

Reliability & Validity Evidence for **PATH**

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Outline the empirical evidence from peer reviewed sources for the validity and reliability of the proposed assessment instruments.

Reliability

Reliability reflects the consistency or repeatability of test results. A test or questionnaire is reliable if it is consistent and precise in its measurements of cognitive ability or personality dimensions, and reflects the respondent's true scores. In order for an assessment to be valid, it needs to be reliable.

The reliability of personality questionnaires can be assessed in multiple ways, the most commonly reported measure is the internal consistency which measures the degree that the items that make up a personality scale measures a single underlying construct and are free from error. Ideally the reliability of personality scales should be greater than 0.7. This demonstrates that the scale is relatively free of measurement error and less than 0.9 suggesting that the scale is measuring an adequately broad construct. All of the PATH scales have reliability coefficients (Cronbach's Alpha) within this range and the questionnaire overall has a median reliability of 0.81.

Scale	Number of Items	Mean	Standard Deviation	Standard Error	Cronbach's Alpha
Accepting	7	33.63	5.02	0.38	0.83
Adaptable	6	28.96	3.82	0.29	0.81
Amiable	6	25.92	2.53	0.08	0.73
Analytical	6	25.69	3.82	0.29	0.78
Collaborative	6	30.12	3.59	0.27	0.87
Competitive	6	24.20	5.91	0.45	0.87
Compliant	6	26.53	4.15	0.32	0.81
Composed	6	27.27	4.68	0.36	0.88
Data Driven	5	19.38	3.47	0.26	0.74
Decisive	6	26.27	4.23	0.32	0.81
Directing	6	28.13	4.45	0.34	0.89
Driven	6	29.24	4.00	0.30	0.82
Energetic	5	23.51	4.06	0.31	0.86
Empathic	6	13.63	3.91	0.13	0.80
Influential	6	26.47	3.74	0.29	0.76
Intuitive	6	24.95	4.26	0.32	0.76
Innovative	6	26.72	4.05	0.31	0.82
Learning Focused	5	24.63	3.73	0.28	0.88
Meticulous	7	32.62	4.24	0.32	0.78
Motivating	6	29.73	3.90	0.30	0.86
Optimistic	6	30.50	4.05	0.31	0.85
Receptive	6	29.27	3.64	0.28	0.74
Reliable	6	27.81	4.50	0.34	0.79
Risk Tolerant	6	27.01	4.38	0.33	0.85
Self Aware	6	25.25	4.00	0.30	0.72

Self Confident	6	27.83	3.71	0.28	0.79
Sociable	6	29.19	4.74	0.36	0.89
Socially Aware	6	27.53	3.81	0.29	0.79
Strategic	6	27.82	4.20	0.32	0.87
Theoretical	7	31.62	4.57	0.35	0.82
Trusting	7	29.14	4.09	0.31	0.72
Work Focused	6	27.34	4.06	0.31	0.76
Mean	6.03	27.12	4.10	0.30	0.81
Median	6	27.43	4.06	0.31	0.81
Min	5	13.63	2.53	0.08	0.72
Max	7	33.63	5.91	0.45	0.89

Table 1 Psychometric properties of the PATH personality scales including the number of items, mean, standard deviation, standard error, and Cronbach's Alpha

Comparative Reliability

The reliability of the PATH compared to other personality questionnaires is presented in table 2. Comparing the PATH personality questionnaire to other personality questionnaires shows that the PATH provides a highly reliable measure of personality, with a median Cronbach's Alpha of 0.81. While being a highly reliable personality questionnaire the PATH also measures a wide range of work relevant personality traits while being relatively quick to complete with 193 items.

	PATH	Wave	OPQ32	HPI	GPI	15FQ+	16PF
Items	193	216	312	206	299	192	185
Scales	32	36	32	8	37	16	16
Median Reliability	0.81	0.76	0.76	0.78	0.71	0.72	0.75

Table 2 Psychometric properties of the PATH personality questionnaire compared to other commercially available personality questionnaires

Validity

As a general concept, the validity of a psychometric assessment is the degree to which it measures what it is designed to or claims to measure. For example, if a personality assessment of sociability is valid then socially reserved or introverted types are more likely to score lower on this measure than gregarious, extroverted types who score highly. Similarly, a cognitive ability test assessing verbal reasoning should correlate significantly with a candidate's ability to interpret and use information presented in this form – candidates scoring highly should be faster and more accurate when working with novel or complex subject matter presented in verbal or written form. Conversely, candidates scoring lower on this assessment will take significantly longer and/or require more guidance to reach the same level of understanding, and probably work best with basic concepts or very familiar subject matter. Thus, the assessments are predicting the same behaviours and aptitudes that we expect them to be.

There are many types of validity applicable to psychometric assessments, some of which relate principally to the development and construction of the assessment, e.g. construct validity, content validity, face validity, convergent validity, and divergent validity. Subsequent to test construction, other types of validity, such as incremental validity and criterion-related validity, can be established to demonstrate the utility of the assessment in a specific context, such as selecting the right candidate for a job.

Construct Validity

The robust procedure followed during the development of the Talegent PATH Personality Questionnaire was in part to ensure a high level of construct validity (Figure 1). Steps such as carefully defining the content area of each scale and mapping questions around this add to the likelihood that the scales in the Talegent PATH Personality Questionnaire measure the subject area that they are expected to. Furthermore, items were selected and tested to ensure that homogenous scales were formed. Item analysis was performed, and items that did not show internal consistency correlations of over 0.70 were removed. The process outlined in figure 1 is suggested to be a sufficient and exhaustive process for establishing construct validity by Simms and Watson (2007).

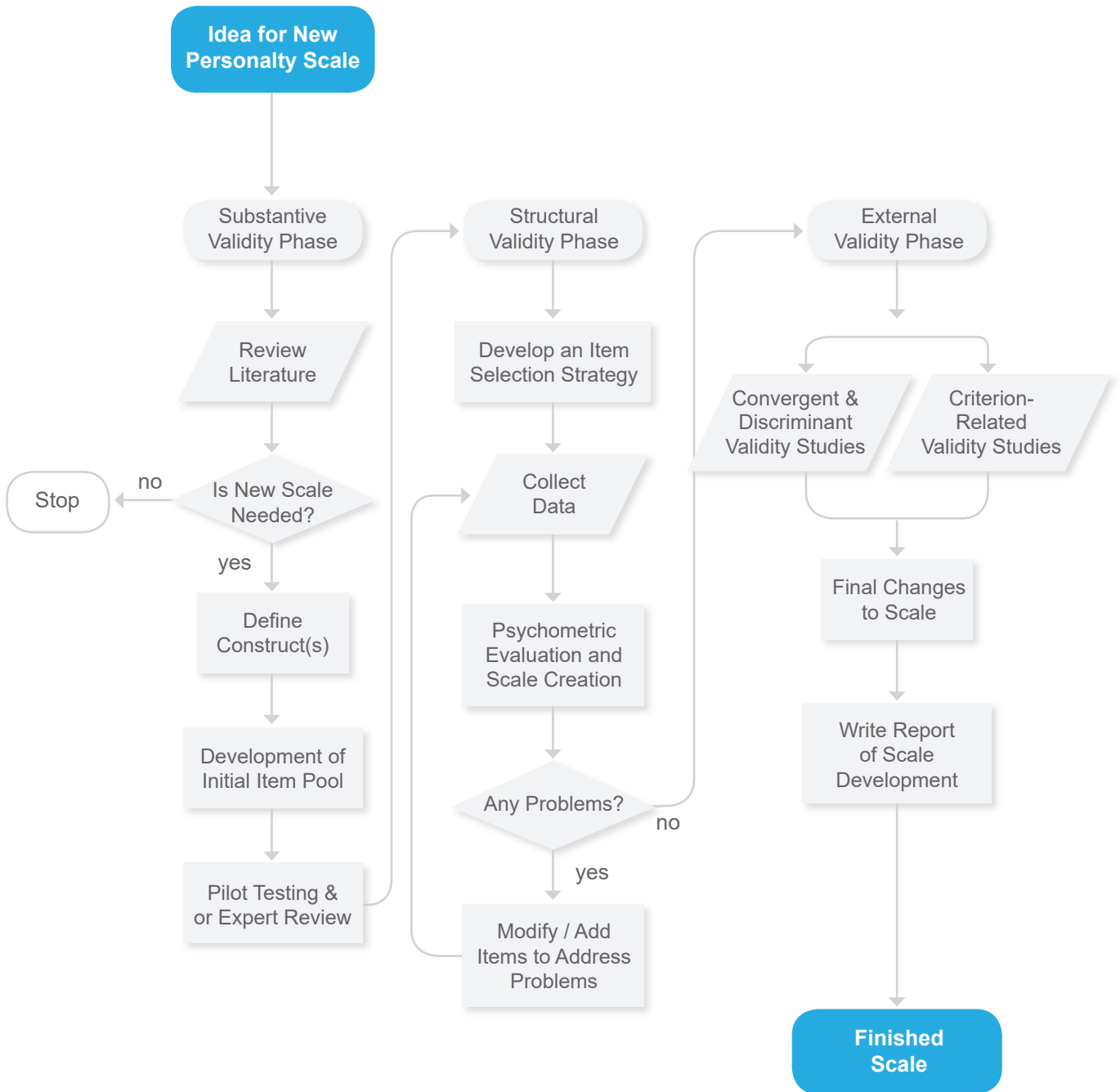


Figure 1 Overview of the development process taken with the PATH personality questionnaire

Content Validity

A key stage of development for the Talegent PATH Personality Questionnaire was generating a large item pool considered to be representative of the content area for each scale. Furthermore, an over inclusive approach was taken, whereby the item pools written for each scale initially included items that seemed to go beyond the content covered by the area. This was done in order to establish the conceptual and empirical boundaries of the target construct. Items that did not fit the homogenous structure of the item were removed in later analyses, leaving only relevant and representative items.

Convergent validity of PATH Cognitive ability

The Path Cognitive Assessments have been assessed for convergent and divergent validity and demonstrated proven validity when compared with existing cognitive measures. Path Verbal Reasoning Assessment converges with ACER Professional Select Verbal ($r = 0.60$, $p < 0.01$) and the Wonderlic Personnel Test ($r = 0.45$, $p < 0.01$), and diverges from ACER Professional Select Numerical ($r = 0.31$, ns).

Path Numerical Reasoning Assessment converges with ACER Professional Select Numerical ($r = 0.63$, $p < 0.01$) and the Wonderlic Personnel Test ($r = 0.56$, $p < 0.01$), and diverges from the ACER Professional Select Verbal ($r = 0.17$, ns).

Overall scores on the Path Assessments converge with ACER Professional Select Verbal ($r = 0.40$, $p < 0.05$), ACER Professional Select Numerical ($r = 0.58$, $p < 0.01$) and the Wonderlic Personnel Test ($r = 0.58$, $p < .01$).

Predictive validity of PATH Cognitive Ability

The criterion related validity of the PATH cognitive ability assessments was investigated through a predictive validity study. Applicants for technical professional and leadership roles were assessed during the recruitment process with their managers providing ratings of their subsequent work performance following 3 months of working for the client organisation. The predictive validity of the verbal reasoning assessment was investigated through its correlation with manager ratings of ability to communicate with others, speak in a logical well organised way, and adapt their style and level of communication.

The analysis found a positive correlation between applicants' scores on verbal reasoning and managers' ratings of communication ability (Table 3). Likewise, the predictive validity of the numerical reasoning assessment was investigated through its correlation with manager ratings of the employees' ability to make decisions based on numerical data, analyse numerical information, and understand numerical and financial information. The analysis found a positive correlation between applicants' scores on numerical reasoning and managers' ratings of analytics ability (Table 3).

Finally, the predictive validity of the logical reasoning assessment was investigated through its correlation with managers' ratings of ability to solve complex problems, understand technical information, and learn new processes and procedures. The analysis found a positive correlation between applicants' scores on logical reasoning and managers' ratings of problem solving ability (Table 3).

PATH Ability Score	Criterion	Criterion Mean	Criterion SD	r	r _c
Verbal Reasoning	Communication	13.59	2.57	0.19	0.20
Numerical Reasoning	Analysis	18.79	3.13	0.30	0.31
Logical Reasoning	Problem Solving	13.98	2.77	0.31	0.33
	Mean	15.45	2.82	0.27	0.28
	Median	13.98	2.77	0.30	0.31
	Min	13.59	2.56	0.19	0.20
	Max	18.79	3.13	0.31	0.33

Table 3 Validity statistics of the verbal, numerical, and logical reasoning assessments. Note: r_c is the validity coefficient corrected for attenuation due to measurement error in the criterion only

Predictive validity of PATH Personality questionnaire

The criterion related validity of the PATH personality questionnaire was investigated through a predictive validity study. Applicants for technical professional and leadership roles were assessed during the recruitment process with their managers providing ratings of their subsequent work performance following 3 months of working for the client organisation. The result of the analysis for each scale is shown in table 4 with summary statistics of the average, min, and max validity coefficients. Overall, the PATH personality questionnaire demonstrates strong predicative validity with a median uncorrected correlation of 0.27 between personality scores and relevant workplace performance.

PATH Personality Scale	Criterion	Criterion Mean	Criterion SD	r	r _c
Accepting	Embracing Diversity	14.13	2.00	-0.03	-0.03
Adaptable	Variety Seeking	14.29	2.59	0.08	0.08
Analytical	Evaluating Information	13.38	2.41	0.27	0.29
Collaborative	Helping Others	14.25	2.12	0.20	0.21
Competitive	Surpassing Others	12.27	2.42	0.23	0.24
Compliant	Following Rules	13.76	2.82	0.49	0.51
Composed	Stress Tolerance	13.34	3.45	0.39	0.40
Data Driven	Empirically Minded	13.27	2.81	0.28	0.29
Decisive	Confident with Decisions	12.64	2.64	0.06	0.06
Directing	Taking Control	12.78	3.02	0.49	0.51
Driven	Achievement Striving	12.96	2.40	0.32	0.33

Energetic	Enthusiasm	14.05	2.61	0.32	0.34
Influential	Getting Buy-in	12.65	2.42	0.22	0.23
Innovative	Creative Thinking	12.96	2.94	0.35	0.36
Learning Focused	Enjoys Learning	14.47	3.00	0.00	0.00
Meticulous	Attention to Detail	14.09	2.72	0.14	0.15
Motivating	Transformational Leader	12.05	2.18	0.20	0.22
Optimistic	Positive Attitude	13.67	2.74	0.27	0.28
Receptive	Handles Feedback	13.04	2.78	0.32	0.33
Reliable	Dependability	14.42	2.67	0.25	0.27
Risk Tolerant	Seizes Opportunity	12.51	2.36	0.13	0.14
Self Aware	Development Oriented	12.70	2.53	0.38	0.41
Self Confident	Assured	13.95	2.39	0.38	0.42
Sociable	Socially Confident	13.49	2.67	0.29	0.31
Socially Aware	Emotionally Intelligent	12.95	2.62	0.38	0.39
Strategic	Future Focused	12.45	2.62	0.36	0.37
Theoretical	Conceptual	13.31	2.71	0.27	0.28
Trusting	Believes in others	13.38	2.39	0.49	0.50
Work Focused	Task Orientated	13.53	2.80	0.18	0.19
	Mean	13.34	2.61	0.27	0.28
	Median	13.34	2.62	0.27	0.29
	Min	12.05	2.00	-0.03	-0.03
	Max	14.47	3.45	0.49	0.51

Table 4 Validity statistics for the PATH personality scales. Note: rc is the validity coefficient corrected for attenuation due to measurement error in the criterion only

Comparative Validity

The comparative validity of the PATH cognitive ability and personality questionnaires is presented in table 5. The PATH suite of assessments demonstrates strong validity compared to other assessments with the cognitive ability suite having a median validity coefficient of 0.30 with work performance and the personality questionnaire showing a median correlation of 0.27 with work performance.

	Overall Total Performance
PATH Cognitive Ability	0.30
PATH Personality	0.27
Wave Professional Styles Competency Potential	0.34
Wave Professional Styles	0.30
Wave Focus Styles Competency Potential	0.25
Wave Focus Styles	0.22
Saville PP	0.19
OPQ32i	0.18
NEO-PI-R	0.20
Hogan Personality Inventory (HPI)	0.18
16PF-5	0.18

Table 5 Overall validity coefficients for commercially available assessment suites

Outline practitioner feedback and other evidence of validity and evidence of best practice of the proposed assessment instruments.



“Within the first three months we have already noted recruitment efficiencies, the solution has sped up our time to hire... finding the right people faster.”

Emma Franks, Recruitment Manager, A&G



“Seven of the top ten on the ASB leader board were hired after the installation of the Talegent Selection Solution. There was a notable improvement in the success of training.”

Matt Pontin, Head of Talent Acquisition & Careers, ASB



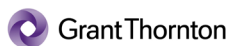
“We have found the Team at Talegent a pleasure to work with. They designed an assessment plan to suit our specific needs and the end result has been fantastic. The communication through the design, building and implementation has been great and the whole team has helped to make it a smooth process. We would absolutely recommend using the services of the Talegent team. They are knowledgeable, passionate and forward thinking about what they do.”

Debra Ryan, HR Manager, BDO



“Talegent were great during our national graduate recruitment campaign. Support was always at hand and queries were dealt with in a timely manner. We look forward to this continuation of service excellence.”

Michelle Strawbridge, Staples Rodway



“Talegent have been an amazing firm to work with. They were extremely open and willing to try a new testing platform proposition for our Graduate recruitment that other providers turned down and said was impossible to do. Not only did they pull off the impossible, they were extremely positive and open to the concept and worked tirelessly to make it successful. They communicate openly and on a regular basis so you always know where they are up to in the process and stuck to some very tight and aggressive time frames, to deliver our new platform on time for the start of our graduate recruitment campaign. The team have been willing to bend over backwards for us and we truly value their expertise and positive support.

I used their executive test recently and was impressed with not only the fact turnaround, the accuracy of the report and the ability to be able to link results to the role we were recruiting and our internal competencies. The reports are extremely easy to read and understand and the results provide a comprehensive overview of strengths and development areas.”

Rebecca Isted, National HR Manager, Grant Thornton New Zealand Ltd



“Talegent truly know the meaning of customer service. Everything about the experience of dealing with Talegent has been exceptional. We always felt as though we were their highest priority... I have no hesitation recommending Talegent”

Damien Pfeiffer, HR Partner, GrainCorp

Range and scope of instrument options, and the rationale for use in this project.

Verbal Reasoning

This instrument assesses a person's ability to understand complex written arguments and make accurate decisions on the basis of that information. Scores on this assessment provide an indication of how easily someone will understand relatively complex written material such as research information, reports, and correspondence.

Available Comparison Groups: Admin, Graduates, Professional, Managers, Executives, Development

Numerical Reasoning

This instrument assesses a person's ability to understand and make decisions on the basis of numerical information. Scores on this assessment provide an indication of how well someone will understand information presented in tables, figures and graphs.

Available Comparison Groups: Admin, Graduates, Professional, Managers, Executives, Development

Logical Reasoning

This instrument assesses a person's ability to pick up on trends and patterns within data and to apply these patterns to solve a problem. This score provides an indication of how well someone will learn new information and integrate this with their existing knowledge. It can also provide an indication as to how well someone is able to work with strategic ideas and intangible concepts.

Available Comparison Groups: Admin, Graduates, Professional, Managers, Executives, Development

PATH Personality Questionnaire

The Talegent PATH Personality Questionnaire gives employers deep insight into what motivates and drives individuals – the way they think, how they relate to others, their preferred work style, and more. These measures can be analysed in relation to the key role competencies exhibited by top performers for a given role.

Available Comparison Groups: Admin, Graduates, Professional, Managers, Executives, Development