

Research groups and subgroups' summary data for Dx ranges and CIs for μ ;

Rationale for boundary value adjustment to Dx = 592.5

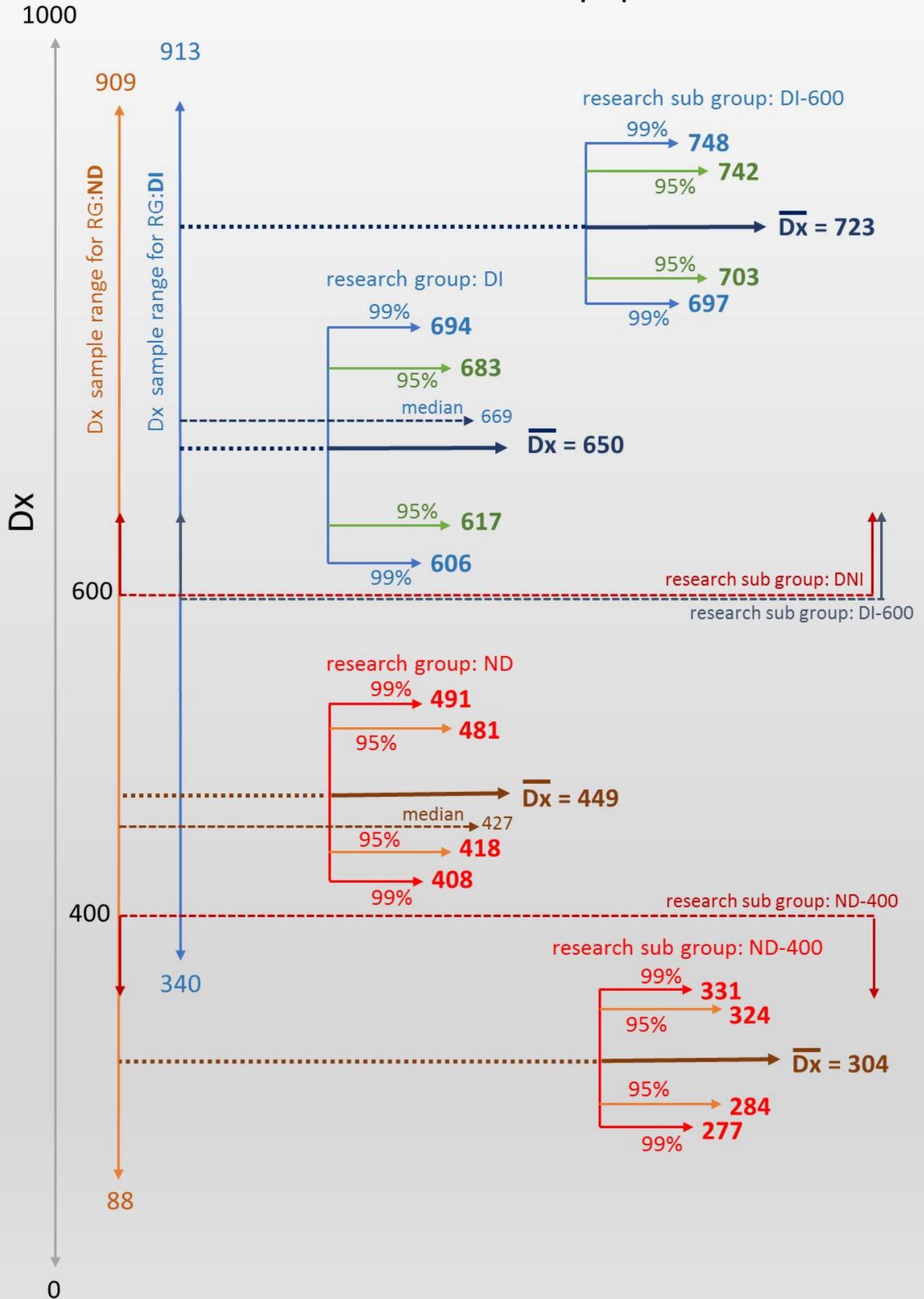
As far as possible it is necessary for the principal research subgroups DNI and DI-600 to share the similar Dyslexia Index characteristics in order that the Academic Behavioural Confidence can be compared between the subgroups' datasets.

I have variously reported in earlier posts the outcome of my reflections on how to set a boundary value in research group ND – students with no reported dyslexia – which enables datasets to be sifted out into research subgroup DNI – students with no reported dyslexia but who are presenting dyslexia-like profiles. I have thought about this carefully and somewhat arbitrarily settled on a boundary value of Dx = 600 because the sizeable majority of respondents in research group DI present Dx values which are greater than Dx = 600 (43 respondents from n = 68). In addition, confidence interval analysis shows that the 99% interval for the background population mean, μ , for Dyslexia Index for the complete research group DI – that is, all students who reported dyslexia – includes a lower boundary of Dx = 606, which is suggesting that Dx values below this are likely to be highly unusual events and at best may be considered as outliers.

Hence the research subgroup established from applying this boundary value Dx = 600 (to the datasets in research group DI) is considered reasonable and has been designated as research subgroup DI-600, which is considered sensible as the CONTROL GROUP against which other parameters in the enquiry analysis can be compared against.

This is summarized in the first graphic below from which it can be seen that research subgroup DI-600 presents a mean Dx = 723.

Confidence intervals for population means



Research subgroup DNI (n = 17) (not shown in this graphic) from research group ND is of particular interest in the project and ABC data between respondents in this subgroup and the dyslexia control subgroup DI-600, will be compared.

However with research subgroup DNI presenting a mean Dx = 690, some 33 Dx points below the mean for research subgroup DI-600, it was felt necessary to conduct a t-test for independent sample means to establish whether this sample mean Dx = 690 is significantly different from the sample mean Dx = 723 for research subgroup DI-600. If not, then the boundary value of Dx = 600 remains a sensible one for sifting respondents into research subgroup DNI, however if there IS a significant difference between these sample means then this is suggesting that the two subgroups are not sharing the similar (background population) characteristic of mean Dx and hence other comparison analysis of attributes in these two research subgroups could not be considered so robustly.

The outcome of Student's t-test for independent sample means, set at the conventional 5% level and as a one-tail test because it is known that the sample mean for research subgroup DI-600 is higher rather than different from that for research subgroup DNI, returned values of $t = 1.6853$, $p = 0.0486$ ([calculation source](#)) indicating that there **IS** a significant difference between the sample means of the two research subgroups, albeit only just. Following several further iterations of the t-test based on different boundary Dx values close to Dx = 600, an outcome that is considered satisfactory has been established using a boundary value of Dx = 592.5 which returned t-test results of $t = 1.6423$, $p = 0.05275$ which now suggests **no** statistically significant difference between the sample means, although again, this p-value is only JUST above 'not significant' boundary value of the test.

The impact of this adjustment has been to increase the sample sizes of research subgroup DNI from n=17 to n=18, and of research subgroup DI-600 from n = 43 to n = 45.

It is accepted that this tinker-factor is very small and results in very marginal adjustments to other outputs from the data analysis but it was felt important to consider.

The graphic below is adjusted to reflect the revised sample means and confidence intervals for the population means, μ , for all research groups and subgroups.

Confidence intervals for population means

