



Adolescent Brain Cognitive Development®
Teen Brains. Today's Science. Brighter Future.

ABCD Protocol Summary

Four-year Follow-up

ABCDStudy.org

The Adolescent Brain Cognitive Development (ABCD) Study

The ABCD Study is the largest long-term study of brain development and child health in the United States. The ABCD Research Consortium consists of a Coordinating Center (CC), a Data Analysis, Informatics and Resources Center (DAIRC), and 21 research sites across the country (see map), which have invited more than 10,000 children ages 9-10 to join the study. Researchers will track their biological and behavioral development through adolescence into young adulthood.

The ABCD CC, DAIRC, and Consortium Workgroups have established standardized and harmonized assessments of physical and mental health, neurocognition, substance use, and culture and environment. They also have established multimodal structural and functional brain imaging and bioassay protocols. Brain imaging and biospecimen collection for genetic analyses will be done every other year, and the remaining assessments will be conducted and additional biospecimens will be collected semi-annually or annually.

During the COVID-19 pandemic, in-person ABCD visits were suspended. When in-person visits resumed, most protocol elements were administered remotely where possible, via video chatting platforms, tablet or phone. Limited components of the protocol that could not be administered virtually (e.g., neuroimaging) were conducted in-person.

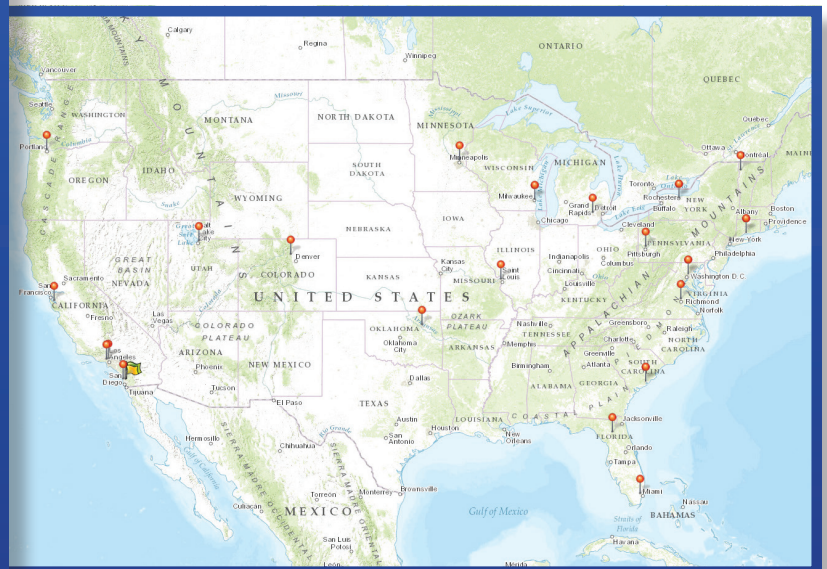
ABCD Open Science Model

One goal of the multisite longitudinal ABCD Study is to create a unique data resource for the entire scientific community by embracing an open science model. Curated data are released annually through the NIMH Data Archive. For more information on what is included in each data release, please see <https://abcdstudy.org/scientists/data-sharing/>.

Sharing ABCD data in this way will allow scientists from all over the world to conduct analyses, pool resources, and enrich the value of this study by rapidly expanding the types of scientific questions answered.

Locations of ABCD Research Sites in the United States

	Coordinating Center	University of California, San Diego
	Data Analysis and Informatics Center	University of California, San Diego
	Research Sites	Children's Hospital of Los Angeles Florida International University Laureate Institute for Brain Research Oregon Health & Science University SRI International University of California, Los Angeles University of California, San Diego University of Colorado University of Florida University of Maryland University of Michigan University of Minnesota University of Pittsburgh University of Rochester Medical University of South Carolina University of Utah University of Vermont Virginia Commonwealth University Washington University in St. Louis University of Wisconsin-Milwaukee Yale University



Physical Health

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Anthropometrics*	Height, weight, waist circumference	3	
Blood Pressure	Blood pressure	4	
Snellen Vision Screen	Vision screen	2	
Youth Risk Behavior Survey - Exercise	Physical exercise	1	
Pain Questionnaire	Pain	1	
Munich ChronoType Questionnaire	Sleep, chronotype	3	
Respiratory Functioning	Asthma, respiratory health	1	
COVID-19 Annual Form	COVID experiences	5	
Pubertal Development Scale & Menstrual Cycle Survey	Pubertal stage and menstrual phase	5	2
Block Kids Food Screener	Foods child ate in past week	6	3
Sports and Activities Involvement Questionnaire (only reading and listening to music administered to youth)	Involvement in sports, music and hobbies, reading and listening to music, TBI risk	1	4
Demographics Survey*	Demographics, race, gender, family structure, SES, education and occupation; youth resilience		2
Developmental History Questionnaire	Prenatal exposure by trimester - medications, drugs, alcohol, tobacco		15
Medical History Questionnaire	Medical history and health services utilization		2
Medications Survey*	Current and past medications		2
Sleep Disturbance Scale for Children	Sleep and sleep disorders		3
Ohio State TBI Screen-Short	Traumatic brain injury of youth		2
Total Minutes		32	35

* Modified from PhenX

Mental Health

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS 5)			
Background Items Survey	Youth: School, sexual orientation	1	
	Parent: School, family, social relations		4
Diagnostic Interview for DSM-5	Youth: Mood Disorders, Social Anxiety Disorder, Generalized Anxiety Disorder, Eating Disorder, Conduct Disorder, (Alcohol and Drug Use Disorders if applicable), Sleep, Suicidality	11	
	Parent: All modules except Enuresis & Encopresis, Tic Disorders, and Selective Mutism		20
UPPS-P for Children - Short form (ABCD version)	Impulsivity, urgency	6	
Behavioral Inhibition/Behavioral Approach System (BIS/BAS) Scales*	Inhibition and reward seeking	3	
Prodromal Psychosis Scale	Prodromal psychosis level	4	
Youth Resilience Scale	Peer friendships	2	
Brief Problem Monitor Scale	Attention, internalizing and externalizing functioning	1	
Peer Experiences Questionnaire	Peer bullying and peer victimization	1	
Cyberbullying Questionnaire	Cyberbullying experiences	1	
Life Events Scale	Lifetime and past year stressful and traumatic events	4	2
Emotion Regulation Scale	Emotion regulation experiences	1	
Gender Identity Questionnaire	Early dating and sexual behavior	5	2
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Mental Health (cont.)

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Child Behavior Checklist	Dimensional psychopathology, adaptive functioning		5
Difficulty in Emotion Regulation Scale	Parent report on youth's difficulty with emotional regulation		6
Parent General Behavior Inventory - Mania	Subsyndromal mania		4
ASEBA Adult Self-Report	Parent report on personal psychopathological syndromes		7
ASEBA Adult Behavior Checklist	Parent report on youth's other parent's psychopathological syndromes		3
Occupation Survey	Parent occupation		2
Total Minutes		40	55

* Modified from PhenX

Substance Use

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Participant Last Use Survey	Tobacco/caffeine/medication usage in the last 24 hours	1	1
Community Risk & Protective Factors*	Perceived availability for youth	1	2
Parent Rules	Parental SU approval and rules		2
Household Substance Use, Density, Storage & Second-Hand Exposure	Use, access and exposure to substances in household		8
Peer Group Deviance*	Peer group deviance & influences	1	
Sibling Use	Sibling use of alcohol, cannabis, tobacco, and other substances	1	
PATH Intention to Use Tobacco Survey	Intention to use, susceptibility (if haven't used yet)	1	
Perceived Harm of Substance Use*	Youth perceptions of harm caused by use of substances	1	
Peer Tolerance of Use*	Acceptability of peers' use of substances	0.5	
Caffeine Intake	Caffeine use, type & quantity (if one used it)	1	
Having tried alcohol, tobacco/nicotine, marijuana (e.g., sip or puff) since last visit:			
iSay II Q2 Sipping Items	Early alcohol use (if sipped alcohol)	0.5	
Tobacco Low-Level Use Measure	Early tobacco use (if puffed or chewed tobacco)	0.5	
Marijuana Low-Level Use Measure	Early marijuana use (if puffed or tasted marijuana)	0.5	
Having used alcohol, tobacco/nicotine, marijuana (more than just a sip or puff) since last visit:			
Timeline Follow-back	Quantity/frequency of all substance use	3-20	
Acute Subjective Response to Alcohol*	Sensitivity to alcohol effects	0.5	
Acute Subjective Response to Tobacco*	Sensitivity to tobacco effects	0.5	
Acute Subjective Response to Marijuana	Sensitivity to marijuana effects	0.5	

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* Modified from PhenX

Substance Use (cont.)

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Having 2 or more occasions of the respective substance use since last visit:			
Hangover Symptom Scale	Alcohol hangover experiences	2	
Rutgers Alcohol Problem Index	Alcohol use consequences	1	
Nicotine Dependence (from PATH)	Nicotine use consequences	2	
Marijuana Problem Index	Marijuana use consequences	2	
Cannabis Withdrawal Scale	Past 24-hour experience of cannabis withdrawal symptoms	0.5	
Drug Problem Index	Other drug use consequences	1	
Drinking Motives Questionnaire*	Motives for drinking alcohol	1	
Marijuana Motives Questionnaire*	Motives for using cannabis	1	
Tobacco Motives Inventory	Motives for using tobacco products	1	
Electronic Nicotine Delivery Systems Motives Inventory	Motives for using electronic nicotine delivery products	1	
Reasons for Electronic Nicotine Delivery Systems Use	Reasons for using electronic nicotine delivery products	1	
Vaping Motives	Motives for using vaping products	1	
Total Minutes		6.5-44	13

* Modified from PhenX

NeuroCognition

ABCD 4-Year Follow-up	What it Measures	Youth (min)
NIH Toolbox Tasks		
Picture Vocabulary	Language: vocabulary knowledge, estimated verbal IQ	4
Flanker Inhibitory Control & Attention	Attention, cognitive control; executive function; inhibition of automatic response	4
List Sorting Working Memory	Working memory, information processing	8
Pattern Comparison Processing Speed	Information processing; processing speed	3
Picture Sequence Memory Form B	Episodic memory; sequencing	6
Oral Reading Recognition	Language: oral reading (decoding) skills, academic achievement	2
Little Man Task	Visuospatial processing, flexibility, attention	4
Game of Dice Task	Aversion/attraction to risky decisions	6
Social Influence Task*	Social influence	9
BIRD Distress Tolerance Task	Distress tolerance, frustration induction	10
Total Minutes		56

* Approximately 1/2 of participants

Culture & Environment

ABCD 4-Year Follow-up	What it Measures	Youth (min)	Parent (min)
Parental Monitoring Survey	Parental monitoring/supervision	1	
Acceptance Subscale from Children's Report of Parental Behavior Inventory (CRPBI) - Short	Environment - Family & Religion	1	
Pet Ownership	Pet ownership	0.5	
School Risk & Protective Factors*	Risk and protective factors	1	
Peer Behavior Profile: Prosocial Peer Involvement & Delinquent Peer Involvement	Prosocial activity; academic achievement, and rule breaking of youth's friends	2	
Peer Network Health: Protective Scale	Positive/protective features of youth's network of friends	1	
Resistance to Peer Influence Scale	Resistance to peer influence	3	
Perceived Discrimination Scale	Experiences and perception of discrimination	1	
Mexican American Cultural Values Scale	Youth: Familism, religion, self-reliance	2	
	Parent: Familism, religion, independence, self-reliance		4
School Attendance of Youth & Grades	Number of excused and unexcused school absences, grades, and participation in an Individualized Education Program		1
Prosocial Behavior Survey	Resilience	1	1
Acculturation Survey*	Cultural factors	1	1
Family Environment Scale - Family Conflict Subscale*	Family dynamics, cohesion, expressiveness, conflict	1	3
Neighborhood Safety/Crime Survey*	Risk and protective factors, crime	1	1
Community Cohesion and Informal Social Control Subscales of the Project on Human Development in Chicago Neighborhoods (PHDCN)	Assessment of neighborhood cohesion and prosocial characteristics		2
Total Minutes		16.5	13

* Modified from PhenX

Brain Imaging

ABCD Scan Module	Protocol	Youth (min)
Pre Scan (outside scanner)	Day of Scan Additional MRI Screening*	1
	MRI Simulator with motion compliance while practicing tasks	20-30
	Pre Scan Questionnaire	1
Scan (inside scanner)	Setup	3-6
	Localizer	1.5
	3D T1 (show child movie)	6.5-8
	fMRI Field Map	0.25
	rsfMRI 2-5 min. runs with 10-sec film clip^ between runs^	10
	Diffusion Field Map	0.25
	DTI (show child movie)	9-10
	3D T2 (show child movie)	6-7
	fMRI Field Map	0.25
	rsfMRI up to 2-5 min. runs with 10 sec. film clip between runs^	5-10
	fMRI Field Map	0.25
	fMRI Monetary Incentive Task (2-5 5 min. runs)	12
	fMRI Field Map	0.25
	fMRI Stop Signal Task (2-5.75 min. runs)	13
	fMRI Field Map	0.25
fMRI Emotional N-Back Task (2-5.1 min. runs)	12	
Post Scan (outside scanner)	Post Scan Questionnaire	1
	Recognition Memory for Emotional N-Back Task	11
	Monetary Incentive Delay Task Survey	2
Total Minutes		116-137

*To be completed by Parent and Child at screening, at scheduling, and at scan. All other measures Child only

^To avoid fatigue, sleep, compliance problems will show 10-20 sec. movie clips between each 5 min. rsfMRI run

Mobile Technology and Other Data Sources

ABCD 4-Year Follow-up	What It Measures	Youth (min)	Parent (min)	Teacher (min)
Geocoding from Residential History	Environmental risk		3	
School Records	Educational attainment		3	
Brief Problem Monitor - Teacher Form	Dimensional psychopathology, adaptive functioning			2
Fitbit Pre and Post Assessments	Sleep, health, activity	6	10	
Screen Time Survey	Screen time utilization	15	13	
Total Minutes		21	29	2

Biospecimens

ABCD 4-Year Follow-up	What It Measures	Method	Youth (min)	Parent (min)
Drug Screen	Past day drug use	Urine	1	
Alcohol Screen*	Past day alcohol use	Breathalyzer	1	
Reditest Smoke Cassette	Detection of Cotinine (nicotine metabolite) for past day nicotine use	Urine	1	
Substance Use History	Metabolites of past 3 month substance use	Hair (~100 strands)	4	
Venipuncture	Hemoglobin A1C, cholesterol, CBC, anemia, genetic factors	Blood	30	
Pubertal Hormones	Estradiol, testosterone, DHEA	Oral fluid	6	
Baby Teeth	Substance & environmental toxin exposure	Prior/newly shed baby teeth		1
Total Minutes			43	1

* Subset of participants



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