

*Applied Personnel Research in a Non-Profit R&D Organization: Balancing Science and Practice*

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Presentation Overview

- What is HumRRO?
- What types of work do we do?
- Life as an applied researcher
- HumRRO as a non-profit organization
- Questions

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What Is HumRRO?

What HumRRO Is Not



- **Not** a lawn mower company!

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HumRRO Overview

- An independent non-profit R&D organization
- Headquartered in Alexandria, VA 
  - Offices in KY, MN, NJ, and CA
- Established in 1951
  - Originally part of U.S. Army
  - Became independent in 1969
- Full-time staff of about 120, including 90 researchers
  - Psychology: Mostly I-Os, some social and experimental
  - Other fields: Educational measurement, statistics, management, computer science, and political science



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Our Niche

Consulting . . . with an academic focus



Not-for-profit status ensures objectivity

Custom solutions

Complete dedication to state-of-the-art science

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## Different Ends via Different Means

Not-Prof/Profit  
Organizations: **Public Services** → **Profit**

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## What Types of Work Do We Do?

## Applied Personnel Research

- **Military selection, classification, and training**
  - HumRRO's roots—still a primary source of work
  - DoD, Army, Air Force, Navy
  - Often long-term projects, some involve scientific oversight committees
  - Examples: Project A, First Term, AFMS, FLRI, MAVNI
- **HR-related assessment for Federal civilian agencies**
  - Conducting job analyses and developing assessments (e.g., selection and promotion measures, performance appraisal systems)
  - Examples: ATF assessment centers, OPM Selection
- **HR program and policy evaluation**
  - Evaluate training programs and HR policies (e.g., compensation)
  - Examples: Confessi, OPM HCM

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## Test Development and Support

- **Credentialing**
  - Defining roles and requirements of professions, and developing tests to certify candidates meet a profession's standards
  - Examples: Veterinary surgeons, physical therapists, fireplace installers(!)
- **High-stakes educational testing**
  - Relatively new area of work for us
  - Biggest area of growth
  - Examples: Evaluating state high school exit exams (KY, FL, MN, ID, UT, others)
- **Private for-profit and non-profit organizations**
  - Small but growing arena
  - Examples: EEI, IBM, P&G

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## Life as an Applied Researcher



The good

The bad

~~The ugly~~



## Life as an Applied Researcher

- ☺ • **Exposure to diverse knowledge and ideas**
  - Multidisciplinary staff
  - Work in teams tailored to project needs
  - Interaction with academia, external consultants
- ☺ • **Address important and interesting questions for clients/society**
  - *Often not of our own choosing*
- ☺ • **Seeing clients/society use, benefit from our research/products**
  - *Sometimes our work goes unused*
- ☺ • **Variety and challenge**
  - HumRRO has no product line—we custom-build everything
  - Every project presents unique challenges
  - Answers are rarely "textbook"
  - *Biggest challenges do not always come at the most convenient times*
- ☺ • **Gaining insights into the gaps between science and practice**
  - Life on the other side of the "file drawer problem"
  - *Having little time to fill the gaps we see*

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## Other I-O Work Environments

- **Academia**
  - More choice with regard to research topics and designs
  - More opportunities for formal teaching
  - Easier to stay “current” with the literature
  - More pressure to publish, but more time to publish
  - Generally less exposure/access to organizational problems/data
- **Large Consulting Firms and Testing Companies**
  - Profit-/client-driven
  - Pressure to bring in business
  - More competitive environment → more hours
  - Work can get repetitive
  - “Everything looks like a nail when you’ve got a hammer”
- **Government**
  - Work driven by policy or operational needs—research secondary
  - May involve more contract management than “hands-on” research
  - May involve interaction with a wide range of contractors/consultants

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## Life as an Applied Researcher at HumRRO

- Emphasis on quality, professional development
- Value contributing to science and society
- Collegial environment
- Informal atmosphere
- Flat organization—matrix structure
- Unity in purpose—lack of politics

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## KSAOs for Applied Researchers

- Psychometrics
  - Research Methods
  - Substantive I-O knowledge base
  - Statistics
- } Foundation for applied creativity and adaptability
- Written Communication
  - Oral Communication
  - Teamwork Skills
  - Mentoring and Teaching Skills
  - Data Management Skills
  - Creativity
  - Adaptability

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## HumRRO as a Non-Profit Organization

## Contributing to Science and Society

- **A core value**
- **Staff members active in the scientific community**
  - Past APA division presidents
  - Three SIOP fellows
  - Service on APA and SIOP committees
  - Service on National Academy of Sciences committees
  - Reviewing for journals and conferences
  - Presenting at professional conferences
  - Publishing in scholarly journals and books
  - Collaborating with academia

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## Structures to Support Scientific Contributions

- **Graduate student development and support**
  - Crawford doctoral dissertation fellowship in I-O psychology (\$12,000)
  - Internship program
    - 3- to 9-month internships: I-O and Educational Measurement
    - Applications due on/before March 1
  - Conference sponsorship (IO/OB, River Cities I-O)
  - Presentations at graduate schools
- **Internal structures**
  - Internal Research and Development (IR&D) program
  - Professional development
    - Conference attendance
    - Article writing
    - Training courses (e.g., SAS, Microsoft Office)
  - Principal Scientist career track

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## Research at HumRRO

... can be of interest to the scientific community

Project	Topic
• Project A	• Predictor/criterion development and measurement; job performance models
• Project First Term	• Turnover models
• AIM	• Operational selection using personality measures
• P&G iCAT	• Unproctored, on-demand, Internet-delivered, computer-adaptive cognitive ability screening for personnel selection
• Irish Career Explorer	• Person-job matching, percent match statistic
• EEI Meta-Analysis	• Predictive validity of computerized clerical tests

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## Research at HumRRO

... often related to applied measurement issues

- Stems from gaps between the scientific literature and practice
- Recent examples
  - Structure and scoring of forced-choice personality measures
  - Estimating inter-rater reliability in ill-structured measurement designs
  - Percentage match statistic for vocational exploration battery
  - Developing/validating measures of applicants' needs for selection
  - Applications of spline regression in I-O psychology (P-E fit, SJTs)

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**Questions?**

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**Linked Slides**

## Infamous 1950s Studies: Desert Rock

- Effects on soldiers of orientation program and exposure to nuclear detonation
- Clinton administration's ACHRE report
  - Advisory Committee on Human Radiation Experiments

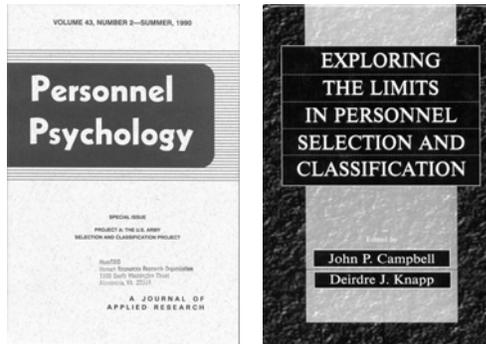
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## Infamous 1950s Studies: Fighter IV

- Effects of stress on soldier performance
  - Errant artillery fire, leak of radioactive material, approaching forest fire
- APA Board of Ethics review

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## Army Project A



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## Project First Term

- **Client:** U.S. Army Research Institute for the Behavioral and Social Sciences
- **Problem:** GAO estimates that *each* Soldier failing to complete his/her initial enlistment term costs the Army more than \$35,000 to replace – annual costs in excess of \$700 million
- **Task:** Identify pre-cursors of first-term attrition in the Army and build models that inform potential remedial actions
- **Study:** Six-year longitudinal study of attrition among all Soldiers who entered the Army in FY99 ( $n = 63,000$ )
- **Measures:** Seven surveys administered at various points in Soldiers' first term; archival data reflecting characteristics at entry and subsequent status at quarterly intervals
  - Pre-entry surveys: Pre-enlistment behavior, efficacy beliefs, and Army-related attitudes
  - In-service surveys: Soldier attitudes and quality of Army experiences
  - Exit surveys: Reasons for leaving

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## Project First Term: Method

- **Challenge:** Design a comprehensive analysis plan
  - Over 700 survey items; some items unique to a survey, some repeated
  - Final analysis database had more than 2 million person-x-period records in it
- **Questions**
  - At what point(s) in a Soldier's first term is s/he at most risk of attrition?
    - Event tables, hazard functions
  - What types of attrition occur in each phase of a Soldier's first term?
    - Basic training, skills training, post-training (in-unit)
  - What factors are most predictive of attrition at various times?
    - Discrete-time event history models (Singer & Willett, 2003)
  - What variables have direct and indirect effects on attrition?
    - SEMs of attrition for within-phase models
- **Scientific Oversight:** Paul Allison, Paul Bliese, Marty Fishbein, Roger Griffith



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## Project First Term: Results

- Soldiers' greatest attrition risk during first 3 months of service
- Training attrition
  - Fitness and medical issues
  - Past withdrawal behavior (e.g., quitting jobs, school, etc)
  - Pre-entry attrition-related cognitions
- Post-training attrition
  - Deviance (e.g., pre-service history of getting into trouble, underage smoking)
  - Past withdrawal behavior
  - Attrition-related cognitions
- Variables with indirect effects through attrition-related cognitions
  - Antecedents differed depending on *when* they were assessed
    - Pre-training: (Pre-entry Army affect, generalized self-efficacy, homesickness)
    - Post-training: (Importance of completing enlistment term to valued others, perceived fit with Army, efficacy for performance)



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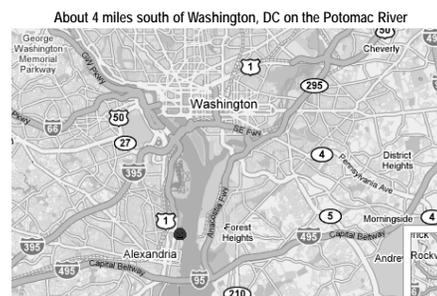
## OPM Entry-Level Selection

- **Client:** U.S. Office of Personnel Management (OPM)
- **Task:** Identify exemplars of selection methods used for white-collar occupations, and forecast future trends in personnel selection
- **Method**
  - Identified competencies of interest based on archival OPM job analysis data
  - Established criteria for evaluating assessments
    - Psychometric criteria, as well as implementation-related criteria
  - Identified assessments for initial consideration
    - Interviewed 60+ experts in personnel selection and testing
      - Academia, consulting firms, test publishers, Fortune 500, and public-sector
    - Queried MMY, Test Critiques, ETS Test Database, other sources of test info
  - Gathered readily available information on assessments
    - Test reviews, tech manuals, validation reports, journal articles
  - Reviewed "futures" literature and recent changes to Federal employment testing guidelines



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## Where Is HumRRO HQ?



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## Typical File Drawer



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## Backup Slides

## OPM Entry-Level Selection: Results

- **Identified 400+ assessments for initial consideration**
- **50% failed our first cut**
  - Multiple negative test reviews
  - Content development issues
    - Lack of grounding in job analysis and/or scientific literature
  - Language issues
    - Dated language
  - Scoring issues
    - Lack of standardized procedures
  - Insufficient psychometric evidence
- **Ultimately provided OPM with exemplars of selection methods and future trends in selection**

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## OPM Entry-Level Selection: Future

- Validating minimum qualifications and "search criteria" that organizations use to ID applicants
- New models of validating and refining assessments (streaming validation)
- "Competency"-based assessment and item-banking
- Advancing psychometric theory at the rate of advances in technology
  - Scoring and reliability estimation for complex assessments
  - Automated scoring of constructed responses (e.g., *E-rater*)
- Selecting for fit
  - Supplementing traditional KSA-based selection measures

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