ABCD Human Subject Study

Adolescent Brain Cognitive Development – ABCDSTUDY.org

Release Notes: Adolescent Brain Cognitive Development℠ Study (ABCD Study®) Data Release 4.0

Other Non-imaging Instruments

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October 2021

Change Log
October 2021 – Data Release 4.0

List of Instruments

Name of Instrument	Short Name
ABCD Screener	abcd_screen01
ACS Post Stratification Weights	acspsw03
ABCD Longitudinal Tracking	abcd_lt_01

General Information

The following information refers to the Adolescent Brain Cognitive Development Study℠ (ABCD) Data Release 4.0 available from https://nda.nih.gov/abcd. An overview of the ABCD Study® is at https://abcdstudy.org and detailed descriptions of the assessment protocols can be viewed at https://abcdstudy.org/scientists/protocols.

This document describes the contents of various instruments available for download. To understand the context of this information, see *Release Notes ABCD README FIRST* and *Release Notes ABCD Imaging Instruments*.

ABCD Screener

Eligibility screener and screener risk measures. These risk measures are preliminary and not necessarily predictive of risk.

As the ABCD Study aims to recruit a sample that reflects the diversity of the US population of nine- and ten-year-old children, its philosophy is to be as inclusive as possible.

ABCD Inclusion/Exclusion criteria

Some exclusions are necessary, however, which include the following criteria:

- Any condition that might render the assessment procedures dangerous to participants (e.g., MRI contra-indications);
- The presence of a medical or psychiatric condition that would affect the participant's capability to complete the assessments (e.g., schizophrenia; severe autism) or other circumstances that would affect the ability to complete the assessments such as poor English skills or sensorimotor impairments.
- Existing alcohol or substance use disorders to obtain a baseline assessment unaffected by exposure effects.
- Intention to move away from an ABCD site in the coming years.
- Extreme prematurity or low birth weight are exclusionary.
- The presence of focal brain abnormalities that might impact the automated processing pipelines.

In addition to the specific exclusionary criteria listed below, an expert group adjudicates on unusual cases such as those presenting with uncommon medical conditions.

Youth Criteria at Study Entry

Inclusion Criteria:

- Age 9.00 to 10.99 years at time of baseline assessments.
- Able to validly complete baseline assessments including MRI scanning.
- Fluent in English.

Exclusion Criteria

- MRI contraindications such as orthodontic braces or irremovable dental appliances containing ferromagnetic materials, claustrophobia that cannot be overcome with repeated attempts, non-removable ferromagnetic metal implants that may distort the images, or youth is pregnant on day of scanning based on urine pregnancy test in postmenarcheal girls;
- Youth is not fluent in English (all youth materials are in English, but parents can be assessed in Spanish at some sites);

- Non-correctable vision, hearing or sensorimotor impairments that may confound the child's responses on the assessments;
- A history of persistent major neurological disorders such as cerebral palsy, brain tumor, stroke, brain aneurysm, brain hemorrhage, or subdural hematoma. Other exclusionary medical or neurological conditions include multiple sclerosis, sickle cell disease, and the following seizure disorder diagnoses: Lennox-Gastaut syndrome, Dravet syndrome, and Landau Kleffner syndrome;
- Gestational age less than 28 weeks or birthweight less than 1,200 grams (2 lb 10 oz). Birth complications that resulted in hospitalization for more than a month are exclusionary (but not if the hospitalization was due to prematurity alone);
- A current diagnosis of schizophrenia, autism spectrum disorder (moderate or severe), mental retardation/intellectual disability, or alcohol/substance use disorder. (A past diagnosis that has remitted is not exclusionary);
- A history of traumatic brain injury (TBI): TBI with loss of consciousness >30 minutes, or Amnesia >24 hours, or positive neuroimaging findings (e.g., symptomatic hemorrhage) secondary to TBI;
- A parent/guardian's report that the child would be unable to complete the baseline assessments (i.e., answer questions, solve puzzles on an iPad, follow directions, and lie still in the MRI scanner).
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Parent/Legal Guardian Criteria at Study Entry

Inclusion Criteria:

- Serve as the primary custodial parent or legal guardian with child in home for most of the year.

Exclusion Criteria:

- Unwilling to attend annual visits and complete the parental assessments.

ACS Post Stratification Weights

The NDA release contains American Community Survey (ACS) post stratification weights and family relationship measures.

The ACS post stratification weight, "acs_raked_propensity_score", is updated for the baseline interview and then further modified to create weight values for the 1-year follow-up visit. At the 1-year visit, if a participant's follow-up tracking status was not "fully completed" or "partially completed", the value of the weight is set to 0.

The rel_family_id and rel_relationship variables in this instrument are based on information obtained from guardians at enrollment and are not genetically informed. However, 268

participants' rel_family_id and rel_relationship have been updateddue to multiple steps of quality controls, including cross-check with PII, call back sites to confirm, etc. In most cases, they were changed from "single" from different families to "siblings" in the same family because the pair of participants' original visit dates were far apart.

The genetic variables in release 4.0 include genetic PI_HAT, genetic zygosity status and genetic ancestry factors. 1653 participants (siblings/twins/triplets) with at least one PI_HAT and one zygosity status are available. PI_HAT is aimed to estimate the probability of having shared alleles between two individuals, as identity-by-descend (IBD). We used SNPs that passed quality controls and pruned to ensure independency between SNPs, and then use plink --genome command to calculate the PI_HAT. All the genetic variables are time invariant and are released in 4.0 under baseline.

For additional information, see: Heeringa, SG & Berglund, PA. (2020). A Guide for Population-based Analysis of the Adolescent Brain Cognitive Development (ABCD) Study Baseline Data, bioRxiv 2020.02.10.942011; doi: https://doi.org/10.1101/2020.02.10.942011.

ABCD Longitudinal Tracking

The Longitudinal Tracking instrument includes site ID (site_id_l) of subject at each visit to facilitate identification of the site ID associated with each scan.

Site name associations to the site_id_l variable in the Longitudinal Tracking instrument

To provide ABCD Study researchers with additional geographic information, we are providing the ABCD Study site locations for use with the site_id_l in the ABCD Longitudinal Tracking instrument (abcd_lt01 instrument). The site location can help inform regional characteristics (e.g., economy, health system, schooling system, pollution), legislation (e.g., juvenile crime, cannabis accessibility), and events impacting the state (e.g., natural disasters). Please note that while participants interact with the sites every 6 months, many do not live near the site and may be subject to local laws separate from the site. For additional information on the study sites, see https://abcdstudy.org/study-sites/

The site_id_l code to site name associations is:
01 = CHLA; 02 = CUB; 03 = FIU; 04 = LIBR; 05 = MUSC; 06 = OHSU; 07 = ROC; 08 = SRI; 09 = UCLA; 10 = UCSD; 11 = UFL; 12 = UMB; 13 = UMICH; 14 = UMN; 15 = UPMC; 16 = UTAH; 17 = UVM; 18 = UWM; 19 = VCU; 20 = WUSTL; 21 = YALE; 22 = MSSM (site discontinued during baseline assessment).