

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

2

What Is HumRRO?


What HumRRO Is Not



- **Not** a lawn mower company!

4

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

5

Our Niche

Consulting . . . with an academic focus



Not-for-profit status ensures objectivity

Custom solutions

Complete dedication to state-of-the-art science

6

Different Ends via Different Means

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

7

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

9

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

10

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*

12

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

13

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

14

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

15

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

17

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

18

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

19

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)

20

Questions?

21

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

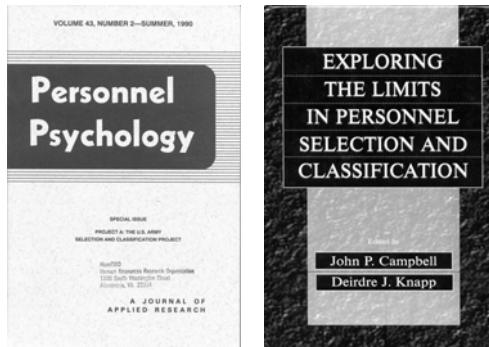
23

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

24

Army Project A



25

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

26

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



27

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)



28

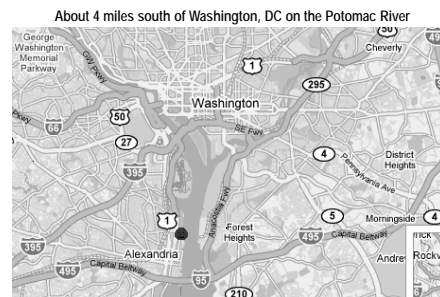
OPM Entry-Level Selection

- **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



29

Where Is HumRRO HQ?



30

Typical File Drawer



31

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**

33

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

34