



neurozone®



**The Development and Validation of  
the Neurozone® High Performance  
Team Assessment**

## Introduction

Team resilience, the collective ability of a group of individuals to recover, adapt, and thrive in the face of challenges and setbacks, while remaining healthily bonded, is a complex and multifaceted phenomenon. There are many aspects of a team's behavior and dynamics that can either positively or negatively affect its collective resilience. Neurozone® set out to identify the most important dimensions in this regard, assess them reliably and validly, and devise interventions to improve these team dimensions with the ultimate goal of enhancing a team's collective resilience. The selection of these team dimensions was rooted in an established empirical and/or theoretical relationship with team resilience. Put differently, if performance on these dimensions is improved or enhanced, a team's collective resilience should increase. Team resilience in this context is measured by the Team Resilience Index, a demonstrated reliable measure of a team's collective resilience. Importantly, the Neurozone® High Performance Team Assessment does not measure cognitive capacities (e.g., IQ), aptitude levels, or personality dimensions. Furthermore, it explicitly refrains from capturing any data that could be leveraged either in support of or in opposition to any individual, such as in recruitment, occupational placement, or performance evaluations.

## Development of the Assessment

Development of the assessment was based on existing scientific literature and the subject matter expertise from an expert panel of psychologists<sup>1</sup>. The expert panel identified several constructs based on an established and/or theoretical relationship with team resilience. Following this, each construct was populated with items that accurately capture the most important aspects of each construct. All items and constructs that were included in the assessment were reviewed and endorsed by an independent psychometrist.

Importantly, these constructs are theoretically distinct and were not developed to measure the same phenomenon (e.g., Team Bonding and Innovation Capability). However, they are included in the assessment due to their unique (statistical) relationship with team resilience. Each construct in the assessment can therefore be regarded as a mini scale/questionnaire within the broader assessment. This approach to scale development was reviewed and endorsed by an independent statistician.

## The Sample

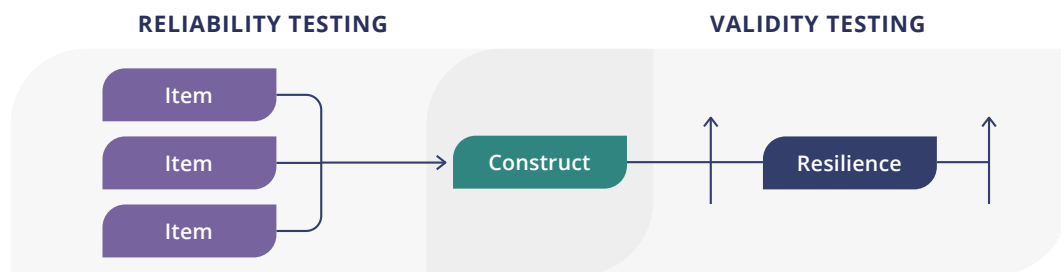
The original sample consisted of 447 individuals working in teams in organizations. 47.20% of participants identified as men, 43.40% as women, and 1.12% of participants chose not to disclose their gender identity. There was missing gender-based data for 8% of the sample. The average age of the sample was 39. Finally, the sample was recruited from >12 different countries (regions included are Africa, Asia, Australia, Europe, and the United States), and from ≥15 different job levels, ≥15 different departments, ≥15 different industries, and ≥15 different obtained HLOEs (highest levels of education).

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<sup>1</sup> The expert panel was made up of experts from the fields of neuropsychology, neurology, and psychology.

## Reliability and Validity Testing

Item-level reliability assessments were conducted for each individual construct. In other words, all items contained in each construct were included in factor analysis as its own mini-questionnaire/scale. When, based on the theory underlying scale development, a one- or two-factor solution was established, Cronbach's  $\alpha$  was computed in order to assess whether each mini-scale falls within the desired range for the reliability metric. If a mini-scale scored below the acceptable threshold of Cronbach's  $\alpha$  ( $<0.700$ ), it was removed from the overall assessment. Finally, in order to assess the validity of the different mini-scales, correlational analyses were conducted. In order for a mini-scale to be considered valid, it has to show a significant correlation with the Neurozone® Team Resilience Index, which serves as the criterion outcome. Constructs that did not meet this criterion were removed from the overall assessment. See below for an example of the different levels of reliability and validity testing:



## Results

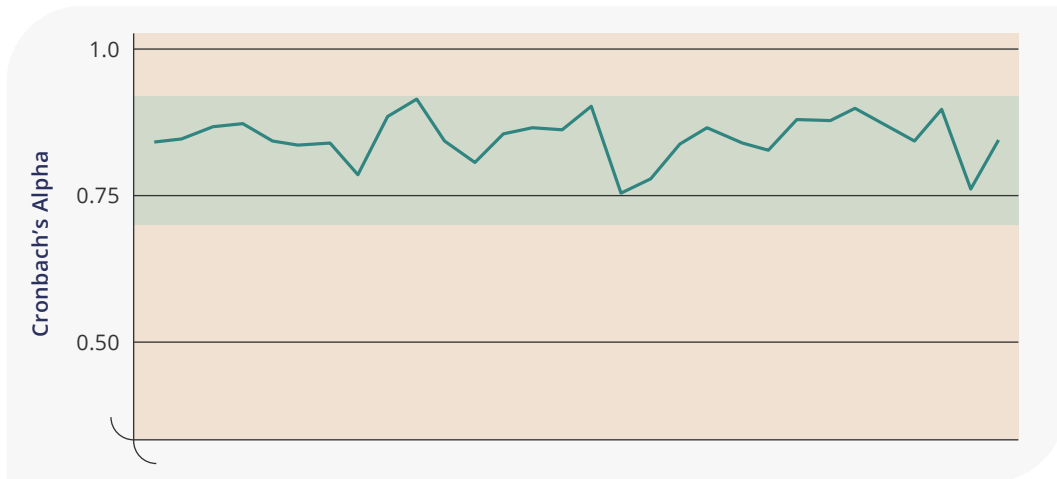
### Component Extraction

The Kaiser-Meyer-Olkin (KMO) statistic, a measure of sampling adequacy for principal component analysis, yielded a value of 0.743. This indicates that the dataset is suitable for principal component analysis, as values closer to 1.0 suggest a high degree of intercorrelation among variables. In addition, The Bartlett's sphericity test, assessing the suitability of data for principal component analysis, was statistically significant ( $p < 0.001$ ). This supports the notion that correlations between variables are sufficiently large for meaningful component(s) to emerge. The average cumulative proportion of total variance explained across all mini-scales accounted for 72.91% of the total variance. This constitutes a substantial degree of variance in the data captured by the extracted components, especially in psychological science. The mean inter-item correlation, indicative of the average linear association between items across all mini scales, stood at 0.556. This value strongly supports the existence of shared variance among the items under consideration. The average component loading, at 0.831, denotes the extent to which each item contributes to the underlying component(s). This signifies a strong relationship between the items and their corresponding component(s). The loading cut-off for retaining items was 0.500, which is considered very robust.

### Reliability Testing Results

The internal consistency of the mini scales were evaluated by computing Cronbach's  $\alpha$ . Put simply, internal consistency refers to how well the items that fall under each mini-scale 'work together' to reliably measure the same thing (the respective mini-scales included in the overall assessment). The ideal range of Cronbach's  $\alpha$  is between 0.700 and 0.900. A higher

value is indicative of higher reliability, while a value exceeding 0.900 is indicative of possible redundancy in the measure. Results show a Cronbach's  $\alpha$  average value of 0.843 across all the mini-scales. This value signifies a high degree of internal consistency, reflecting the high reliability of the mini-scales. See below for a distribution of Cronbach's  $\alpha$  values across all mini-scales included in analyses:



### Validity Testing Results

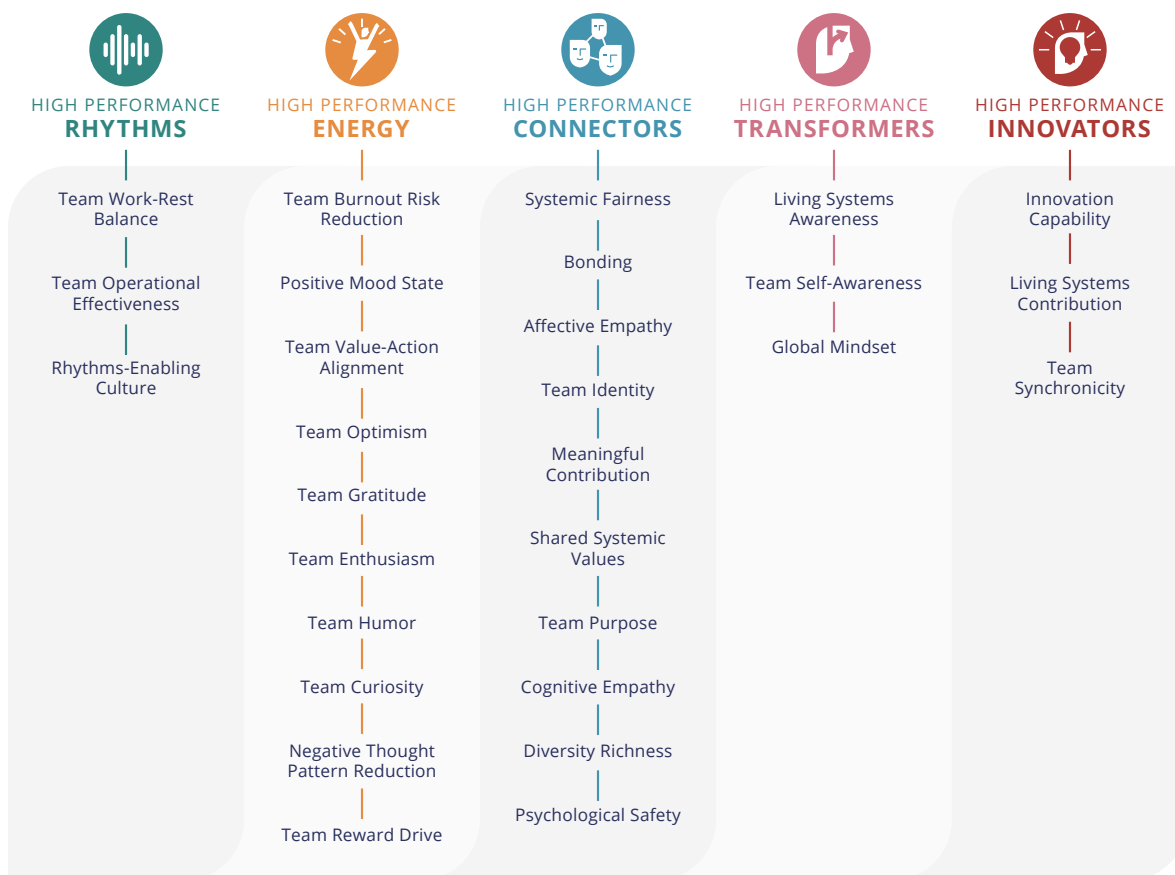
Validity was assessed by determining whether there is a significant correlation between each mini-scale and the Team Resilience Index. Results show that all mini-scales exhibit a significant correlation with the Team Resilience Index. Put differently, a better score on each mini-scale is associated with a higher score on the Team Resilience Index. The average correlation size (Pearson's  $r$ ) across all mini-scales was 0.478 (medium-to-large range), which is more than double the size of correlations typically found in psychological research<sup>2</sup>. See below for a distribution of correlation sizes for all mini-scales:



<sup>2</sup> Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, 2, 156-168.

### Mini-Scales Summary

Below we present the final mini-scales included in the broader assessment. The mini-scales are grouped into functional (non-statistically-derived) domains for ease of reference and use in the Neurozone® High Performance Team Report:



### Discussion & Conclusion

The findings indicate that all mini-scales that were retained in the Neurozone® High Performance Team Assessment well surpassed the minimum reliability threshold of 0.700. The average Cronbach's  $\alpha$  value across all mini-scales was 0.843, which is indicative of very high overall reliability. Moreover, and with regard to validity testing, every mini-scale demonstrated a significant correlation with the Team Resilience Index. On average, the magnitude of the correlation size across all mini-scales was measured at 0.478. This represents a large effect size. These outcomes collectively provide strong support that the Neurozone® High Performance Team Assessment demonstrates robust psychometric properties with excellent levels of reliability and validity. The different team behaviors and dimensions measured by the various mini-scales can be cultivated and improved as part of targeted interventions to build a team's resilience and to set them up for high performance.



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