

New Developments in Psychometrics



“HR executives don’t buy tests based on their validity coefficients. If they did, they’d all be buying Saville Wave”

Paul Barrett

What are we trying to predict with psychometric questionnaires?

What is the most important criterion?

- Culture fit?
- Motivation?
- Talent?
- Potential to perform?
- Potential for promotion?

Who are we?

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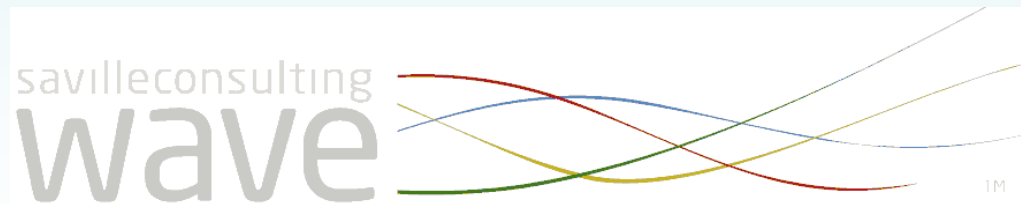
- Saville Consulting was founded in 2004 by Professor Peter Saville (previously founder of SHL Group)
- Key drivers: ongoing research, innovation, maximising power of internet, exceptional prediction, richer feedback
- Partnered with over 50 like-minded organisations internationally as distributors
- PeopleCentric: the NZ distributor and alliance partner
 - Assessment
 - Development
 - Engagement and well-being
 - Outsourced HR
 - Strategic HR



- The Wave Development Process
- The Epsom Study – A Co-Validation Study
- Applied Cases of Validation

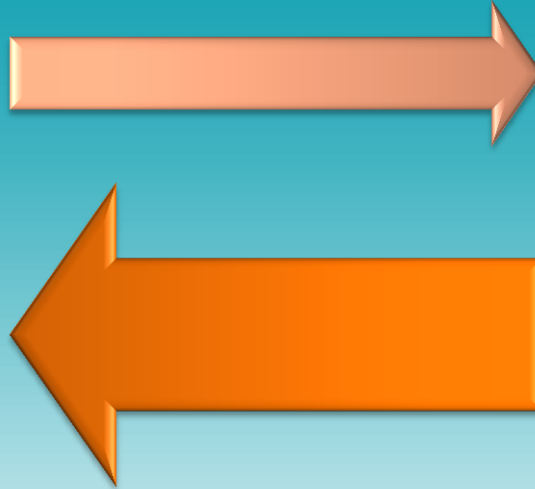
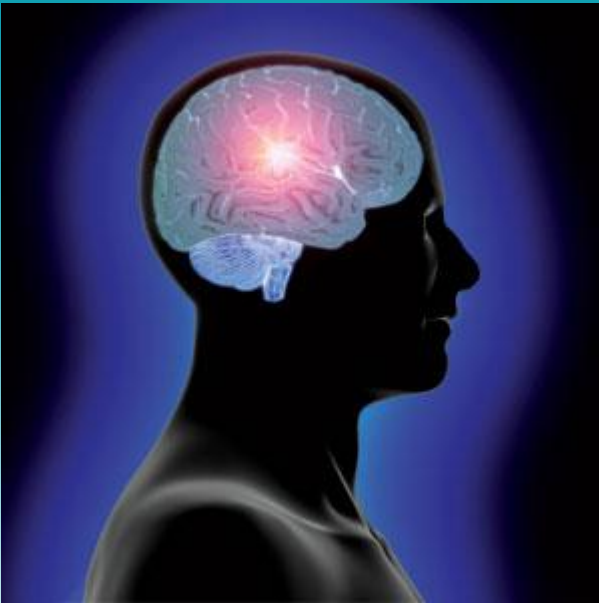
What Saville did differently:

1. Performance aligned
2. Validation centric development
3. Performance weighting
4. Combines motivation and talent
5. Dynamic normative-ipsative format



1. Performance aligned

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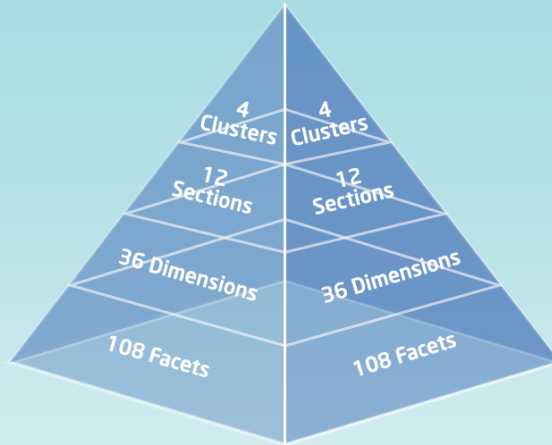


Personality

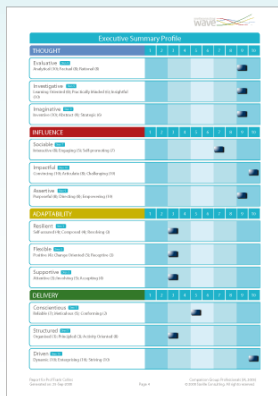
Motivation, self-efficacy,
culture

Job Performance

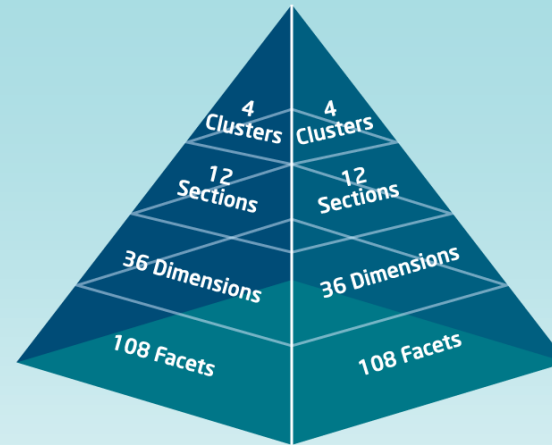
Potential Wave Styles Behaviour Predictors



Prediction of potential assessed by
Wave Professional Styles and Focus Styles



Performance Wave Behavioural Performance Criteria



Performance assessed by
Wave Performance 360

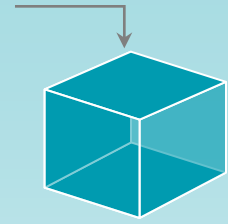


21st century, work-relevant items

developing strategy



comfort with IT



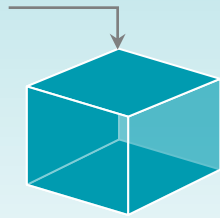
networking



building rapport



responsibility for big decisions



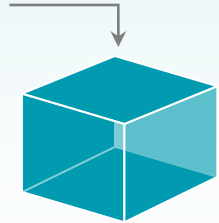
sticking to decisions



engaging



identifying business opportunities



encouraging others



Project Colossus

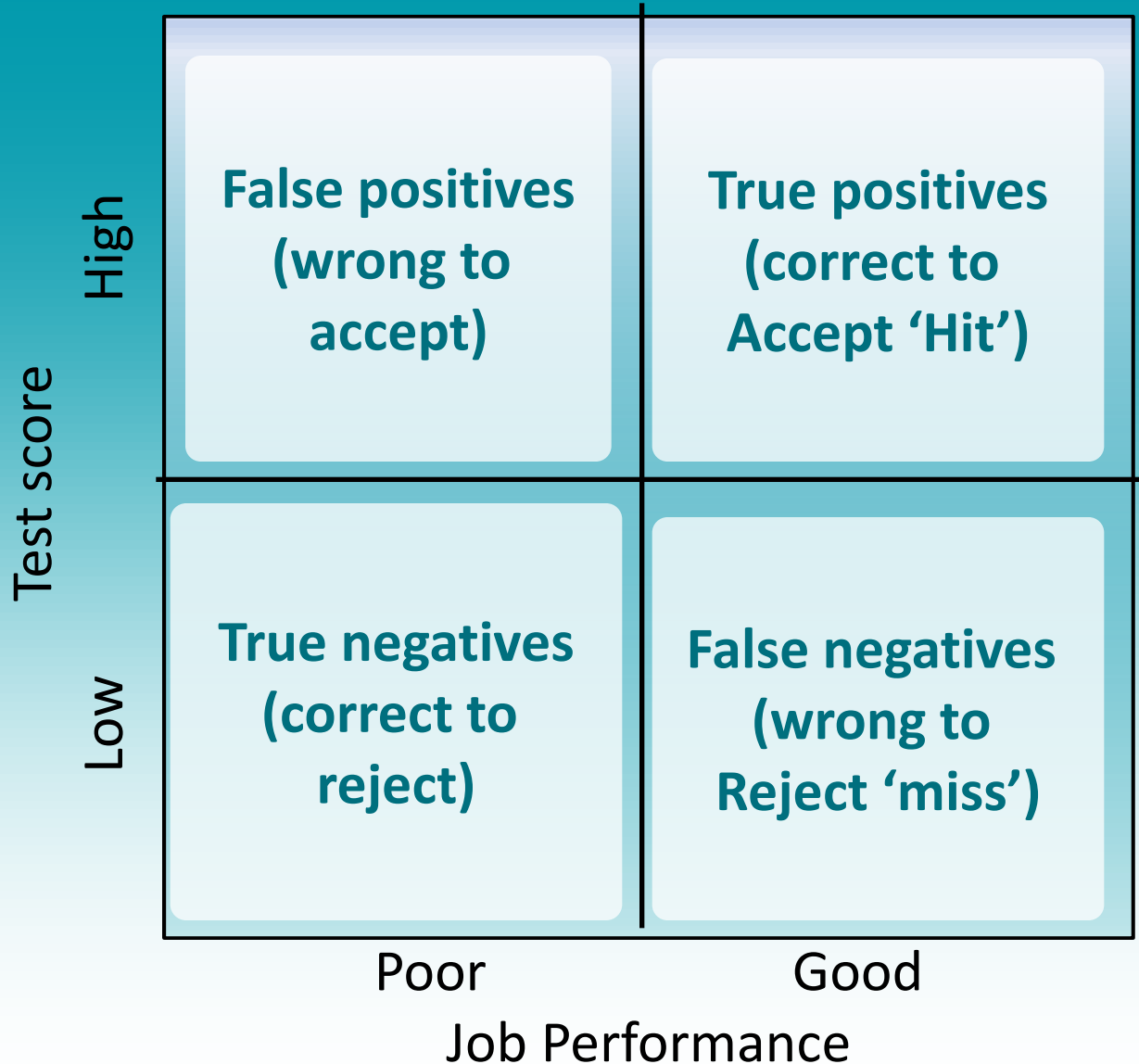
- 428 unique work constructs identified based on review of existing questionnaires, competency models, client requirements, validation studies
- For each of the 428 constructs, 8 items were written (6 positive, 2 negative)
- This created a bank of over 4,000 items
- Initial development trial completed by 1,011
- Items selected based on:
 - validity (correlation with overall job performance, matched competency, potential for promotion)
 - psychometric properties (mean, SD, correlation with own scale and others)
 - internationalisation (reviewed in 50+ countries)



Criterion-related validity:

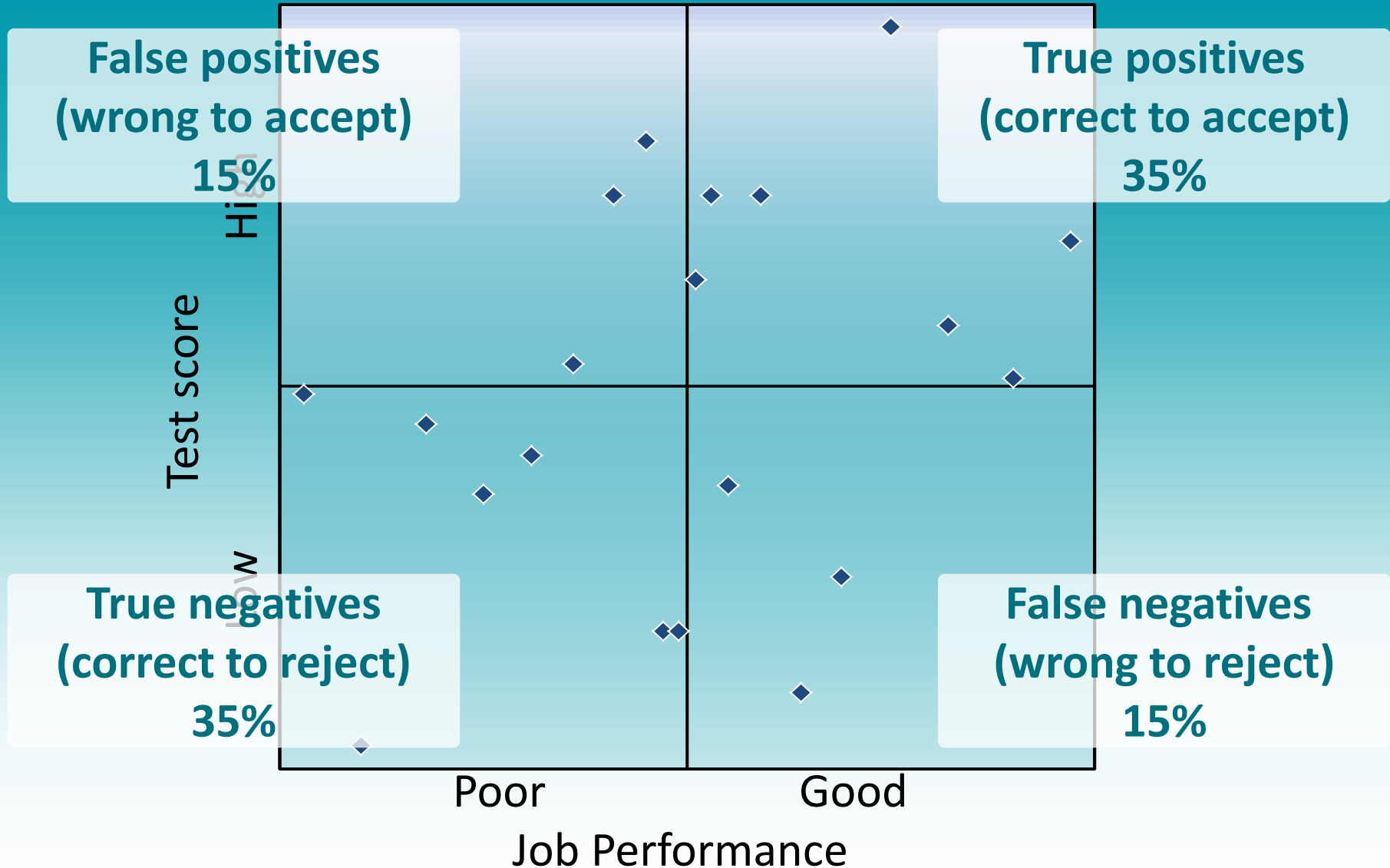
- Weighted composite validity (competency profile) with overall job performance = 0.57
- Mean single dimension validity = 0.39 for Invited Access, 0.38 for Supervised Access
- Mean composite validity = 0.46 for both Invited Access and Supervised Access versions
- 75% of these 0.4 or higher
- Mean composite validity with overall job performance = 0.34/0.42
- Mean composite validity with potential for promotion = 0.54/0.64

Why validity matters

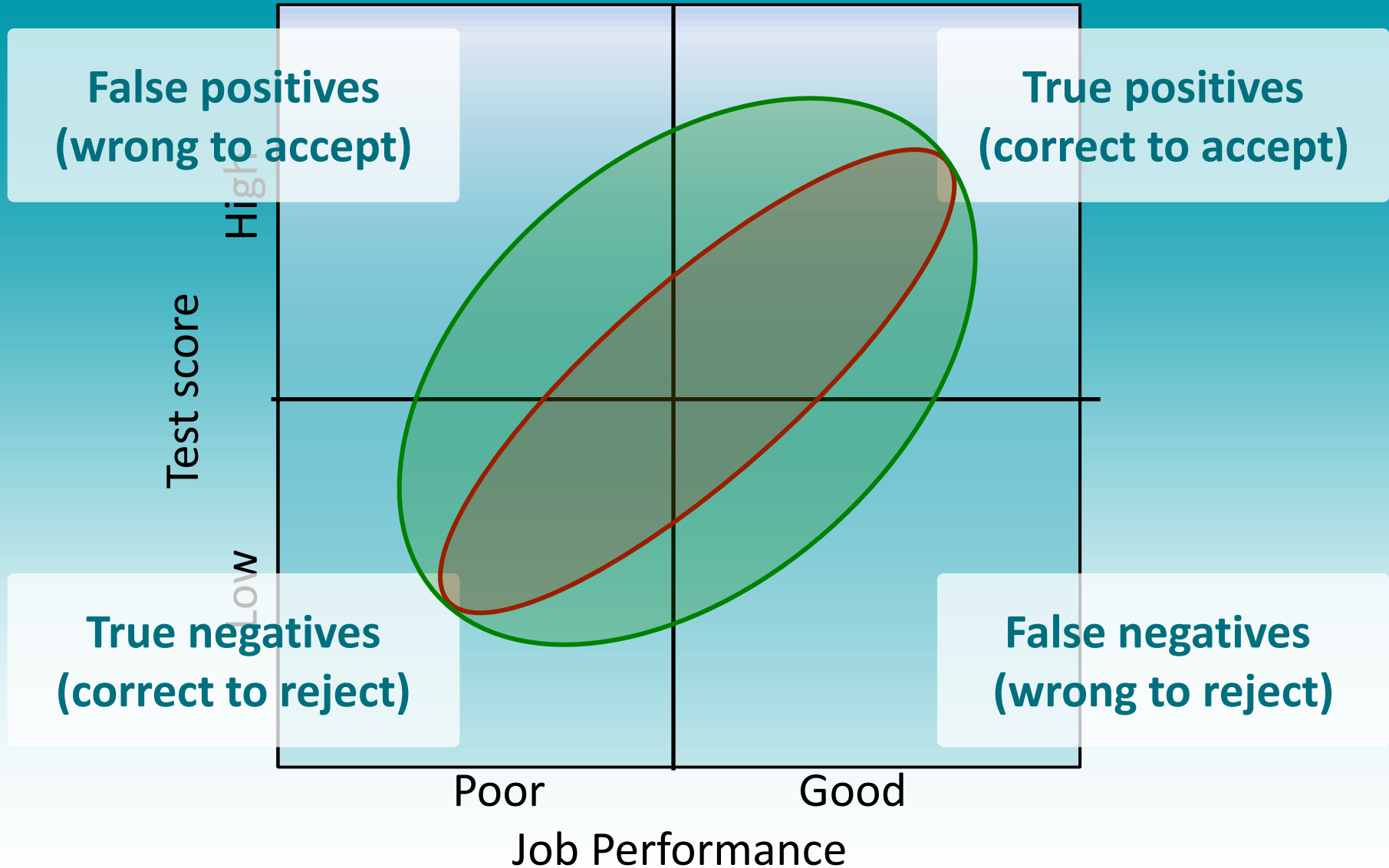


Validity $r = .3$

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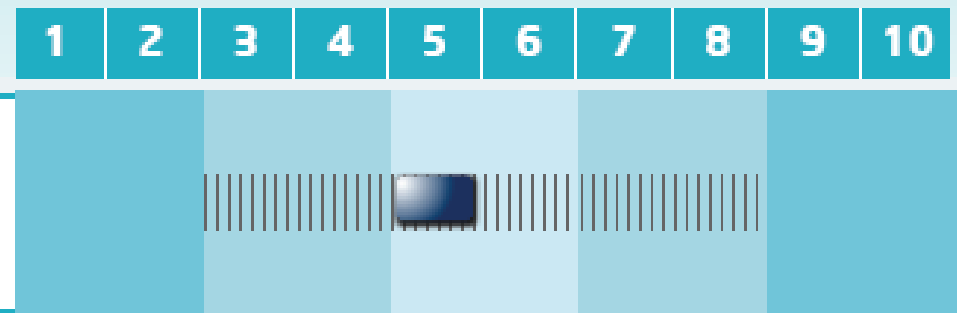
Increase validity = more accurate decisions



3. Performance weighted

High score = high performance

Facets weighted based on relationship with performance



Inventive Step 5

generates fewer Ideas than others (4); produces fewer original Ideas than others (3); favours radical solutions to problems (8)

4. Combine motive and talent

- Separately identify what the candidate is motivated by, and what they see themselves as good at
- When motive and talent are aligned, performance is sustained
- Explains the underperformance of talented people
- Highlights potential development opportunities

Resolving Step 3

feels less need than many people to resolve disagreements (3); dislikes having to deal with angry people (4); copes reasonably well with people who are upset (5)



5. Dynamic normative-ipsative format

- The candidate responds freely on a **rating** scale
- Tied ratings require finer differentiation and are re-presented in ipsative format for rank ordering
- This combination provides the most valid results possible
- Highlights the gap between what the candidate would like to be, and what they think they are
- Provides a picture of what the person will do 'when the chips are down'

Normative format

	Very Strongly Disagree	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree	Very Strongly Agree
I am a competitive person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
I like to challenge people's ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
I am comfortable working alone	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am cheerful most of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer to take the lead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
I am good at building rapport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Ipsative format

	Most	Least
I am a competitive person	<input checked="" type="radio"/>	<input type="radio"/>
I like to challenge people's ideas	<input type="radio"/>	<input type="radio"/>
I prefer to take the lead	<input type="radio"/>	<input type="radio"/>
I am good at building rapport	<input type="radio"/>	<input checked="" type="radio"/>

Normative										
	1	2	3	4	5	6	7	8	9	10
THOUGHT							■			
INFLUENCE							■			
ADAPTABILITY							■			
DELIVERY							■			

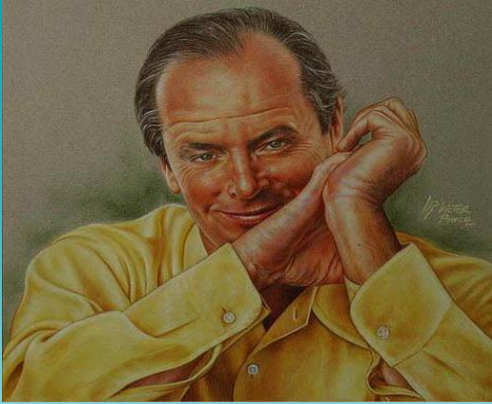
Ipsative										
	1	2	3	4	5	6	7	8	9	10
THOUGHT						■				
INFLUENCE			■							
ADAPTABILITY					■					
DELIVERY								■		

Dual Dynamic										
	1	2	3	4	5	6	7	8	9	10
THOUGHT							■			
INFLUENCE			■			■		N		
ADAPTABILITY						■				
DELIVERY							■			



'True' personality

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Normative

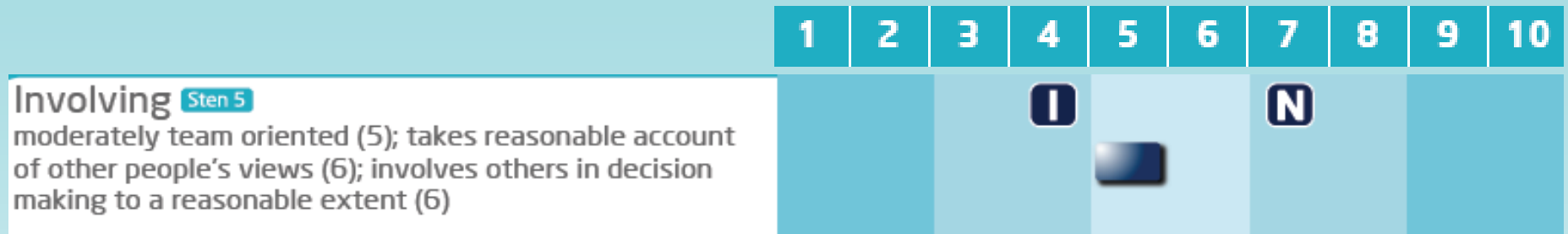
+

Ipsative

=






'True'

Example



- Hypothesis: normative reflects how they like to present themselves, ipsative reflects their behaviour when they have to choose between competing commitments
- Interpretation: while this is where they sit, they may be slightly lower on this scale than they appear

Competency profile

Competency Description	Potential
Creating Innovation Generating Ideas (8); Exploring Possibilities (7); Developing Strategies (3)	 Fairly High higher than about 75% of professionals
Evaluating Information Analysing Situations (7); Documenting Facts (9); Interpreting Data (4)	 Fairly High higher than about 75% of professionals
Making Judgements Providing Insights (6); Adopting Pragmatic Approaches (6); Developing Expertise (7)	 Above Average higher than about 60% of professionals
Presenting Information Convincing People (3); Challenging Ideas (7); Articulating Information (5)	 Below Average higher than about 40% of professionals
Structuring Tasks Organising Resources (5); Upholding Standards (3); Completing Tasks (8)	 Below Average higher than about 40% of professionals

The Epsom Study

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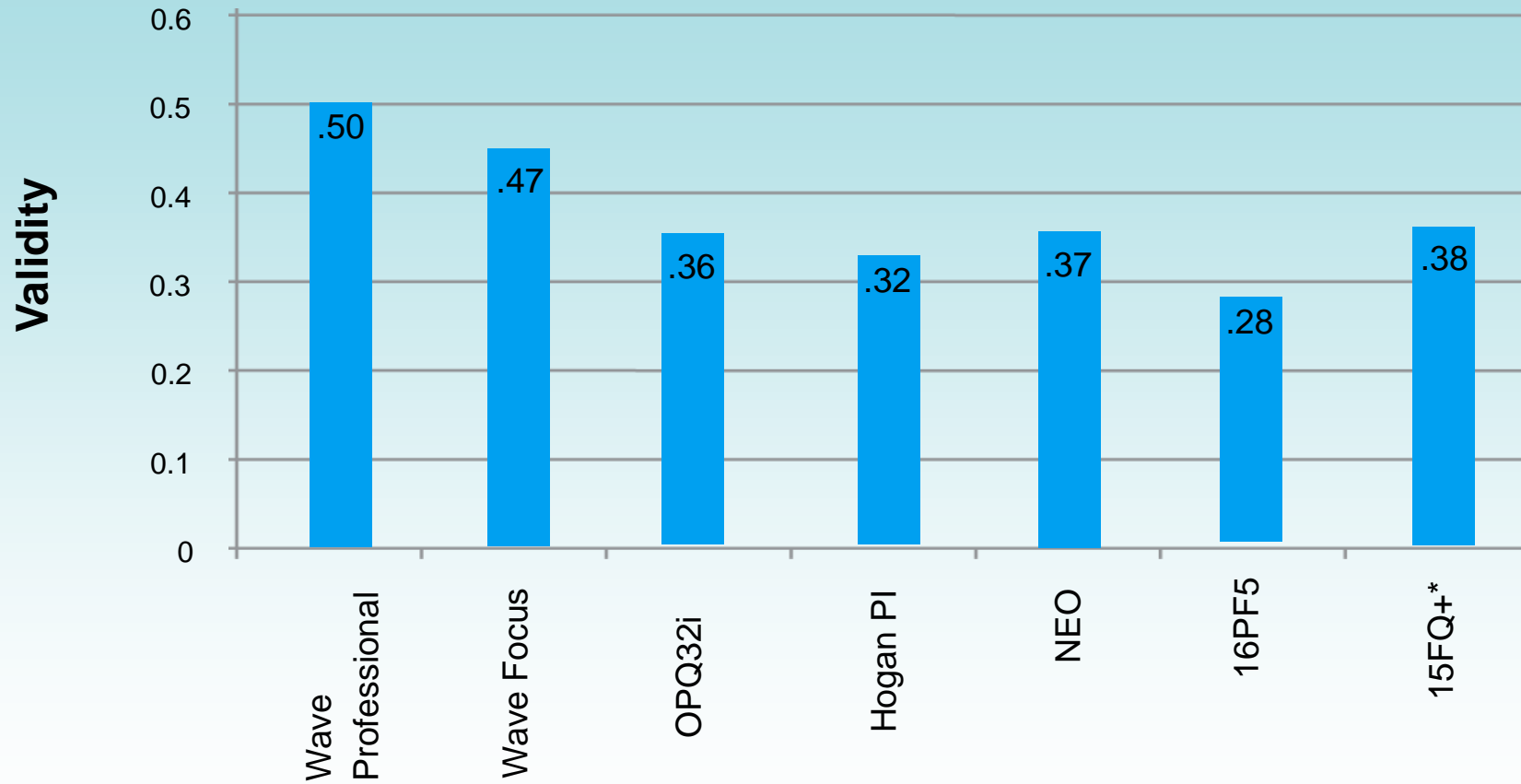
Instruments in the project include

- Wave Focus Styles
- Wave Professional Styles
- OPQ32i
- Thomas International DISC
- MBTI
- 16PF5
- NEO-PI-R
- Hogan Development Survey
- Hogan Personality Inventory

A priori equations were written to predict individual competencies, specifically SHL's Great 8 from its Universal Competency Framework:

- Analysing and Interpreting
- Creating and Conceptualising
- Leading and Deciding
- Interacting and Presenting
- Supporting and Co-Operating
- Adapting and Coping
- Organising and Executing
- Enterprising and Performing

Competencies



Total performance is the most important criteria

A priori equations were developed based on the methodology described by Bartram (2005) – then summed to give a total score

Total Global Work Performance

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Performance 360

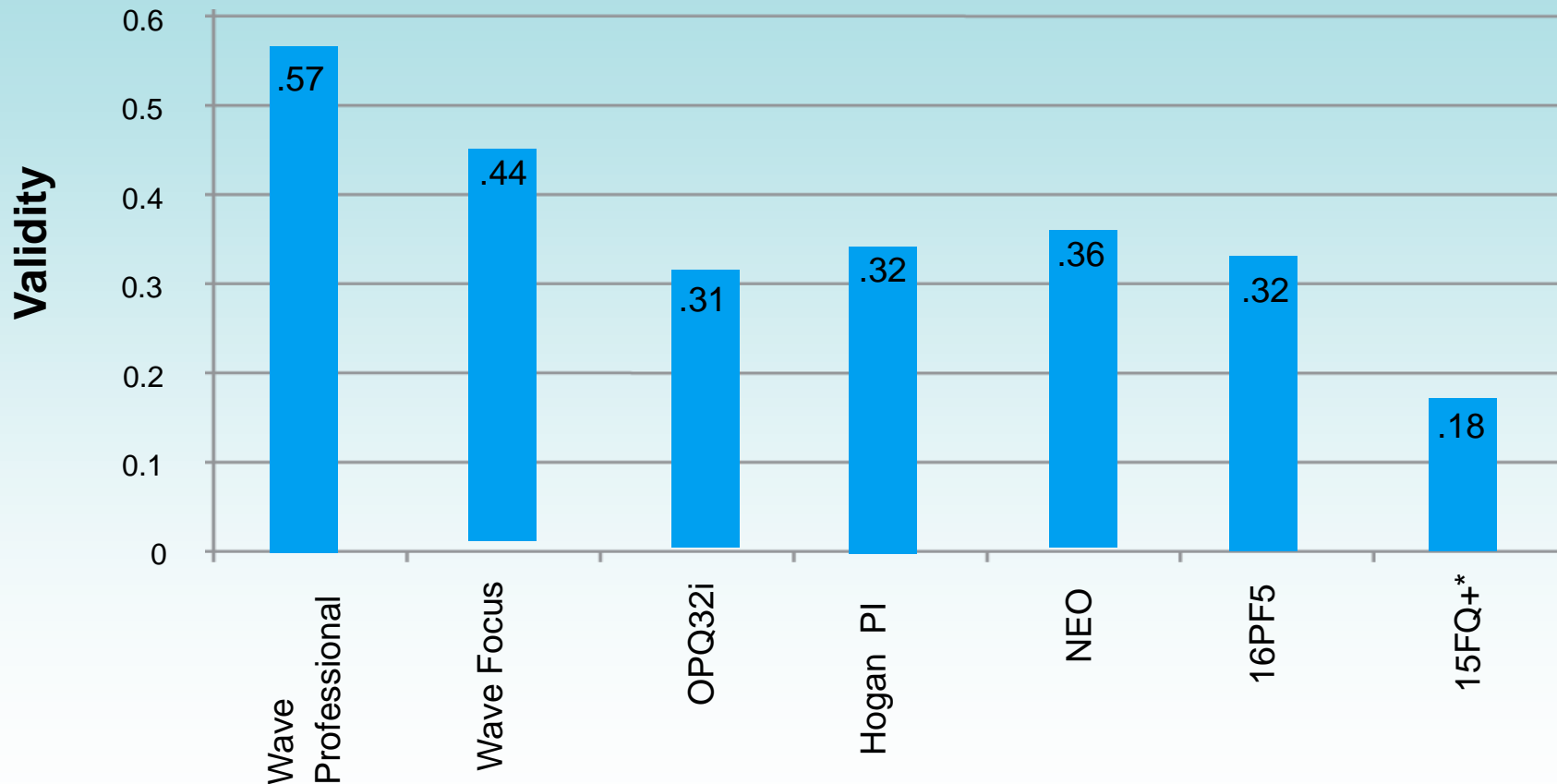
Overall Performance

Applying Specialist Expertise - e.g., Utilising Expert Knowledge; Applying Specialist Skills; Sharing Expertise

Accomplishing Objectives - e.g., Achieving Personal Targets; Contributing to Team Objectives; Furthering Organizational Goals

Demonstrating Potential - e.g., Seeking Career Progression; Demonstrating Capabilities Required for High Level Roles; Showing Potential for Promotion

Global Performance
(Applying Specialist Expertise + Accomplishing Objectives + Demonstrating Potential)
Matched Sample N=308



Validities shown here are consistent with validation studies/meta-analyses, for example:

- Validities found with the Hogan Personality Inventory are consistent with Hogan's published research (Hogan et al., 2007)
- OPQ validities are also consistent with research published by SHL (Bartram, 2005)
- Wave Selection & Development Review (Saville et al., 2006)
- Coaching Psychology (2008) found statistically significant difference between OPQ and Wave predicting overall performance
- Saville development trials (Wave technical manual)

Airways validation study

AIRWAYS

making your world possible

- Air Traffic Control Trainee's completed OPQ for selection process
- A sample also completed the Wave Professional Styles assessment and the Airways 360

- Severe range restriction: Airways assess between 1,500 and 3,000 applicants per year
- Sample size: only 17 candidates completed both the Wave and 360 (note: this was mid-way through when the February Earthquake struck)

- Low sample size = low statistical power = difficult to find significant relationships
- Multiple regression
 - Takes advantage of chance co-variance. With a small sample size this can be exaggerated
 - Adjusted R² compensates for sample size and number of variables in the model

OPQ and Wave Dimensions

OPQ	Wave
Controlling	Directing
Independent	Challenging
Detail Conscious	Involving
Rule Following	Meticulous
Rule Following	Conforming
Relaxed	Composed
Emotional Control	Composed
Decisive	Purposeful

Results summary

360 scale	OPQ	Wave
Total Performance	Democratic (r=.37) Detail Conscious (r=.42)	Team Working (r=.41) Checking Thing (r=.51) Risk Adverse (r=.40)
Safe	Democratic (r=.36) Detail Conscious (r=.51)	Team Working (r=.38) Checking Things (r=.45) Risk Adverse (r=.38) Copes with Pressure (r=.31)
Bloody Good	Democratic (r=.34) Detail Conscious (r=.31)	Team Working (r=.55) Checking Things (r=.48) Risk Adverse (r=.42)
Value Each Other	Detail Conscious (r=.42)	Quality Oriented (r=.34)
Planning and Time Management	Democratic (r=.44) Detail Conscious (r=.34)	Team Working (r=.56) Checking Things (r=.58) Risk Adverse (r=.40) Copes with Pressure (r=.31)

Results summary (continued)

360 scale	OPQ	Wave
Procedural Accuracy and Completion	Controlling (r=.34) Democratic (r=.39) Detail Conscious (r=.49)	Team Working (r=.38) Checking Things (r=.49) Risk Adverse (r=.40)
Problem Identification	Democratic (r=.38) Detail Conscious (r=.30)	Team Working (r=.53) Checking Things (r=.58) Risk Adverse (r=.37) Copes with Pressure (r=.34)
Making Contextual Decisions	Democratic (r=.37) Detail Conscious (r=.48)	Challenging Ideas (r=.30) Team Working (r=.30) Checking Things (r=.48) Risk Adverse (r=.40)
Customer Service	Democratic (r=.36) Detail Conscious (r=.39)	Directing People (r=.43) Team Working (r=.46) Checking things (r=.61) Risk Averse (r=.40)
Communication	Democratic (r=.43) Detail Conscious (r=.48)	Directing People (r=.36) Team Working (r=.40) Checking Things (r=.49) Risk Averse (r=.45)

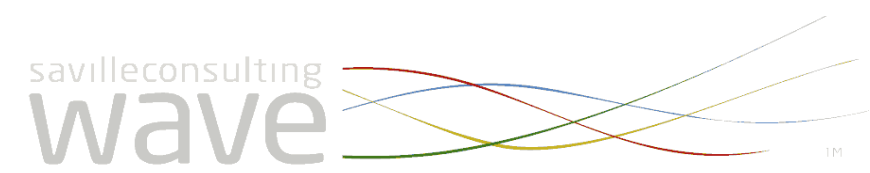
The Wave had more explanatory power compared than the OPQ, therefore providing greater detail and explanation of trainee performance

According to Wave, good Air Traffic Control trainees are high on:

- Team Working
- Checking Things
- Risk Adverse
- Cope with Pressure
- Quality Oriented
- Challenge Ideas
- Directing People

The background consists of several overlapping, slightly crumpled white papers. Each paper has a large, bold, black question mark printed on it. The papers are arranged in a way that they partially cover each other, creating a sense of depth and repetition. The overall color palette is grayscale, with the white of the paper and the black of the question marks.

**Questions
Comments**



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