Catalyzr

The Science of Potential

Trevor Higgs

Table of Contents

TABLE OF CONTENTS 1
WHAT IS INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY? 2
THE SCIENCE OF POTENTIAL 3
DEMOCRATIZING I/O PSYCHOLOGY 10
AUTHOR 0
REFERENCES 1

What is Industrial/Organizational Psychology?

Industrial/Organizational (I/O) Psychology is the study of human behavior in the workplace. The practice of I/O Psychology applies psychological theories and principles to organizations. I/O Psychologists contribute to an organization's success by improving performance, motivation, team effectiveness, job satisfaction, innovation, occupational health, and well-being, and more. I/O Psychologists improve hiring, training, and management by studying worker behavior, evaluating companies, and conducting leadership training. I/O Psychology is one of the 15 recognized specialties in professional psychology in the United States.

The following organizations are just a few of the Fortune 500 companies that have in-house I/O Psychologists improving their employee selection, development, feedback, and more:

Amazon	General Motors	Procter & Gamble
Apple	Halliburton	Starbucks
AT&T	IBM	State Farm
CenturyLink	Johnson & Johnson	The Kellogg Company
Dell Inc.	Marriott International	Union Pacific Railroad
eBay	Nordstrom	Verizon
Facebook	PepsiCo	Walmart

While the "organizational" side of I/O Psychology focuses on understanding how organizational structures and management styles affect individual behavior, the "industrial" side involves understanding how to best match individuals to specific roles. A priority on this end of I/O Psychology is to gather evidence that identifies which selection methods best predict performance, such as personality tests. One of the biggest challenges facing I/O Psychologists is disrupting the age-old usage of pseudo-personality tests, like Myers-Briggs (MBTI) and DISC, in selection processes.

	MBTI/DISC Tests as Selection Methods	I/O Psychology-validated Selection Methods
Predict performance	No	Yes
Measure personality as a spectrum (not dichotomies)	No	Yes
Measure job relatedness	No	Yes

The Science of Potential

Catalyzr leverages the power of Industrial/Organizational Psychology to help you select the right people for the right roles at your organization, whether it is for internal mobility, workforce planning or career development. Here is how Catalyzr does it:

Catalyzr Assessment Suite

Create a Cognitive Fingerprint™ for every employee with a 15-20 minute set of cognitive assessments that measure key elements of GMA such as critical thinking, problem solving, etc.

Catalyzr Exemplars & Roles

Every company has top performers they wish they could "clone". Catalyzr's "Exemplars" setting lets you identify top performers in a role – and then merge them into a Role Profile unique to your company.

If you do not have a set of top performers to model for a role, Catalyzr has over 1,000 standardized role profiles you can use to match against your talent.

The "Catalyzr Quotient"

The Catalyzr Quotient (CQ) measures an employee's "Potential to Succeed" based on an analysis of how closely their Cognitive Fingerprint matches an Exemplar or Role Profile.

Talent Management Use Cases

Leverage Catalyzr for multiple scenarios, such as internal mobility, career pathing, and strategic work-force planning.

Focusing on General Mental Ability

Research shows that General Mental Ability (GMA), which includes critical thinking and problem-solving traits, predicts employment success significantly better than the "Traditional" data points used by Recruiters and Career Development Managers for the following reasons.[1]

1. It has the highest validity and lowest application cost.
2. The research evidence for the validity of GMA measures for predicting job performance is stronger than that for any other method.[2]
3. GMA has been shown to be the best available predictor of job-related learning. It is the best predictor of acquisition of job knowledge on the job, and of performance (learning) in job training programs.[3,4]
4. The theoretical foundation for GMA is stronger than for any other personnel measure as theories of intelligence have been developed and tested by psychologists for around 100 years.[5]

As a result of this massive research literature, the meaning of the construct of intelligence is much more precise than, for example, the meaning of what is measured by other selection procedures such as interviews, situational judgment tests, "emotional intelligence" measures, person-job fit measures, person-organization fit measures, or assessment centers.[6]

GMA is also an excellent predictor of job-related learning. It has been found to have high and essentially equal predictive validity for performance (amount learned) in job training programs for jobs at all job levels studied. Thus, when an employer uses GMA to select employees who will have a high level of performance on the job, that employer is also selecting those who will learn the most from job training programs and will acquire job knowledge faster from experience on the job.

Because GMA is an excellent predictor of job performance and an excellent predictor of job-related learning, GMA can be considered the primary personnel measure for hiring decisions. It

---

[1] Schmidt, F. L., Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*(2), 262–274.

[2] Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behavior*, *29*, 340–362.
Hunter, J. E., & Schmidt, F. L. (1996). Intelligence and job performance: Economic and social implications. *Psychology, Public Policy, and Law*, *2*, 447–472.

[3] Schmidt, F. L., & Hunter, J. E. (1992). Development of a causal model of processes determining job performance. Current Directions in Psychological Science, 1, 89–92.

[4] Schmidt, F. L., Shaffer, J. A., & Oh, I.-S. (2008). Increased accuracy of range restriction corrections: Implications for the role of personality and general mental ability in job and training performance. Personnel Psychology, 61, 827-868.

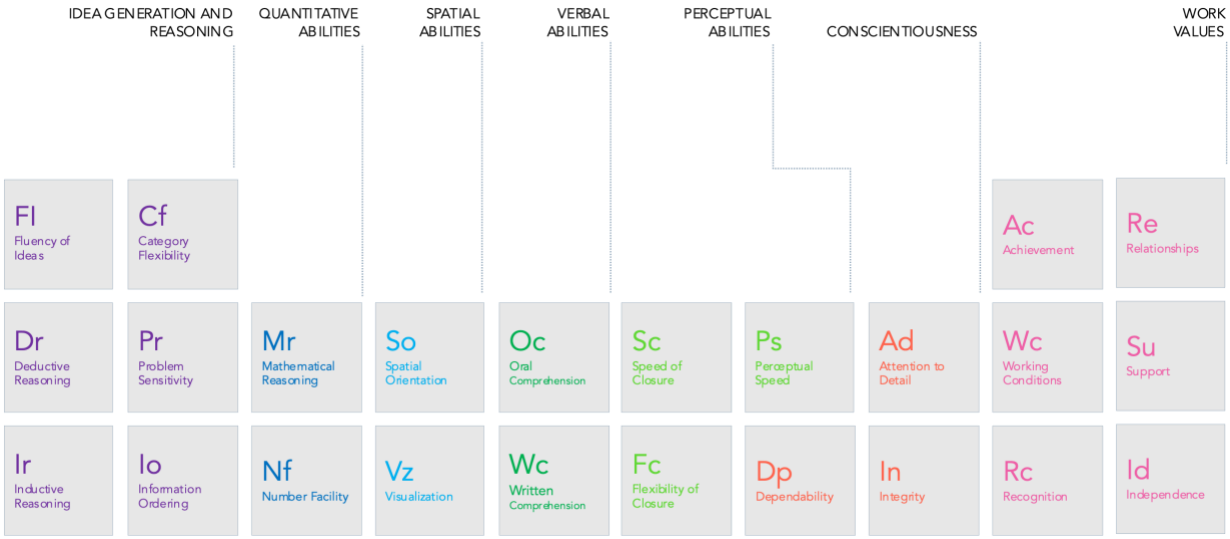
[5] Jensen, A. R. (1998). *The g factor: The science of mental ability*. Westport, CT: Praeger.

[6] Arthur Jr, W., & Villado, A. J. (2008). The importance of distinguishing between constructs and methods when comparing predictors in personnel selection research and practice. *Journal of Applied Psychology*, *93*, 435-442.

is because of these abilities to predict success consistently and reliably, that GMA is the center of Catalyzr's "Science of Potential".

Elements of Potential

Catalyzr has established a *Periodic Table of Potential* that captures not only the core elements of GMA, but also elements of other areas that have been shown to increase the predictive power of GMA when they are assessed for in conjunction with GMA.[7]



We measure these Elements as part of our assessment suite and then use a proprietary algorithm to combine their scores to create each employee's unique Cognitive Fingerprint.

Catalyzr Assessment Suite

Catalyzr's assessment suite is made up of seven assessments that take approximately 15-20 minutes to complete and may be taken in one sitting or across multiple sittings. These assessments measure the different elements of GMA and, taken together, create a unique Cognitive Fingerprint for every employee in the company. This Cognitive Fingerprint is what is compared to an Exemplar or Role Profile to create the employee's individualized Catalyzr Quotient for that role.

Assessments of GMA

The GMA portion of the Catalyzr Assessments leverages several different assessments to assess the capacity to think logically and solve new problems. The questions are designed to estimate candidates' potential in using mental processes required to solve work-related problems or to

[7] Schmidt, F. L., Oh, I.S., (2016), *The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 100 years of research findings*, Iowa City, IA: University of Iowa

acquire new job knowledge. Research has shown that scores on these tests consistently predict how successful candidates are in training and making effective decisions on the job.[8]

Catalyzr uses multiple different types of the assessments to measure different elements of GMA. By assessing these different elements, Catalyzr can build a more complete picture of an employee's Cognitive Fingerprint. The employee's Cognitive Fingerprint is the key input into the calculation of the Catalyzr Quotient, the metric that shows an employee's potential for success at a specific role. Every employee receives a CQ for every role in the company – providing a personalized analysis of their career options.

General Aptitude Test Battery (GATB)

Research has shown that the assessments contained within the General Aptitude Test Battery (GATB) Forms E and F can be combined into a GMA composite in a valid and reliable manner.[9] These assessments align with the Elements of Potential seen above.

Assessment	Definition
Spatial Visualization	Assesses the ability to form pictures in your mind. It involves easily understanding how drawings represent real objects and correctly imaging how parts fit together.
Verbal Ability	Assesses the ability to understand the meaning of words and use them effectively in good communication when you listen, speak, or write.
Arithmetic Reasoning	Assesses the ability to use several math skills and logical thinking to solve problems in everyday situations through the gathering and sorting of information related to a problem and making informed guesses about how to best solve the problem.
Perceptual Speed	Assesses the ability to see differences quickly and accurately in the details of text, numbers, in lists or in tables. It involves noticing if there are mistakes in the text and the numbers, or if there are careless errors in working math problems.

Raven's Progressive Matrices

To ensure that we are building a complete picture of an employee's Cognitive Fingerprint, Catalyzr uses "Raven's Progressive Matrices" to measure "fluid" abilities, as it does not require language or much by way of acquired knowledge to solve the problems. These fluid abilities are most related to pattern recognition and deductive reasoning. The most comprehensive review of the validity of this type of employment test was conducted by Postlethwaite based on the

[8] Salgado, J.F., And Moscoso, S., (2019). *Meta-analysis of the validity of General Mental Ability for Five Performance Criteria: Hunter & Hunter (1984) Revisited*. Front. Psychol. 10:2227. Doi: 10.3389/fpsyg.2019.02227

[9] Hunter, J.E., (1983a). *The test validation for 12,000 jobs: An application of Job Classification and Validity generation Analysis to the General Aptitude Test Battery (GATB).* Washington, DC: US Department of Labor, US Employment Office

results of dozens of studies and thousands of job candidates.[10] This review showed that scores have a strong statistical relationship to job performance.

Most importantly, high performers get more questions correct on such tests than low performers because all roles require learning and problem solving. Because of this, cognitive ability tests have been shown to predict performance across roles and organizations that use them in hiring are more productive and have lower turnover as a result.[11] Moreover, problem solving predicts job success beyond other prerequisites, such as work experience and employment interviews.[12]

Work Values Assessment

In addition to making sure that people have the correct cognitive "Fit" to each role, it is important to make recommendations that are tailored to what a person values within a job so that they are satisfied and happy with the work that they are doing.

The Catalyzr Values Assessment is based on the Theory of Work Adjustment (TWA) which says that the degree that an individual's skills and abilities align to the skill and ability requirements of the work being done will predict the individual's ***satisfactoriness to do the work***; whereas the degree that an individual's needs and values and the reinforces available in the work environment will predict an individual's ***satisfaction with the work they are doing***.[13]

There are six Work Values that are identified the TWA, and the purpose of the assessment is to identify the top two Work Values for the participant.

Work Value	Definition
Achievement	Occupations that satisfy this work value are results oriented and allow employees to use their strongest abilities, giving them a feeling of accomplishment
Recognition	Occupations that satisfy this work value offer advancement, potential for leadership and are often considered prestigious.
Working Conditions	Occupations that satisfy this work value offer job security and working conditions that provide a sense of security, variety, and independence
Independence	Occupations that satisfy this work value allow employees to work on their own and have the responsibility to make their own decisions
Relationships	Occupations that satisfy this work value allow employees to provide service to other and work with co-workers in a friendly non-competitive environment

[10] Postlethwaite, B/E/ (2011). *Fluid ability, crystalized ability, and performance across multiple domains: A meta-analysis (Doctoral dissertation)*. Iowa City, IA: University of Iowa

[11] Schmidt, F. L., Hunter, J. E., (1981). *Employment testing: Old theories and new research findings*. American Psychologist, 36(10), 1128-1137

[12] McDaniel, M.A, Hartman, N.S., Whetzel, D.L., and Lee Grubb III, W., (2007). *Situational judgement tests, response instructions and validity: A meta-analysis*. Personnel Psychology, 60,63-91

[13] Dawis, R.V, & Lofquist, LH. (1984). *A psychological theory of work adjustment*, Minneapolis, MN: Minnesota University Press.

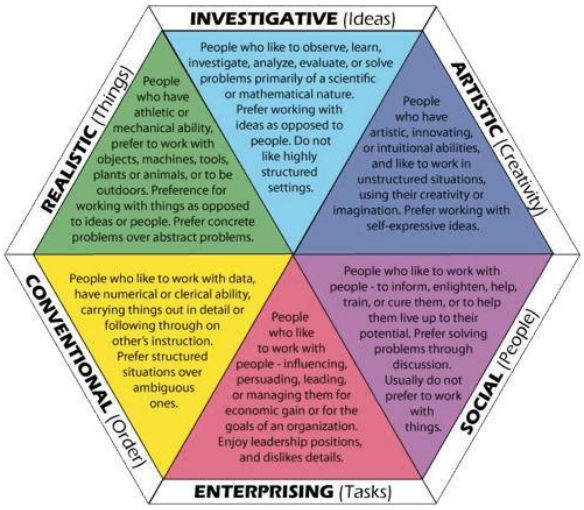
Support	Occupations that satisfy this work value offer supportive management that stands behind employees providing guidance and supervision

The Work Values assessment requests that the participant prioritize 21 "need statements" about their ideal work environment. For example:

> *"In my ideal job, it is important that I make use of my abilities."*
>
> *"In my ideal job it is important that I be treated fairly by the company."*

After completing the prioritization exercise the participant rates each need statement as either *important* or *not important*.

The output of this assessment is to calculate and inform the participant of their top two work values.[14] These Work Values are then included in the Catalyzr Quotient algorithm so that roles that match these values are given more weight than those that do not.



Work Interests Assessment

A RIASEC assessment is a career interest inventory, based on John Holland's theory, that people choose occupations and college majors that align with their personality types, and that a good fit between personality and work environment leads to greater satisfaction and success.[15] The theory categorizes individuals and careers into six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The assessment asks questions about a person's interests and activities to generate a customized report, providing insights into suitable fields of study and career paths.

How the RIASEC Assessment Works

- Questionnaire: The test consists of questions about a person's aspirations, activities, skills, and interests in various jobs and fields.
- Holland Code Classification: Based on the responses, the individual is assigned a three-letter Holland code, which represents their top three dominant personality types within the six categories.

The Six RIASEC Themes

- Realistic (R): Enjoys hands-on, practical work with tools, machinery, or outdoors.
- Investigative (I): Likes to observe, learn, analyze, and solve complex problems intellectually.

---

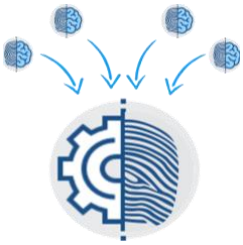
[14] McCloy, R., Waugh, G., Medsker, G. (1999). *Development of the O*NET Computerized Work Importance Profiler*, Raleigh, NC: National Center for O*NET Development

[15] Holland, John L. "A Theory of Vocational Choice." *Journal of Counseling Psychology*, vol. 6, no. 1, pp. 35–45, doi.org/10.1037/h0040767. Accessed 20 Sept. 2022.

- Artistic (A): Prefers unstructured situations that allow for the use of creativity and self-expression.
- Social (S): Enjoys working with people, helping, teaching, and assisting others.
- Enterprising (E): Likes to lead, persuade, and influence others in a business or leadership role.
- Conventional (C): Enjoys organized, methodical work, following procedures, and working with data.

The participant's RASIC Profile is then included in the Catalyzr Quotient algorithm, so that roles matching these interests are given more weight than those that do not.

Career Matching: Role Profiles & Exemplars



Some assessment tools that assess for personality traits such as those found in the Five Factor Model (FFM) or "Big Five" personality model, at least half of the dimensions on a psychometric assessment may not actually predict success for any given position.[16] With Catalyzr, every element of the assessment is designed to drive the prediction of potential success and is mapped to data within our Role Profiles.

Catalyzr has over 1,000 role profiles that capture the elements defined in the Periodic Table of Potential. As part of the implementation process, clients map their jobs to these roles to create the GMA baseline for each job.

Every company has top performers they wish they could "clone". Catalyzr's "Exemplars" setting lets a client identify their top performers in a role. These top performers take the assessments and create their individual Cognitive Fingerprints. These Fingerprints are then merged to create an "Exemplar Profile" that is unique to the company.

This Exemplar Profile is then used by the matching algorithm to find any employee from across the company who have a close cognitive match, and thus high potential for success at that role.

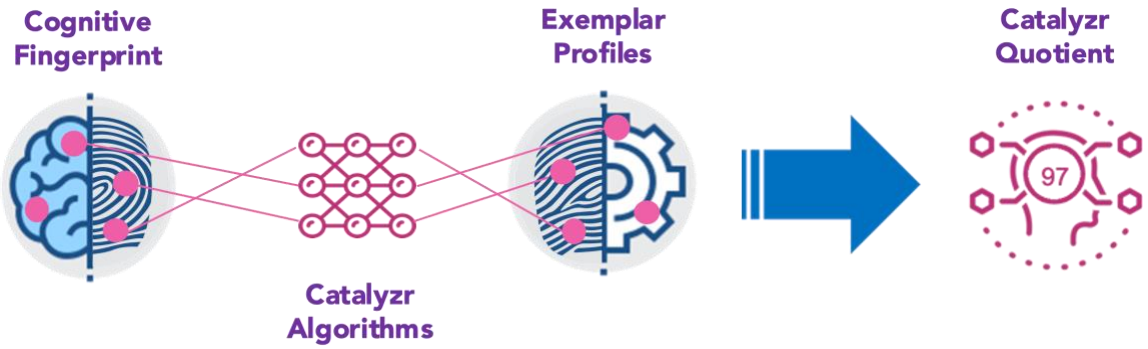
Catalyzr Quotient: GREATER VALIDITY

The Catalyzr Algorithms have multiple advantages over the assessment results of platforms that use personality assessments or Artificial Intelligence as matching tools. First, Catalyzr consistently uses the same elements of potential for every role that it assesses; what matters for the match is how much of that element is needed for each role. Second, Catalyzr can provide a baseline of GMA measurements for over 1,000 roles; Catalyzr's Exemplar Profile function allows clients to model employees who have been successful in the company, making the matching profile unique to the client. Third, Catalyzr assesses and makes matches based on

[16] Christiansen, N., and Schneider, L., (2020). *The Science Behind Plum, a Groundbreaking Approach to Talent Assessments*, Kitchner, Ontario: Plum, Inc

correlations between an employee's GMA and the GMA requirements of the role, making Catalyzr significantly better at predicting potential success than other platforms.[17]

Catalyzr's algorithms compare the employee's cognitive fingerprint with the Exemplar Profile to assess the employee's potential to succeed in that role. We call this the ***Catalyzr Quotient***.



The Catalyzr Quotient is an easy-to-use and simple-to-understand metric that measures an employee's potential for success in any role in the company. Simply put, the higher the employee's CQ is for a role, the more likely they are to succeed (once properly trained). The Catalyzr Quotient can be aggregated at a team, unit, or division level so that leaders can see how well-aligned their employees are for success in one simple, easy-to-understand metric.

The Catalyzr Quotient is truly, ***"The one number you need to know for Talent"***

Democratizing I/O Psychology

There was once a time when organizations could only gain access to the deep insight of Industrial/Organizational Psychology through (often time-consuming and costly) consulting services. At Catalyzr, we automate I/O Psychology and make the certainty of I/O Psychology available to all. By providing our customers with valid talent data, they're able to make better workforce planning, internal mobility, and career development decisions.

[17] Schmidt, F. L., Oh, I.S., (2016), *The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 100 years of research findings*, Iowa City, IA: University of Iowa

AUTHOR

Trevor Higgs
Founder, CEO

Trevor Higgs, a co-founder of Catalyzr, brings over 25 years of HR and HR Technology experience, having worked with some of the leading companies in Finance, Pharmaceuticals, and Management Consulting.

At Credit Suisse, Trevor managed the development of custom HR applications and the implementation of SaaS applications; eventually taking the Head of HR Technology role before leaving Credit Suisse for Accenture.

In Accenture's Strategy group, Trevor built the HR Technology team, wrote the HR SaaS Point of View that was shared with clients, and advised global HR Leaders on the future of HR Technology.

Deciding to put the theory into practice, Trevor joined Johnson & Johnson as the Global Head of Candidate Experience, where he implemented the award-winning "J&J Shine" program.

It was after he helped to co-found TCT, Inc., beqom's partner of choice for Financial Services implementations, that he and Jeremy had the idea to form Catalyzr—a talent intelligence tool that uses cognitive science to measure and quantify a person's potential for employment success in any role in a company.

Trevor received a BA in East Asian Studies from Yale University.

References

Schmidt, F. L., Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*(2), 262–274.

Hunter, J. E. (1986). Cognitive ability, cognitive aptitudes, job knowledge, and job performance. *Journal of Vocational Behavior*, *29*, 340–362.

Hunter, J. E., & Schmidt, F. L. (1996). Intelligence and job performance: Economic and social implications. *Psychology, Public Policy, and Law*, *2*, 447–472.

Schmidt, F. L., & Hunter, J. E. (1992). Development of a causal model of processes determining job performance. Current Directions in Psychological Science, 1, 89–92.

Schmidt, F. L., Shaffer, J. A., & Oh, I.-S. (2008). Increased accuracy of range restriction corrections: Implications for the role of personality and general mental ability in job and training performance. Personnel Psychology, 61, 827-868.

Jensen, A. R. (1998). *The g factor: The science of mental ability*. Westport, CT: Praeger.

Arthur Jr, W., & Villado, A. J. (2008). The importance of distinguishing between constructs and methods when comparing predictors in personnel selection research and practice. *Journal of Applied Psychology*, *93*, 435-442.