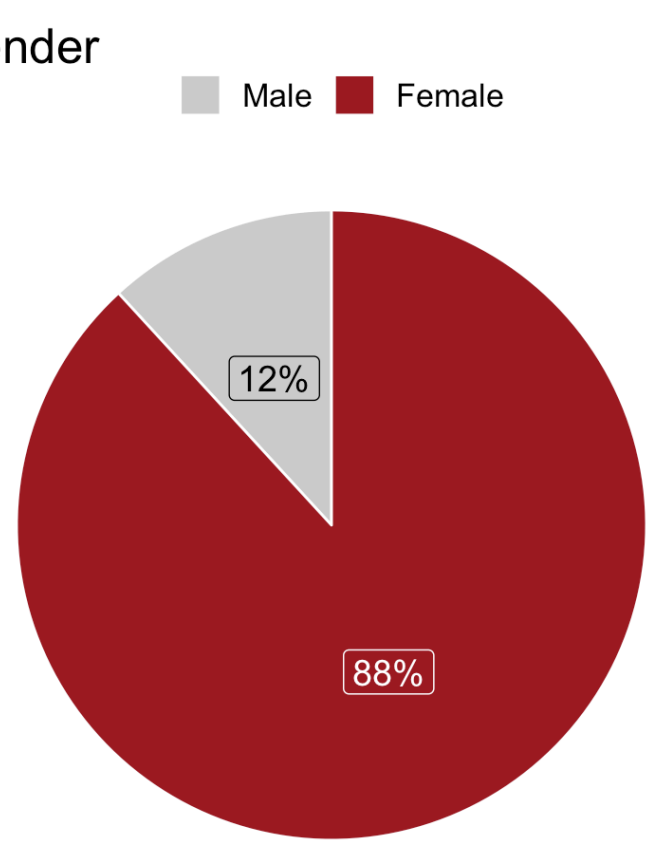
Research Study Design

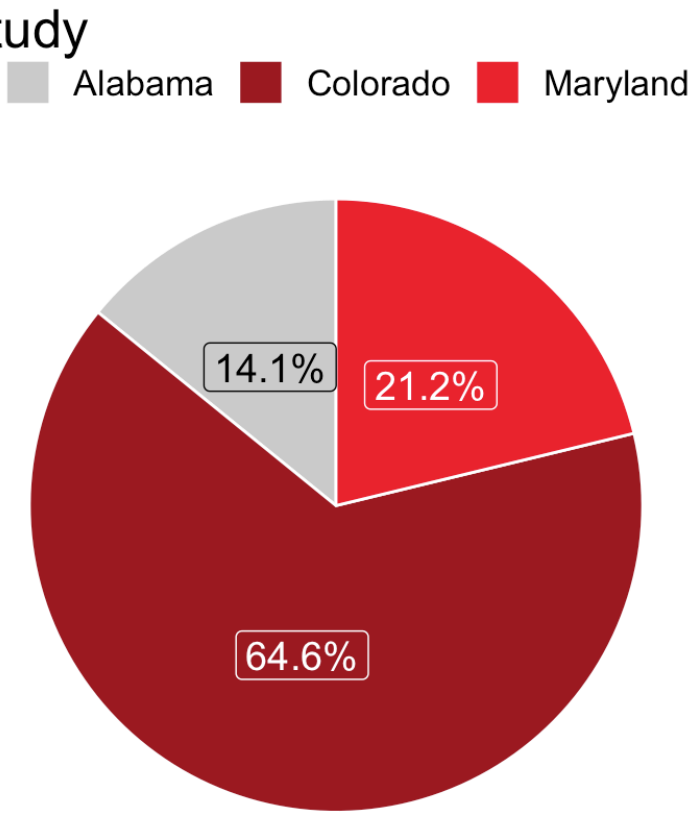
1. Partnered with agencies to provide study participants
    a. Created a stratified sampling plan from available personnel
2. Administered *FireEdge* under standardized conditions
3. Obtained ratings of job performance from supervisors
4. Performed exploratory data analysis (EDA)
5. Ran several statistical analyses (correlation, regression, ANOVA)
6. Summarized findings and developed technical documentation

Sample Composition

Break down of study participants:





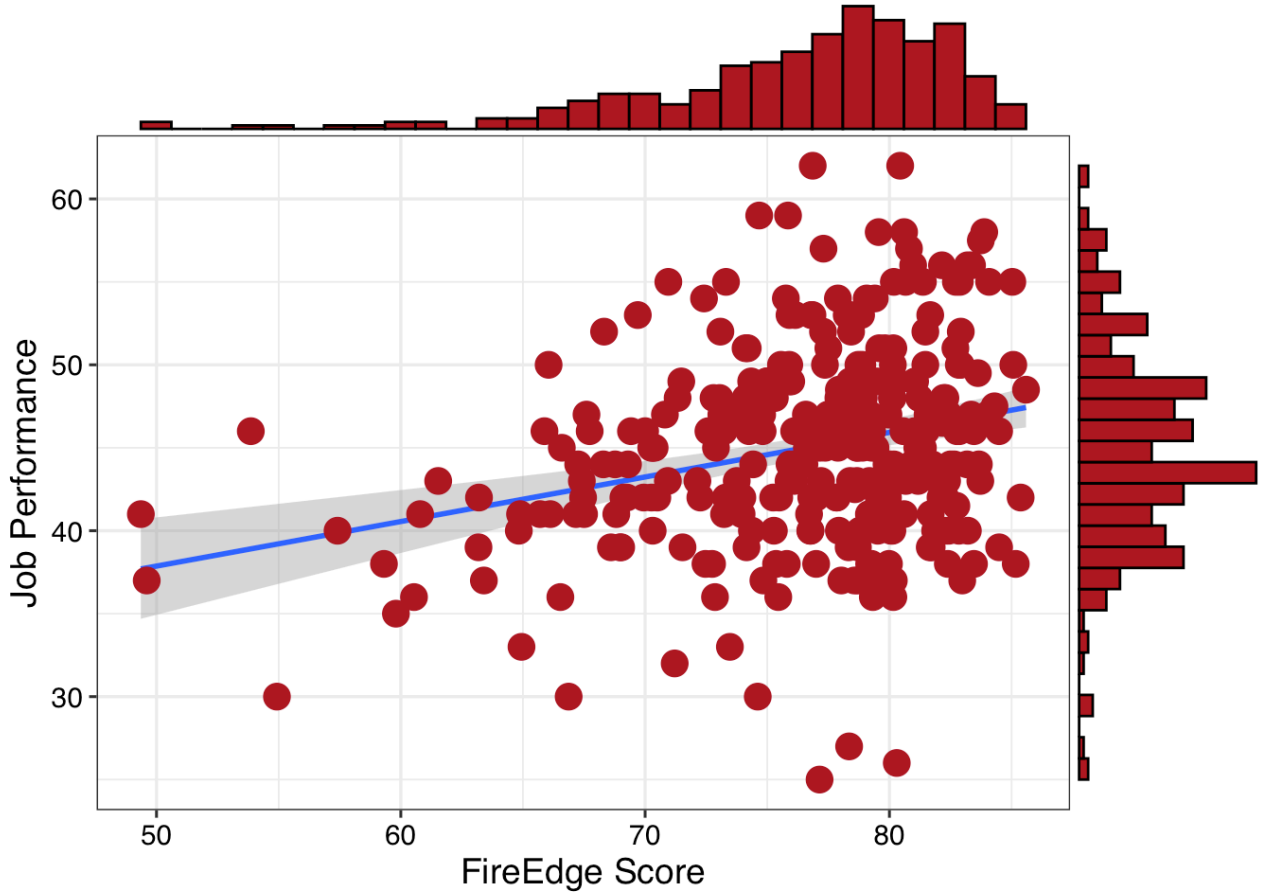


Pearson Correlation Coefficient

- A significant, positive correlation between *FireEdge* and Job Performance was found:
  - $t(295) = 4.884$, $p < .001$
  - Pearson Correlation $\boldsymbol{r} = .273$
- The *t-test* statistic demonstrates that the correlation coefficient is significantly different from zero
- As test scores rise, so too does job performance

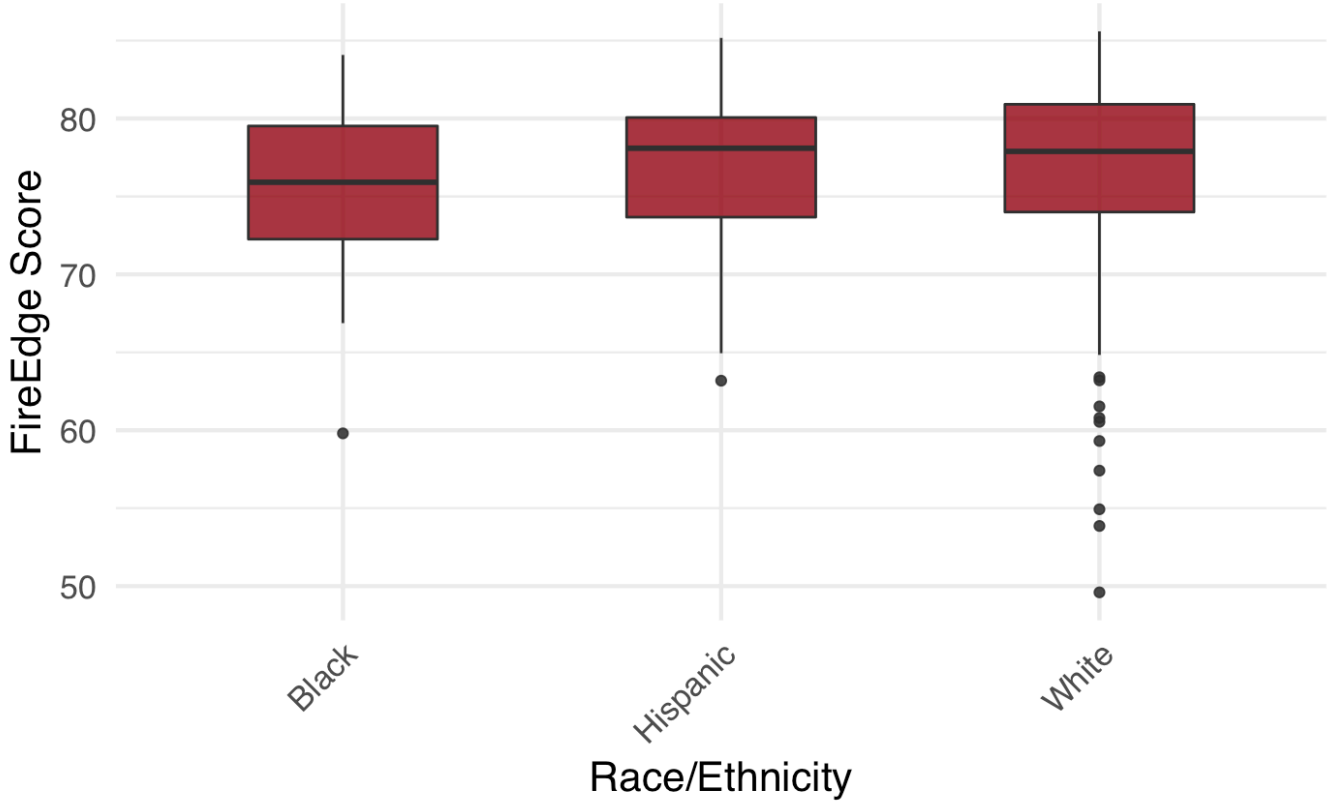
Linear Regression Model

- Correlation = .273, $p < .001$
- Test predicts job performance
- Line of best fit trends upward
- F-test is also significant
  - $F(1, 295) = 23.85$, $p < .001$



Analysis of Variance on *FireEdge Score*

- Non-significant findings
- $F(4,274) = .663$, $p = .618$
- No evidence of significant differences in *FireEdge* scores by Race/Ethnicity
- Test scores were consistent across Race



Study Limitations

- Concurrent study design
- More diversity in study participants
- Potential bias in job performance ratings
- Overpredicting performance due to qualified applicant pool
- Correcting correlation coefficients

Conclusion

- Empirical evidence that test scores are significantly correlated with subsequent firefighter job performance($r = .273$, $p < .000$)
- Analysis of Variance (ANOVA) test concludes no significant differences on *FireEdge* test score by Race
  - Ensures no bias/adverse impact in test scores
  - Rank ordering of top-down scoring appropriate
- We conclude that higher scores on the *FireEdge* will yield more successful firefighters in general on the job, without adverse impact