



CONSORTIUM FOR
REPRODUCIBILITY AND
RELIABILITY

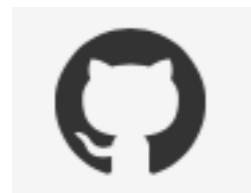
Official Dataset of Brainhack Vienna



1629 Subjects
3357 Anatomical Scans
5093 Resting Functional Scans
1302 Diffusion Scans
300 Cerebral Blood Flow Scans



Curated and maintained by the International Neuroimaging Datasharing Initiative



<https://github.com/zuoxinian/CoRR>

Data Descriptor | [OPEN](#)

An open science resource for establishing reliability and reproducibility in functional connectomics

Author's corner: A testbed for reproducible and standardized human MRI connectomics



The Current State of CoRR
Connectome Reliability and Reproducibility

Xi-Nian Zuo

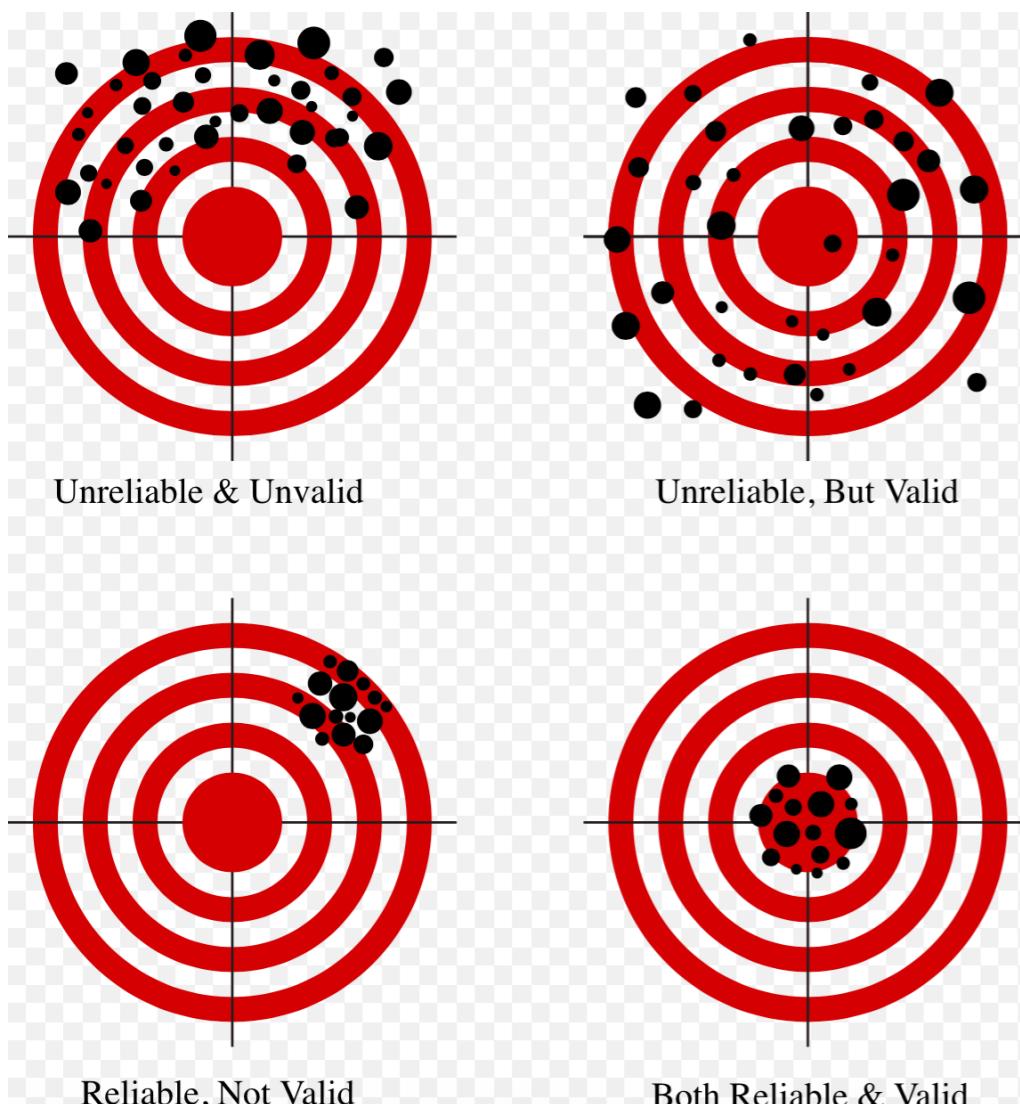




ANNUAL REVIEWS **Further**

Click here for quick links to Annual Reviews content online, including:

- Other articles in this volume
- Top cited articles
- Top downloaded articles
- Our comprehensive search

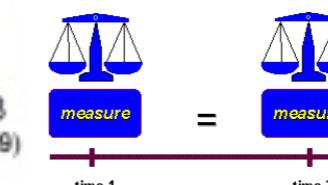
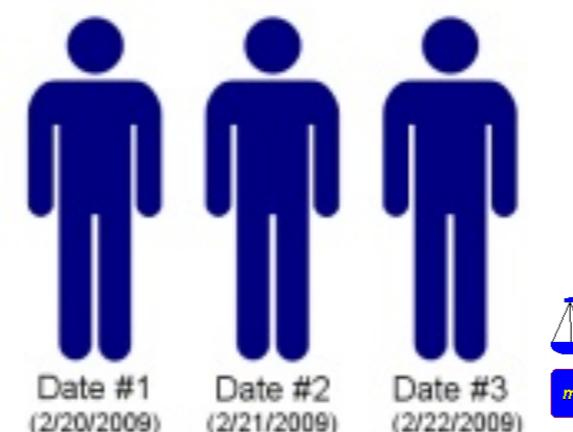


The Reliability of Clinical Diagnoses: State of the Art

Helena Chmura Kraemer

Department of Psychiatry and Behavioral Sciences, Stanford University (Emerita), Palo Alto, California 94301; and Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania 15213; email: hckhome@pacbell.net

Concept: Reliability and Validity



SAME MEASUREMENT

$$ICC = \frac{MS_b - MS_w}{MS_b + MS_w}$$

$$A' = A + n(A)$$

$$B' = B + n(B)$$

$$r(A', B') = r(A, B) \sqrt{ICC(A)ICC(B)}$$

ICC

Slight

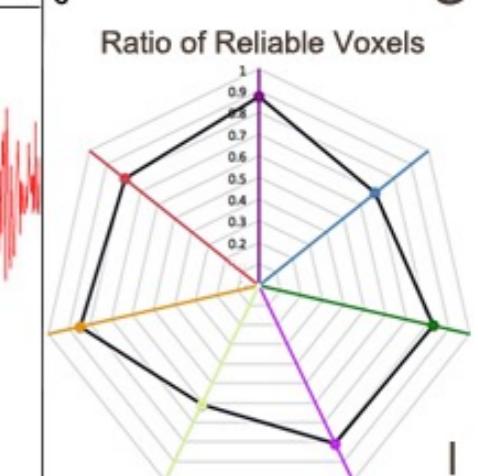
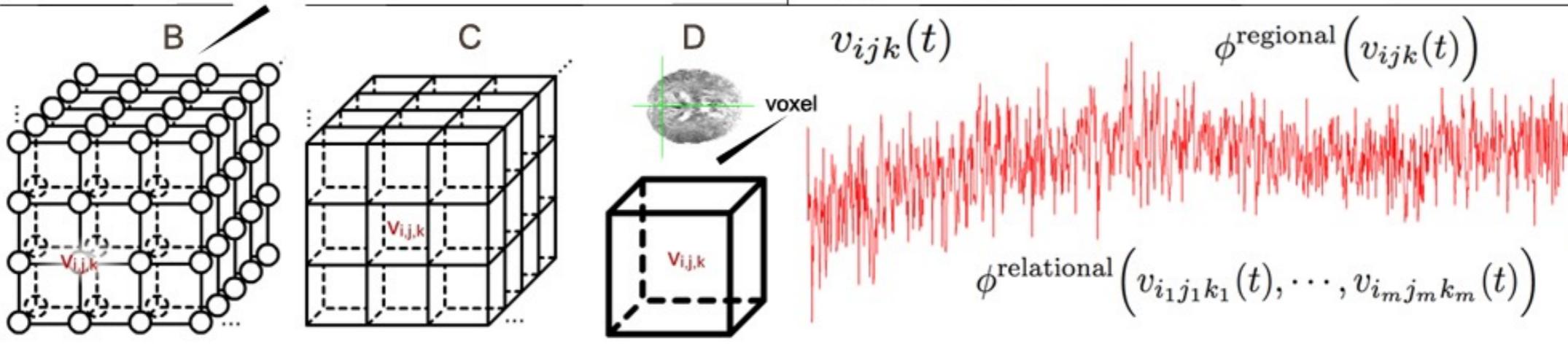
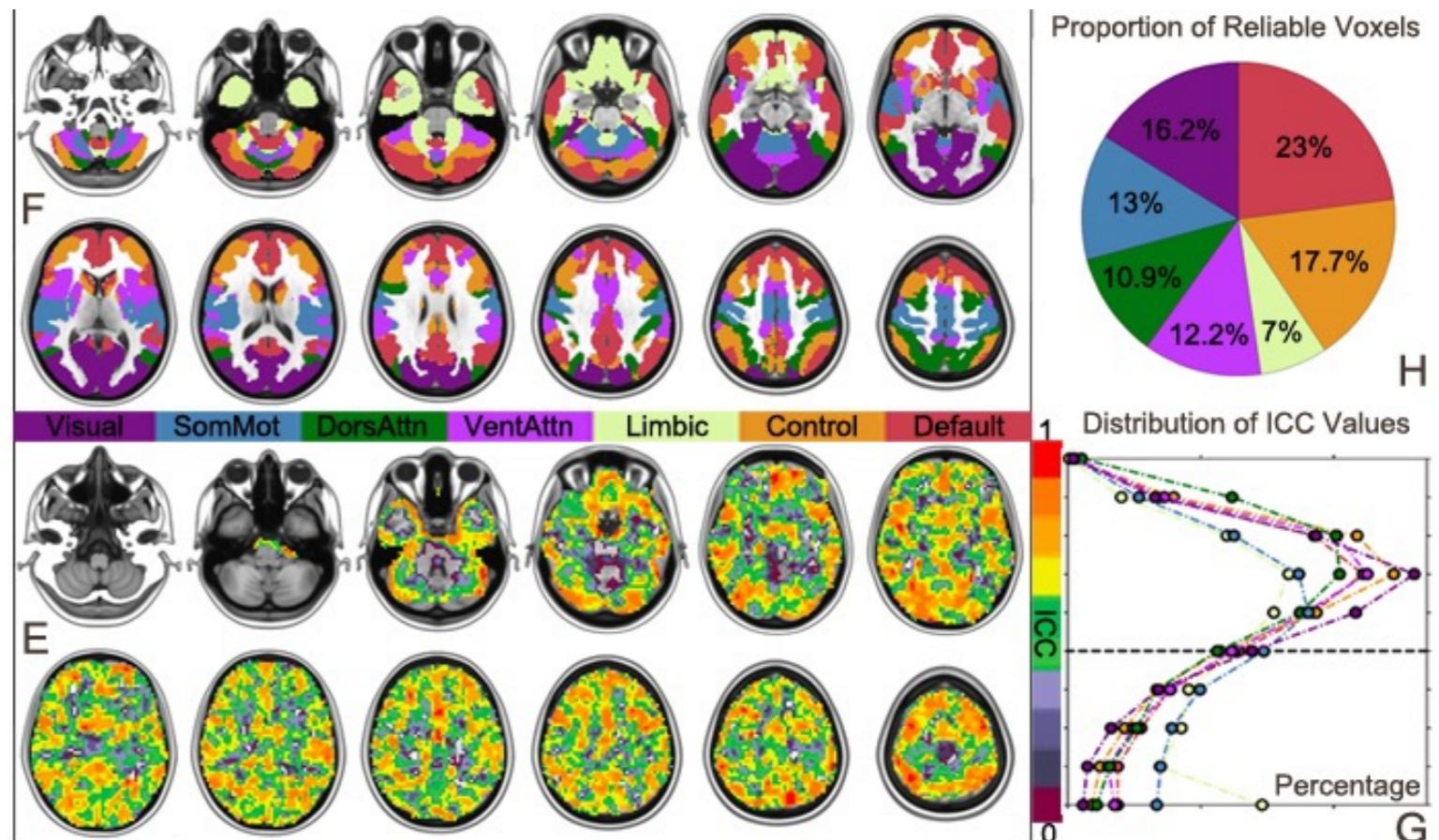
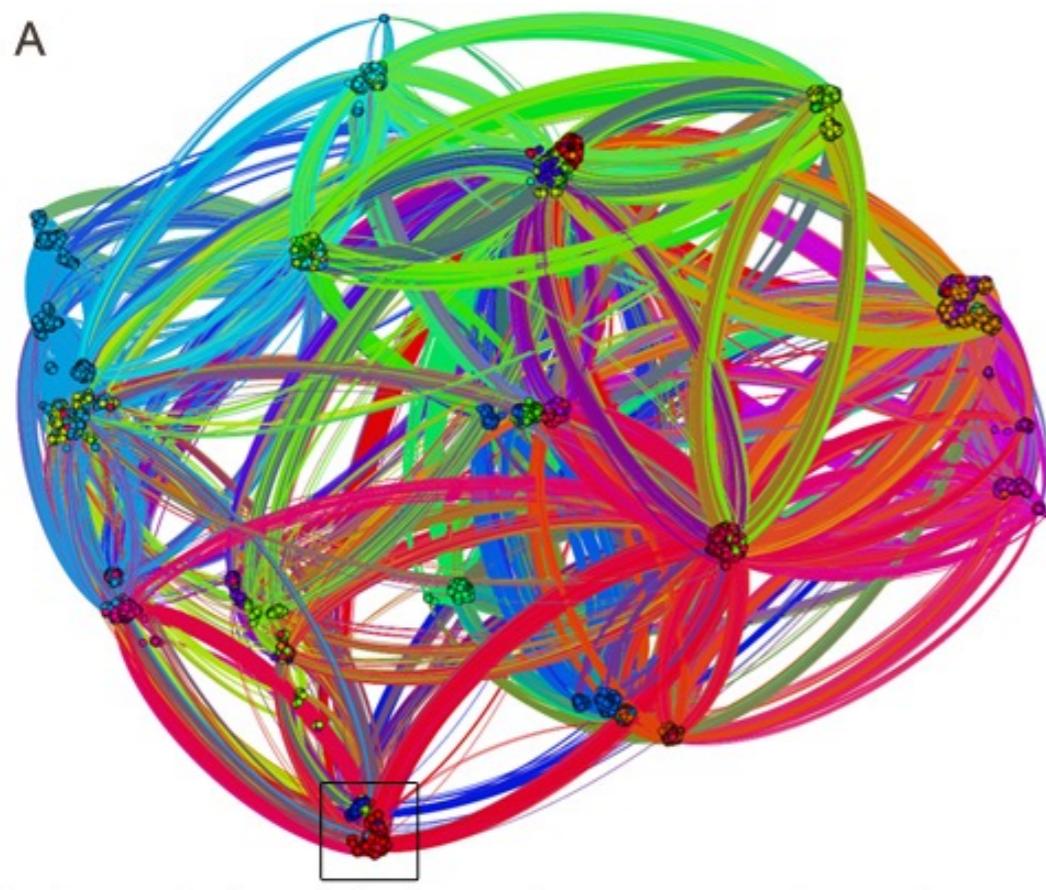
Fair

Moderate

Substantial

Almost Perfect

rfMRI Metrics: A Meta-Reliability Analysis



CoRR: Consortium for Reliability and Reproducibility



Xuanwu Hospital
Capital Medical University



南京军区南京总医院

Nanjing General Hospital of Nanjing Military Command



MAX-PLANCK-GESELLSCHAFT



中国科学院
CHINESE ACADEMY OF SCIENCES



HARVARD
UNIVERSITY



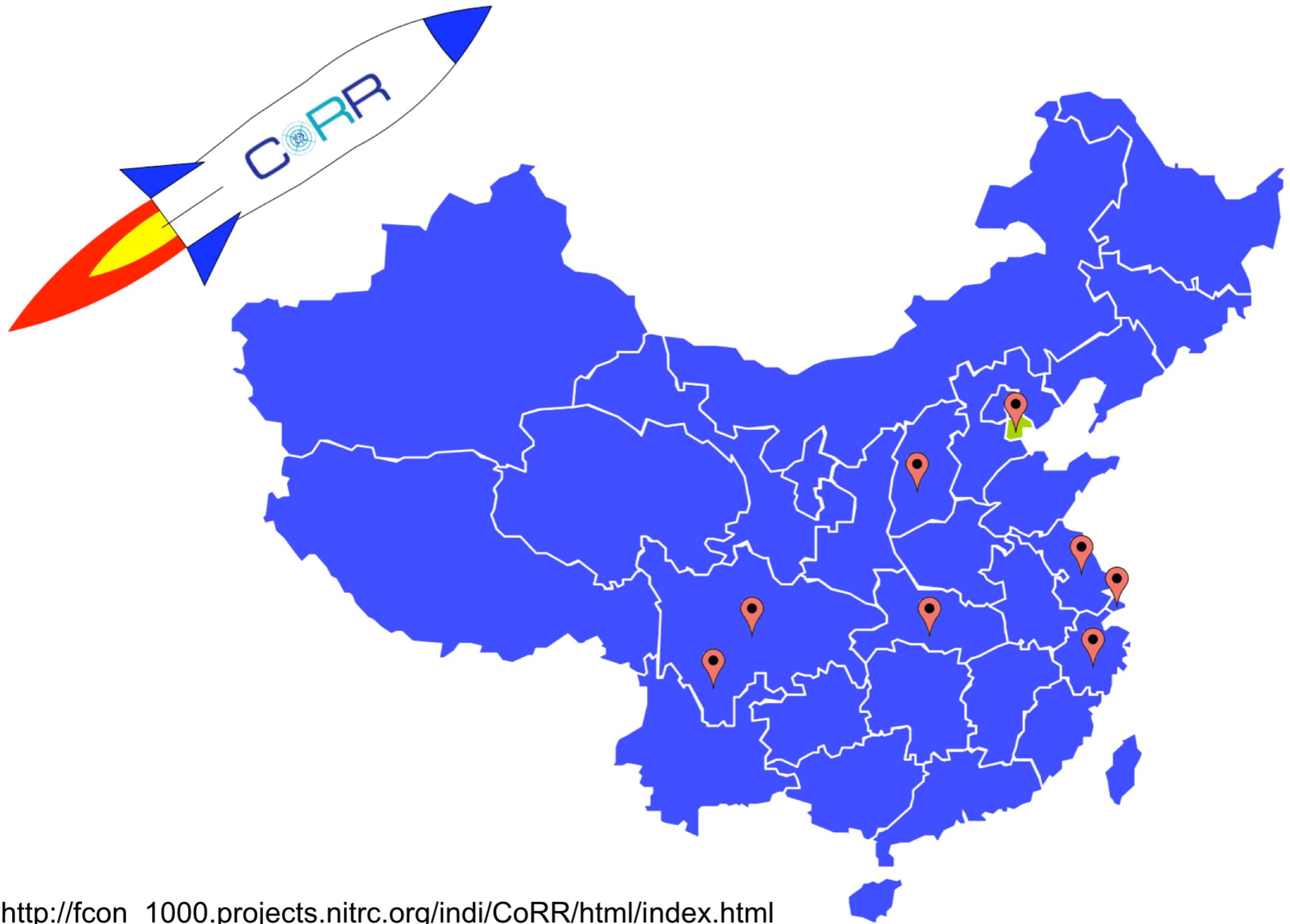
杭州师范大学
认知与脑疾病研究中心
Center for Cognition and Brain Disorders



CHILD MIND®
INSTITUTE

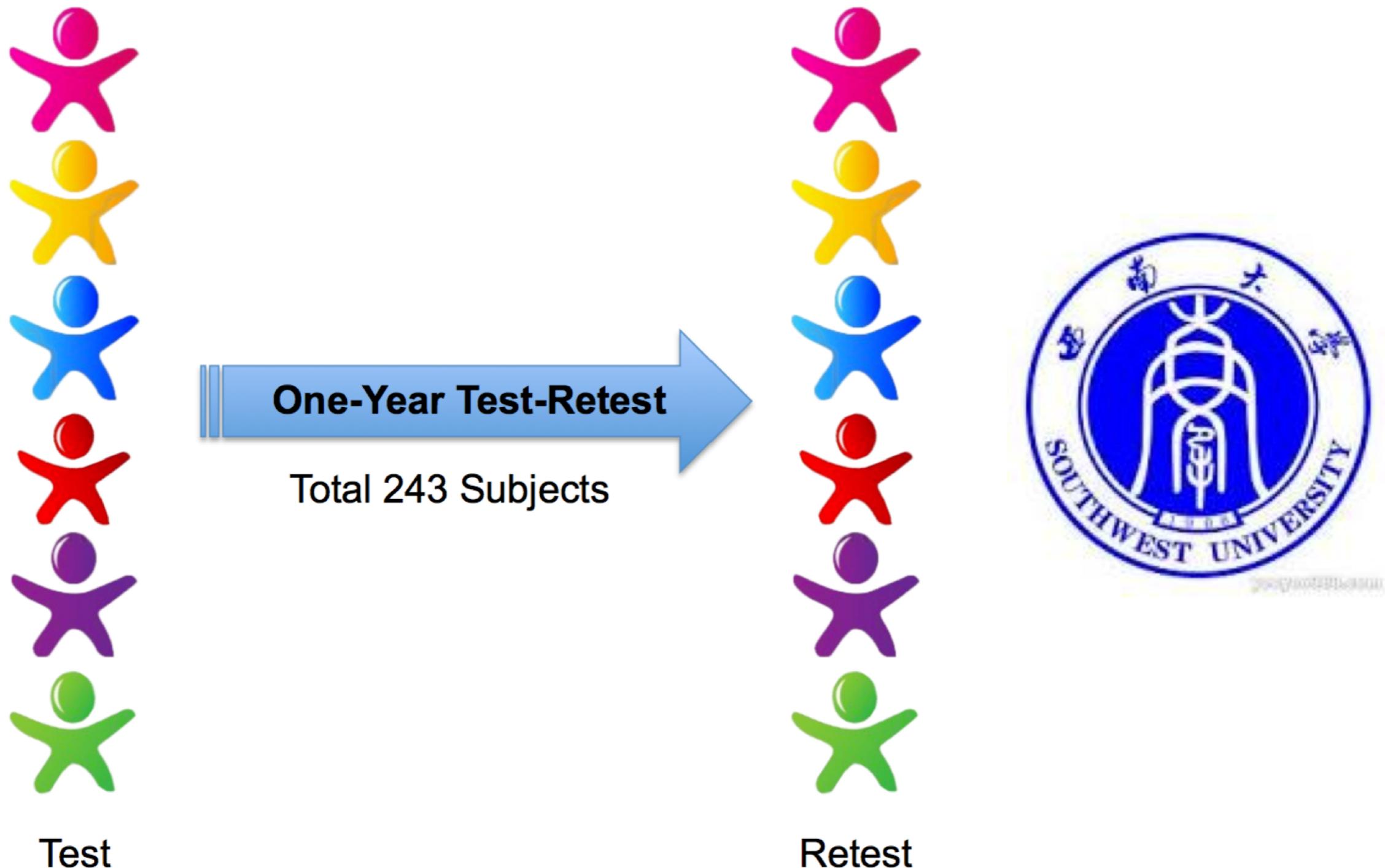


CoRR: Consortium for Reliability and Reproducibility

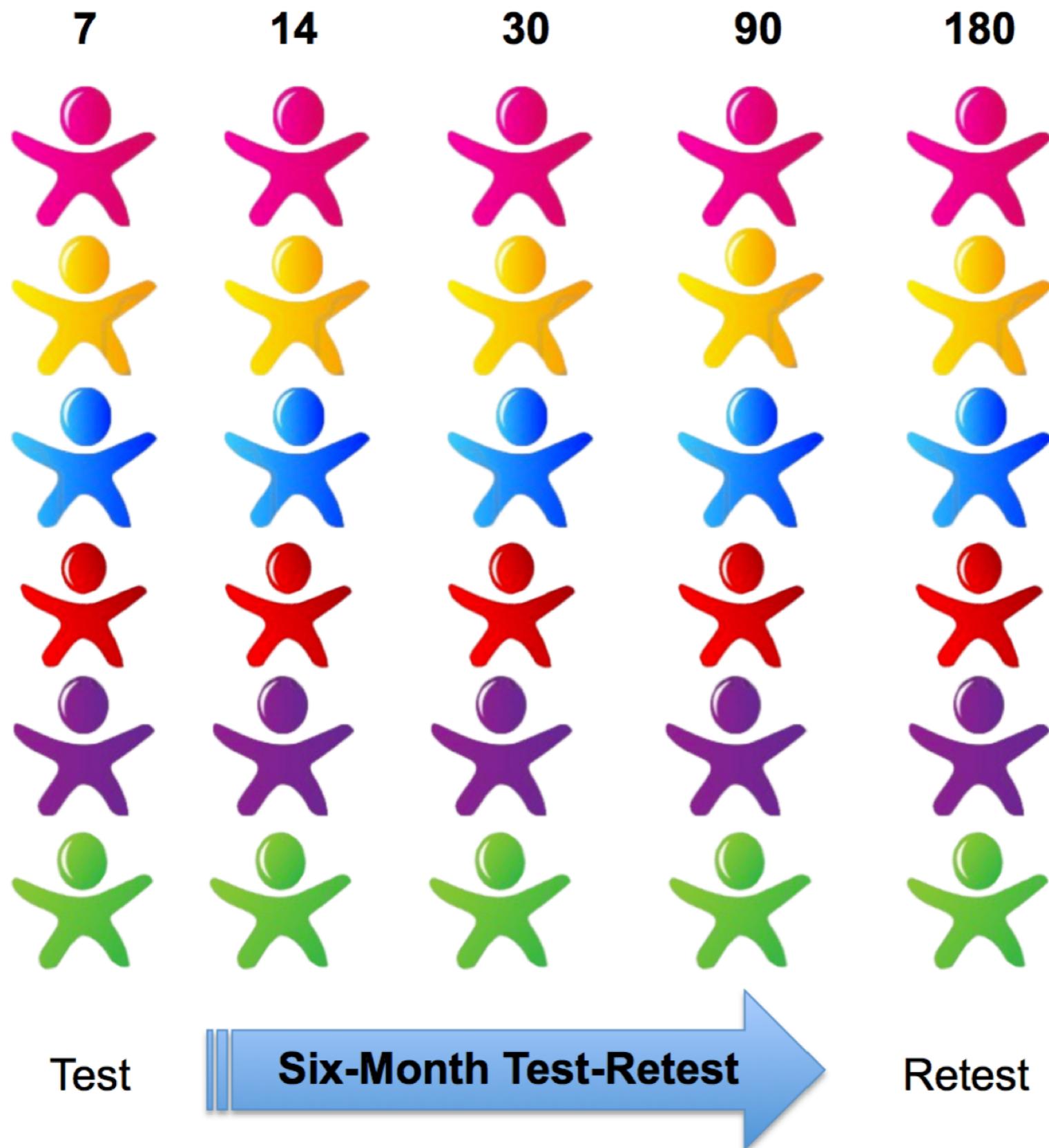


http://fcon_1000.projects.nitrc.org/indi/CoRR/html/index.html

CoRR: Consortium for Reliability and Reproducibility

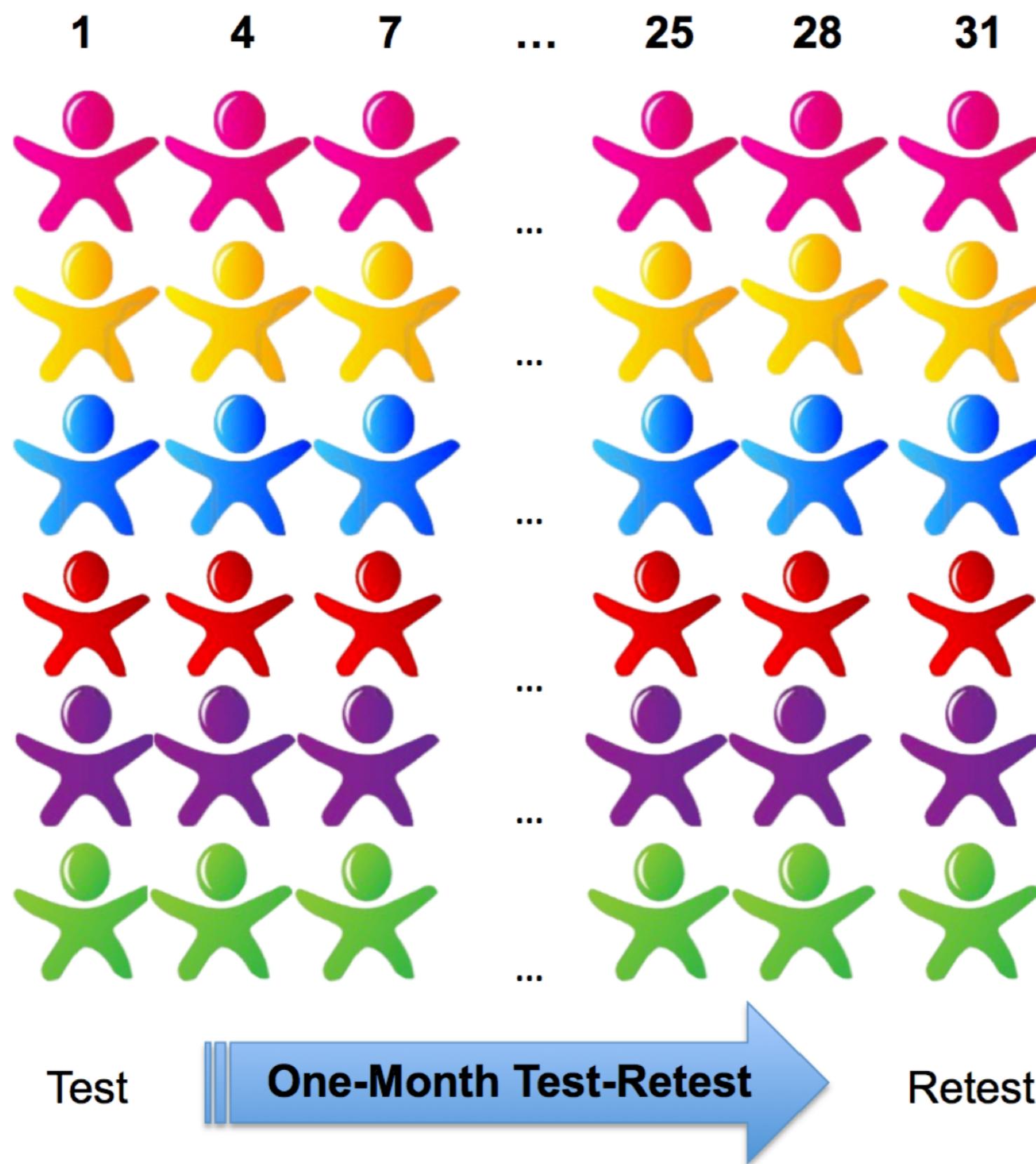


CoRR: Consortium for Reliability and Reproducibility



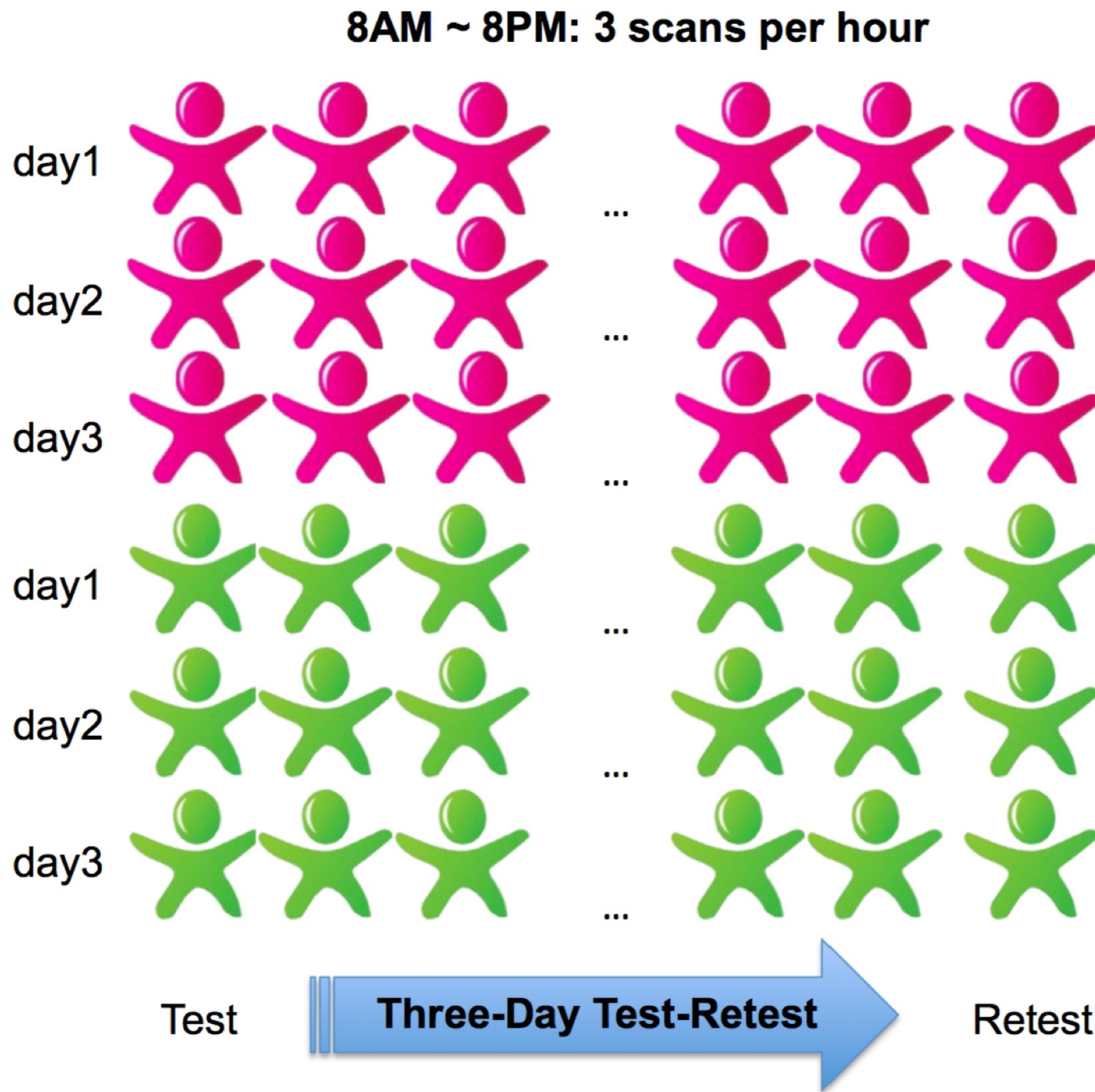
Xuanwu Hospital
Capital Medical University

CoRR: Consortium for Reliability and Reproducibility

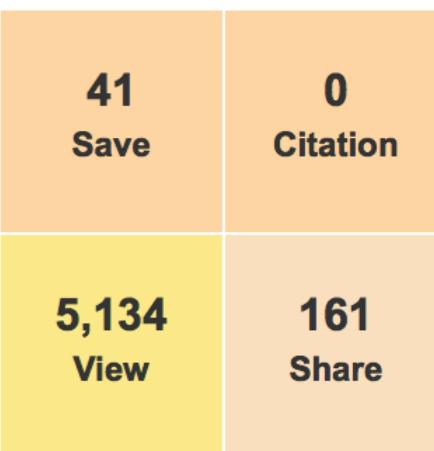


杭州师范大学
认知与脑疾病研究中心
Center for Cognition and Brain Disorders

CoRR: Consortium for Reliability and Reproducibility



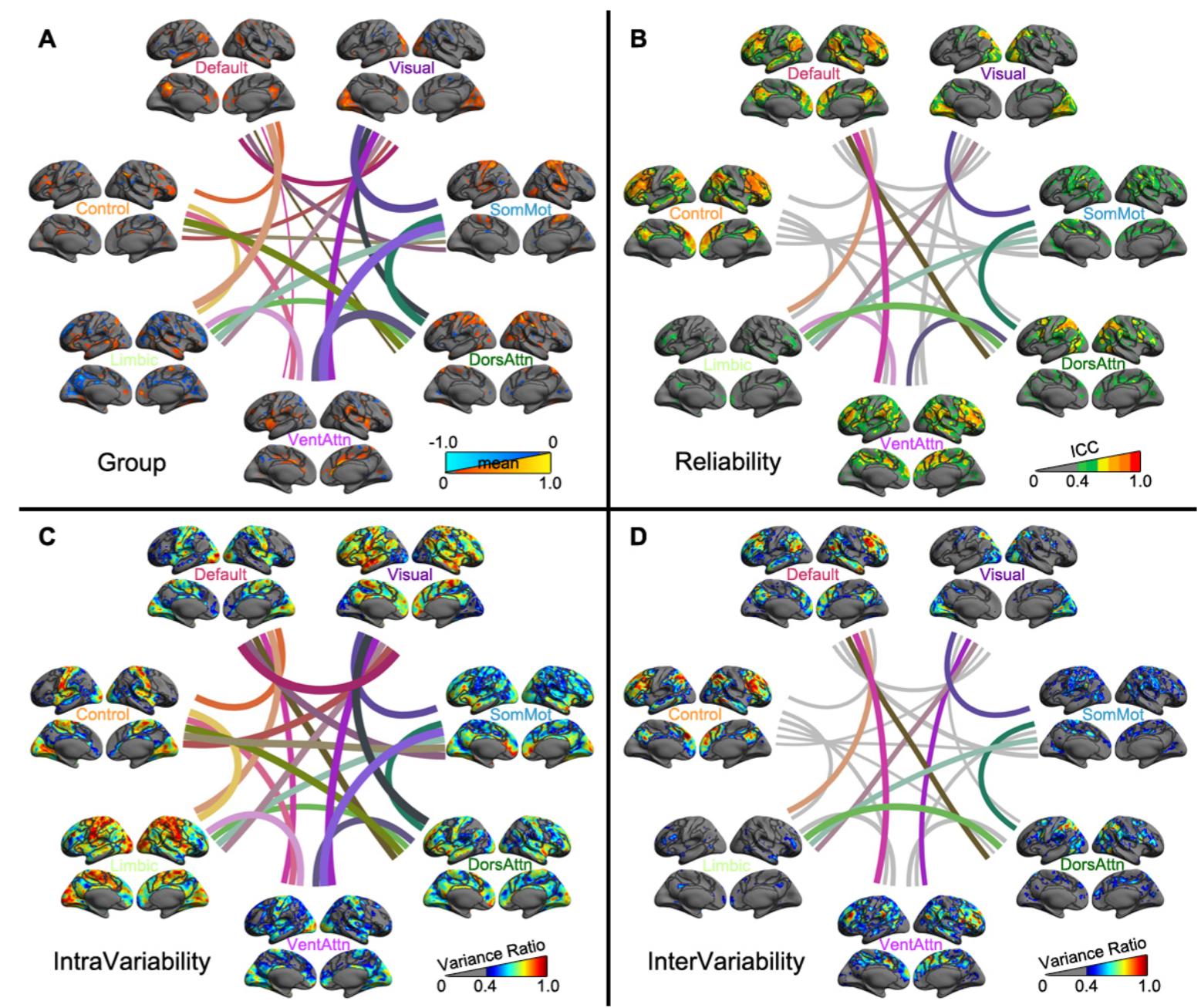
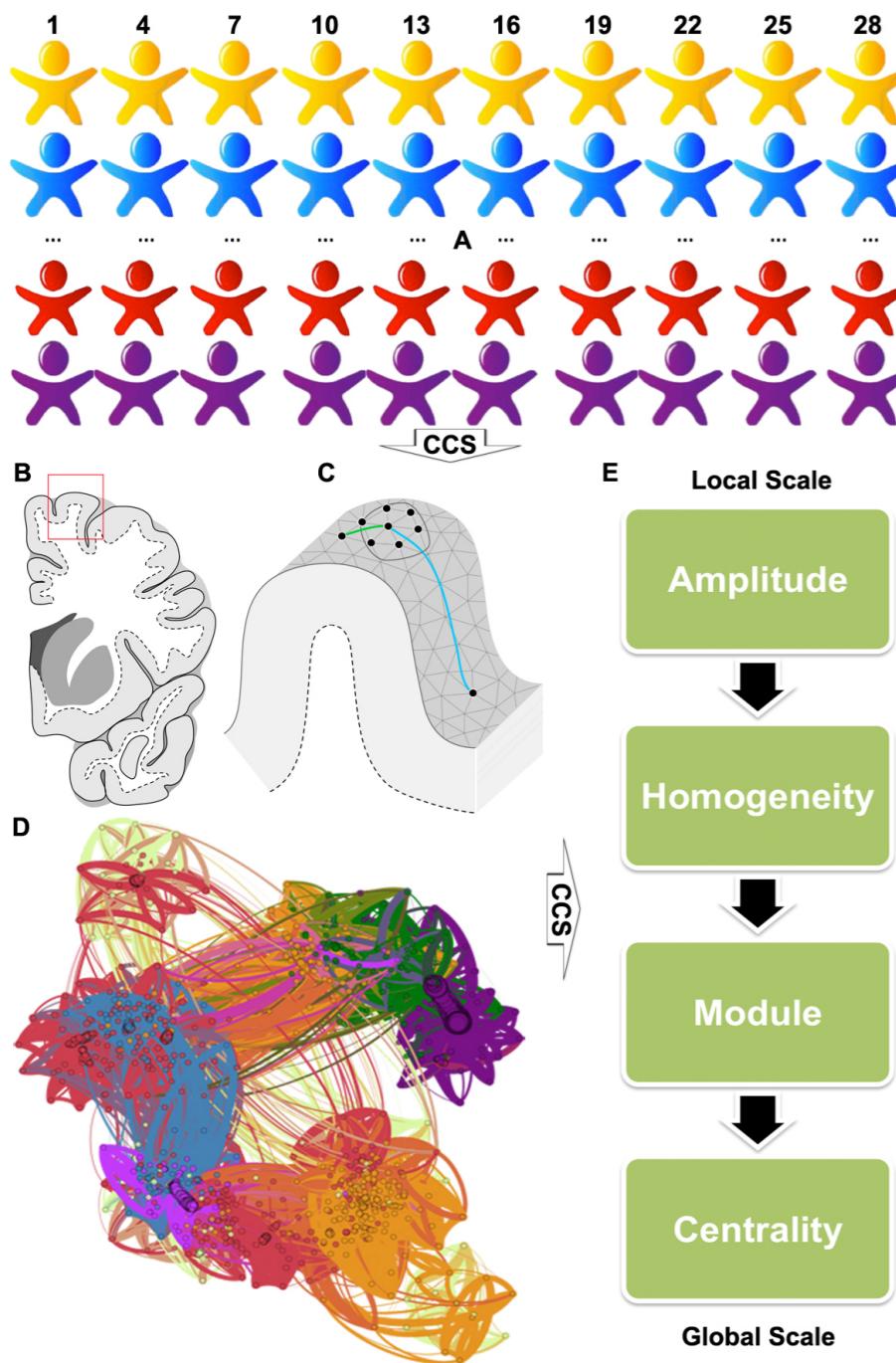
CoRR Data: HNU1



Individual Variability and Test-Retest Reliability Revealed by Ten Repeated Resting-State Brain Scans over One Month

Bing Chen , Ting Xu , Changle Zhou, Luoyu Wang, Ning Yang, Ze Wang, Hao-Ming Dong, Zhi Yang, Yu-Feng Zang, Xi-Nian Zuo , Xu-Chu Weng 

Published: December 29, 2015 • <http://dx.doi.org/10.1371/journal.pone.0144963>



A Continuous Model of Cortical Connectivity

Daniel Moyer, Boris A. Gutman, Joshua Faskowitz, Neda Jahanshad, and Paul M. Thompson

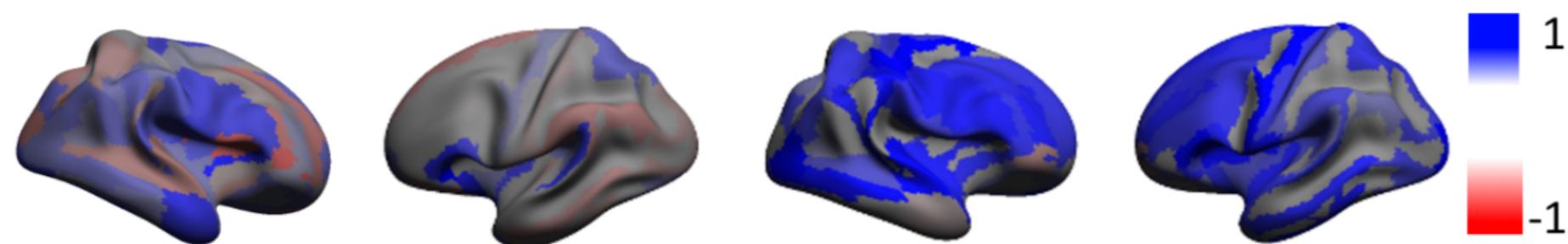


Fig. 1. A visualization of the ICC scores for connectivity to Brodmann Area 45 (Destrieux region 14) for the Count connectomes (**left**) and the proposed Integrated Intensity connectomes (**right**). **Blue** denotes a higher score.

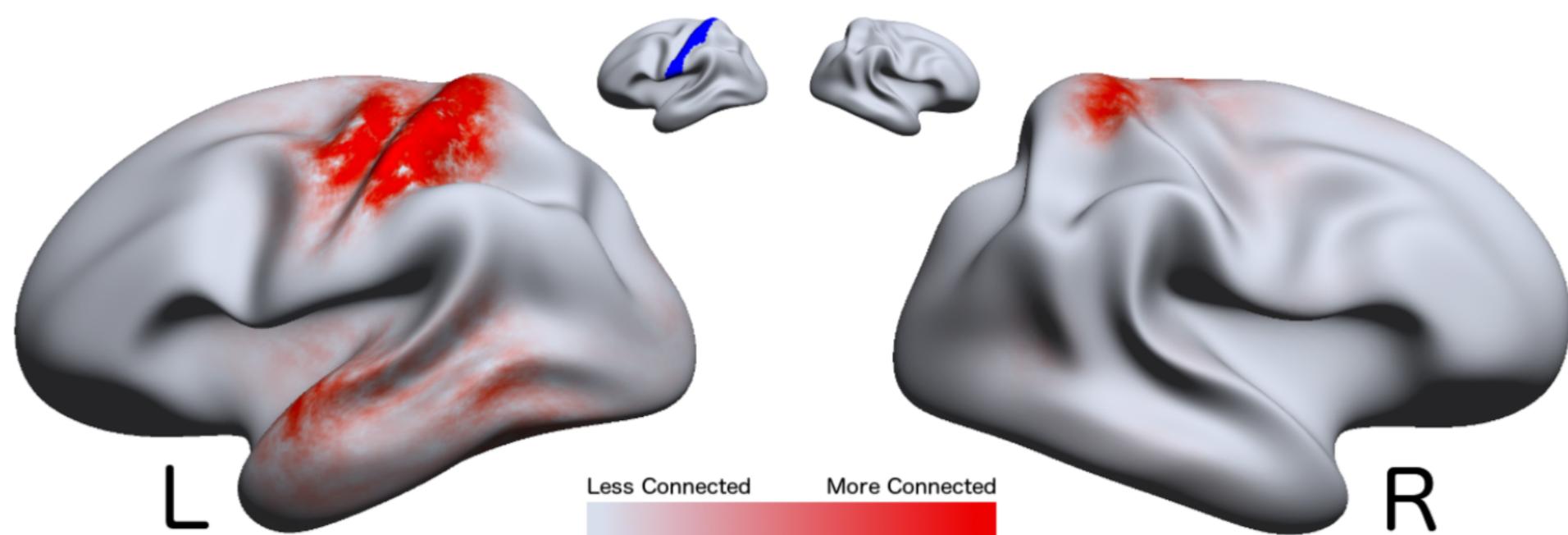


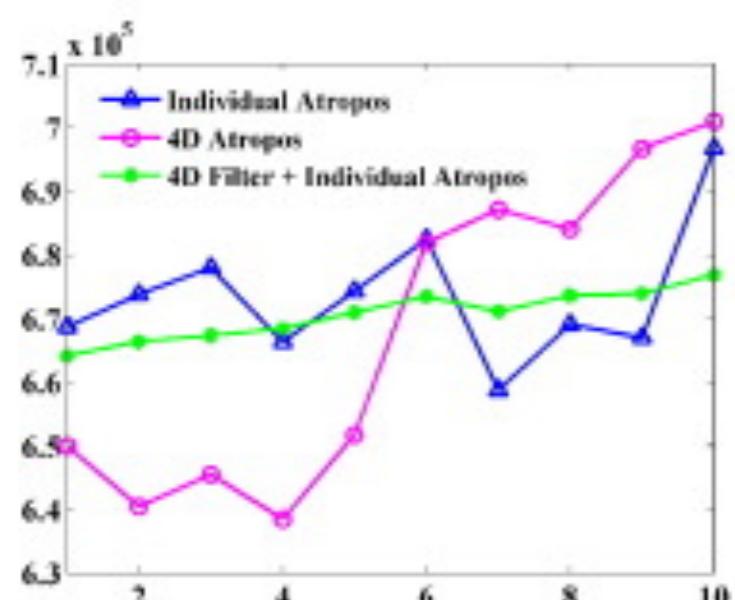
Fig. 2. A visualization of the marginal connectivity $M(x) = \int_{E_i} \hat{\lambda}(x, y) dy$ for the Left Post-central Gyrus region of the DK atlas (Region 57). The region is shown in **blue** on the inset. **Red** denotes higher connectivity regions with the **blue** region.

Temporal filtering of longitudinal brain magnetic resonance images for consistent segmentation

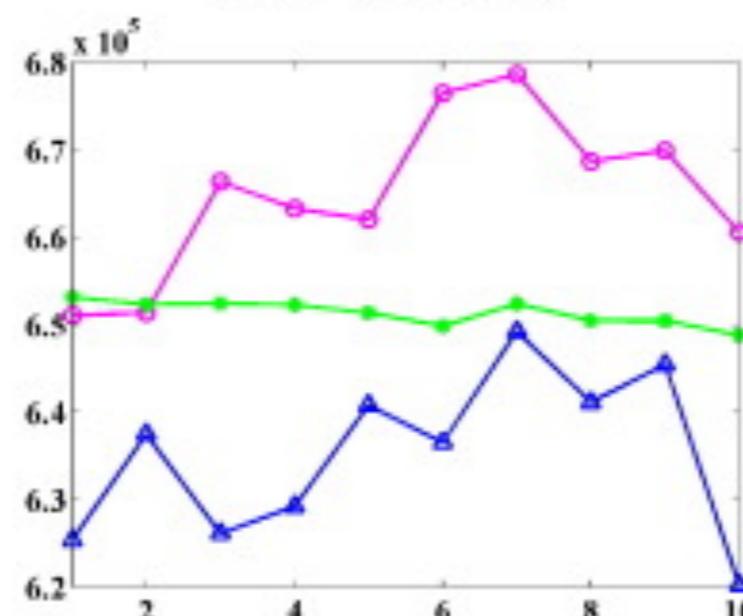
Snehashis Roy^a, , , Aaron Carass^{b, c}, Jennifer Pacheco^d, Murat Bilgel^{b, d}, Susan M. Resnick^d, Jerry L. Prince^b, Dzung L. Pham^a



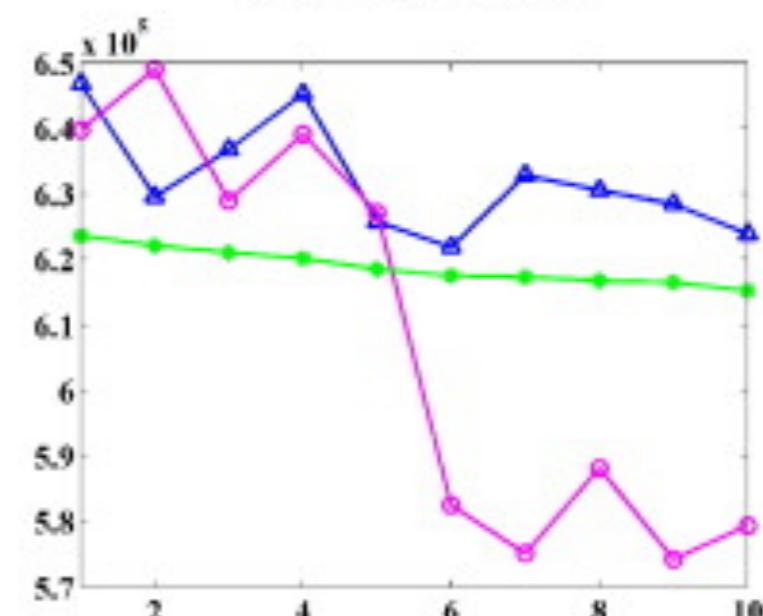
CSF VOLUME



GM VOLUME

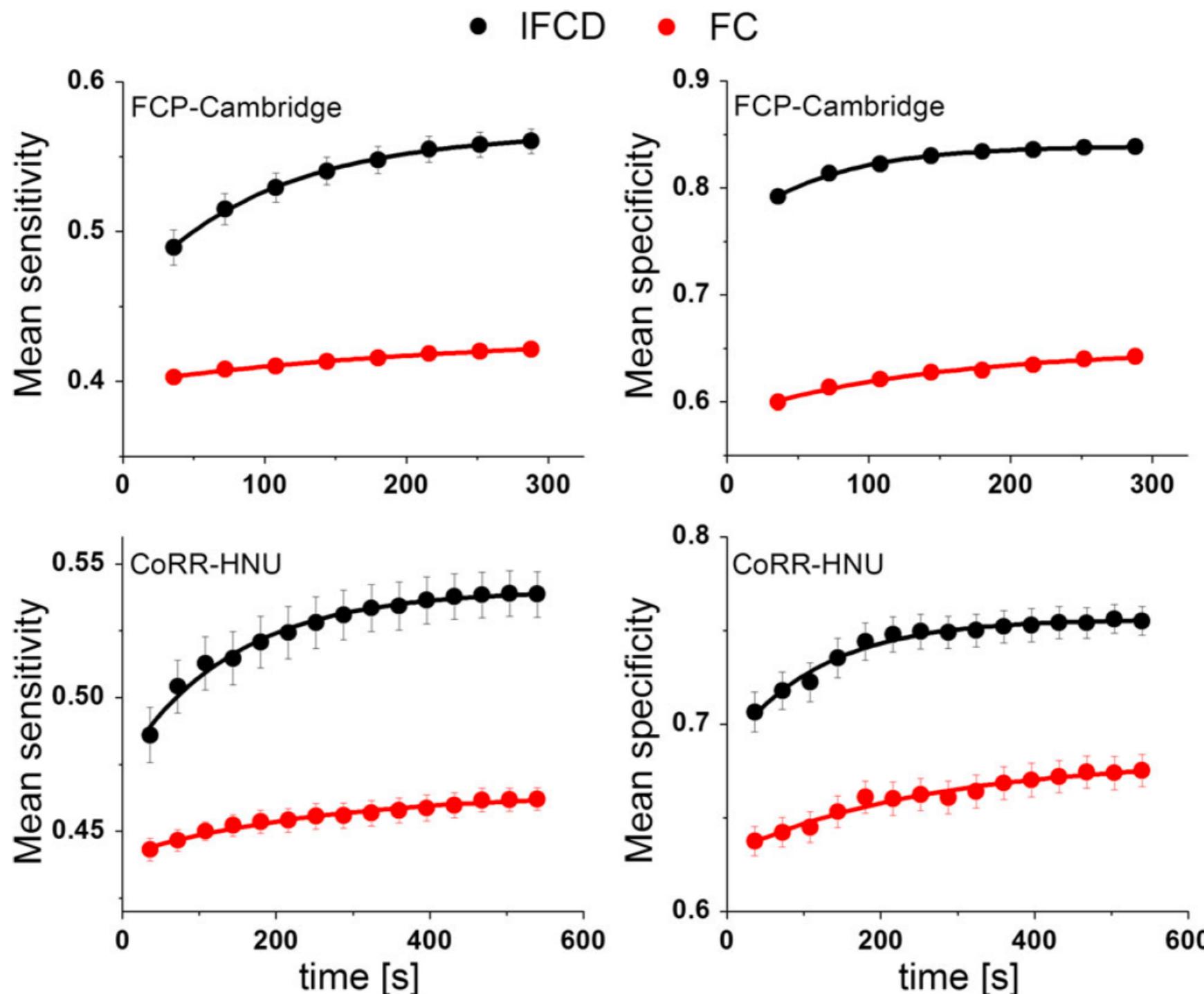


WM VOLUME

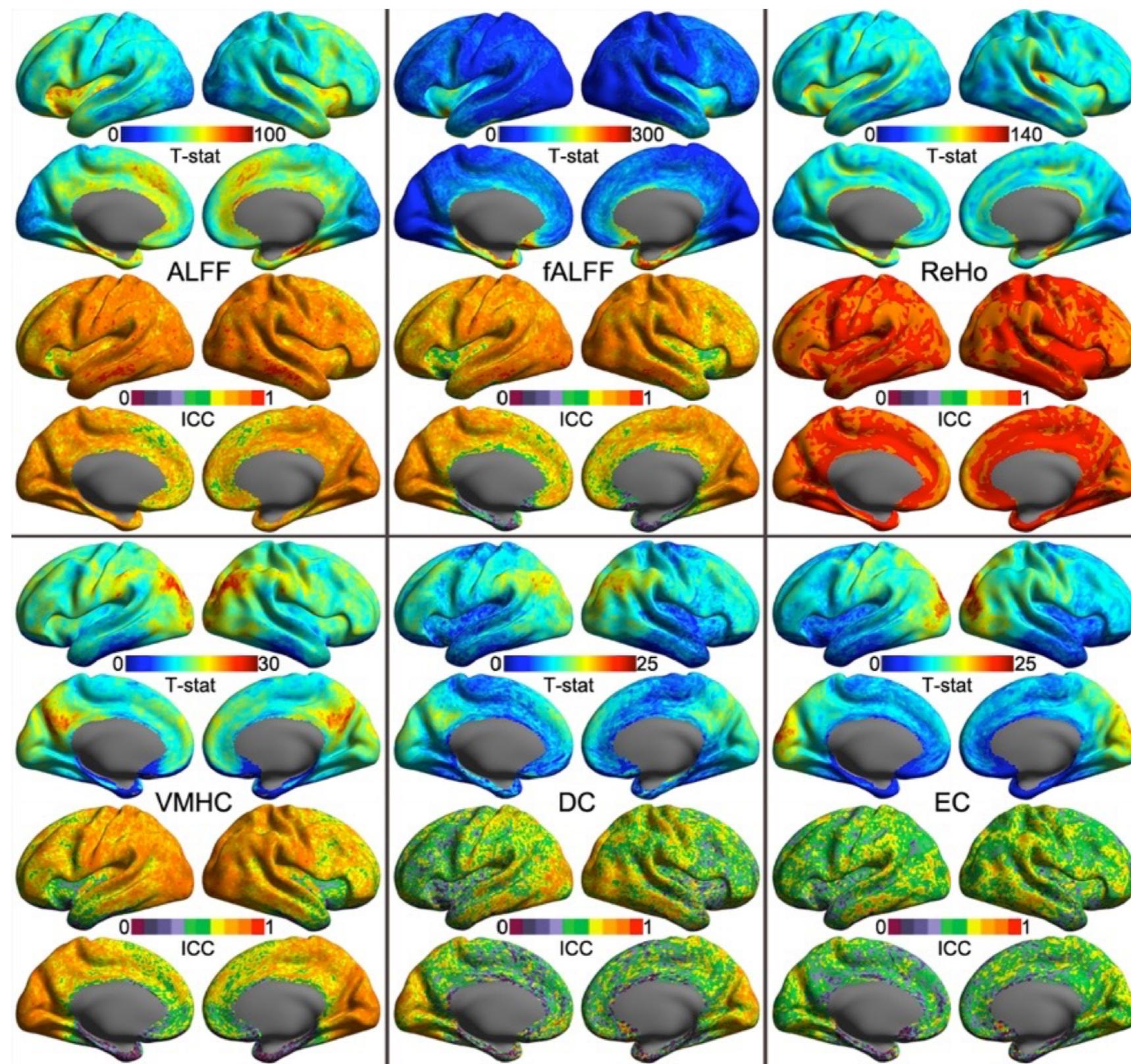


Temporal Evolution of Brain Functional Connectivity Metrics: Could 7 Min of Rest be Enough?

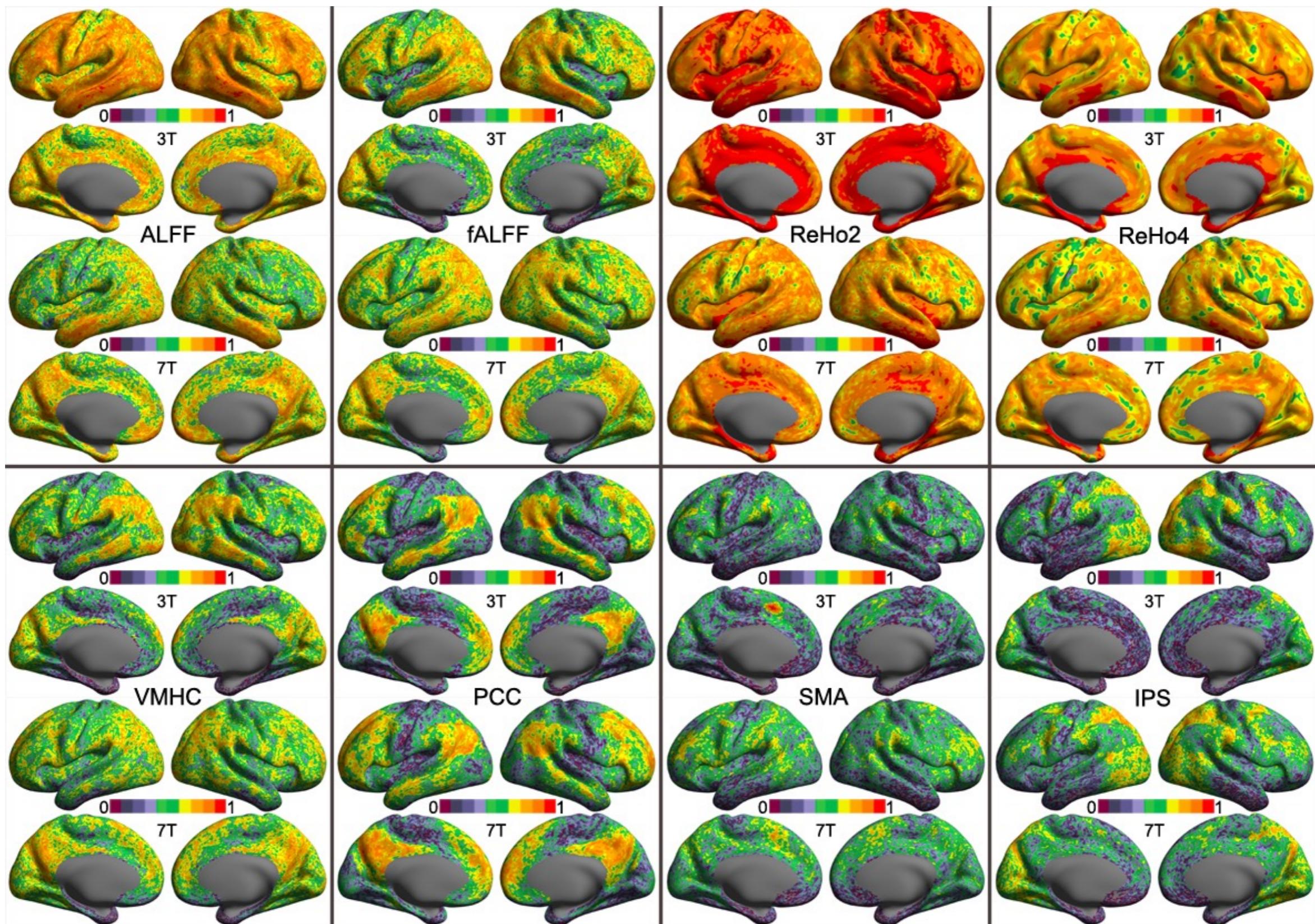
Dardo G. Tomasi¹, Ehsan Shokri-Kojori¹, and Nora D. Volkow^{1,2}



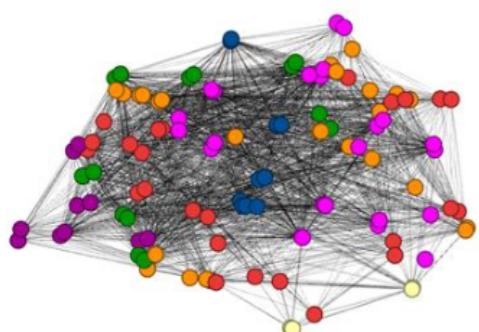
rfMRI Metrics: HCP Reliability



rfMRI Metrics: Replication of HCP Reliability



You Can Contribute: Use Open Data Resources



Research Topic

Reliability and Reproducibility in Functional Connectomics

About this Research Topic

Functional connectomics enables researchers to monitor interactions among thousands of units within the whole brain simultaneously by using various vivo imaging technologies. For example, resting-state functional magnetic resonance imaging (rfMRI) can image low-frequency fluctuations in the spontaneous brain activities, representing a popular tool for macro-scale functional connectomics to characterize inter-individual differences in normal brain function, mind-brain associations, and the various disorders. This suggests reliability and reproducibility for commonly used rfMRI-derived measures of the human brain functional connectomics. Unfortunately, lacking a data platform for researchers to rigorously explore the reliability and reproducibility of the functional connectome indices has been a bottleneck of further development of clinically oriented imaging markers in the field. With recent efforts on data sharing, such as Consortium for Reliability and Reproducibility (CoRR: <http://www.nature.com/sdata/collections/mri-reproducibility>), Human Connectome Project (HCP: <http://www.humanconnectome.org>) and OpenFMRI (<https://openfmri.org>), the data platform is increasingly available for the field to refine and evaluate reliability and reproducibility of novel methods as well as those that have gained widespread usage without sufficient consideration of reliability.

To promote the many possible uses of these data repositories, we call the field to: (1) establish test-retest reliability and reproducibility for commonly used MR-based connectome metrics, (2) determine the range of variation in the reliability and reproducibility of these metrics across imaging sites and retest study designs, (3) develop novel metrics with respect to improved reliability and reproducibility. This Frontiers Research Topic aims at bringing together contributions from researchers in brain imaging, neuroscience, computer sciences, applied mathematics, psychology and related fields from an interdisciplinary perspective.

Topic Editors



Xi-Nian Zuo

Chinese Academy
of Sciences (CAS)
Beijing, China



27,604 views **95** publications



Bharat B Biswal

UMDNJ
Newark, USA



28,974 views **8** publications



Russell A Poldrack

Stanford University
San Francisco, USA



107,851 views **187** publications

Submission Deadlines

31 October 2016 Abstract

31 December 2016 Manuscript

Frontiers in
Neuroscience

Brain Imaging Methods

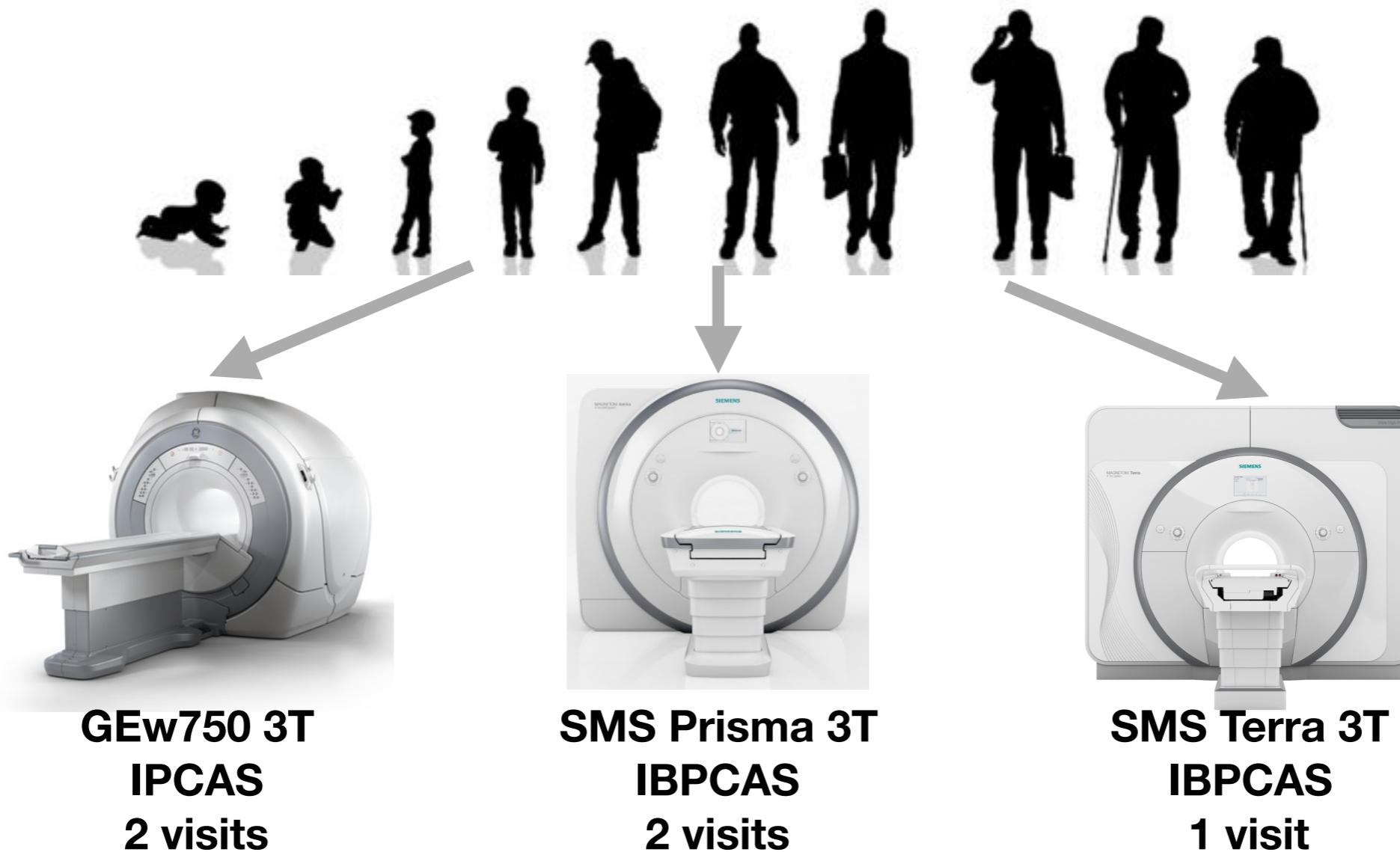
Frontiers in
Neurology

Brain Imaging Methods



Xi-Nian Zuo
@zuoxinian

Future: A Big Single-Site CoRR Data Sharing

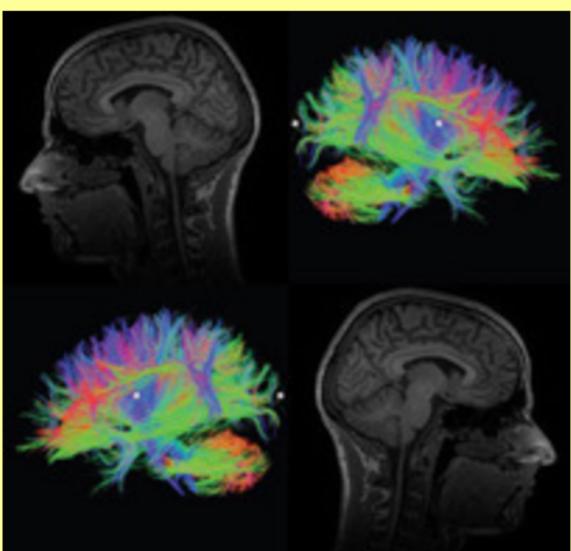


Total 6,000 Visits, 1200 People (6-85 yrs)

Total 5 Retests per Person

Thanks to All CoRR Contributors and Funding Agencies

Xi-Nian Zuo^{1,2,*}, Jeffrey S. Anderson³, Pierre Bellec⁴, Rasmus M. Birn⁵, Bharat B. Biswal⁶, Janusch Blautzik⁷, John C.S. Breitner⁸, Randy L. Buckner⁹, Vince D. Calhoun¹⁰, F. Xavier Castellanos^{11,12}, Antao Chen², Bing Chen¹³, Jiangtao Chen², Xu Chen², Stanley J. Colcombe¹¹, William Courtney¹⁰, R. Cameron Craddock^{11,14}, Adriana Di Martino¹², Hao-Ming Dong^{1,15}, Xiaolan Fu^{1,16}, Qiyong Gong¹⁷, Krzysztof J. Gorgolewski¹⁸, Ying Han¹⁹, Ye He^{1,15}, Yong He²⁰, Erica Ho^{11,14}, Avram Holmes²¹, Xiao-Hui Hou^{1,15}, Jeremy Huckins²², Tianzi Jiang²³, Yi Jiang¹, William Kelley²², Clare Kelly¹², Margaret King¹⁰, Stephen M. LaConte²⁴, Janet E. Lainhart⁵, Xu Lei², Hui-Jie Li¹, Kaiming Li¹⁷, Kuncheng Li²⁵, Qixiang Lin²⁰, Dongqiang Liu¹³, Jia Liu²⁰, Xun Liu¹, Yijun Liu², Guangming Lu²⁶, Jie Lu²⁵, Beatriz Luna²⁷, Jing Luo²⁸, Daniel Lurie^{11,14}, Ying Mao²⁹, Daniel S. Margulies¹⁸, Andrew R. Mayer¹⁰, Thomas Meindl⁷, Mary E. Meyerand³⁰, Weizhi Nan^{1,15}, Jared A. Nielsen³, David O'Connor^{11,14}, David Paulsen²⁷, Vivek Prabhakaran³¹, Zhigang Qi²⁵, Jiang Qiu², Chunhong Shao³², Zarrar Shehzad^{11,14}, Weijun Tang³³, Arno Villringer³⁴, Huling Wang³⁵, Kai Wang^{1,15}, Dongtao Wei², Gao-Xia Wei¹, Xu-Chu Weng¹³, Xuehai Wu²⁹, Ting Xu^{1,11,14}, Ning Yang^{1,15}, Zhi Yang¹, Yu-Feng Zang¹³, Lei Zhang^{1,15}, Qinglin Zhang², Zhe Zhang^{1,15}, Zhiqiang Zhang²⁶, Ke Zhao¹, Zonglei Zhen²⁰, Yuan Zhou¹, Xing-Ting Zhu^{1,15} & Michael P. Milham^{11,14}



Human Brain MRI Reproducibility

A series of Data Descriptors describing human brain scans, which can be used to assess the reproducibility of brain imaging techniques and to develop new methods based on these data-types. Central to this collection are studies from the Consortium on Reliability and Reproducibility (CoRR).