

SITE EFFECT CORRECTION USING NORMATIVE MODELLING

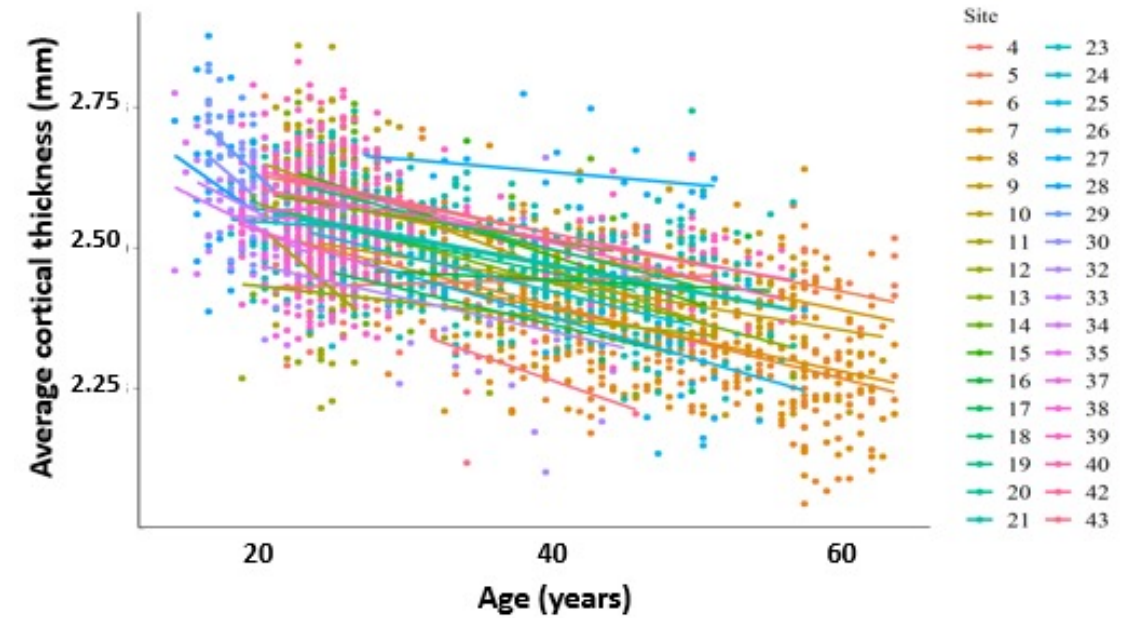
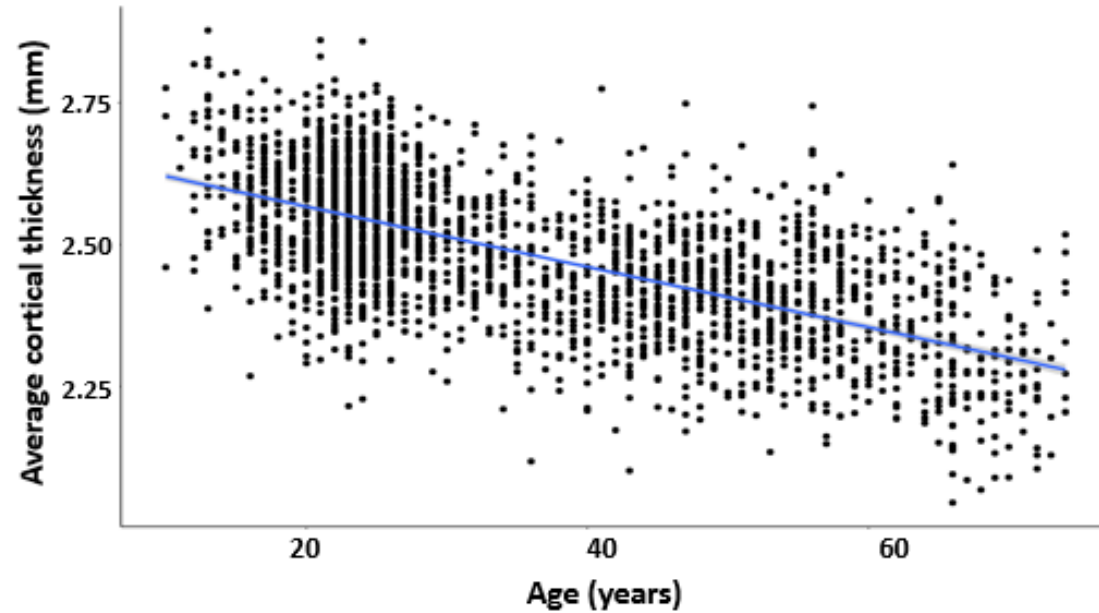
Normative modelling educational course

OHBM 2024, Seoul

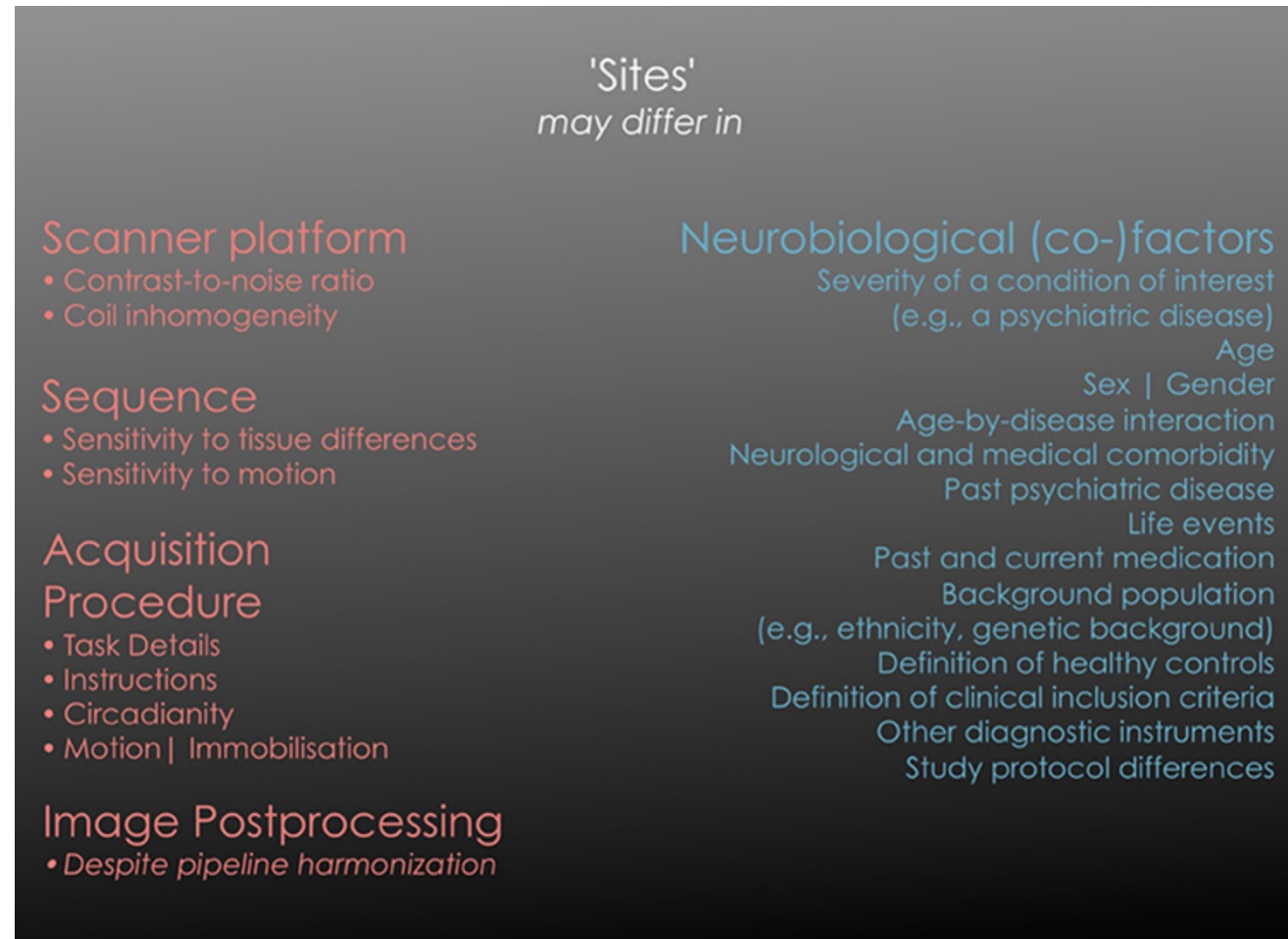
Dr. Johanna Bayer



THE SITE EFFECT PROBLEM



ORIGINS OF SITE EFFECTS



Bayer et al. 2022



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SPECIALTY SECTION

This article was submitted to

Site effects how-to and when: An overview of retrospective techniques to accommodate site effects in multi-site neuroimaging analyses

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Christopher R. K. Ching³, Mengting Liu⁴, Andrew Chen^{5,6},

Review

Image harmonization: A review of statistical and deep learning methods for removing batch effects and evaluation metrics for effective harmonization



Fengling Hu^{a,*}, Andrew A. Chen^a, Hannah Horng^a, Vishnu Bashyam^b, Christos Davatzikos^b,
Aaron Alexander-Bloch^{c,d,e}, Mingyao Li^f, Haochang Shou^{a,b}, Theodore D. Satterthwaite^{c,d,g},
Meichen Yu^{h,#}, Russell T. Shinohara^{a,b,#}

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Accommodating site variation in neuroimaging data using normative and hierarchical Bayesian models

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Thomas Wolfers⁴, Jinglei

Affiliations + expand

PMID: 36272672 PMCID:



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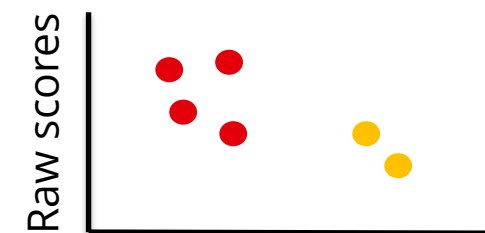
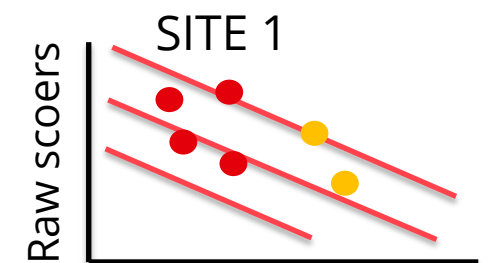
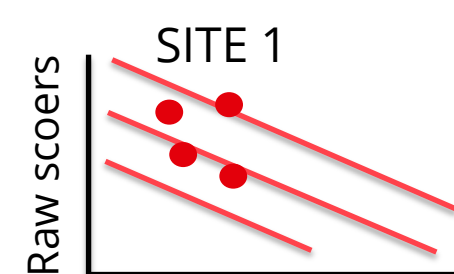
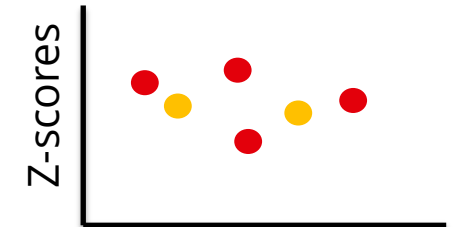
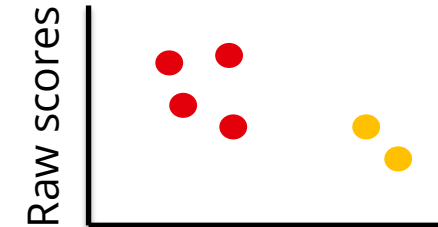
Estimating cortical thickness trajectories in children across different scanners using transfer learning from normative models

C. Gaiser, P. Berthet, S. M. Kia, M. A. Frens, C. F. Beckmann, R. L. Muetzel, Andre F. Marquand 

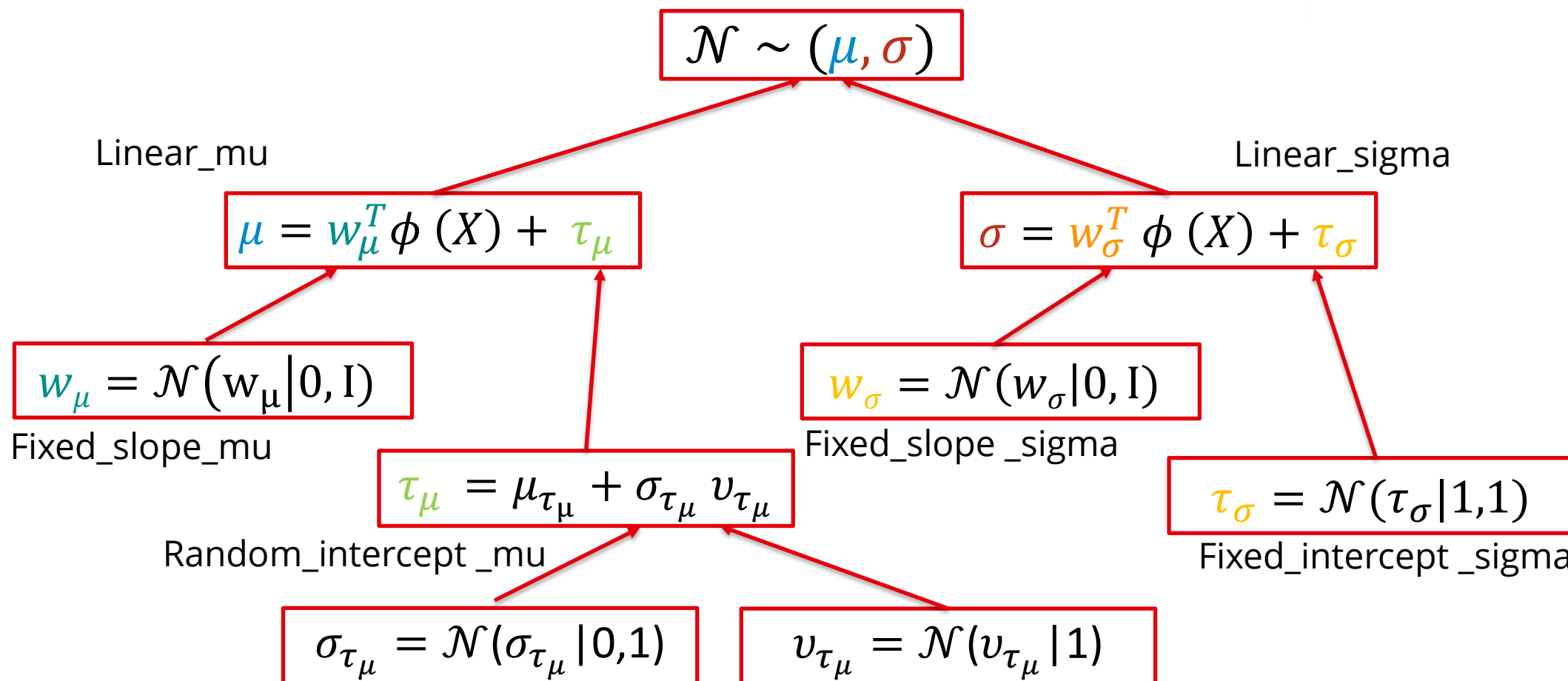
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USE CASES FOR NORMATIVE MODELLING FOR SITE EFFECT CORRECTION

- 1. Site effect correction: Making predictions for a site that is already in the training set.
- 2. "Translating" between z-scores and raw scores, between sites.
- 3. Out of site prediction: Adjusting the site effect difference to data (sites) that are not in the training set.
 - Posterior of fitted data set will be used as priors for fitting new (unseen) sites in an adaptation set
 - Predictions in a transfer test set.



HIERARCHICAL BAYESIAN MODEL



Spoiler: linear_delta and linear_epsilon for skewness and kurtosis also possible

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Imaging
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Non-Gaussian normative modelling with hierarchical Bayesian regression

Augustijn A. A. de Boer, Johanna M. M. Bayer, Seyed Mostafa Kia, Saige Rutherford, Mariam Zabihi, Charlotte Fraza, Pieter Barkema, Lars T. Westlye, Ole A. Andreassen, Max Hinne, Christian F. Beckmann, Andre Marquand 



> Author and Article Information

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