Game-Based Assessment for High-Stakes Personnel Selection

Jason Blaik
Organisational Psychologist
Lead Psychometrician
<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>REVELIAN ASSESSMENTS</th>
<th>WHAT IS MEASURED</th>
<th>WORKPLACE OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aptitude, cognitive ability</td>
<td>• Cognify</td>
<td>• General cognitive and problem-solving ability</td>
<td>• Better job performance</td>
</tr>
<tr>
<td></td>
<td>• Cognitive Ability Test (RCAT)</td>
<td></td>
<td>• Reduced turnover (involuntary)</td>
</tr>
<tr>
<td></td>
<td>• Separate ability tests (verbal, numerical &amp; abstract reasoning)</td>
<td></td>
<td>• Improved training outcomes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Increased productivity</td>
</tr>
<tr>
<td>Work-related values</td>
<td>• Values Inventory (RVI)</td>
<td>• Organisation and cultural fit</td>
<td>• Improved organisational commitment, engagement and tenure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reduced turnover (voluntary)</td>
</tr>
<tr>
<td>Preferences</td>
<td>• Work Preferences Profile (RWPP)</td>
<td>• Person-job fit</td>
<td>• Reduced turnover (voluntary)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Increased job satisfaction and engagement</td>
</tr>
<tr>
<td>Safety behaviour</td>
<td>• Work Safety Assessment (RWSA)</td>
<td>• Safety attitudes and behaviours</td>
<td>• Improved safety motivation and participation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reduced LTIs, MTIs and work cover claims</td>
</tr>
<tr>
<td>Integrity and reliability</td>
<td>• Work Reliability Scale (RWRS)</td>
<td>• Attitudes to counterproductive behaviours</td>
<td>• Reduced incidence of behaviours such as fraud, theft, dishonesty, shrinkage and absenteeism</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td>• Emotify</td>
<td>• Identifying, understanding and using emotions at work</td>
<td>• Improved leadership performance and customer satisfaction</td>
</tr>
<tr>
<td></td>
<td>• Emotional Intelligence Test (MSCEIT)</td>
<td></td>
<td>• Improved communication and teamwork</td>
</tr>
<tr>
<td>Behaviour and personality</td>
<td>• Behavioural Profile (RBP)</td>
<td>• Style and behaviour at work</td>
<td>• Team understanding</td>
</tr>
<tr>
<td></td>
<td>• 16 Personality Factors*</td>
<td></td>
<td>• Team effectiveness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reduced turnover (involuntary)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Improved communication and teamwork</td>
</tr>
<tr>
<td>Technical skills</td>
<td>• 900+ skills tests</td>
<td>• Core skills critical to the role</td>
<td>• Reduced training requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Increased productivity</td>
</tr>
</tbody>
</table>

* The 16 Personality Factors assessment is only available in Australia and New Zealand
Game-Based Assessment

- More than correct or incorrect response
- Identify high potential candidates quickly
- Device agnostic
- Generate much more data
- Innovative client brand representation
- Engaging experience
- Limited reliance on language
- Applicable to a wide range of roles
- Psychometrically sound
Cattell-Horn-Carroll Theory of Cognitive Abilities

Schneider & McGrew (2018)
Low-Fidelity Prototypes
Game assessing **Verbal Knowledge**

This game assesses the candidate's breadth of knowledge and ability with written (English) language, particularly spelling, grammar and identifying errors in text. This ability is important in roles which require reading and writing.

**Proof it!**

Candidates need to identify as many misspelled words and punctuation errors as possible within the time limit.
• People liked GBA - preferred general affect; job-related
• Perceived as more fair
• High level of convergence with stand-alone cognitive ability tests
• JAP paper in the works
Modern Prediction Methods

Plot Legends (V2 – using all predictors vs. only those shortlisted for GLM based models)
- BENCH = Regression using Revelian’s current scoring
- REG = Linear Regression
- Pencal/GLM = Regularised Regression (LASSO & Ridge)
- GAM = Generalised Additive Model
- MARS = Multivariate Adaptive Regression Splines + BAG MARS = Bagged Multivariate Adaptive Regression Splines
- BOOST = Boosted linear model
- PLS = Partial Least Squares Regression
- SVM = Support Vector Machine
- RF = Random Forest
- XGB = Extreme Gradient Boosted Trees
Automated Item Generation (AIG)
Translation

Welcome

You will be completing a series of interactive mini-games, each designed to assess your abilities in different ways. These games might be fun, but remember that you're being assessed. Play each game to the best of your ability.

How to Play

Read Tutorial

Each assessment begins with a tutorial page. Read it carefully so that you can do your best.

Give it Your Best

The time remaining and number of puzzles will be displayed at the bottom of each assessment.

Games to Complete

Bienvenue

Ces évaluations sont susceptibles de différencier qui vous avez participé le passé. Avant de commencer, nous souhaitons vous informer sur quelques informations sur le que nous devons vous aimer.

Vous devez compléter quelques questions interactives, il est que le temps pour envoyer les réponses de différentes manières. Certaines de ces peuvent un retour d'informations, des résultats, mais pas que vous participez à une évaluation. Vous faites partie de notre mesure pour chaque jeu.

Déroulement du jeu

Selectionner l'évaluation

Vous devrez compléter trois évaluations par une maillon. Une fois que vous avez complété et évalué une sensibilité, vous devez terminer le prochain.

Identifier le meilleur de vous-même

Chaque évaluation utilise un modèle de modèle de test pour déterminer le meilleur de vous-même.

Parties à terminer

Commencer

Nombres

Blocs de jeu

Arbres

Parties de style
Translation
EI

FACTOR

PERCEPTION

UNDERSTANDING

FACILITATION

MANAGEMENT

Mayer & Salovey (1997)
FEAR

The happiness bubble.

Title:

1 of 25
SCORE

PROGRESS

TIME LEFT

A manager at an organization just praised this person for doing a great job on a project they were working on.

This person just found her mom had to take the cat to the vet because it was stuck by a car.

Bob was telling his friend a really exciting story. This friend did not believe what Bob was saying.

1 of 25
HAPPY
SCORE

PROGRESS

TIME LEFT

This person is sitting under a tree having a romantic picnic with his girlfriend. Another man sat on their blanket and started playing his guitar.

Eric is likely to feel:

ANGER

SURPRISE

FEAR

00
TIME LEFT

23
HIGHEST SCORE

Select the emotion that matches each face. Faces at a board room table to provide face validity.
MATCHING FACES

TASK
Correctly identify emotions in facial expression

MEASURES
Emotional Intelligence (Perception)

DETAILS
30 rounds, 90 seconds, highly speeded (3s).
Average time incl. tute 3.5 mins

CONTENT
Diverse emotions, gender, ethnicity, age,
match/no match. Random streaming
EMOTIONAL TIES

**TASK**
Correctly identify emotions and emotional reactions to different situations

**MEASURES**
Emotional Intelligence (Perception; Understanding)

**DETAILS**
20 rounds (singles, duos, multis), 20 mins, powered. Average time incl. tute 16.5 mins

**CONTENT**
Generalisable context and language, diverse emotions, gender, ethnicity, age. Random streaming
John is running late for a job interview for a role he recently applied for.

When John arrives, he finds out the interviewer has been caught up in another meeting and is also running late.

Samuel and Lucy entered into a singing competition. They both chose to perform the same song. Samuel receives a standing ovation while Lucy is later booed off the stage.

Samantha bites into her apple at lunch. When she looks closer she sees a little worm wriggling inside of the apple.

Gaby is shopping on her overseas vacation and unexpectedly bumps into a close friend from home.

Karen is driving late at night when a cat runs out in front of her car.
Validation & Analysis

- ≈ 3,000 participants; 2 phase validation
- Scoring models optimise rel’n between assessments and criterion (STEU)
- Validity MF = .45; ET = .54; Emotify = .65
- Reliability (test-retest) = .77
- Device agnostic; small gender effect \((d = .27)\), ns age effect.
Some early criterion-related validity...
Current Usage

**Cognify**
- Launched Oct 2016
- >140,000 completions
- >230 unique companies
- 23 different industries
- Varied management levels

**Emotify**
- Launched Jan 2019
- >10,000 completions
- >50 unique companies
- 14 different industries
- Mainly graduates
Discover what lies below the surface.

revelian.com