

September 2019

Evidence-Based Selection Process (EBSP)

Authors: Bill Guest and Rachel Cleveland

Evidence-based selection is a fair, objective, data-driven method for selecting talent. Leveraging best practices from industrial/organizational psychology, evidence-based selection brings structured decision making using valid evidence to the practice of talent acquisition. The use of an evidence-based selection process (EBSP) has been shown to improve quality-of-hire, reduce first-year turnover, and increase diversity. Evidence-based selection combines the use of a standardized, consistent process with powerful selection measures, and the informed use of quantitative data. The essential elements of evidence-based selection include: (1) a fair and objective process, (2) compensatory ratings, (3) reliable, valid, and predictive selection measures, and (4) score measures using valid selection criteria.

This research brief is one in a series to support regional implementations of **Talent Supply Chain Management (TSCM)** published by Metrics Reporting, Inc. (MRI). The first page of each brief includes a summary of the topic along with publication date, title, authors, and suggested citation. The last page of each brief is an appendix that provides a one-page overview of the essential elements of TSCM. Pages two through eleven are the body of the brief. Each brief provides a pragmatic summary of one important element of TSCM. In addition to the research briefs we also publish three guidebooks that are available at Amazon.com.

- The **Stakeholder Guidebook** provides step-by-step guidance for creating local and regional initiatives around demand-driven, evidence-based career pathways.
- The **Career Navigation System Guidebook** provides step-by-step guidance for practitioners that defines and specifies components of demand-driven, evidence-based career pathways including the 7-step career pathway model, coaching, and profiles.
- The **Talent Excellence System Guidebook** provides an introduction to Talxcellenz® processes and tools for job analysis and validation studies to support robust demand-driven, evidence-based career pathways.

Suggested Citation: Guest, Bill & Cleveland, Rachel (September 2019). [Evidence-Based Selection Process \(EBSP\)](#). Talxcellenz® Research Brief. Metrics Reporting, Inc. Published at www.metricsreporting.com.

Defining Evidence-Based Selection

Evidence-based selection is a fair, objective, data-driven method for selecting talent. Leveraging best practices from industrial/organizational psychology, evidence-based selection brings structured decision making using valid evidence to the practice of talent acquisition. The use of an evidence-based selection process (EBSP) was pioneered by Mercy Health in West Michigan between 2010 and 2018. After using their EBSP to hire over 10,000 candidates, Mercy Health reports impressive outcomes, including a 23% reduction in first-year turnover; a 16% reduction in time to fill; and a doubling of the racial/ethnic diversity of the workforce.

To help us better understand why evidence-based selection works, we turn to an article published by the Harvard Business Review titled, “Noise: How to Overcome the High, Hidden Cost of Inconsistent Decision Making.” Daniel Kahneman and his coauthors explain the concepts of “noise” and “bias” in decision making and provide examples of the unnecessary expenses associated with inconsistent decisions. They conclude, “Where there is judgment, there is noise – and usually more of it than you think.” Hiring decisions are one set of decisions that suffer from this problem of excessive noise. The article goes on to state “Studies have shown that while humans can provide useful input, algorithms do better in the role of final decision maker.” As a solution, the authors recommend the construction of “reasoned rules” to guide decision making.

Evidence-based selection combines the use of a standardized, consistent process with powerful selection measures, and the informed use of quantitative data. The essential elements of evidence-based selection include:

- **A Fair and Objective Process**
- **Compensatory Ratings**
- **Reliable, Valid, and Predictive Selection Measures**
- **Score Measures using Valid Selection Criteria**

Fair and Objective Selection Processes

Too often talent selection processes are fraught with bias and subjectivity, or the misguided use of selection tools and data. This results in poor outcomes for employers – turnover; lower employee performance, productivity, and satisfaction; limited workforce diversity – and negatively affects the wellbeing of employees placed in the wrong seat, or denied access to the right seat. *Evidence based selection begins with an unwavering focus on being fair and objective in talent acquisition.* As referenced in the HBR article above, being fair and objective in decision making increases the frequency of accurate decisions. For talent acquisition, increased accuracy in candidate selection leads to a set of positive outcomes for employers – reduced turnover; increased employee performance, productivity, and satisfaction; increased workforce diversity – as well as wellbeing benefits for employees and job seekers.

What is a fair and objective process?

Fair is defined as *in accordance with the rules or standards*. One can obtain fairness in a selection process by establishing valid selection criteria – standards – which are used to develop rules guiding the screening and selection of candidates.

Objective means that a *person or their judgment is not influenced by personal feelings or opinions in considering and representing facts*. Objectivity in the selection process is obtained through the consistent and structured use of valid and reliable selection tools to inform selection decisions.

Therefore, it is essential that organizations develop and maintain standardized processes for their talent acquisition practices. **Process Standardization** describes *the establishment of a set of rules governing how people in an organization are supposed to complete a given task or sequence of tasks*. For a process to be fair and objective, it must be standardized and followed consistently. Processes should be mapped, documented, and when possible built into software to maintain consistency and compliance. **Compliance** is a *state of being in accordance with established guidelines or specifications*. Organizations should measure, track, and report on process compliance to build accountability to their selection process's fairness and objectivity.

The following sections review the essential elements of evidence-based selection supporting fairness and objectivity in the screening and selection of candidates.

Compensatory Ratings

Evidence-based selection includes the use of a compensatory rating system. In a compensatory system, multiple aspects of a candidate's fit with a job are measured such as cognitive skills, personality, behavior, and physical abilities. This allows organizations to assess the candidate's potential job performance as a whole person – not just a few elements, or one element. In a compensatory rating system, selection measure scores are first banded and normed, then averaged to produce a compensatory rating for each candidate.

Banding Scores

Banding refers to the method of categorizing scores into broad bands and treating all scores within the bands as the same. We generally recommend dividing scores into three bands: Red, Yellow, and Green. We then give each band a value (usually red = 1, yellow = 2, green = 3) allowing us to norm and average the scores across selection measures to support compensatory rating (described below).

Compensatory Scoring Systems

A compensatory scoring system, such as the 5-Star method, enables high scores to compensate for low scores. There are no cut-scores that require the candidate to be rejected. Rather the average of the scores is viewed as the best indicator of the candidate’s overall skills.

Example of a 5-star compensatory rating system:

Selection Measure	Candidate Score	Band Value
Cognitive – Document	400	3
Cognitive – Prose	350	2
Cognitive – Quantitative	375	3
Job Fit (Personality)	6	2
Structured Interview Guide	18	2
Reference Check	9	3
		★★★★☆

Reliable, Valid, and Predictive Selection Measures

The use of highly predictive selection tools supports talent acquisition professionals in making an informed hiring decision. In order for these tools to work, they must provide valid and reliable data. Ultimately, we are looking for tools with the highest predictive validity. The concepts of reliability, validity, and predictive validity are described below.

Reliability

Reliability in statistics and psychometrics is the overall consistency of a measure. A measure is said to have a high reliability if it produces similar results under consistent conditions. All selection tools or measures utilized in an evidence-based process must be reliable. This requires the structured, consistent use of a tool to enable the replication of results in similar situations. Some tools, such as the unstructured interview, fail to obtain reliability due to the inherent variability between interviews and the lack of structured questions and ratings.

Validity

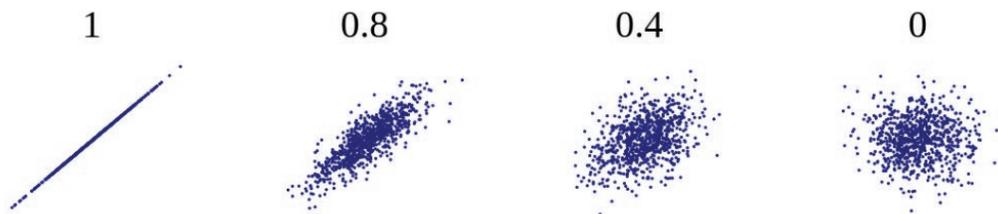
Validity quantifies the relationship between what a test actually measures and what it is intended to measure or predict. Simply stated, it means the degree to which a test measures what it is supposed to measure. To understand the validity of selection measures, we refer to the criterion-related validity. Criterion-related validity evidence involves the correlation between the test and a criterion variable (or variables) taken as representative of the construct. In other words, it compares the test with other measures or outcomes (the criteria) understood to be useful. For example, employee selection tests are often validated against measures of job performance (the criterion), and college entrance tests are often validated against measures of academic performance in college courses (the criterion).

If the test data and criterion data are collected at the same time, this is referred to as concurrent validity evidence. If the test data are collected first in order to predict criterion data collected at a later point in time, then this is referred to as predictive validity evidence.

Predictive Validity

Predictive validity refers to the degree to which the test score can predict (or correlate with) other measures of the same construct that are measured at some time in the future. When looking at the predictive validity of a selection process, we look at the correlation between selection measures and a criterion, usually job performance. Predictive validity values are presented as correlations. A correlation indicates a relationship (connection) between two sets of data. Correlations fall between -1 and 1, with -1 representing a perfect negative correlation and +1 representing a perfect positive correlation. Below are examples of scatter plots representing different correlation values:

Predictive Validity



In selection systems, we are looking to accurately predict the future job performance of candidates:

Predictive Validity

Employers need to connect these two targets:

 Competency Target	 Performance Target
Predictors: <ul style="list-style-type: none">• Cognitive – Prose• Cognitive – Documents• Cognitive – Quantitative• Job Fit – Overall• References – Overall• Structured Interview Scores	Job Performance: <ul style="list-style-type: none">• Overall Job Performance• Attendance• Safety and Rule Compliance• Engagement Scores

I/O Psychology – Hunter Smidt

Due to the inherent unpredictability of human behavior, it is not possible to develop a ‘perfect’ selection system. However, industrial/organizational psychology teaches us that some selection tools are inherently more effective than others. In 1998, Schmidt and Hunter published *The Validity and Utility of Selection Methods in Personnel Psychology: Practical and Theoretical Implications of 85 Years of Research Findings*. This is the most cited study in the history of Industrial/Organizational Psychology, providing a summary of the meta-analysis of predictors of job performance. General Mental Ability (GMA), or cognitive ability, is the top predictor. We often use the phrases critical thinking and problem-solving skills to describe cognitive ability. The chart also shows the incremental validity by adding a second predictor to GMA. The top predictors to add to GMA are: structured interview guides, job knowledge tests, integrity tests, conscientiousness tests, and reference checks. Although commonly used, selection measures such as job experience (years) and years of education have a much lower predictive validity.

Predictive Validity

Predictive Validity for overall job performance of general mental ability (GMA) scores combined with a second predictor.

Personnel Measure	Validity (r)	Multiple R	Additional validity from adding a second predictor	% Increase in validity	
GMA tests	.51				1
Interview (structured)	.51	.63	.12	24%	3
Job knowledge tests	.48	.58	.07	14%	5
Integrity tests	.41	.65	.14	27%	2
Interview (unstructured)	.38	.55	.04	8%	
Assessment centres	.37	.53	.02	4%	
Biographical data	.35	.52	.01	2%	
Conscientiousness tests	.31	.60	.09	18%	4
Reference checks	.26	.57	.06	12%	6
Job experience (years)	.18	.54	.03	6%	
Years of education	.10	.52	.01	2%	
Interests	.10	.52	.01	2%	
Graphology	.02	.51	0	0%	
Age	-.01	.51	0	0%	

Source: Adapted from Schmidt and Hunter (1998, p.265) *The Validity and Utility of Selection Methods in Personnel Psychology: Practical and Theoretical Implications of 85 Years of Research Findings*

Based on the above research, it is recommended that employers utilize a structured combination of cognitive assessments, personality assessments, and structured interview guides; along with other predictive tools such as reference checks and job knowledge tests to inform selection decisions.

Score Measures using Valid Selection Criteria

The final element of an evidence-based selection system is accurate use and scoring of selection measures. To enable a fair and objective process, we must measure and consider only the relevant data, which we call valid selection criteria. Evidence-based selection utilizes job grouping, job analysis, and validation studies to identify and update valid selection criteria.

Grouping and Analyzing Jobs

In order to accurately assess a candidate's potential job performance, we first must understand the job he or she will be performing. Industrial organizational psychology teaches us that foundational competencies are the most effective predictors of job performance. In addition, organizations want to understand and assess a candidate's ability to perform specific functions of a job, which we will refer to as occupational competencies.

Job Grouping

To effectively analyze the foundational and occupational competencies required to perform a particular job, first group similar jobs into job families. A job family is a set of jobs that are logically grouped by similar job characteristics such as knowledge, skills, abilities, behavioral skills, training requirements, education level, compensation and other factors. Most organizations have 10 – 15 job families, depending on organization size, industry, and other variables.

JOB GROUPING PROCESS:

1. Gather your organization's list of job codes and titles, along with information on the jobs including: job descriptions, hiring requirements, performance assessments, and other job artifacts.
2. Align your job codes to O*NET using the Standard Occupational Classification (SOC) system.
3. Use the Talxcellenz® system to build job families, analyzing which O*NET occupations have similar foundational competencies and job requirements.
4. Refine and improve job families through use of job analysis and validation studies.

To understand more about Job Grouping and Talxcellenz®, see the “Job Family Structure. Talxcellenz® Research Brief”, published at www.metricsreporting.com.

Job Analysis

Once you have grouped your jobs into job families, job analysis can be performed. Job analysis defines the job characteristics that are demonstrably related to job performance. Job analysis is a family of procedures used to identify the content of a job in terms of the activities involved in the work, the competencies or attributes of the individuals that do the job, or the job requirements needed to perform the work activities. This process provides detailed information to organizations that helps to determine which potential or incumbent employees are the best fit for specific jobs.

Evidence-based selection utilizes the O*NET-Based Confirmatory Job Analysis process, leveraging the O*NET, the nation's largest job's database. The process uses O*NET data gathered and organized by Talxcellenz® tools to clarify occupational and foundational competencies that define the things individuals need to know and be able to do at work. The O*NET is a project of the US Department of Labor (USDOL) and is the nation's largest database for job related information. The O*NET model contains hundreds of competency elements of knowledge, skills, abilities, work styles, and more.

JOB ANALYSIS PROCESS:

- 1. Preparation:** Create job families, complete job research, and compile draft documents to review with Subject Matter Experts (SMEs).
- 2. SME Session:** An SME session is a discussion with a representative group of subject matter experts from the job family under review that is facilitated by a job analyst with support from employers and community partners. The SMEs have the final say about the adequacy of the preparation work and their input is the basis of any modifications of the occupational competencies, foundational competencies or tools and technology lists.
- 3. Job Analysis Report:** The job analysis report includes a series of documents that will need to be properly archived for purposes of sharing information with education and training providers and for employer compliance with EEOC's Uniform Guidelines on Employee Selection Procedures.

To understand more about O*NET Confirmatory Job Analysis, see the "Job Analysis and Validation Talxcellenz® Research Brief." published at www.metricsreporting.com.

Implementing an Evidence-Based Selection Process

When implementing an evidence-based selection system, first complete Job Grouping and Analysis as described above. Once an understanding of the foundational and occupational competencies required for job performance is established, organizations can build their EBSP. Building your EBSP requires four core activities:

- determine selection tools;
- complete process mapping;
- procure selection tools; and
- build selection tools.

Determine Which Selection Tools

To begin, review the Hunter Smidt chart referenced above to determine the most predictive selection tools for each job family. Identify the important foundational competencies for the family and use this data to determine how to score selection tools.

Using Job Analysis Data to Inform Selection Tool Scoring

Review the results of job analysis to inform how to score your selection tools. Specifically, review the importance and level ratings assigned to foundational and occupational competencies to determine which competencies are a priority to assess (those that are most important to job performance) and at what skill level each competency should be performed (how advanced candidates need to be).

Process Mapping and Documentation

Once you have determined the selection tools you will use for each job family, build a process map outlining the organization's EBSP. Compare your EBSP to your current state process and identify which tools will need to be procured (such as assessments) and which need to be built (such as structured interview guides). Create clear process documentation such as a Standard Operating Procedure, toolkits, process overview, and other tools to support process compliance and standards. When possible, build your process into software systems and tools, such as Applicant Tracking Systems (ATS) and Human Resource Information Systems (HRIS).

Procure Selection Tools

Cognitive Assessments

Cognitive assessments are good indicators of critical thinking and problem-solving. Cognitive skills rise and fall together. Multiple measures of cognitive ability will generally vary together. That is called covariance. The covariance among cognitive measures is so high that it is safe to say that any three reliable measures are a good measure of general mental ability (GMA). Recall that GMA is the best predictor of job performance.

The covariance of cognitive skills is helpful in that any three or more reliable measures of cognitive ability can be used to estimate GMA. For example, measures of Prose, Document, and Quantitative skills can be used to estimate critical thinking and problem solving.

An example of a predictive cognitive assessment is the ETS WorkFORCE Assessment for Cognitive Ability, more here <https://www.ets.org/workforce/cognitive-ability/about>

Personality Assessments

To support assessing candidate's foundational competencies, it is important to understand which personality characteristics are related to job performance. In the most general sense, Conscientiousness, Agreeableness, and Emotional Stability are factors related to job performance. Job analysis and validation studies are used to precisely determine the relationships for specific job families. Personality tests are tools that are used to evaluate personality characteristics. Review the foundational competencies related to job performance with your assessment vendor to determine scoring algorithms for your personality assessment.

An example of a predictive personality assessment is the ETS WorkFORCE Assessment for Job Fit, more here <https://www.ets.org/workforce/job-fit/about>

Note on Personality and Behavior and Using SIGs and BARS

It can be helpful to think of personality as your behavioral DNA. Personality is quite stable over time. It is who you are. Personality influences behavior but does not dictate behavior. People make choices. As people mature and develop, they improve their ability to recognize the situation and choose the appropriate behavior. Consider an adult and a teenager in a similar situation. They may have similar personalities and display significantly different behaviors.

Structured Interview Guides (SIGs) and Behaviorally Anchored Rating Scales (BARS) are tools to evaluate behavior rather than personality. A common method is the behavioral-based interview STAR Method.

Using the STAR method, questions are carefully crafted to ask: “Tell me about a time when you _____” to probe a specific behavior. The question is constructed to probe a historical behavior with the understanding that the best predictor of future behavior is past behavior. The SIG question is the opportunity for the interviewer to understand how well the candidate has learned to observe a situation and choose the appropriate behaviors. The best SIGs also have BARS to score the questions. Scores enable more consistent decision making and enable the SIGs to be evaluated for predictive validity via a validation study.

Build Selection Tools

While assessments are generally purchased from a vendor, many tools such as Structured Interview Guides (SIGs) can be created internally.

Structured Interview Guides

The goal of creating a SIG is to prepare a standard set of interview questions and a set of anchored responses to assist in the evaluation of the job applicants’ answers.

To develop your own SIG:

1. Frame your SIG (Structure and Content)
2. Complete job grouping and job analysis
3. Review job analysis report focusing on the items listed below. Identify top competencies for the job family using the results of job analysis.
4. Write behaviorally based interview questions and probes. Draft a rating scale.
5. Create Behaviorally Anchored Rating Scales (BARS).
6. Test the Structured Interview Guide with incumbents or other hiring managers.

Maintaining an Evidence-Based Selection Process

Implementing an evidence-based selection process is not an event, but rather a journey. A transition to data-driven decision making in talent management can be a significant challenge for organizations. Strong change management practices support these transitions, along with the activities described above. Ultimately organizations must be committed to the goal of a fair and objective selection process, with leaders willing to support the standardized process and process compliance. Explore other related topics such as Talent Supply Chain Management (TSCM), Evidence Based Career Coaching (EBCC), and Evidence-Based Career Pathways (EBCP) to learn more about transitioning to data-driven decision making in all your talent practices.

Once an organization has implemented an EBSP, it is essential to engage in structured reviews and analysis of outcome data and utilize this information to improve elements of the process. These activities can be performed through the use of structured problem solving methods, validation studies, use of key performance measures, process compliance audits, and structured team reviews.

Appendix

Talent Supply Chain Management (TSCM) is a holistic set of solutions that enables employers and regions to build reliable pipelines of high-quality talent to meet their needs. The mission of Metrics Reporting, Inc. (MRI) is to design and implement the best TSCM systems in the world. MRI designs and implements demand-driven, evidence-based career pathways that meet the needs of regional employers and provide a clear path for individuals to prepare for and secure good jobs. There are three essential components of TSCM:

- 1. Evidence-Based Selection Process (EBSP)** is a decision-making model that elevates reliable evidence of applicant characteristics that are measurably related to job performance and reduces the use of elements that are not valid predictors of performance.
 - Cognitive measures that indicate critical thinking and problem-solving skills
 - Personality measures that indicate workplace behavioral skills
 - Measures of previous workplace behaviors via structured interviews and references
 - Continuous improvement based on talent analytics
- 2. Evidence-Based Career Pathways (EBCP)** meet the talent needs of employers and provide clear pathways for individuals to develop the skills to get and keep good jobs.
 - Seven-step career pathway model to support career navigation
 - Four-step evidence-based career coaching to define and document career plans
 - Use career profiles including evidence of skills aligned with employer requirements indicating that an individual is a highly qualified applicant
- 3. Support Activities: Sectors, Jobs, Job Families, Job Analysis, and Validation Studies**
Employers need to be organized into sector-based career councils, and job information needs to be gathered, analyzed, and published.
 - Regional careers councils are organized for each industry sector to prioritize needs
 - Regional competency models create a common language around skills
 - Careers councils organize and confirm supply-demand data
 - Jobs are aligned with SOC codes and O*NET codes to leverage occupational information
 - Jobs are grouped into job families with common competency requirements
 - Consortia-style job analysis engages subject matter experts (SMEs) from employers
 - Job information is published with foundational competencies, occupational competencies, tools and technologies lists, and credentials requirements
 - Validation studies confirm that hiring requirements are related to job performance

Bill Guest

President and Chief Solutions Architect

616.430.0828

bill.guest@metricsreporting.com