White Paper

LINKING NEURO-PSYCHO-METRICS WITH CORTISOL

JULY 2017

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INTRODUCTION

Psychometric validation procedures (e.g. factor analysis, reliability analysis, etc.) are fairly limited in the sense that they are mostly dependent on self-rated assessment data. While these procedures are an important step to improve the accuracy of psychometrics, not many studies have shown links between psychometric data and bio-markers. **Neurozone®** believes that the cross-pollination between biology and psychometrics is an essential validation procedure missing in the current standard practice of validating metrics.

OBJECTIVES

This study is aimed at demonstrating a relationship between the **Neurozone®** Brain Performance Diagnostic (BPD) and levels of cortisol as attained through blood samples to further validate our measures.

METHODOLOGY

A small cohort of n=56 was selected as subjects for the sample. Participants were screened and the rigorous inclusion criteria (e.g. no diseases, medication) resulted in a final sample of 21 individuals. The individuals completed the well-validated BPD and blood was extracted at the ideal

time where cortisol levels were the most stable (professional medical companies were assisting). The following **Neurozone®** indices were then correlated with cortisol (nmol/L) levels:

- Resilience
- Self-Leadership
- Learning Capacity
- Innovation Capacity
- OBBS (composite of the exercise, nutrition, sleep/wake cycle, silencing the mind, social safety, etc. indices that indicate the state of healthy behaviour).

RESULTS

The Pearson 2 tailed correlation results showed below indicates that Resilience, Self-Leadership and OBBS had a significantly negative correlation with cortisol levels ($p < 0.05$).

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CORRELATIONS		Resilience	Self-Leadership	Learning Capacity	Innovation Capacity	OBBS	Cortisol nmol/L
Resilience	Pearson Correlation	1	,058	-,058	,377	.551**	-.436*
	Sig. (2-tailed)		,803	,802	,092	,010	,048
Self-Leadership	Pearson Correlation	,058	1	-,019	-,067	,162	-.541*
	Sig. (2-tailed)	,803		,934	,774	,483	,011
Learning Capacity	Pearson Correlation	-,058	-,019	1	.474*	,199	-,066
	Sig. (2-tailed)	,802	,934		,030	,386	,776
Innovation Capacity	Pearson Correlation	,377	-,067	.474*	1	.626**	-,060
	Sig. (2-tailed)	,092	,774	,030		,002	,795
OBBS	Pearson Correlation	.551**	,162	,199	.626**	1	-.519*
	Sig. (2-tailed)	,010	,483	,386	,002		,016
Cortisol nmol/L	Pearson Correlation	-.436*	-.541*	-,066	-,060	-.519*	1
	Sig. (2-tailed)	,048	,011	,776	,795	,016	

CONCLUSION

The results indicate that **Neurozone®**'s self-rated metrics do in fact negatively correlate with the bio-marker of cortisol. This indicates that as stress increases (i.e. cortisol), resilience and self-leadership decrease. These results provide an important step forward in the further validation of the BPD. The study is however limited to the small sample size.

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