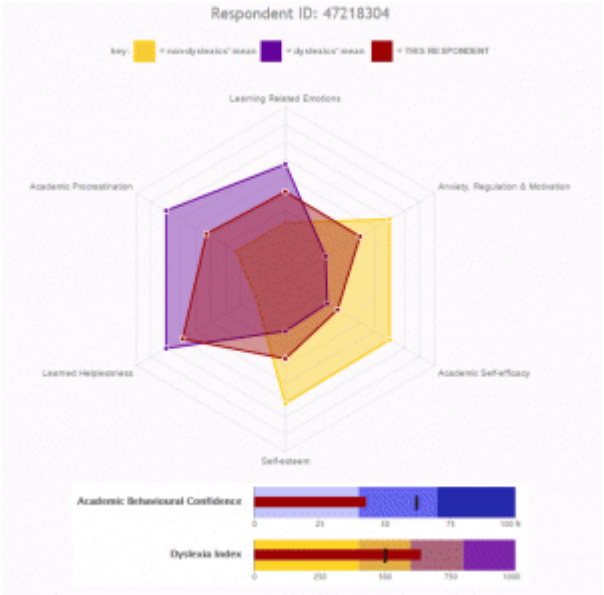
BlogPost #19: DIMENSIONS OF DYSLEXIA 2: REVISITING THE DATA; LOOKING FOR MEANING

Part 1 of this commentary on my preliminary enquiry about dimensions of dyslexia outlined my increasing unease about pitching my project into the plethora of research about dyslexia as I learned more about the wide range of viewpoints on not only the nature of dyslexia as a syndrome (or not), the diversity of perspectives on its 'causes', such that any (learning) 'difference' might be attributable to a cause, and frankly, the difficulty in just pinning down a decent definition of what 'dyslexia' is, or what it means to be 'dyslexic'.

In trying to get to grips with this, I developed a brief questionnaire that I sent out to professional colleagues in universities to ask about their experience of the prevalence of the various characteristics, attributes, *dimensions*, that are widely associated with a dyslexic profile, especially in the context of higher education learning environments.

Although I only received 30 responses to my questionnaire, these have provided rich and varied data which has contributed a great deal to the formulation of the main data-collection QNR for the project.

A key element of this has been the modification of the QNR to now include a section of Likert-style response items that draw on the results of this preliminary enquiry to colleagues. The aim of this additional section is to collect data that can generate what I have termed a 'Dyslexia Index', the formulation process for which directly draws on the results.



The Dyslexia Index will be an additional indicator of the liklihood that any particular respondent to the QNR is aligned to a dyslexic profile where this profile has emerged from their responses to the 6 constructs being explored by the other Likert Scales in the QNR (these being: learning related emotions; anxiety, regulation and motivation; academic self-efficacy; self-esteem; learned helplessness; and academic procrastination).

So the purpose of this second part of the commentary on the results of the preliminary enquiry on dimensions of dyslexia is to record my thoughts, feelings and questions that arise from looking more carefully at the data – which I have visualized it into a number of graphs, charts and diagrams – and the 153 correlation coefficients that I have calculated that looks for associations between all possible pairs of combinations of the 18 dimensional statements in the enquiry.

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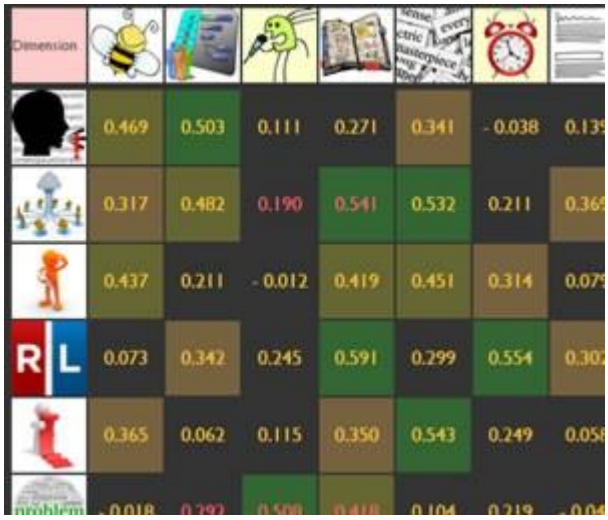
The matrix of correlation coefficients:

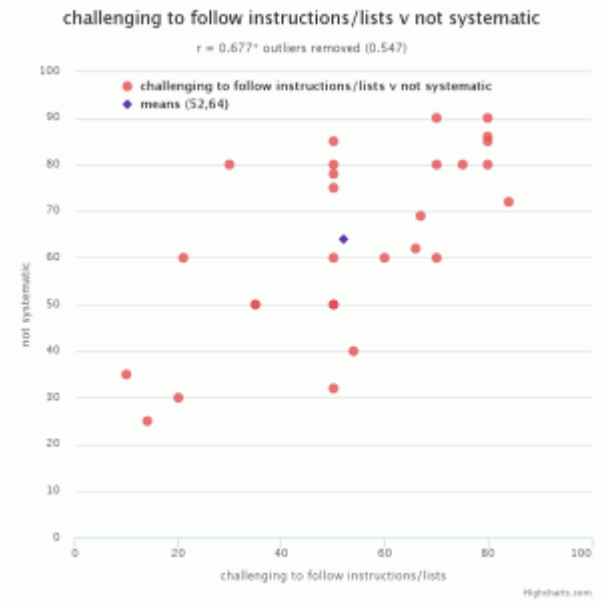


The matrix of correlation coefficients indicates the degree of association between all possible pairs of stem statements / dimensions.

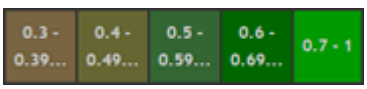
This is an essential overview of a complex pattern of possible interrelationships between the dimensions of dyslexia reported by my colleagues across the sector and as a first step towards understanding where linkages appear to exist, this matrix is a very valuable visualization.

Shown, are Pearson Product-Moment correlation coefficients (***r***) calculated through Excel to 3 significant figures and hyperlinked to each coefficient is the scatter diagram representation of each pair of dimensions, created using the HighCharts application (reported in the StudyBlog post 'Technical Log').

Not only has calculating ***r*** been an essential step in gaining meaning from the data collected, inspecting the scatter diagrams has also enabled outliers to be identified and thence removed from the datasets to enable ***r*** to be *recalculated* into a more representative indication of association. In the matrix, this is indicated in the bottom quadrant with the recalculated coefficients identified with an asterisk. Where this adjustment has been applied, 4 outliers at most were removed from the respective datasets. (The figure, right, is hyperlinked to the live matrix, and the figure, below-right, is hyperlinked to a live scatter diagram).



I could find no definitive criteria for setting correlation coefficient level boundaries for indication of strength of association although 'rule of thumb' guidelines suggest that ***r*** > 0.6 indicates a 'strong' association dropping to 0.3 < ***r*** < 0.4 suggesting a 'weak' strength of association. In the ***r***-matrix I created, I colour-coded cells to provide an 'at-a-glance' indication of the level of correlation between pairs of dimensions, which conveniently defines my own level boundaries



Indicated strong associations:

A first step to understanding these correlation coefficients is to consider the indications of very strong associations, where $r > 0.7$:

1. students who are creative problem-solvers <=> students who find following directions to get to places challenging or confusing; $r = 0.771$ (outliers removed);
2. student who are poor time-keepers <=> students who often use the wrong word for their intended meaning; $r = 0.779$ (outliers removed);
3. students who are creative problem-solvers <=> students who prefer explaining things verbally rather than in their writing; $r = 0.720$ (outliers removed);
4. students who find it very challenging to manage their time effectively <=> students who are weak or poor in spelling; $r = 0.761$ (outliers removed);

Let us look at each of these in turn:

1. students who are creative problem-solvers are also likely to find following directions to get to places challenging or confusing:

Should we expect this? A very extensive research base over many decades broadly attributes creative problem-solving to higher level, 'right-brain' activity and divergent thinking processes, the original idea for which comes from Guildford (1950). An extensive meta-analysis of Dietrich & Kanso (2010)

More later – data is now arriving from the deployment of the research QNR so this post is to be continued…..

References

Guildford, J.P., 1950, Creativity. *American Psychologist*, 5, pp444-454.

Dietrich, A., Kanso, R., 2010, A review of EEG, ERP and neuroimaging studies of creativity and insight. *Psychological Bulletin*, 136, pp822-848.