

Adolescent Brain Cognitive Development

Teen Brains. Today's Science. Brighter Future.

An NIH Collaboration:
NIDA, NIAAA, NCI,
NIMH, NIMHD, NICHD,
NINDS, OBSSR

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Director, ABCD Project
Division of Extramural Research, NIDA
June 9, 2016

NIH Collaboration

National
Institute on
Drug Abuse



National
Institute on
Alcohol Abuse
and Alcoholism



National
Cancer
Institute



*Eunice Kennedy
Shriver* National
Institute of Child
Health and Human
Development



National
Institute of
Mental Health



National
Institute on
Minority Health
and Health
Disparities



National
Institute of
Neurological
Disorders
and Stroke



NIH Office of
Behavioral and
Social Sciences
Research



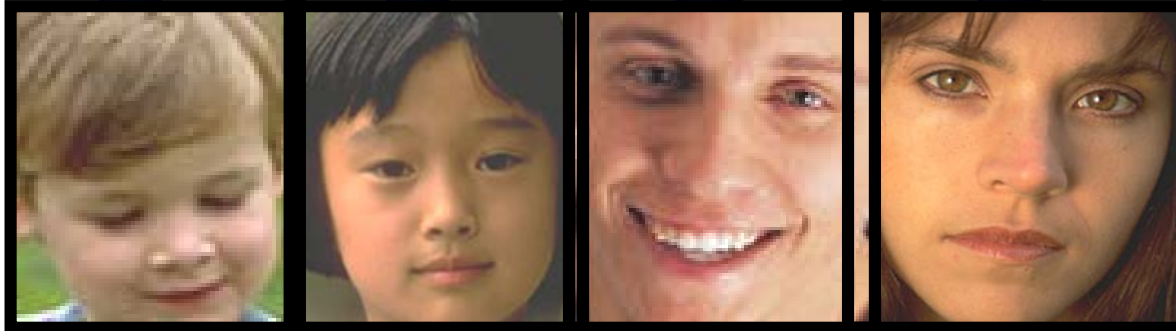
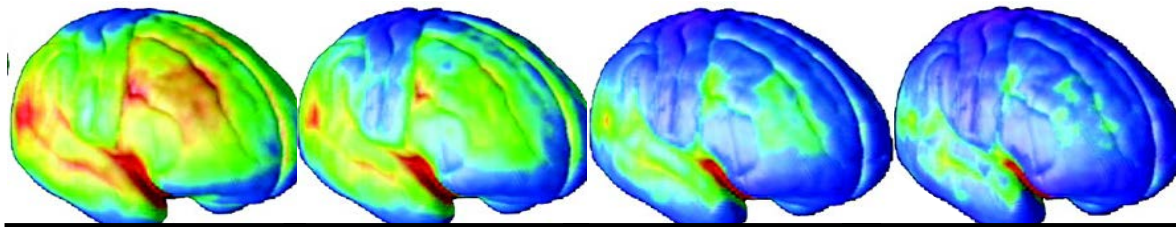
Adolescent Brain Cognitive Development

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A longitudinal study of about 10,000 children from ages 9-10 through early adulthood to assess factors that influence individual brain development trajectories and functional outcomes

Why?

Adolescence: a time of extraordinary physical, emotional, and intellectual growth



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Yet, there is much we don't know...

About how childhood experiences (participation in sports or music, playing video games, sleep patterns, alcohol, marijuana, and tobacco use, and others) affect brain, social, emotional, and academic development.



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Activities Leading up to Funding

- ✓ **Expert panel workshop** to develop recommendations on best large-scale designs and measures to assess developmental effects of substance exposure. **May 27-28, 2014**
- ✓ **A Request For Information** to get input on proposed study design/measures. **July-August, 2014**
- ✓ **Revised design** based on input from RFI and discussion at **SfN satellite symposium**. **October, 2014**
- ✓ **FOAs released:** U24—Coordinating Center, Data Analysis and Informatics Center; U01 Research sites. **January, 2015**
- ✓ **Robust response to the FOAs;** applications reviewed **July, 2015**
- ✓ **Grants awarded:** 13 awards: 1 CC, 1 DAIC, 11 Research Grants (19 Research Sites) **Sept, 2015**



NIH Collaboration – FY16

National
Institute on
Drug Abuse

\$18,400,000



National
Institute on
Alcohol Abuse
and Alcoholism

\$6,800,000



National
Cancer
Institute

\$1,500,000



*Eunice Kennedy
Shriver National
Institute of Child
Health and Human
Development*

\$1,000,000



National
Institute of
Mental Health

\$1,000,000



National
Institute on
Minority Health
and Health
Disparities

\$300,000



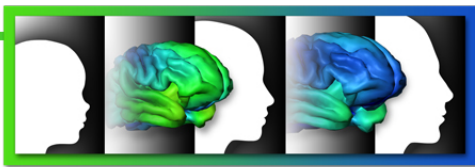
National
Institute of
Neurological
Disorders
and Stroke

\$500,000



NIH Office of
Behavioral and
Social Sciences
Research




\$500,000



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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
Icahn School of Medicine at Mount Sinai
Oregon Health & Science University
SRI International
University of California, Los Angeles
University of California, San Diego
University of Colorado
University of Florida
University of Hawaii at Manoa
University of Michigan
University of Minnesota
University of Pittsburgh
University of Utah
University of Vermont
Virginia Commonwealth University
Washington University in St. Louis
Yale University |



Since Funding

- ✓ **First PI meeting. Oct, 2015**
- ✓ **External Advisory Board meeting. January 14-15, 2016 to review and provide recommendations on initial protocol**
- ✓ **January – May, 2016**
 - ✓ **Refinement of protocol to reduce length, improve acceptability**
 - ✓ **Development of informatics systems for data capture and transfer**
 - ✓ **Development of outreach strategies/materials to raise awareness of the study and engage school systems**
 - ✓ **Hiring and training staff. Train-the-trainer meeting April 18-20, 2016.**





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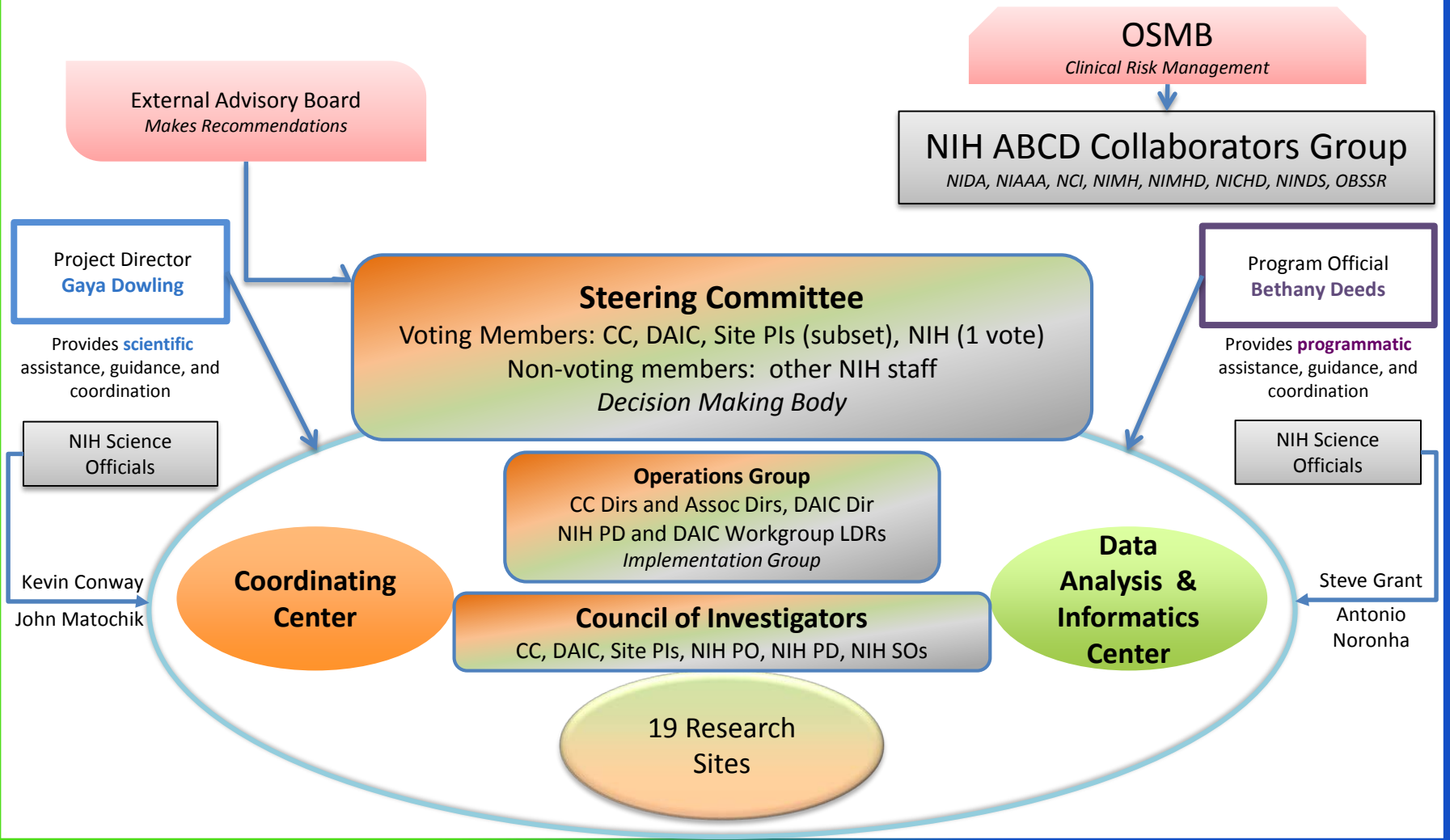
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Structure
Organization
Function



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ABCD Governance Structure



ABCD External Advisory Board

- **Role:** To provide scientific and administrative oversight throughout the study course, including:
 - Review study protocol before initiation
 - Assess progress and related activities
 - Suggest modifications to the scope of the research program if needed
 - Consult on recruitment and retention of new scientific staff and faculty
 - Represent and communicate community interests and views.
- The EAB will provide recommendations to the ABCD Steering Committee and the NIH regarding scientific program and activities.
- **Composition:** National experts in relevant fields and scientific areas critical to study design and implementation.

- Child and adolescent development
- Prevention research
- Mental health
- Education and education research
- Bioethics

- Community outreach
- Cognitive development
- Neuroimaging
- Informatics
- Data sharing



ABCD Observational Study Monitoring Board

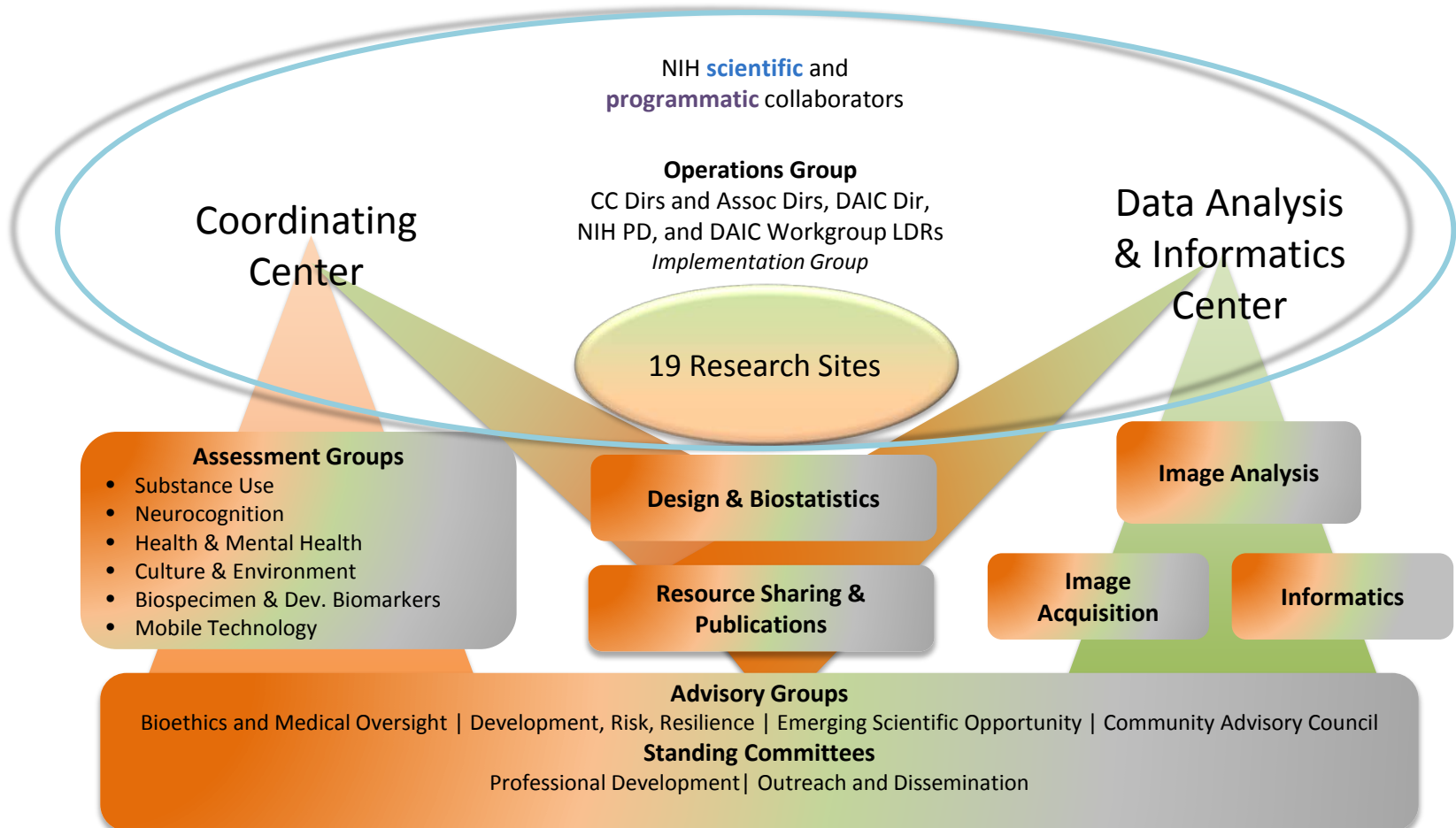
- **Role:** The principal role of the OSMB is to monitor regularly the observational study and make recommendations to the NIH with respect to:
 - Participant safety, confidentiality, and informed consent, including notification of and referral for abnormal findings
 - Participant burden
 - Impact of proposed ancillary studies and sub-studies on participant burden and overall achievement of the main study goals
- **Composition:** National experts in longitudinal adolescent studies, bioethics, regulations, and legal issues related to consent and confidentiality in studies of adolescents.





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ABCD Functional Organization





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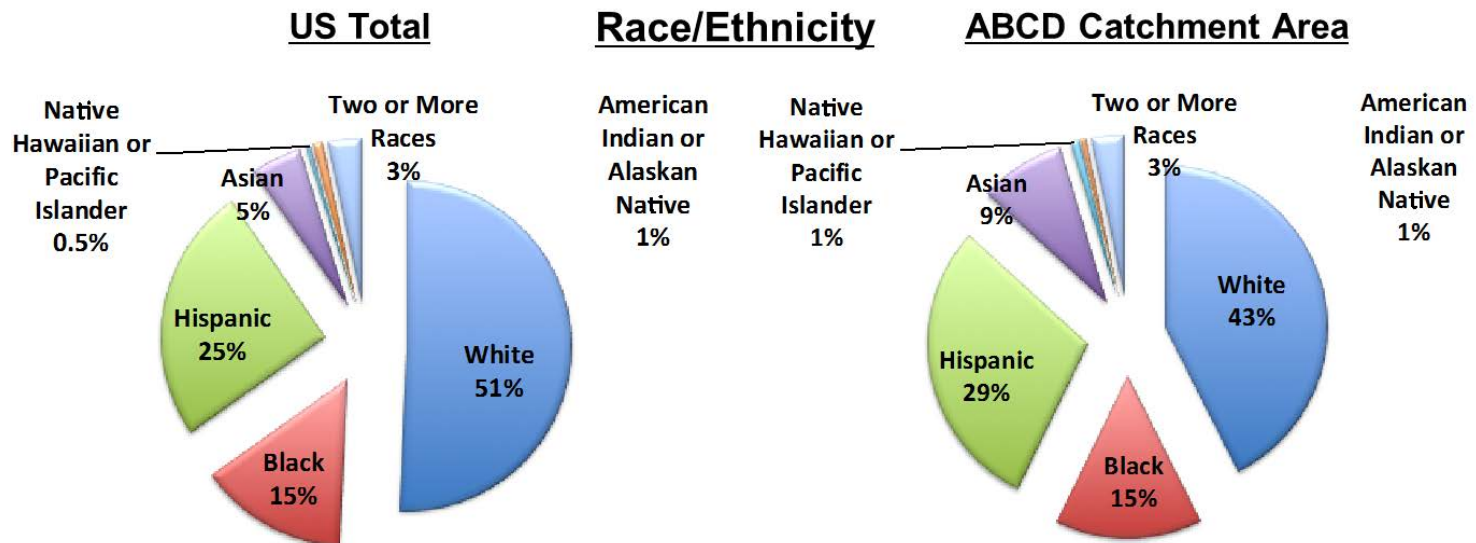
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ABCD Protocol

Design and Recruitment

Recruitment Strategy (school-based strategy for non-twins)

- Identify all public and private schools with kids aged 9-10 within geographic catchment area for each site.



Design and Recruitment

Recruitment Strategy (school-based strategy for non-twins)

- Begin by engaging schools for their support.
- Schools send information packets to families of 9/10 year olds (at our expense)
- Interested families contacted by site.
- Screen with parent/guardian.
- Screener assesses inclusion/exclusion criteria (aim is to be very inclusive).

Twin Cohort (800 pairs)

- Four sites (Colorado, Minnesota, Missouri, Virginia)
- Birth registry records





ABCD Partners



Adolescent Brain Cognitive Development
For More Information, Please Visit:
ABCStudy.org



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School District Approvals

What is the ABCD Study?

The Adolescent Brain Cognitive Development (ABCD) Study, supported by the National Institutes of Health, is the largest long-term study of brain development and child health ever conducted in the United States. It will enroll 10,000+ youth ages 9 to 10 from across the country and follow their progress into young adulthood.

Using non-invasive neuroimaging and cognitive, academic, social, emotional, and biological assessments, scientists will determine how



Adolescent Brain Cognitive Development (Teen Brains, Today's Science, Brighter Future). Childhood experiences interact with each other and with children's changing biology to affect brain development and other outcomes. Understanding these relationships can inform policies and programs to help our children lead healthy, more fulfilling lives.

The ABCD Study can inform educational practices and policy to improve the health and success of our youth!

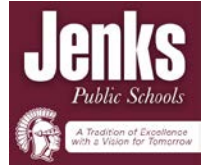
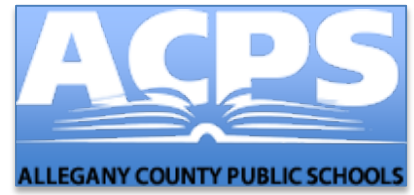
Questions the Study Could Answer:	Leading to New Policies/Interventions in:
What are some of the factors that contribute to achievement gaps?	Curricula and other school programs
How prevalent are traumatic brain injuries (TBI) among student athletes? Do TBIs affect educational achievement?	Precautions, assessments, and education of student athletes on TBIs
Which extra-curricular activities (e.g. athletics, music) lead to better health and educational outcomes?	After-school programming
Does use of substances such as alcohol, tobacco, or marijuana lead to use of other substances? Does substance use affect learning?	Targeted substance abuse prevention and education interventions



The Adolescent Brain Cognitive Development (ABCD) Study will enroll 10,000+ healthy children and follow them from ages 9 to 10 into early adulthood to understand how children's experiences affect brain development and other aspects of their lives—including academic achievement, social development, and behavioral and overall health. The ABCD Study, sponsored by the National Institutes of Health, is being conducted by researchers across the country. You may be eligible to participate at a Study Site in your area.

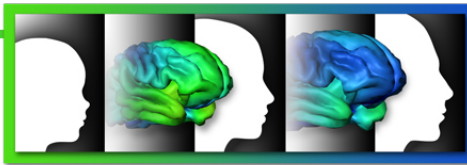


SAN MATEO COUNTY OFFICE OF EDUCATION



UNION PUBLIC SCHOOLS
Together We Make A Difference





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Assessment Protocol

Neurocognition	Attention, learning, memory, information processing, verbal IQ, motivation, impulsivity
Substance Use	Parental rules, peer influences, intention to use, use, sensitivity, consequences
Mental Health, Health, & Demography	Physical activity, mental health, puberty, sleep, TBI, screen time, family history, sports participation, food insecurity
Culture & Environment	Ethnic identity, acculturation, discrimination, religiosity, neighborhood safety, parental monitoring, school environment
Biospecimens	Breath, saliva, hair (subsample), blood (subsample), baby teeth (optional)
Mobile Tech & Passive Data	Fitbit, school records, pediatrician records, geocoding
Structural MRI	Shape, size, integrity of brain structures
rs- and task-based fMRI	Functional organization of the brain at rest or when doing a task



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ABCD Study

TIMELINE OF EVENTS



STUDENT AGE	9-10		10-11		11-12	
STUDENT TIME	6-7 hours		15 minutes	2-3 hours	15 minutes	6-7 hours
STUDENT ACTIVITY		<p>every 3-6 months</p>		<p>every 3-6 months</p>		
PARENT TIME	3 hours		5 minutes	1 hour	5 minutes	3 hours
PARENT ACTIVITY						

REPEAT ... until age 19-20

LEGEND

- In-Person Visit
- Biosamples
- Phone Call
- Brain Scan
- iPad Tasks
- Interview

ABCD Open Science Model – A Unique Resource for the Entire Scientific Community

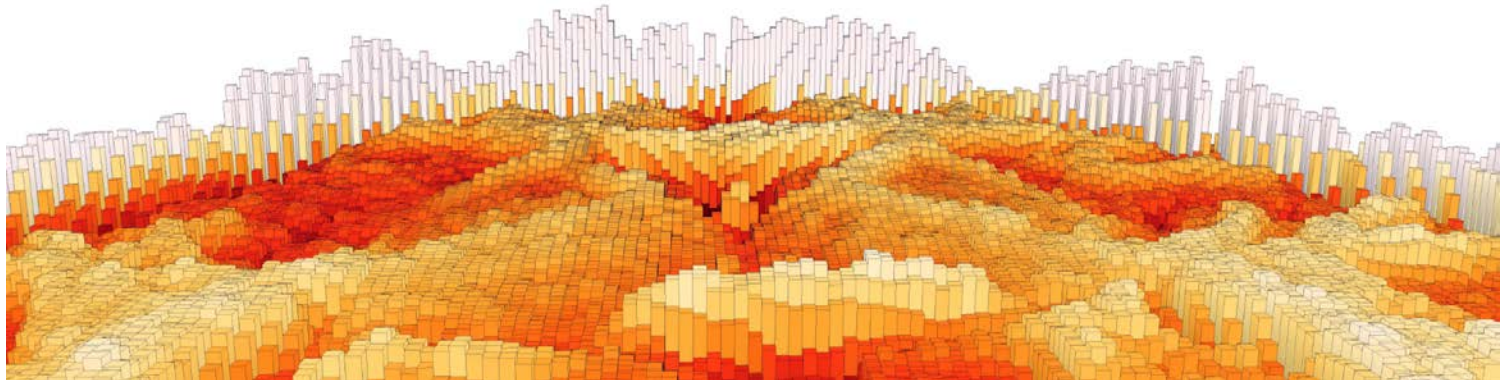
Sharing ABCD data will allow scientists worldwide to conduct “**Big Data**” analyses (10 petabytes) , pool resources, and enrich the value of this study.

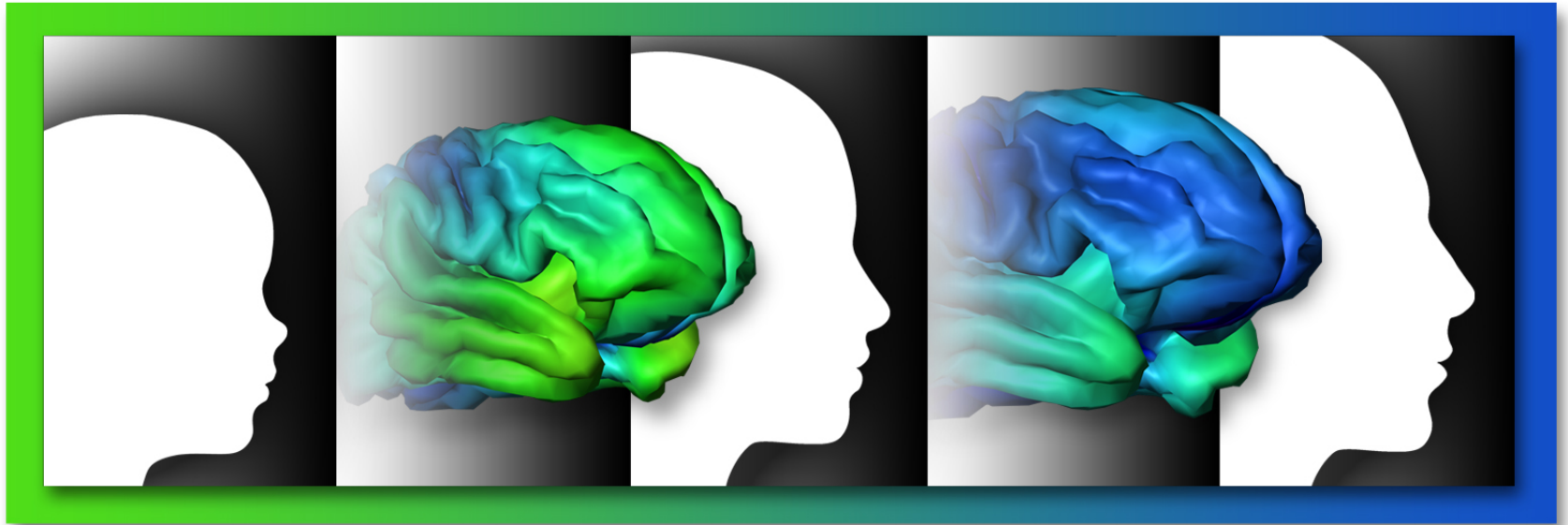
The ABCD Study will release:

- Raw, cleaned, anonymized data one month after data collection begins
- Curated, anonymized data annually beginning 1 year after data collection begins
- Computational workflows used to produce the data.

Adolescent Brain Cognitive Development

Welcome to the resources of the ABCD-DAIC





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For More Information, Please Visit:

ABCDStudy.org