



July 2020

## ABCD Scientists' Newsletter

### NEWS

**Curated ABCD Data Release 3.0 due August/September, 2020.** With the third release of curated ABCD Study® data, longitudinal measures of neuroimaging, cognitive performance, and social, emotional and environmental factors will be available for authorized researchers. As this large cohort enters adolescence, this is a key period for investigating the emergence of psychiatric and neurological symptomatology. For neuroimaging assessments, this release contains all baseline data and half of the 2-year follow-up (second imaging timepoint). For non-imaging assessments, this release contains baseline and follow-up data for the 6-month and 1 year visits on the full participant cohort, as well as interim data for the 18-month, 2-year, and 30-month visits. Authorized users can obtain more information and access the updated data from <https://nda.nih.gov/abcd>.

### HIGHLIGHTS

The **ABCD-ReproNim Course provides training for reproducible analyses** of the Adolescent Brain Cognitive Development (ABCD) Study data. Students will receive instruction on reproducible data analyses endorsed by ReproNim, a Center for Reproducible Neuroimaging Computation. The 13-week Online Course will include access to pre-recorded video presentations and live Q&A with instructors who are ABCD investigators and reproducibility experts in the field. Readings will be provided for each lesson and data exercises will be posted to help students achieve learning objectives. During the course, students will self-organize into small, collaborative learning groups and develop proposals for data analysis or resource development projects. At the completion of the Online Course, enrolled students will be invited to attend a 5-day virtual Project Week, where they will apply the skills they learned towards completion of a project and learn how to contribute to open source software. ABCD-ReproNim training is targeted to students, postdoctoral fellows, and early career faculty. There are no registration fees and all materials will be open and accessible. Teaching assistant applications are due Aug 21, 2020, student applications are due Aug 28, 2020, and the online course starts October 16, 2020. For more information visit <https://ABCD-ReproNim.org>.

Sponsored by the National Institutes of Health, **Beyond Statistical Significance: Finding Meaningful Effects Virtual Meeting** will be held on September 2, 2020. Population neuroscience initiatives, such as the Adolescent Brain Cognitive Development<sup>SM</sup> Study, offer unparalleled opportunities to understand trajectories of development and related health outcomes. An inherent consequence of large, observational studies, however, is that although effects may be statistically significant, they may only account for a small proportion of the variance and/or have little ability to predict outcomes. The objective of this workshop is to develop best practice recommendations for interpreting meaningful effects in “big data” by engaging scientists from a range of disciplines in discussions of meaningful science that go beyond statistical significance. For more information refer to <https://apps1.seiservices.com/meaningfuleffects/>.

**Stop-signal task design.** Bissett and colleagues recently raised thought provoking questions about the fMRI stop-signal task (SST) being used in the Adolescent Brain Cognitive Development (ABCD)<sup>SM</sup> Study (<https://doi.org/10.1101/2020.05.08.084707>). A response to their report and concerns raised is available in preprint (<https://doi.org/10.1101/2020.07.27.223057>). Briefly, the

critique focuses primarily on a design feature of the task that Bissett and colleagues contend might lead to a violation of race model assumptions (i.e., that the Go and Stop processes are fully independent) which are relevant to the calculation of the Stop Signal Reaction Time, a measure of the inhibition process. The authors also raise a number of secondary concerns. In the ABCD Study® investigators' response, we note that satisfying race model assumptions is a pernicious challenge for Stop task designs but also that the race model is quite robust against violations of its assumptions. Most importantly, while Bissett et al. raise conceptual concerns with the SST our response focuses on analyses of both the performance and the neuroimaging data and we conclude that the concerns appear to have minimal impact on the task data. We note that there were errors in the analyses conducted by Bissett et al. that may have inflated their estimates of race model violations in the ABCD Study®. Notably, Bissett and colleagues did not apply any performance-based exclusions to the data they analyzed, a number of the errors that they flagged were already identified and corrected in the ABCD Study® annual data releases, and we argue that a number of the other concerns reflect sensible design decisions. In our response, we list some adjustments that will be made to the task and some new flags that will be added to the annual, curated data releases. We stress that the ABCD Study® data are fully available to the scientific community who are empowered to apply whatever inclusion and exclusion criteria they deem appropriate for their analyses and we conclude that the SST in the ABCD Study® yields valuable data that researchers can use to track adolescent neurodevelopment.

## TECHNICAL TIPS

As part of the 2020 Society of Biological Psychiatry (Virtual) Meeting, a **Preview of the Adolescent Brain Cognitive Development (ABCD) Study Release 3.0** is [now available on YouTube](#). This presentation provides a timely update on new features of the ABCD Study® dataset, including an online statistical portal, updated genotyping data, activity tracker for sleep and physical activity data, geo-tagged meta-data (e.g., reflecting pollution exposure and local socio-economic information), and the upcoming COVID-19 adolescent development survey.

**Researcher's Guide to the Adolescent Brain Cognitive Development (ABCD) Study: Release 3.0**, part of the Organization for Human Brain Mapping (OHBM) Annual Meeting (Virtual Meeting), Montreal, Canada. This half-day educational course provided important updates from the 2019 course (which detailed the baseline data only) to align with ABCD Study® Data Release 3.0, including ways of accessing different raw and curated datasets, leveraging new analytical tools to accelerate research, and statistical considerations important in population studies. Updates include behavioral ontologies, mental health assessments, longitudinal imaging data considerations, and the integration of novel technologies, such as data from wearable technologies and geotagged informatics on pollution, socio-economic factors, and climate change implications. Recordings of this presentation will be available shortly at <https://www.pathlms.com/ohbm/courses>.

**Creating an NDA Study to share results.** ABCD Study® researchers who share data through NDA, or who conduct a secondary analysis on data shared through NDA, are expected as part of the Terms of Use to report their results using the NDA Study feature. An NDA Study links a finding, data release, or publication directly to the underlying subject-level records for the data defined. The NDA Study provides attribution (i.e. credit) for those that contributed the data. Each NDA Study is also issued a Digital Object Identifier (DOI), which is expected to be referenced in the publication as a persistent link to the supporting dataset. Visit <https://nda.nih.gov/get/manuscript-preparation.html> to learn more about how the NDA Study must be used to cite data and provide acknowledgement of its original collectors when used for secondary analyses, and how to create an NDA Study while preparing to publish a manuscript.

## RECENT PUBLICATIONS

The views expressed in these publications are those of the authors and do not constitute an endorsement by the ABCD Study®.

- Cserbik, D., Chen, J-C, McConnell, R., Berhane, K., Sowell, H.R., Schwartz, J., Hackman, D.A., Kan, E., Fan, C.C., Herting, M.M. (2020). Fine particulate matter exposure during childhood relates to hemispheric-specific differences in brain structure. *Environment International*, vol. 143, Oct. 2020, 105933. <https://doi.org/10.1016/j.envint.2020.105933>
- Watts AL, Wood PK, Jackson KM, Lisdahl KM, Heitzeg MM, Gonzalez R, Tapert SF, Barch DM, Sher KJ (2020). Incipient Alcohol Use in Childhood: Early Alcohol Sipping and Its Relations With Psychopathology and Personality. *Dev Psychopathol* [Epub ahead of print] PMID: 32522303 <https://psyarxiv.com/bpu4r/>
- Mullins TS, Campbell EM, Hogeveen J. (2020) Neighborhood Deprivation Shapes Motivational-Neurocircuit Recruitment in Children. *Psychol Sci*. 2020 Jul;31(7):881-889. doi: 10.1177/0956797620929299. Epub 2020 Jun 30.
- Vargas T, Damme KSF, Mittal VA. (2020) Neighborhood deprivation, prefrontal morphology and neurocognition in late childhood to early adolescence. *Neuroimage*. 2020 Jun 25;220:117086. doi: 10.1016/j.neuroimage.2020.117086. Online ahead of print.
- Zhang H, Lee ZX, Qiu A. (2020) Caffeine intake and cognitive functions in children. *Psychopharmacology (Berl)*. 2020 Jun 29. doi: 10.1007/s00213-020-05596-8. Online ahead of print. PMID: 32601990
- Winiger, E.A. & Hewitt, J.K. (2020). Prenatal cannabis exposure and sleep outcomes in children 9–10 years of age in the adolescent brain cognitive development study. *Sleep Health*, Available online 28 June 2020.
- Conley, M.I., Hindley, I., Baskin-Sommers, A., Gee, D.G., Casey, B.J., and Rosenberg, M.D. (2020). The importance of social factors in the association between physical activity and depression in children. *Child Adolesc Psychiatry Ment Health* (2020) 14:28. <https://doi.org/10.1186/s13034-020-00335-5>.
- Karcher, N.R., Niendam, T.A., Barch, D.M. (2020). Adverse childhood experiences and psychotic-like experiences are associated above and beyond shared correlates: Findings from the adolescent brain cognitive development study. *Schizophrenia Research*, Available online 8 June 2020. <https://doi.org/10.1016/j.schres.2020.05.045>.
- Assari, S. (2020). Family Socioeconomic Status and Exposure to Childhood Trauma: Racial Differences. *Children* 2020, 7, 57. DOI:10.3390/children7060057
- Assari, S. (2020). Parental Education on Youth Inhibitory Control in the Adolescent Brain Cognitive Development (ABCD) Study: Blacks' Diminished Returns. *Brain Sci*. 2020, 10(5), 312; <https://doi.org/10.3390/brainsci10050312>.
- Assari S, Boyce B, Caldwell CH, Bazargan M (2020). Minorities' Diminished Returns of Parental Educational Attainment on Adolescents' Social, Emotional, and Behavioral Problems. *Children* (Basel) 7(5). PMID: 32443584 <https://www.mdpi.com/2227-9067/7/5/49>
- Rosenberg, M.D., Martinez, S.A., Rapuano, K., Conley, M.I., Cohen, A.O., Cornejo, M.D., Hagler Jr., D.J., Meredith, W.J., Anderson, K.M., Wager, T.D., Feczko, E., Earl, E., Fair, D.A., Barch, D.M., Watts, R., & Casey, B.J. (2020). Behavioral and neural signatures of working memory in childhood. *Journal of Neuroscience* 25 May 2020, JN-RM-2841-19.

## ABCD CALENDAR

- August 28, 2020: **Tentative date for the curated ABCD Data Release 3.0**. For neuroimaging assessments, this release contains all baseline data and half of the 2-year follow-up (second

imaging timepoint). For non-imaging assessments, this release contains baseline and follow-up data for the 6-month and 1 year visits on the full participant cohort, as well as interim data for the 18-month, 2-year, and 30-month visits. Authorized users can obtain more information and access the updated data from <https://nda.nih.gov/abcd>.

- August 28, 2020: All applications for the **ABCD-ReproNim Course** due. For more information visit <https://ABCD-ReproNim.org>.
- September 2, 2020: **Beyond Statistical Significance: Finding Meaningful Effects Virtual Meeting**. Refer to <https://apps1.seiservices.com/meaningfuleffects/>.
- October 16, 2020: **ABCD-ReproNim Course** starts. For more information visit <https://ABCD-ReproNim.org>.
- Postponed until July 2021: **Leveraging novel statistical tools in the Adolescent Brain Cognitive Development (ABCD) Study**. Australian and New Zealand Statistical Conference. Gold Coast, Queensland, Australia.

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