Techniques for Improving the Measurement of Experience

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Overview of Session

- Theory behind training and experience (T&E) measures
- Development of entry-level experience questionnaire
- Other variables affecting T&E measures
- Development of accomplishment records
- Administering Experience Instruments Via the Internet

Theory Behind Training and Experience Measures

Tim McGonigle

Background on T&Es

- T&E measures are the most common personnel selection instruments
  - Tradition; Can't make a selection decision without reviewing an application or resume
  - Education and experience are thought to be indicators of important job-related KSAs
  - Most reviews of T&E can be performed by those without test and measurement skills
  - Evaluations are unassembled

Background on T&Es

- Traditionally, little thought has gone into assumptions underlying the use of T&E measures

- T&E measures have a sparse research literature that grows slowly

Assumptions of T&Es

- Assumptions underlying use of T&Es are often not explicit
  - Assumptions concern inferences made from evidence of training and experience
  - Explicit consideration of assumptions can improve practice

What are T&Es

Five types

1. Holistic Judgment
2. Minimum Qualifications
3. Point & Task Methods
4. KSA-oriented Methods
5. Accomplishment Records

1. Holistic Judgment

- Unstructured review of resume or application
  - Raters can use different criteria
  - Most frequent approach
  - Unknown validity

2. Minimum Qualifications

- Semi-structured review of resume or application
  - Identify minimum educational and experiential credentials
  - Does not address variability in performance of those who pass
  - Hard to equate education and experience across applicants
  - Unknown validity

3. Point & Task Methods

- Assign points for increasing levels of experience

- Low validity
  - Range restriction likely
  - May be weak indicators of KSAs
  - Does not model experience-job performance relationship

4. KSA-oriented Methods

- Applicants indicate experience performing activities related to the job

- Measures experience as indicator of KSAs

- Focuses on *amount* of experience

- Models the experience-job performance relationship

- Validity as high as .43

5. Accomplishment Records

- Applicants write "accomplishments" that demonstrate their level of proficiency within job–related competencies

- Requires significant written communication skills

- Focuses on *quality* of experience

- Validity as high as .45

Theory Behind T&Es

- Experience can best be viewed as an opportunity to gain KSAs
- Individuals with same length of job experience will vary widely in KSAs and job performance

Theory Behind T&Es

- The KSAs gained are likely a function of person characteristics, situation characteristics, and their interaction
  - Person characteristic: Intelligence, openness to experience, and extroversion
  - Situation: Degree to which environment provides different experiences
  - Interaction: Motivation

Experience-Performance Relationship

- Most selection measures show linear relationships with job performance
- Length of experience is an exception
- Experience typically has an asymptotic relationship with job performance

Asymptotic Relationship Between Experience and Job Performance

High

Job

Performance

Low

Length of Job Experience
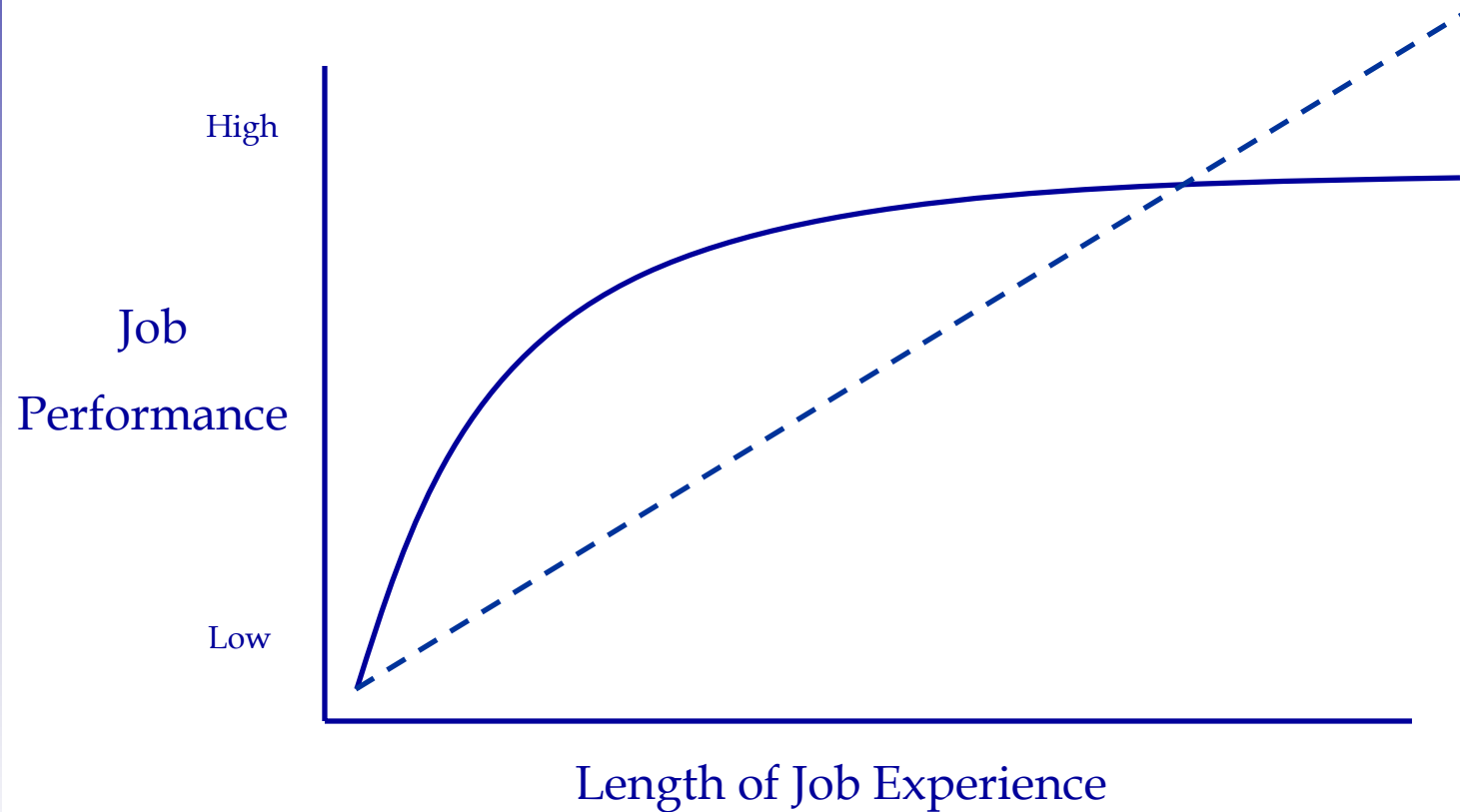
Experience

- Early career experience usually yields the greatest improvements in job knowledge

- As the knowledge of the employee expands, increasing amounts of experience add smaller and smaller increments to knowledge

Factors that Control when the Relationship Asymptotes

- Pre-work Education
  - Pre-work education that is targeted to job-related KSAs should cause one to asymptote more quickly (an accounting degree for an accounting job)
  - Less targeted education (a business degree for a restaurant manager) may not result in substantial KSA development. One will need more experience to gain the knowledge and thus a longer time to asymptote

Factors that Control when the Relationship Asymptotes

- Job Complexity
  - High complexity jobs often require formal education (e.g. college)
  - Formal education increases job knowledge prior to working on the job
  - Employees who gain KSAs through formal education may asymptote more quickly resulting in lower correlations between experience and job performance

Factors that Control when the Relationship Asymptotes

- Type of KSA
  - In jobs where the knowledge base changes rapidly, knowledge gained from past experience may be less helpful in job performance
  - Some KSAs may not have an asymptote at all
    - Interpersonal skills

Validity of T&E Methods

1. Holistic Judgment   ???
2. Minimum Qualifications   ???
3. Point & Task Methods   .11-.15
4. KSA-oriented Methods   .43
5. Accomplishment Records   .45

Factors Reducing Validity of T&E Methods

- Range restriction
- Asymptotic relationship with job performance
- Individual differences in what is gained from training and experience
- Relatively few studies

Summary of Theory Behind Experience Measures

- T&E methods started as a matter of convenience and administrative ease
- Little thought was given to validity
- Practice will improve to the extent that assumptions underlying a T&E approach are made explicit and evaluated
- Validity estimates for all measures are likely to be underestimates

Development of Entry-Level Experience Questionnaires

Tim McGonigle

Entry-Level Training & Experience Questionnaires (KSABQ)

- Applicants indicate experience performing activities related to the job

- Measures experience as indicator of KSAs

- Don't need to have experience with specific job tasks

- Can be used for entry-level jobs

- Minimal level of written communications skills required

Steps to Develop KSABQ

- Identify qualifying KSAs

- Generate activities

- Develop scoring system

Identify Qualifying KSAs

- Include KSAs that:
    - Meet job analysis screens:
        - Important
        - Needed-at-entry
        - Others
- Limit KSABQ to KSAs with which applicants could develop proficiency through related experience
- Avoid measuring only experience with the job tasks

Generate Activities Using KSAs

- Activities:
  - Behaviors that represent different levels of proficiency with KSAs
  - Can be performed as part of "feeder" jobs or education/training
  - Behavioral representations of KSAs

Generate Activities

- SMEs create activities that:
  - Are linked to specific KSAs
  - They performed in previous jobs that helped them prepare for current job
  - Represent varying levels of proficiency
  - Could be performed as part of education/training-based preparation
- Key is to consider preparation from the *applicant's* standpoint

Examples of Activities

- Data analysis skills may generalize:
  - Task: Calculating task criticality using SPSS or SAS.
  - Activity: Creating new variables using SPSS or SAS.
- Same with writing skills:
  - Task: Writing report to document procedures and results of job analysis study.
  - Activity: Writing documents that report the procedures and results of scientific studies.

Develop Scoring System

- Award points for increasing amounts of experience performing tasks
  - Number of times

- Reflect the asymptotic relationship between experience and performance
  - Estimate asymptotes based on job analysis and MQ data
  - SMEs review and adjust asymptotes
  - Assign points linearly below asymptote

Challenges

- Faking
- Collecting accurate/reliable information
- Setting performance asymptote
- Measuring education/training-based experience

Faking

- Three levels of protection:
  - Certification of information accuracy
    - Applicant signs statement certifying accuracy of responses
    - Lists potential penalties (e.g., prosecution) for falsification
  - Verifiers
    - References that can support accuracy of information
  - Counterfeit items
    - Nonsensical tasks or activities that applicant could not perform
    - Include multiple opportunities to "correct" responses

Collecting Accurate/ Reliable Information

- Number of times is best predictor, but hard to estimate
  - Calculate from frequency and duration
    - More verifiable
    - Difficult when tasks/activities vary in frequency

Collecting Accurate/ Reliable Information

Skill in repairing clocks				
Please rate your experience with each of the activities below:	How much **work experience** do you have performing this activity?			Who can **verify** your work experience with this activity?
	Duration		**Frequency**	
	Years	**Months**		
1. Replacing the batteries in clocks.			⓪ ① ② ③ ④ ⑤	①②③④⑤ ⑥⑦⑧⑨⑩
2. Replacing the hands on a clock.			⓪ ① ② ③ ④ ⑤	①②③④⑤ ⑥⑦⑧⑨⑩
3. Replacing the gears in a clock.			⓪ ① ② ③ ④ ⑤	①②③④⑤ ⑥⑦⑧⑨⑩

Collecting Accurate/ Reliable Information

- Number of times is best predictor, but hard to estimate
  - Provide anchoring examples
    - More flexible
    - Less verifiable
    - Applicants may overlook them

Collecting Accurate/ Reliable Information

Skill in Repairing Clocks				
Activity	**Frequency**	**Examples**		**Verifier(s)**
	How many times have you performed this activity? (Mark the option closest to your level of experience).	*To perform this activity the number of times listed in the option to the left, you'd have to perform the task…*		**Who can verify your work experience with this activity? (Mark all corresponding verifier numbers that apply)**
		every day for about…	*or every week for about…*	*or every month for about…*	
1. Replacing the batteries in a clock.	a. 0 times	--	--	--	① ⑥ ② ⑦ ③ ⑧ ④ ⑨ ⑤ ⑩
	b. 80 times	*4 months*	*2 years*	*7 years*	
	c. 160 times	*8 months*	*3 years*	*13 years*	
	d. 240 times	*12 months*	*5 years*	*20 years*	
	e. 320 times	*16 months*	*6 years*	*27 years*	
	f . 400 times or more	*20 months*	*8 years*	*33 years*	

Setting Performance Asymptote

- Difficult to estimate asymptote:
  - Some activities may not have one
    - Interpersonal KSAs
    - Complex or rapidly changing jobs
  - Many different routes
    - Experience
    - Education/training
    - Hybrid (e.g. apprenticeships)
  - Does not account for individual differences
    - Intelligence
    - Openness to experience

Measuring Education/Training-Based Experience

- Difficult to equate education/training:
  - Different schools
  - Different instructors
  - Different course materials
  - Person X situation interaction
- Collect information on activities *performed* as part of education or training

Summary

T&Es:

- Show validity under specific conditions
- Can be developed for use in entry-level jobs
- Challenges in collecting useable data can be overcome

Other Variables Affecting T&E Measures

Shelly Butler

Overview

- Theory behind the importance of recency and dispersion when measuring experience

- How experience recency and dispersion may relate to training and experience (T&E) measures

Definitions

- <u>Recency</u> – length of time since the applicant's experience
  - Applicant performed job related tasks 5 years ago or last week

- <u>Dispersion</u> – how frequent was the applicant's experience
  - Applicant performed job related tasks every day or once a month

How People Acquire & Maintain Skills

- **The experience-to-performance level relationship is asymptotic**
  - Ash, Johnson, Levine & McDaniel (1989)
  - Farr (1987)
  - Healey & Bourne (1995)
  - Ackerman (1989)
  - Keil & Cortina (2001)
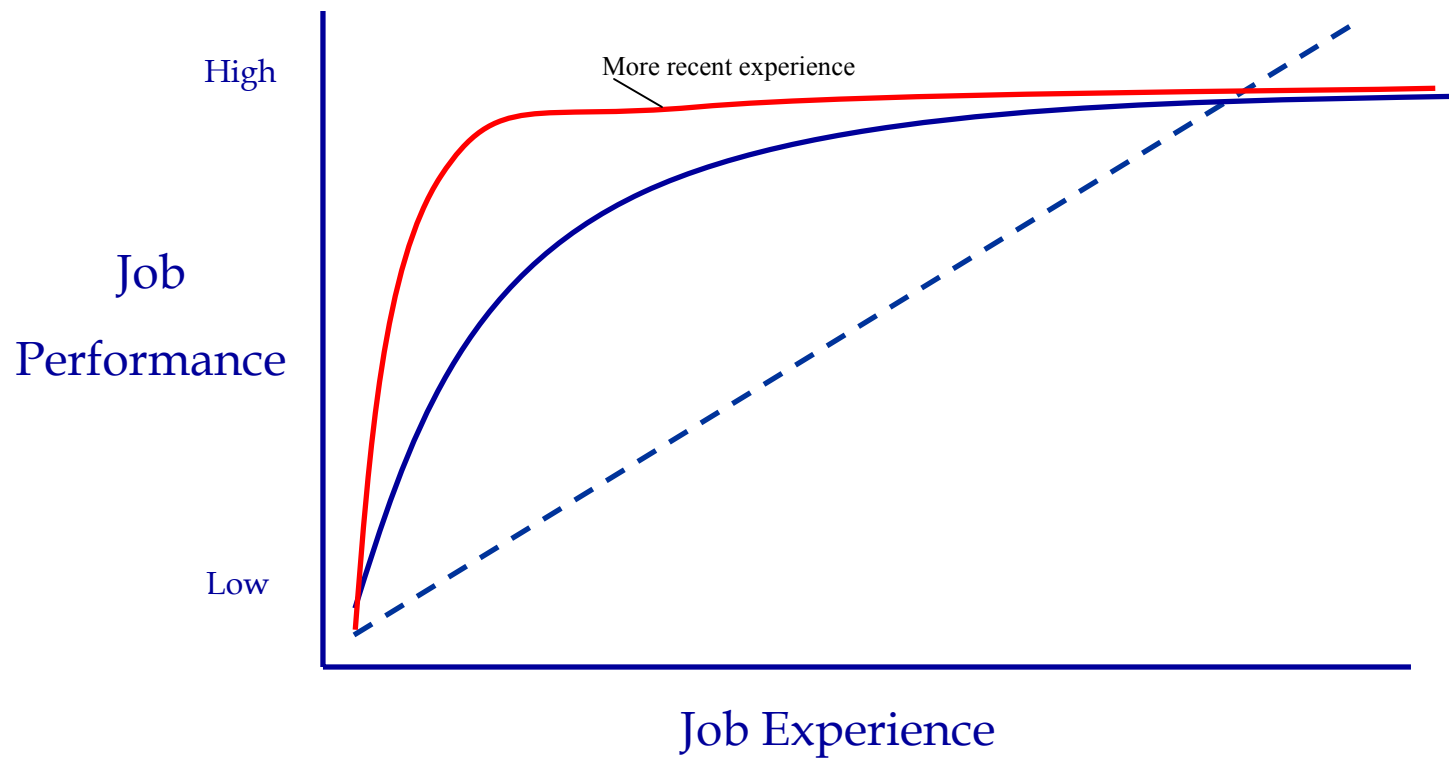 - Rescorla & Wagner (1972)

Asymptotic Relationship Between Experience and Job Performance
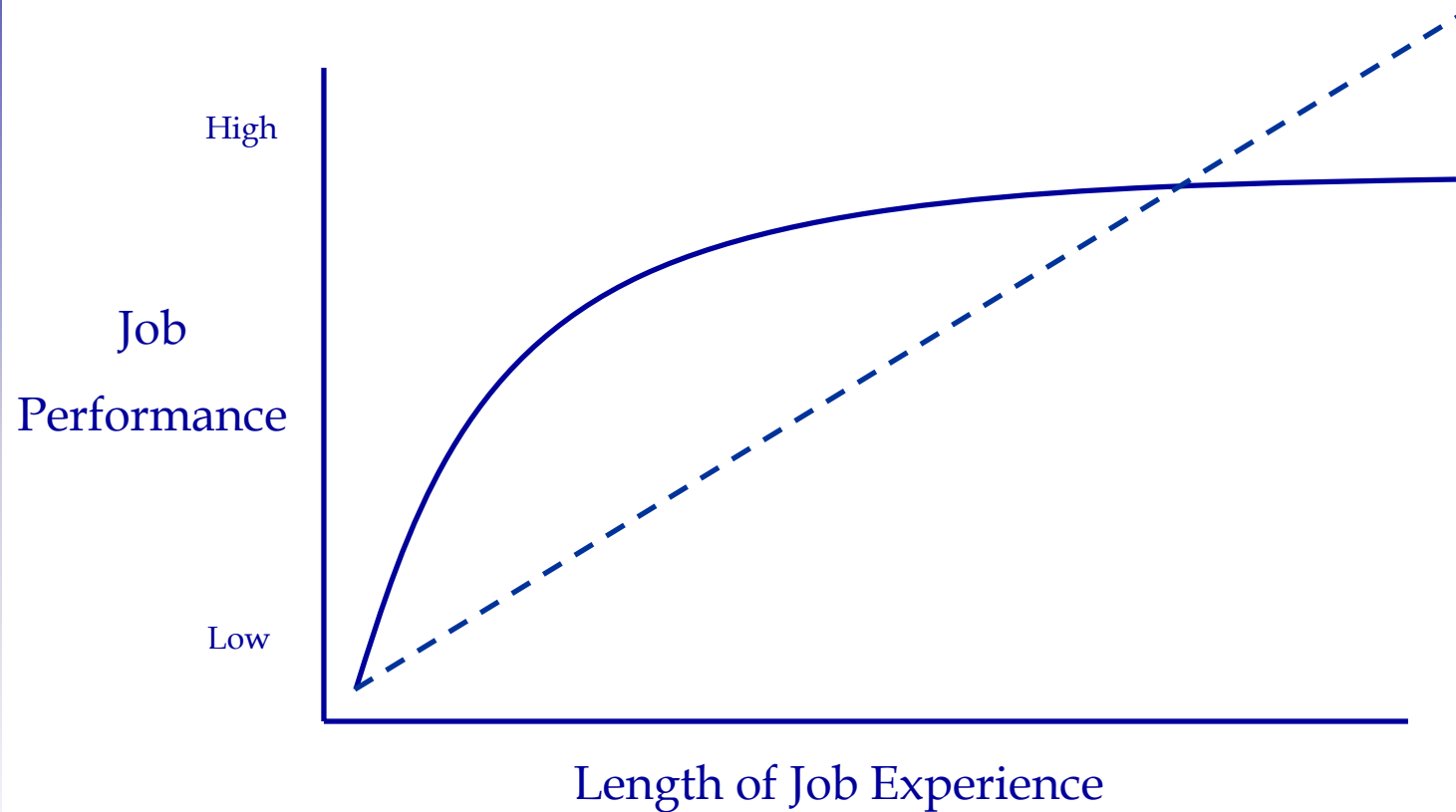
High

Job

Performance

Low

Length of Job Experience

How People Acquire & Maintain Skills, cont'd

- The experience to performance level relationship is asymptotic

- **The more recent the experience the better**

  - **The KSA requirements of the job may change over time (Ash, Johnson, Levine, & McDaniel, 1989)**

  - **Task proficiency may diminish over periods of non-use (Keil & Cortina, 2001)**

Asymptotic Relationship Between Recency of Experience and Job Performance

High

More recent experience

Job

Performance

Low

Job Experience

How People Acquire & Maintain Skills, cont'd

- The experience to skill level relationship is asymptotic
- The more recent the experience is, the better
- **The more frequent the experience the better (dispersion)**
  - **Automatic processing (Ouellette & Wood, 1998)**
  - **"Practice makes perfect"**

Asymptotic Relationship Between Dispersion of Experience and Job Performance
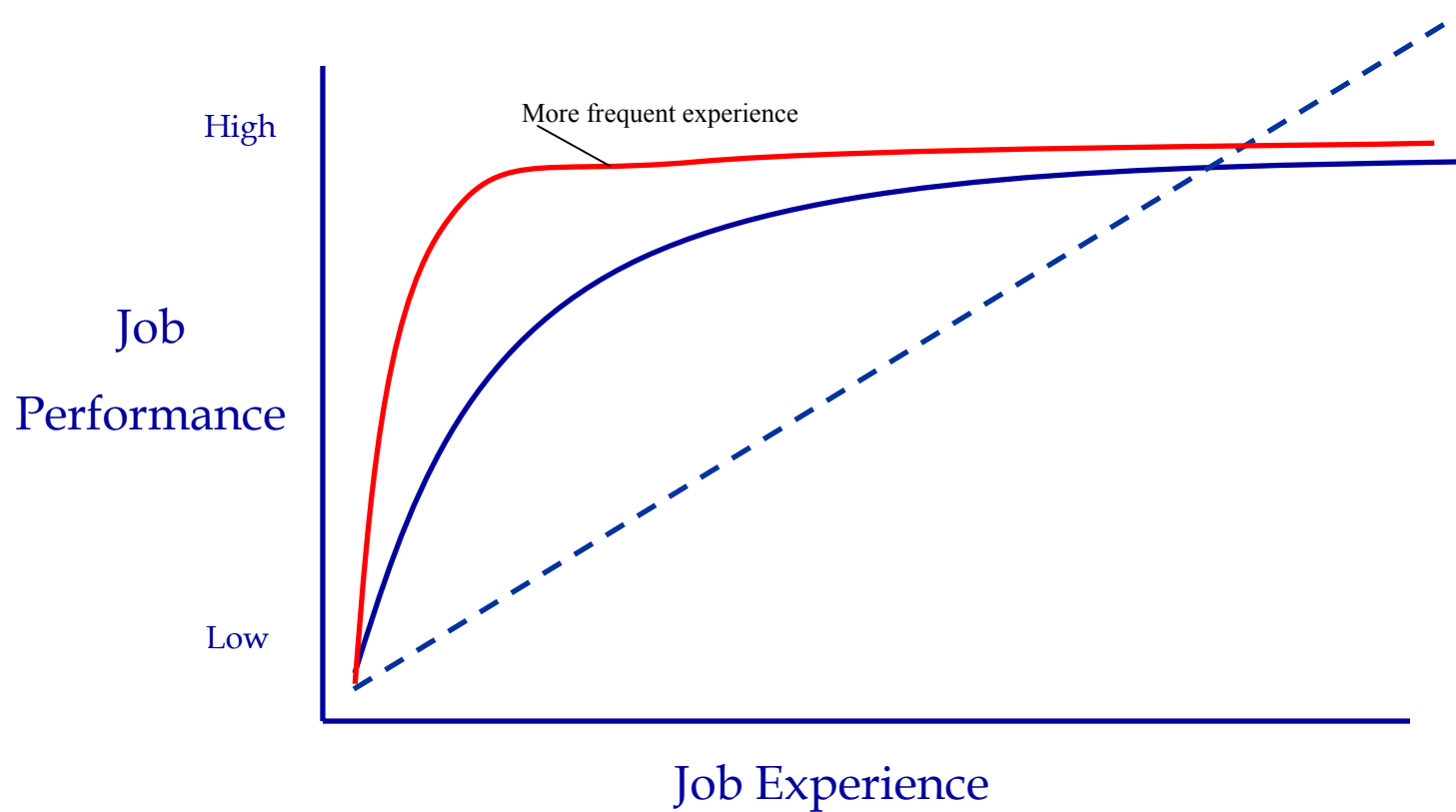
How Experience Recency and Dispersion May Relate to Training and Experience (T&E) Measures

How This Relates to T&Es

- T&E overview
  - Behavioral consistency principle
- Benefits
  - Validity
  - Variability

How This Relates to T&Es

- How can we incorporate experience recency and dispersion in T&E measures?
  - Collecting data
  - Scoring

Development of Accomplishment Records

Christina Curnow

Accomplishment Record Overview

- Background on the Accomplishment Record (AR)

- Developing two ARs

- Practical Considerations and Challenges

What is an Accomplishment Record?

- Measure of job related previous experience.

- Based on the Behavioral Consistency Principle (Schmidt, Caplan, Bemis, Decuir, Dunn, & Antone, 1979)

- Applicants provide "accomplishments" that demonstrate their level of proficiency within job –related competencies

- Accomplishments are specific, verifiable behavioral examples of performance

Jobs for Which ARs Are Most Commonly Used

- Typically used to select applicants into professional positions that require experience
- Have been used most often to select Attorneys
- Also used to select Administrative Law Judges and teachers
- Writing must be an important part of the job

Validity of Accomplishment Records

- Validity is .45
- Limited data in analysis
  - Validity estimate may be unstable
- Validity may be higher because an applicant may fake less
  - More difficult to write well-developed fabrications than checking a box on a task inventory

Reliability of ARs

- Need to worry about rater agreement
- Question stems will often elicit wide ranging response
- Critical to have a good scoring guide that is evaluated for reliability
- Reliabilities ranging from .75 to .85 (Hough, 1984; Hough et al., 1983; Sadwoski & Hess, 1994)

Developing Two ARs

- Two ARs developed for selecting:
  - Federal Judges
  - State Attorneys

Challenges Faced in AR Development

- Need to minimize labor involved in verification
- Scorers who are not intimately familiar with the job, additional job aids developed

Five Steps to AR Development (Hough, 1984)

1. Conduct job analysis

2. Develop AR form

3. Collect accomplishments from incumbents

4. Collect accomplishment ratings

5. Develop benchmarks and scales

Accomplishment Record Development

1. Conduct job analysis

    - Develop competencies or categories of behavior related to job

    - Can be done using critical incidents

    - Example Competency- <u>Oral Communication</u>: Orally expresses information clearly and concisely so that the intended audience can understand it; makes clear and persuasive oral presentations; listens to others and responds appropriately

Accomplishment Record Development

2. Develop AR form

- Instructions must provide enough detail so the applicant will know what to do

- For each competency, the applicant is asked to provide:
    - General statement of an accomplishment
    - Description of exactly what was done
    - Awards or formal recognition
    - Verifier
- Example of AR form

Accomplishment Record Development

3. Collect accomplishments from incumbents

- Based on experiences prior to current position

- Alternatively, the AR could be administered to a representative sample of the potential applicant pool (as long as these individuals are not planning to apply)

- Number of accomplishments needed per competency

- Accomplishments from high and low performers

Sample Accomplishment

Example Competency: Reasoning

Reasoning: Identifies rules, principles, or relationships that explain facts, data, or other information; analyzes information and makes correct inferences or draws accurate conclusions.

General statement of the situation or circumstances surrounding what you accomplished/achieved:

The Commission wanted to influence industry behavior in an area in which the Commission believed it had no authority or jurisdiction.

Description of exactly what you did (i.e., what actions did you took, what outcomes occurred):

In connection with the Commission's consideration of the proposed trade regulation rule, I developed three new legal theories that could be used to justify the Commission's jurisdiction in areas previously thought to be outside the Commission's purview as a result of a Supreme Court decision. I located and analyzed every judicial opinion discussing the Commission's "in commerce" jurisdiction, as well as numerous opinions affecting other federal agencies, and demonstrated that sound legal arguments could be developed to support Commission action in areas usually thought to be outside the agency's jurisdiction. The Chairman of the Commission sent me a note thanking me for my efforts.

Accomplishment Record Development

4. Collect accomplishment ratings

- Remove any identifying information from accomplishments

- Assign a unique identifier to each accomplishment

- SMEs sort accomplishments into categories based on competencies

- SMEs rate each accomplishment for level of effectiveness on a 6-point scale

- Example

Accomplishment Effectiveness Ratings

Read each accomplishment and decide if it represents a high, medium or low level of effectiveness. Form three piles of accomplishments that differ in the level of effectiveness they represent. Next, sort each of the three piles into two more piles representing high and low effectiveness <u>within</u> the high, medium or low category. This will result in six piles (low-low, low-high, medium-low, medium-high, high-low, high-high). Record the accomplishment numbers in the column that represents your effectiveness rating (e.g., low-low or medium-high).

Low		Medium		High	
16987		11556			16995
16589					

67

Accomplishment Record Development

5. Develop Benchmarks and Scales

    • Ratings are analyzed for dimension agreement and placement on achievement scale

    • For each dimension, rating guidelines are developed based on the commonalities of the ratings at each level (high, medium and low) and specific accomplishments are chosen as benchmarks

Example Rating Guidelines

- Legal Research: Conducts research using legal research methods and procedures; utilizes legal texts and/or computerized legal research databases; obtains information from witnesses and other parties

Rating Guidelines for Legal Research - Low

Accomplishments at the *low* level are characterized by investigating simple to moderately complex issues using legal research methods and procedures. Research activities at this level include such things as:

- Referencing federal, state, statutory, and case law on issues such as the timeliness of filings
- Determining if the law cited in a brief was current law
- Drafting briefs and pleadings in appeals cases using federal and state law, law of evidence, and administrative rules
- Determining if a client has an appropriate case to file or settle with the Court
- Locating answers to specific questions from agency staff, other attorneys, or other state agencies

Rating Guidelines for Legal Research - Moderate

Accomplishments at the *moderate* level are characterized by investigating complex issues using legal research methods and procedures. Research activities at this level include such things as:

- Preparing for hearings

- Researching briefs to identify pertinent legal issues

- Researching in order to manage complex civil and criminal court cases

- Analyzing prevailing statutory provisions and case law to draft Attorney General opinions

Rating Guidelines for Legal Research - High

Accomplishments at the *high* level are characterized by investigating highly complex issues using legal research methods and procedures. Research activities at this level include such things as:

- Researching highly complex and/or novel issues in order to handle highly complex litigation

- Researching technical issues to develop a theory for a highly complex case

- Arguing a case that establishes precedent for jurisdictions around the country

Another Rating Guideline Format

Definition

<u>Using Knowledge</u>: Interpreting and synthesizing information to form legal strategies, approaches, lines of argument, etc.; developing new configurations of knowledge, innovative approaches, solutions, strategies, etc.; selecting the proper legal theory; using appropriate lines of argument, weighing alternatives and drawing sound conclusions.

Rating Guidelines

In USING KNOWLEDGE, accomplishments at the lower levels are characterized by the resolution of legal issues which lack impact and importance or issues easily resolved by existing case law or precedent. At progressively higher levels, the accomplishments describe the formulation of increasingly complex legal strategies or the resolution of difficult legal issues which may be included in a case or procedures or substantial import. At the highest levels, accomplishments may refer to the assumption of significant personal responsibility in drafting major rules, regulations, proposed statutes, or like materials. Awards or commendations are likely.

Example Benchmarks

Competency: Using Knowledge

6 —

I successfully handled a recent complex bankruptcy appeal of first impression that required extensive legal research. I challenged the ruling of a bankruptcy court that had enjoined the State from enforcing a valid criminal conviction and judgment pursuant to Alabama law against a debtor. In an unpublished opinion, the Federal District Court overturned the lower court's decision based on the arguments that I raised on appeal. This case is significant because it established precedent for the recognition of state law in a Federal bankruptcy proceeding. My case was highlighted in the Bankruptcy Bulletin published by the National Association of Attorneys General. Moreover, numerous state attorneys from around the nation have consulted with me and cited this case in legal proceedings in other jurisdictions.

5 —

When I was in the Air Force, I was assigned to be the Chief of Labor Law. In that position, I represented management in all personnel actions on the Air Force Base. Although I had never worked in this area of the law before that time, I was successful in finding appropriate research material and became very proficient in the labor law field. I wrote extensive appellate briefs to the Merit Systems Protection Board and to the Equal Employment Opportunity Commission and was successful in defending the Air Force in several hearings filed by workers who had been disciplined or fired from their positions.

4 —

3 —

As a law clerk, I frequently read briefs that were filed with the court and ensured that the law cited in the brief was current law. I used the Shepherds Digest to determine the status of the cases cited. I also had unlimited access to Westlaw's computerized legal research. In addition, the judge asked me on numerous occasions to research issues that he was required to rule on in court. My research was used to make rulings in court on several different issues.

2 —

1 —

74

Exercise: Practice Developing Rating Guidelines

- Sample of accomplishments from one competency

- Group by high, medium and low

- At each level, summarize themes or principles used by SMEs in making judgments

Practical Considerations and Challenges

- A large pool of accomplishments is needed to develop rating scales

- Once implemented, the scoring process can be labor intensive

- Verification can be labor intensive also

- If scorers are not intimately familiar with the job additional aids may be necessary

Example Scoring Aid: Complexity Continuum

Simple to Moderately Complex

Characterized by the following:

- Two parties
- Little or no expert testimony (e.g., scientific, engineering, or environmental testimony)
- Routine cases involving insignificant dollar amounts or societal impact (e.g., traffic, landlord/tenant, misdemeanor, or domestic relations cases)
- Litigation before state and federal trial courts such as probate courts, district courts, municipal courts, and circuit courts and lower appellate courts
- Writing single issue legal documents (e.g., briefs or opinions) or simple correspondence
- Interactions primarily with co-workers and supervisors, in addition to minimal contact with clients, opposing counsel, witnesses, judges, or juries

Example Scoring Aid: Complexity Continuum

Complex

Characterized by the following:

- More than two parties
- Expert testimony in multi-disciplinary technical fields (e.g., scientific, engineering, or environmental testimony)
- Issues of fact, law, and evidence affecting a moderate number of people (e.g., departmental case) or significant interests (e.g., felony cases or convictions involving misdemeanors)
- Litigation before appellate courts such as the Court of Criminal Appeals or Court of Civil Appeals, in addition to state and federal trial courts.
- Writing multiple issue legal documents (e.g., briefs or opinions) or complex and technical correspondence
- Interactions with subordinates, clients, opposing counsel, witnesses, judges, or juries, in addition to co-workers and supervisors

Example Scoring Aid: Complexity Continuum

Highly Complex

Characterized by the following:

- A large number of parties
- Revision/review of new case law
- Expert testimony in multi-disciplinary technical fields (e.g., scientific, engineering, or environmental testimony)
- Many issues of fact, law and evidence affecting a large number of people (e.g., class action case) or significant interests (e.g., capital murder case or toxic waste case)
- Litigation before appellate courts such as the Alabama Supreme Court, United States Supreme Court, or 11th Circuit Court, in addition to state and federal trial courts
- Writing published legal documents (e.g., briefs or opinions) or highly complex and technical correspondence
- Interactions with state departmental officials, corporate management, and special needs clients or witnesses (e.g., child victims, elderly witnesses, laid-off employees)

Conclusions

- ARs can be an effective and valid selection measure for jobs that require writing

- AR Development and implementation process can be modified to meet specific challenges

Administering Experience Instruments Via the Internet

Lance Anderson
Bethany Bocketti

Introduction

- Online administration promises many improvements
  - Save applicant time
  - Reduce processing time
  - Reduce paperwork
  - Reduce staff burden
  - Reduce errors
  - Improve applicant pool
- Lots of unknowns
  - Impact on applicant pool
  - Impact on validity of responses

Purpose

- Explore States' use of the Internet to administer experience instruments
- Discover development process
- Determine issues faced
- Identify solutions

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Method

- Visit state employment websites
- Identify those that use the Internet to process applications
- Contact IPMA members from states with e-mail questions
- Conduct phone interviews with individuals from State Personnel Departments

Interview Questions

- How did you go about developing an Internet-based instrument(s)? What processes did you follow?

- What kinds of things did you consider while you were developing the instrument(s)?

- What kinds of comments have you had from staff, management, and applicants regarding the instrument(s)?

Findings

Online Services Offered

- Obta...er info
- Down...on
- Search...
- Complete...pplication
- Provide T&...data
- Register for e...s
- Obtain feedback on app

Pre-Implementation

■ Goals
  – Attract applicants
  – Save applicants time
  – Reduce staff burden
  – Statewide initiative to do more with the Internet

■ Concerns
  – The applicant pool would change in negative ways
  – Lose control over process
  – Costs would be too high

Implementation

- Most states conducted implementation in phases
  - Certain jobs
  - Certain services
- Entire process took 2-5 years
- Takes longer than planned
- Nearly all used external consultants in some way

Outcomes: Online Applications

- Applying online is method of choice for most applicants
- Number of applicants increases
- Increase in technically oriented applicants
- Apparently no changes in subgroup application rates
- Small number of applicants have difficulty with online process

Outcomes: Online T&E Measures

- Usually involves self-assessment of MQs
- Sometimes interests
- Reduces staff burden
- Shortens process
- Increases number of applicants referred
- Some applicants provide inaccurate information

Reaction

- Staff reaction varied according to comfort with computers
- Management
  - Like accessible and current applicant lists
- Applicants
  - Like availability/convenience
  - Like reduced time
  - Like that it's easier to apply for multiple jobs
  - Sometimes the site is down

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Recommendations

Implementation

- Conduct it in phases
- Check out "off-the-shelf" systems
- Be ready for significant tailoring
- Be ready to design own system
- Expect long term gains for short-term high costs
- Involve internal staff
  - Technical
  - Users
- Establish network of communication with all individuals involved in development
- Get input from managers, HR Reps, and others

Online Applications

- Design system that can talk to others
- Provide for alternate method of application
- Monitor impact on applicant pool

Online T&E Measures

- Ensure that MQs are clear to all
  - Avoid double-barreled statements
  - Expect to have more statements
  - Use concrete, behavioral terms
  - Use verifiable MQs
- Plan to deal with inaccurate responding
  - Warnings
  - Reviews
  - Mechanisms to detect distortion
- Include realistic preview

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