How reliable are the measurements of fetal parieto-occipital and Sylvian fissures?

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Objective
To test the variability in measuring the parieto-occipital (POF) and Sylvian fissures (SF) to determine their reproducibility and applicability in clinical practice.

Methods
Ninety (90) 3-D brain volumes between 15-36 weeks were retrieved and 2-D planes of the transthalamic, transventricular and transcrebellar planes reconstructed. The depth of the Sylvian fissure for each of the planes was measured and that of the parieto-occipital fissure determined on transthalamic plane. Three operators were paired and took the measurements in turns. Each operator was blinded to the other’s measurements. Bland-Altman plots were constructed to determine the inter and intraobserver variability for each of the sulci and variability in calliper replacement.

Results
The mean intra-observer, inter-observer and calliper replacement differences for the parieto occipital fissure was -0. 02mm (95% CI -0. 17-0. 14); 0. 00(95%CI -0. 18-0. 19) and -0. 01(95%CI -0. 20-0. 19) respectively. The intra-observer variability of the Sylvian fissures was -0. 01(-0. 22-0. 20), -0. 01(-0. 22-0. 20), 0. 00(-0. 23-0. 23); inter-observer variability 0. 00(-0. 18-0. 19), 0. 00(-0. 22-0. 23), 0. 00(-0. 22-0. 23) and calliper replacement -0. 00(-0. 28-0. 29), 0. 00(-0. 28-0. 29), 0. 00(-0. 24-0. 25) for the transthalamic, transventricular, transcrebellar planes respectively.

Conclusion
There is minimal intra-, inter- observer and calliper replacement variability in measurement of the parieto-occipital and Sylvian fissures. This justifies the standardisation of these measurements and ultimately construction of normograms to be used in clinical practice.