neurozone®

The Development & Validation of the Neurozone® Personal Assessment

Introduction

Neurozone set out to develop a valid and reliable assessment that measures various behaviors, as well as different emotional and cognitive states. Behaviors and cognitive and emotional states were selected based on their demonstrated and/or theoretical relationship with resilience. Put differently, if these behaviors and cognitive and emotional states are enhanced, an individual's level of resilience should increase. Resilience in the assessment is measured by the **Resilience Index**, a published, peer-reviewed measure that has been demonstrated to be reliable and valid. Importantly, the Neurozone Personal Assessment does not measure cognitive ability (e.g., IQ), aptitude, or personality. It also does not collect any information that could be used in favour of, or against, any individual (e.g., recruitment, job placement, appraisals).

Development of the Assessment

Development of the assessment was based on previously validated constructs, existing scientific literature, and an expert panel[1]. Through a combination of these approaches, various constructs were identified based on an established and/or theoretical relationship with resilience. Each construct was then populated with items and included in the assessment. All items and constructs that were included in the assessment were validated by an independent psychometrist.

Importantly, these constructs are theoretically distinct and do not claim to measure the same phenomenon (e.g. Exercise Duration versus Optimism). They are included, however, in the assessment due to their individual relationship with resilience. Each construct 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.

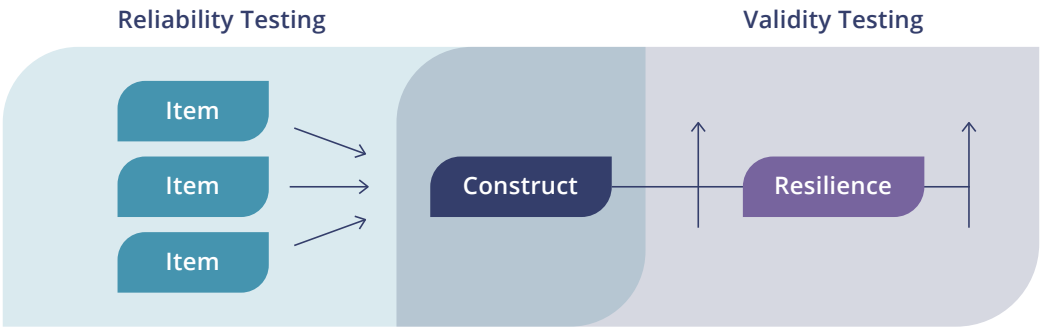
The Sample

The main sample consisted of a global sample of 652 individuals where 57% identified as 'women', 40% as 'men', 2% as 'other', while 1% of individuals opted to not disclose their gender identity. The average age of the sample is 40 with a range of 18-74.

Reliability and Validity Testing

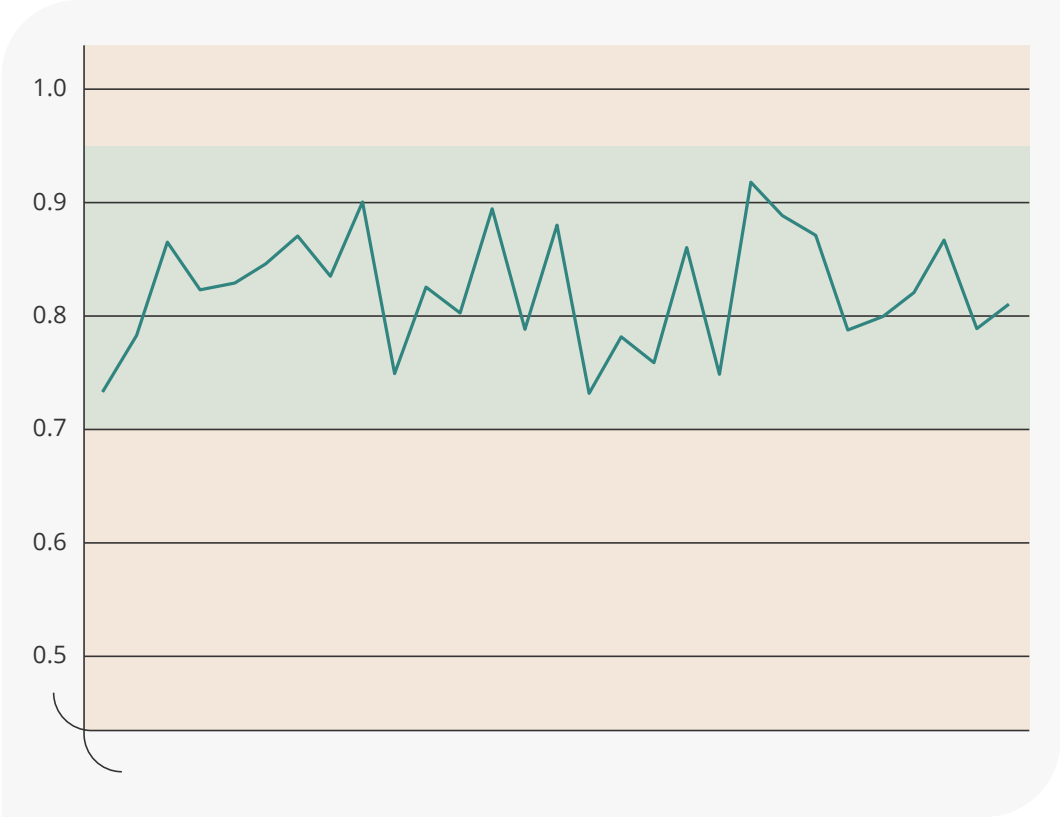
Reliability was tested on the item-level for each construct. Put differently, all items associated with each construct were included in factor analysis as its own questionnaire/scale. For validity testing, correlational analysis was used on a construct level. In order for a construct to be regarded as valid, a significant positive correlation with the Resilience Index needs to be demonstrated. See below for an example of the different levels of reliability and validity testing.

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



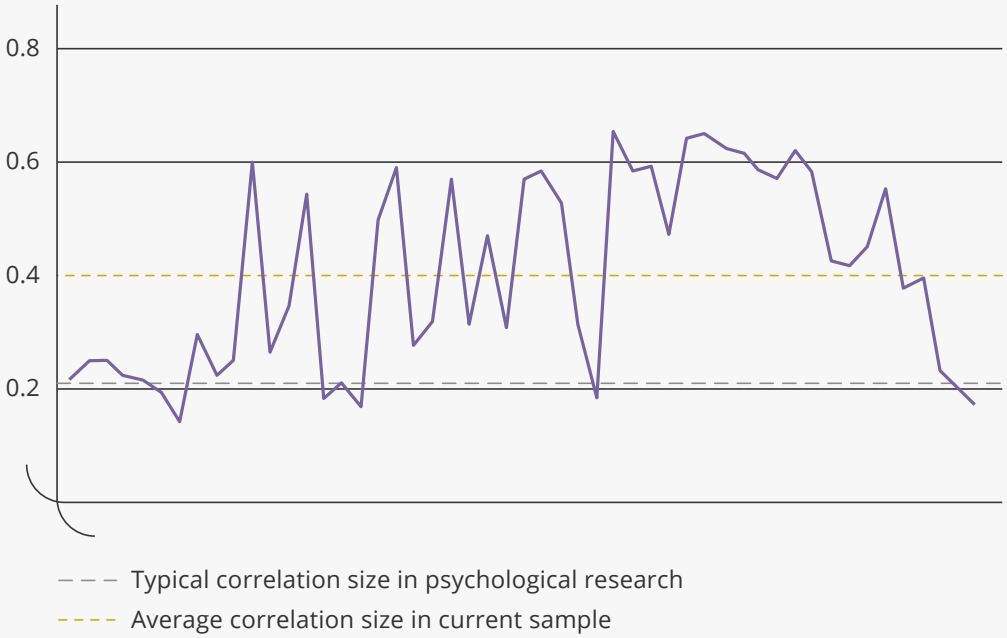
Reliability Testing Results

The Kaiser-Meyer-Olkin statistic for all factor analyses was determined to be >0.600, with Bartlett's sphericity test at p = <0.001 in all instances. These results together indicate sampling adequacy, as well as the suitability of the extraction method employed. The average factor loading for items across all constructs was 0.812 (range 0.390 - 0.927), which is regarded as very high. In addition, all constructs included for internal consistency analyses had Cronbach's α values above the acceptable threshold of 0.700, with a range of 0.731 - 0.916. The average Cronbach α value across all constructs was 0.822, which is indicative of very good reliability. See below for a distribution of Cronbach's α values across all constructs included in analyses:



Validity Testing Results

Validity was assessed by determining whether there is a significant positive correlation between each construct and the Resilience Index. Results show that all constructs exhibit a significant positive correlation with the Resilience Index. The average correlation size (Pearson's *r*) across all constructs was 0.403 (medium-to-large range), which is nearly double the size of correlations typically found in psychological research[2]. See below for a distribution of correlation sizes for all constructs:



Conclusion

Results show that all constructs included in analyses met the minimum reliability threshold with an average Cronbach α value at 0.822, which is indicative of very good reliability. In addition, all constructs have a significant positive correlation with the Resilience Index, while the average correlation size across all constructs was 0.403, which is a medium-to-large size correlation. These results provide strong evidence that the Neurozone Personal Assessment is a highly reliable and valid measure.

2 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.