Principal Component Analysis of both metrics, Dx and ABC

- The process of *Principal Component Analysis (PCA)* performs dimensionality reduction on a set of data, and especially a scale that is attempting to evaluate a construct. The point of this process is to see if a multi-item scale can be reduced into a simple structure with fewer components (Kline, 1994).

- Sander & Sanders (2009) conducted a factor analysis of their original, 24-item Academic Behavioural Confidence (ABC) Scale, finding that it could be reduced into a 17-item scale with 4 factors which they designated as *grades, verbalizing, studying* and *attendance*.

- SPSS was used to conduct a PCA on both metrics used in my research. For the Dyslexia Index, this resulted in five factors being identified and although the factor structure was not as 'simple' as would have been ideal, it was still felt that the outcome was sensible. The five factors which emerged have been labelled:
  - Factor 1: Reading, writing, spelling;
  - Factor 2: Thinking and processing;
  - Factor 3: Organization and time-management;
  - Factor 4: Verbalizing and scoping;
  - Factor 5: Working memory.

- As a result of this factor analysis of Dyslexia Index, the research subgroups were re-sifted in accordance with a revised Dyslexia Index that was established for all the respondents in the datapool. In this way, the Academic Behavioural Confidence values for research subgroup respondents can be explored independently in accordance with each of the five Dyslexia Index factors - which is shown in the graphic.

- It was also felt that although Sander & Sanders (2009) had combined all of their previous datasets together and conducted a PCA on the resulting datapool which established their reduced, 17-item scale, there was merit in also conducting a PCA on my own data as this may yield a different factor structure to theirs. This indeed was the result and five factors were identified and labelled as:
  Factor 1: Study efficacy;
  Factor 2: Engagement;
  Factor 3: Academic output;
  Factor 4: Attendance;
  Factor 5: Debating.

- An attempt has been made to map this factor structure across to the four-factor structure identified in Sander & Sanders' 17-item scale where a generally close match was identified despite the different number of factors in each of the two structures. This is reported on the project's StudyBlog wepbages.