

PSI Reliability and Validity



Creating thriving organisations

The Psychological Safety Indicator

To support development toward high psychological safety within teams, Datadrivesinsight.com set out to create an assessment tool that measured both the existence of psychological safety, and the risk factors that impact the existence. The approach was designed to help teams see where they were currently, discover opportunities, adapt the practices to their own unique work environments, and set a course of development.

The PSI has three scales:

1. Risk factors
2. Psychological safety (within a team)
3. Psychological safety (with other people, outside a team)

To do this, a set of survey questions were created, and validated through the following standard statistical processes.

Reliability of the PSI

RELIABILITY refers to the consistency or stability of the survey results—across items within a scale, between raters who are describing the same person, and over time as appropriate. The 3 most common methods of demonstrating reliability are:

- *Internal Consistency Reliability* (homogeneity within scales – the extent to which the responses to items within a single scale are answered in a consistent way)
- *Interrater Reliability* (agreement among raters – the extent to which respondents who are describing the same person provide similar descriptions)
- *Test-retest Reliability* (stability over time – the extent to which the results are stable over time, where length of time depends on the nature of the construct and the time frame along which it is expected to remain unchanged)

Initial reliability assessments used Internal Consistency to assess the PSI reliability.

PSI Reliability Results: Internal Consistency.

The internal consistency of the three scales were examined using Cronbach’s alpha.

In our study of 810 respondents, alpha coefficients for the three scales range from .928 to .970. Coefficient alpha’s of above .70 are the recommended minimum (Osborne, Costello & Kellow, 2008); thus, these findings provide strong support for the internal consistency of the PSI scales and that the scale scores on the PSI are meaningful and justifies the computation of scale scores.

Internal Consistency Results	
Scale	Coefficient alpha (N = 810)
Risk Factors	.928
Psychological Safety (within a team)	.949
Psychological Safety (outside a team)	.970

Validity of the PSI

Validity refers to the extent to which the scale measures what it is designed to measure or being used to measure.

Various tests have been conducted on the PSI.

- Construct validity refers to the extent to which different measures of the same construct empirically converge (i.e., convergent validity) and measures of different constructs can be empirically differentiated (discriminant validity).
- Criterion-related validity refers to the extent to which the domains are related to other constructs or outcomes.

Validity Results: Construct Validity

Assessment of construct validity involves using factor analysis with loadings of above 0.3 (Tabachnick & Fidell, 2012), demonstrated that the 33 items provide measures of four behavioural and thinking orientations: Purposeful, Curious, Caring, Connecting. These distinctions are consistent with the conceptual framework underlying the ISA.

	Risk Factors	Psych Safety (within)	Psych Safety (outside)
Item 1		0.884	
Item 2		0.868	
Item 3		0.839	
Item 4		0.817	
Item 5		0.815	
Item 6		0.692	
Item 7		0.688	
Item 8		0.677	
Item 9		0.634	
Item 10		0.546	
Item 11		0.503	
Item 12		0.439	
Item 13	0.377	0.424	
Item 14			0.932
Item 15			0.93
Item 16			0.928
Item 17			0.91
Item 18			0.908
Item 19			0.864
Item 20			0.82
Item 21			0.815
Item 22	0.672		

Item 23	0.651		
Item 24	0.615		
Item 25	0.582		
Item 26	0.535		
Item 27	0.469	0.397	
Item 28	0.43	0.312	
Item 29	0.397		
Item 30	0.341		0.33

Thus, the ISA can effectively distinguish between the four scales (i.e., the four scales are somewhat distinct from each other, and that the clusters measure the cluster to which they are purported).

Criterion-related validity

Correlation or regression coefficients were found to be significant at the $p < .05$ level in a positive or direction consistent with the theoretical framework. For example, Risk Factors had a strong, positive relationship with psych safety, while psych safety only had a moderate, positive relationship with psych safety outside. This is expected as our hypothesis suggests risk factors contribute to the existence of psych safety. We also expect that psych safety levels within a team do not have a strong relationship with psych safety levels with others, outside a team. The following table summarises these results.

Correlation Matrix

		Risk Factors	Psych Safety	Psych Safety - Outside
Risk Factors	Pearson's r	—		
	p-value	—		
Psych Safety	Pearson's r	0.854	—	
	p-value	< .001	—	
Psych Safety - Outside	Pearson's r	0.447	0.444	—
	p-value	< .001	< .001	—



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