

**plum** predict certain.

*The Science*

# BEHIND ULTRAVIOLET

**Want to dig deeper into the 50+ years of  
Industrial/Organizational Psychology science that powers  
Plum's Talent Recommendation Engine, Ultraviolet?**

*You're in the right place.*

Plum's team of scientists have automated and redesigned the same quality psychometric testing that selects CEOs for Fortune 500 companies, making these capabilities available at all levels of your organization. In other words, you now have the data you need to make predictive talent decisions at every stage of the employee journey — predicting successful hires, professional development plans, internal mobility pathing, and emerging leader capability.

## 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:

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

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 jobs. 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
<b>Predict performance</b>	✗	✓
<b>Measure personality as a spectrum (not dichotomies)</b>	✗	✓
<b>Measure job relatedness</b>	✗	✓

# WHY WE USE THE SCIENCE THAT WE USE

There is a better way to make talent decisions than “gut instinct.” Plum leverages the power of Industrial/Organizational Psychology to help you select the right people for the right jobs at your organization — whether they’re new hires or internally mobilized talent. Here’s how.



## PLUM DISCOVERY SURVEY

Assess talents that predict performance with a 25-minute job seeker- and employee-facing assessment.



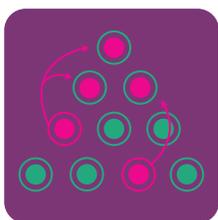
## PLUM MATCH CRITERIA SURVEY

Capture insights from employers and uncover job needs to determine the specific criteria for each role through a 6-8 minute survey.



## PLUM MATCH SCORE

Determine an individual’s fit in a role with a single score that results from merging a person’s profile with the needs of the job.



## TALENT MANAGEMENT USE CASES

Leverage Plum’s Talent Recommendation Engine for multiple scenarios, such as hiring, professional development planning, high-potential selection, career pathing, and strategic workforce planning.

## THE PLUM DISCOVERY SURVEY: PERFORMANCE PREDICTION

Plum's Discovery Survey assesses candidates on 10 Talents:

TALENT	THE ABILITY TO...
<b>Adaptation</b>	Adjust to changes in the workplace while maintaining a positive demeanour
<b>Communication</b>	Convey ideas effectively and identify messages others are attempting to convey
<b>Conflict Resolution</b>	Bring others together to resolve conflict and reconcile differences
<b>Decision Making</b>	Make high-quality decisions based on limited information
<b>Embracing Diversity</b>	Understand others' perspectives and deal effectively with different types of people
<b>Execution</b>	Set goals, monitor progress, and take the initiative to improve your work
<b>Innovation</b>	Generate novel solutions and creative ideas to solve problems
<b>Managing Others</b>	Take charge of a group and motivate group members toward common goals
<b>Persuasion</b>	Convince others of a direction, activity, or idea, and influence decision-making
<b>Teamwork</b>	Work effectively with people and cooperate with others

Our validity studies show that these talents are predictive of performance on the job.

We measure candidates' talents by using a proprietary algorithm to combine their scores on personality traits and cognitive abilities as assessed by the Plum Discovery Survey. Research has shown that combining the results of multidimensional assessments of personality and intelligence will typically have twice the ability to predict job success than either type of assessment alone<sup>1,2</sup>.

## ASSESSING PERSONALITY

Plum assesses personality traits based on the psychological five-factor model (FFM) or “Big Five” personality model. Hundreds of research studies have conclusively demonstrated the relationships between personality and job performance<sup>3,4</sup>.

Plum measures narrow dimensions within each of the Big 5 traits, in line with findings that specific dimensions often predict performance better than broad personality factors<sup>2</sup>.

Applicants will often try to “game” personality tests by denying negative behavioral tendencies in order to raise their scores. Most commercial personality inventories do not make it difficult for applicants to do this, using simple ratings scales or true/false formats where the desirable response is obvious. Research has consistently shown that candidate “faking” happens on these types of inventories with alarming frequency and that it can destroy the capability to predict future job performance<sup>5,6</sup>.

### Here is a typical question used in some of the most popular assessments today

**A. You typically hand in work:**

- Late with occasional mistakes
- Late with no mistakes
- On time with occasional mistakes
- On time with no mistakes

**B. I keep my work space neat and organized at all times:**

- |                 |          |               |          |           |
|-----------------|----------|---------------|----------|-----------|
| <b>1</b>        | <b>2</b> | <b>3</b>      | <b>4</b> | <b>5</b>  |
| Not at all True |          | Somewhat True |          | Very True |

**The personality sections of the Plum assessment are specifically designed to prevent applicants from misrepresenting their behavioral tendencies and claiming to have only positive dispositions at work.**

Plum uses clusters of adjectives and behavioral statements and asks candidates to choose those that are most true of them. The key is that the options have all been matched on how attractive they appear while candidates do not know how they are being scored for a particular role or job in an organization.

### **Plum implements a “Forced-Choice” personality survey**

	<b>Least True</b>	<b>Most True</b>
<b>I tend to sympathize with others’ feelings.</b>		
<b>I always know what I am doing.</b>		
<b>I like to solve complex problems.</b>		

The science behind the “forced-choice” methodology has been firmly established to demonstrate that applicants cannot successfully game the test. Research has consistently shown that forced-choice inventories maintain their validity even when given to the most motivated job applicants, but commercial inventories using rating scales or true/false formats do not<sup>7,8,9</sup>.

# ASSESSING PROBLEM SOLVING

The problem solving portion of the Discovery Survey leverages Raven’s Progressive Matrices 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 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.

SECTION I: PROBLEM SOLVING

Select the missing piece ? below

Our test measures “fluid” abilities, in that 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<sup>10</sup> based on the results of dozens of studies and thousands of job candidates. 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 jobs require learning and problem solving. Because of this, cognitive ability tests have been shown to predict performance across jobs and organizations that use them in hiring are more productive and have lower turnover as a result<sup>11</sup>. Moreover, problem solving predicts job success beyond other prerequisites, such as work experience and employment interviews<sup>12</sup>.

## ASSESSING SOCIAL INTELLIGENCE

Organizations have become increasingly aware that having interpersonally effective employees represents a competitive advantage. Assessment tools such as structured interviews and assessment centers are useful for gauging interpersonal competencies, yet they are costly and impractical when there are large numbers of individuals that need to be assessed.

The social intelligence section of the Discovery Survey assesses individual differences in the ability to understand social cues and anticipate the impact of different actions on the thoughts and feelings of others. The situational judgment item format involves presenting a work situation and requesting the candidate to evaluate the effectiveness of different courses of action, selecting the actions they believe would be the least and most effective responses. McDaniel and colleagues<sup>12</sup> examined over 100 research studies that linked social intelligence test scores to job success and showed that there was a strong relationship.

The questions on our social intelligence test have been extensively researched. Scores on the items of the test have been linked to performance in work situations common to most jobs and to actual observations of socially effective work behavior<sup>13</sup>.

SECTION IV: SOCIAL INTELLIGENCE

Read the below work situation and pick the statement that is **Least effective** and **Most effective**.

Work Situation:

Mila has been asked to facilitate a meeting to identify new marketing opportunities. However, during the meeting none of the team members express opinions about which strategies to choose and how to implement them. This is uncharacteristic of the group, as they are usually very vocal and creative. Mila is concerned about implementing any new marketing strategies without getting useful feedback from the group. If you were Mila, which responses would be the most effective and least effective?

<small>Choose One</small> <small>Least effective</small>		<small>Choose One</small> <small>Most effective</small>
<input type="radio"/>	Bring the meeting to a close and touch base with each team member separately about their recommendations.	<input type="radio"/>
<hr/>		
<input type="radio"/>	Finish the meeting and go ahead with your own ideas about how to implement the strategies.	<input type="radio"/>
<hr/>		
<input type="radio"/>	Continue the meeting and try to convince the team to share their opinions as their input is needed to make the implementation successful.	<input type="radio"/>
<hr/>		
<input type="radio"/>	Share your own opinions about marketing opportunities and see if the team has any concerns and if they support your ideas.	<input type="radio"/>

## THE PLUM MATCH CRITERIA SURVEY: UNCOVERING JOB NEEDS

The profile of what is important for success as a customer service representative will look very different than that of a software developer.

For any given position, at least half of the dimensions on a psychometric assessment may not actually predict success. The key is narrowing down which talents are crucial to the specific job you are hiring for. Research has shown that scores on dimensions identified as relevant by job experts predict performance much better than those that were not<sup>14</sup>.

A job analysis, based on the expert judgments of hiring managers and top performers in the role, are a reliable and valid way of determining job criteria<sup>15,16</sup>. This process can often be time-consuming and arduous, with the use of interviews and focus groups. Plum has designed a 6-8 minute Match Criteria Survey that quickly captures that information and feeds it back to decision-makers.

Results of the Match Criteria Survey are aggregated across job experts and the talents are ranked in terms of importance. The results are then used to determine the 5 Talent scores that will be combined to determine candidate Match Scores.

## THE PLUM MATCH SCORE: GREATER VALIDITY

Plum merges candidates' talent scores with the results of the Match Criteria Survey to generate an overall estimate of how each candidate fits with role requirements — a Match Score.

Plum Match Scores have several advantages over the assessment results of other commercial personality inventories. First, Plum customizes the scoring of the assessment to focus on those dimensions that are important for success, as determined by the Match Criteria Survey. This means that every candidate can take a universal assessment, but be considered for multiple roles. Match Scores also act as a simple way for users to sort individuals based on the extent they have what is needed for success.

The process of merging the results of psychometric assessments with the judgments of job experts has proven to be the most robust method for identifying top candidates<sup>15,16</sup>. This also allows decision makers to not be distracted by assessment results that do not predict success. The science behind how the Plum Match Scores are computed ignores talents that are not important and prioritizes those that are.

## TALENT MANAGEMENT USE CASES

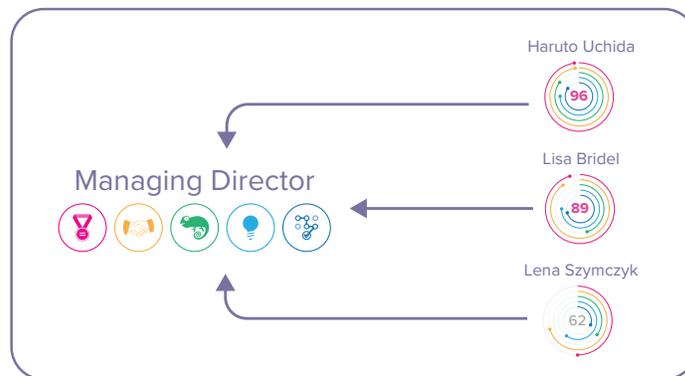
Plum's Talent Recommendation Engine, Ultraviolet, takes a talent-first approach to talent management. Role requirements and individuals' capabilities are assessed using a common talent framework. Then, the match between individuals' natural talents and the talent requirements of a role are intelligently calculated.

This process forms the foundation for a number of talent management use cases. Some of these use cases are described below.

### Succession Planning and Career Mobility

Organizations recognize the need to retain top talent by providing them with opportunities to explore new roles. Whether employees are climbing the career ladder (promotion) or navigating a career lattice (e.g., moving across business units or departments), matching for talent ensures that they have the best chance for success.

In the case of succession planning, potential successors can be chosen by identifying individuals with high talent Match Scores for the role in question.



In the case of career mobility, an individual's talent profile can be compared to a range of roles. Roles that have the best fit can be considered as possible moves.



## Learning and Development

Retaining your top talent means keeping them engaged. One of the best ways to promote engagement is through targeted learning and development opportunities involving feedback<sup>17</sup>.

Ultraviolet leverages individuals' Discovery Survey results to produce Talent Grow professional development guides for employees. Talent Grow provides detailed feedback on individuals' natural tendency to engage in the behaviors within the 10 Plum Talents.



### ADAPTATION

Adaptation includes the following competencies:

#### Preparing for change

Anticipating change and planning for possible contingencies which involves:

- ● ● ● ● Anticipating problems and choosing forward-thinking solutions
- ● ● ● ● Developing plans to accomplish the work
- ● ● ● ● Identifying and developing solutions to potential problems

#### Responding to change

Effectively reacting, responding, and adapting to change which involves:

- ● ● ● ● Persisting through ambiguity and change
- ● ● ● ● Remaining calm and level-headed in the midst of change
- ● ● ● ● Rebounding from the challenges associated with change
- ● ● ● ● Adjusting to change and integrating changes into existing plans and procedures

#### Embracing uncertainty

Demonstrating composure and resilience when faced with setbacks, ambiguity, and stressful situations which involves:

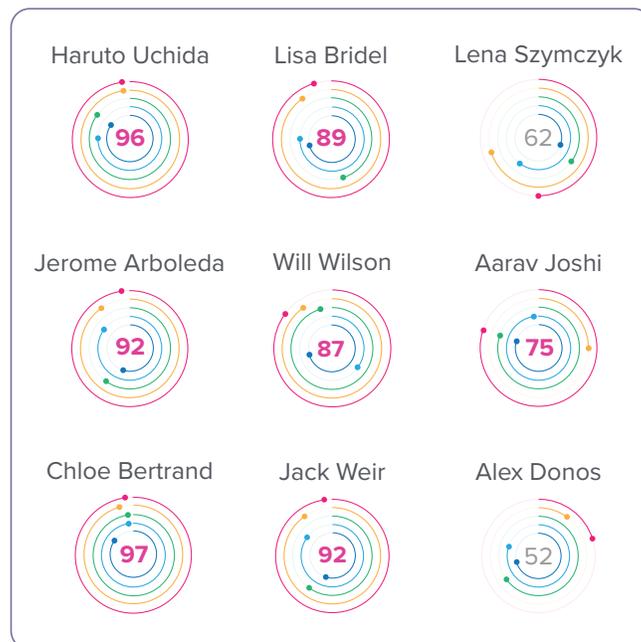
- ● ● ● ● Maintaining productivity during times of change
- ● ● ● ● Operating effectively in stressful situations

Employees can target development areas of their choosing based on their personal goals, manager input, and organizational priorities. They can also choose to target development areas that are relevant to the talents required for particular roles.

## Recruitment and Selection

Making hiring decisions based on the results of psychometric assessments means that you are relying on data that is highly predictive of success on the job<sup>1</sup>. This is in contrast to information like education and experience, which are readily available on a resume, but are poor predictors of job performance.

In Ultraviolet, job candidates are matched to the requirements of a job and sorted based on their talent Match Score.



This provides employers with a prioritized list of candidates for inclusion in further stages of the hiring process. Candidates are vetted for their match based on the talents for the role before employers waste time interviewing candidates who appear like stars on a resume, but do not meet the behavioral requirements of the role.

## AUTOMATING 50+ YEARS OF 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 Plum, we automate I/O Psychology with AI to make the certainty of I/O Psychology available to all. By providing our customers with valid talent data at every stage of the employee lifecycle, they're able to make better hiring, internal mobility, professional development, and emerging leader decisions.

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# AUTHORS

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[Dr. Christiansen's University page](#)

[Handbook of Personality at Work](#)

Neil D. Christiansen, Ph.D., is an expert in the areas of employment testing and psychological measurement. He has worked extensively with corporations to improve their hiring processes and help them identify the most talented job candidates.

Dr. Christiansen specializes in developing innovative assessments to measure personality and interpersonal competencies.

He is currently a Professor of Psychology at Central Michigan University and has published numerous papers on the topic of personality in the workplace. He published the edited volume Handbook of Personality at Work, which is regarded as the most comprehensive book on the subject to date.

## Leann Schneider, Ph.D.

Leann Schneider, PhD., is the Product Manager at Plum. In this role she applies her passion for research-based practice, practical insight, and coaching-supported development to Plum's product development and client delivery.

She obtained her Ph.D. in Industrial/Organizational Psychology at the University of Guelph. Her research focuses on personality, employment interviews, and the assessment of individual differences, and is published in peer-reviewed journals including the International Journal of Selection and Assessment, Journal of Research in Personality, and Social Indicators Research.