Challenges and potential of 7T (f)MRI for investigating attention and perception

Propositions accompanying the PhD-thesis
CHALLENGES AND POTENTIAL OF 7T (F)MRI FOR INVESTIGATING ATTENTION AND PERCEPTION

Yawen Wang

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1. Although the cellular loss of the nbM has been shown to be linked to cognitive decline, caution should be taken when interpreting the volumetric change of nbM measured in neuroimaging studies, given the invisibility of the nbM on standard in vivo MR datasets.
2. Variability of reported nbM volumes between previous neuroimaging studies could be due to the atlases used and the probabilistic thresholds set, but the variability also exists between studies using the same atlas and threshold.
3. One cannot accurately localise the nbM by applying an nbM atlas created from a single subject, or even a few subjects of similar age, because the atlas does not capture the variability in the population.
4. Visualisation of nbM in vivo is not feasible at the moment, but quantitative MR techniques at ultra-high field show great potential to image this structure, and to create a high-resolution template for high-resolution acquisitions.
5. Early visual cortex may well engage in the processing of surface brightness, however we could not find convincing evidence using 7T fMRI.
6. In the online setting, changing the luminance of the whole background or just a narrow region outside the border of the probe (in AW's stimulus) can both induce Anderson and Winawer's brightness illusion. But the illusion was weak and the rotation effect was not effective.
7. Neuroimaging techniques and psychophysics are both essential tools to understand how the brain generates cognition.
8. Quality control is crucial for a research project.
9. Following B.F. Skinner: It would be more useful to scan one brain for 1000 hours than to scan 1000 brains for one hour.
10. The process of creating knowledge is fun but is also hard and complicated.
11. What gets us into trouble is not what we don't know, it's what we know for sure that just ain't so. – Mark Twain.