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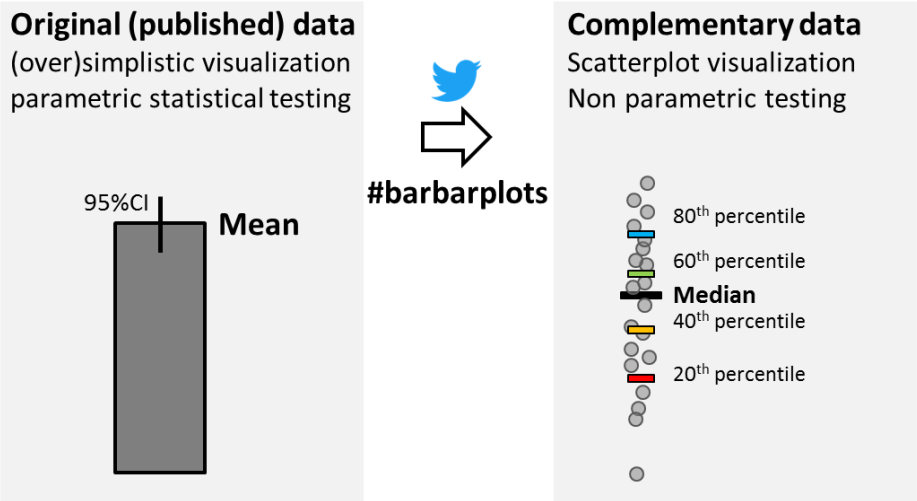
Post-publication analyses

Data from Perrotin, La Joie et al, Alzheimer's & Dementia (in press) doi: 10.1016/j.jalz.2016.08.011

Subjective cognitive decline in cognitively normal elders from the community or from a memory clinic: Differential affective and imaging correlates

Accepted manuscript is available here and corrected proofs are available on the journal website depending on your personal or institutional entitlements.



General comments.

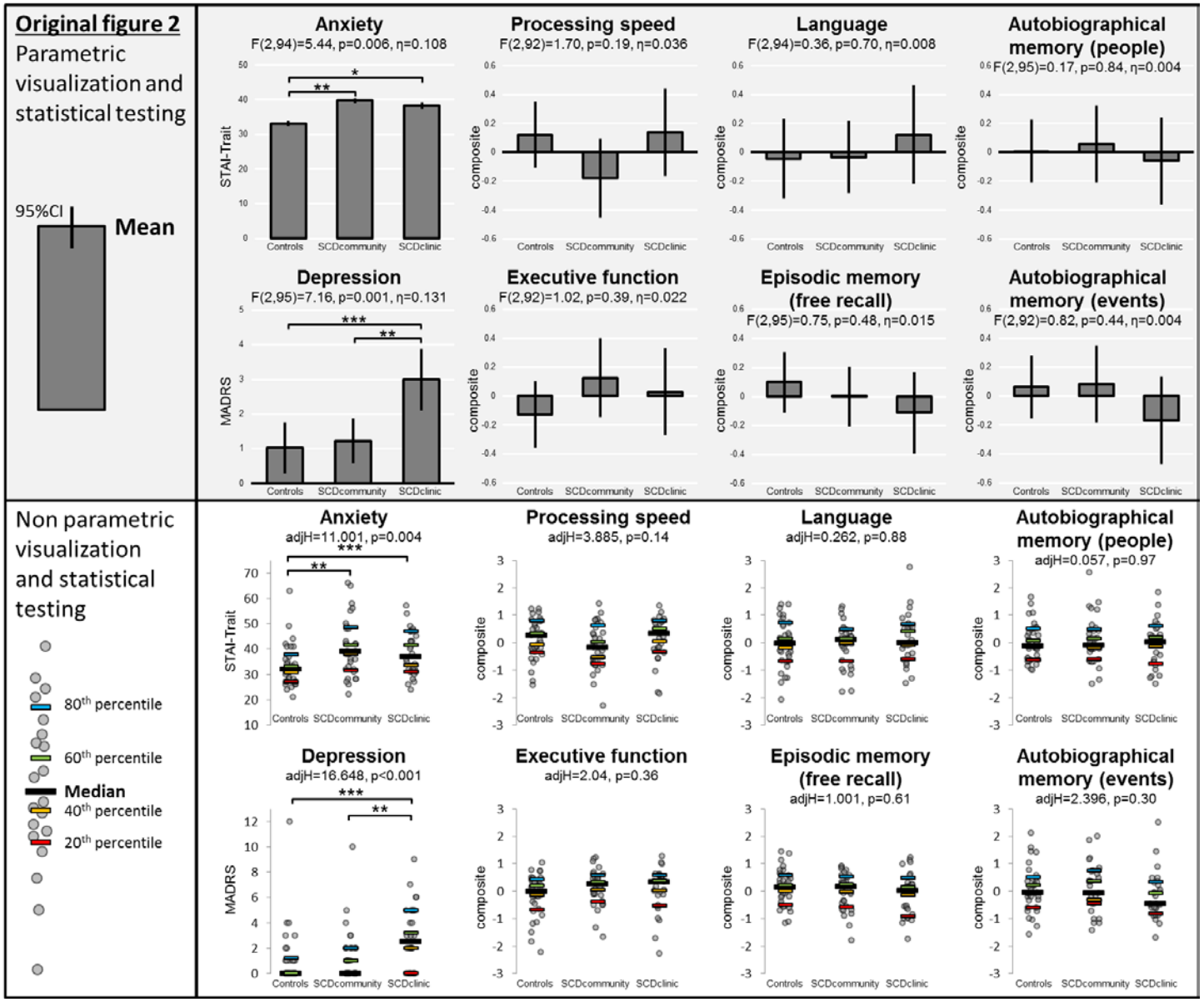
Scientific investigations don't have to stop when a paper is accepted for publication in a peer-review journal. This is probably one of the main advantages of using social media in academia: they are places for sharing results and commenting them. There is no reason why peer-review should only happen before publication, so any feedback is welcome anytime! Let's just make sure the critiques remain courteous and constructive so people don't feel personally mocked or attacked. That could help avoid another ridiculous *methodological terrorism* debate and instead spend our time and energy improving our methods and approaches.

In line with this positive impact of social media to research quality, I posted on twitter early September after the above mentioned paper was accepted in Alzheimer's and dementia. I got interesting feedback, comments and questions regarding some of our results, and notably the potential impact of outliers in some the analyses. Below are some additional analyses and figures I conducted accordingly.

- Good point: these additional analyses all confirmed the original results.
- Bummer: the paper processing was too advanced for me to modify the final version of the article, so these (beautiful) figures and results will not be included in the final article.

1) Group comparisons of cognitive and affective measures

The original figure 2 showed the mean value and the 95% confidence intervals for each measure and each group, parametric Analyses of Variance (ANOVAs) were used to compare the groups. The figure below shows the original figure (and statistics) as well as another, more detailed illustration of the same data, enabling to show each data point as well as a few indicators of data distribution using percentiles. Non parametric Kruskal Wallis tests were conducted.



Results are highly consistent across approaches.

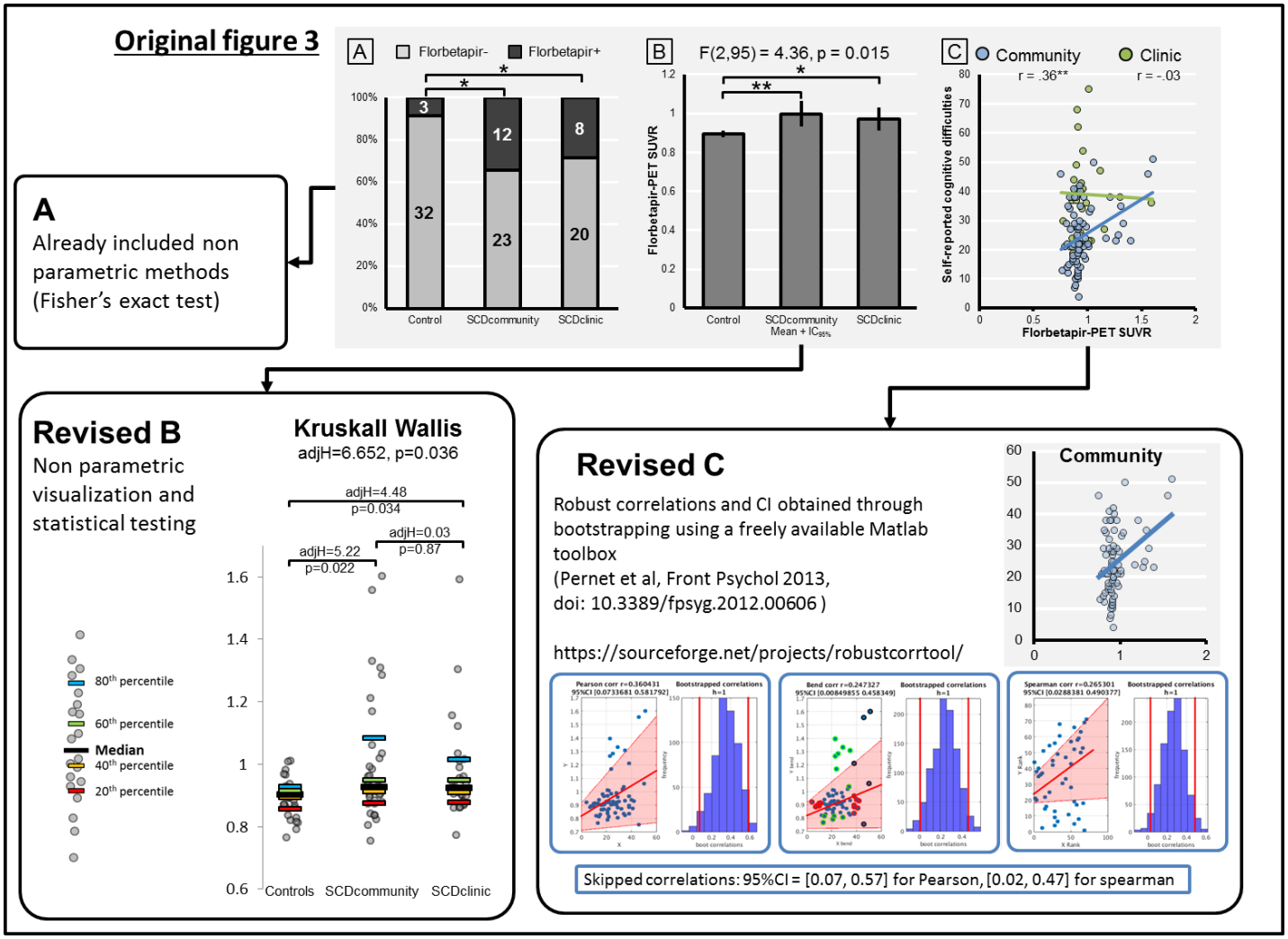
This is likely related to the little number of outliers in the data (the only notable exception being the depression score). The normal-like data distribution can itself be attributed to the choice of variables used to compute composite scores (we only included scores showing non skewed distribution, as mentioned in the original manuscript).

However, the new visualization presented here has clear interest to assess data distribution and get a better understanding of group differences.
For instance, it is clear that although groups overlap, the two SCD groups have clearly increased anxiety scores: ~50% of participants in these groups have value >38-39 while is it only the case for 20% of the Controls.

Depression was the only “outlier” score as the values were strongly skewed: ~60% of controls, ~50% of SCDcommunity and ~20% of SCDclinic scored 0 but the significance of group differences were consistent.

2) Relationships between Florbetapir (amyloid) imaging and subjective cognitive decline

Figure 3 presented results of analyses assessing the relationships between amyloid imaging and subjective cognitive decline. These three panels presented complementary analyses, using categorical or continuous variables for both measures. Panel B showed the mean Florbetapir Neocortical SUVR value and the 95% confidence intervals for each group; parametric Analyses of Variance (ANOVAs) were used to compare the groups. Panel C showed correlations between continuous measures of both Florbetapir and self-reported Cognitive Difficulties. However, the distribution of Florbetapir values (as initially presented on panel C) is not normal, as largely described in the literature (Chetelat et al, Neuroimage clinical 2013 for review). The Figure below shows complementary analyses using a more detailed presentation of the individual values, along with the use of non-parametric tests (Kruskal Wallis test for revised panel B) and alternative, more robust ways to assess correlations (see Pernet et al, Frontiers in Psychology 2013).



Here again, results were consistent with these presented in the original paper: **Florbetapir values increased with elevated level of self-reported cognitive difficulties. This was found across tests and across approaches**:

- Panel A: Controls < SCDcommunity in terms of % positive scans
- Panel B: Controls < SCDcommunity, in terms of Florbetapir uptake
- Panel C: Significant association between Florbetapir uptake and self-reported cognitive difficulties in the community recruited sample.

However, we want to emphasize that these associations are found at the group level but there is very strong overlap between groups. This was already mentioned in the discussion of the accepted paper:
"*our results contribute to identifying the characteristics of SCD individuals who might be at higher risk of AD and bring new evidence that, **at the group level**, elders with SCD but normal neuropsychological examination should not be considered as worried well*".