Adolescent Brain Cognitive Development®

Teen Brains. Today's Science. Brighter Future.

Gaya J. Dowling, Ph.D.
Elizabeth Hoffman, Ph.D.
Kimberly LeBlanc, Ph.D.

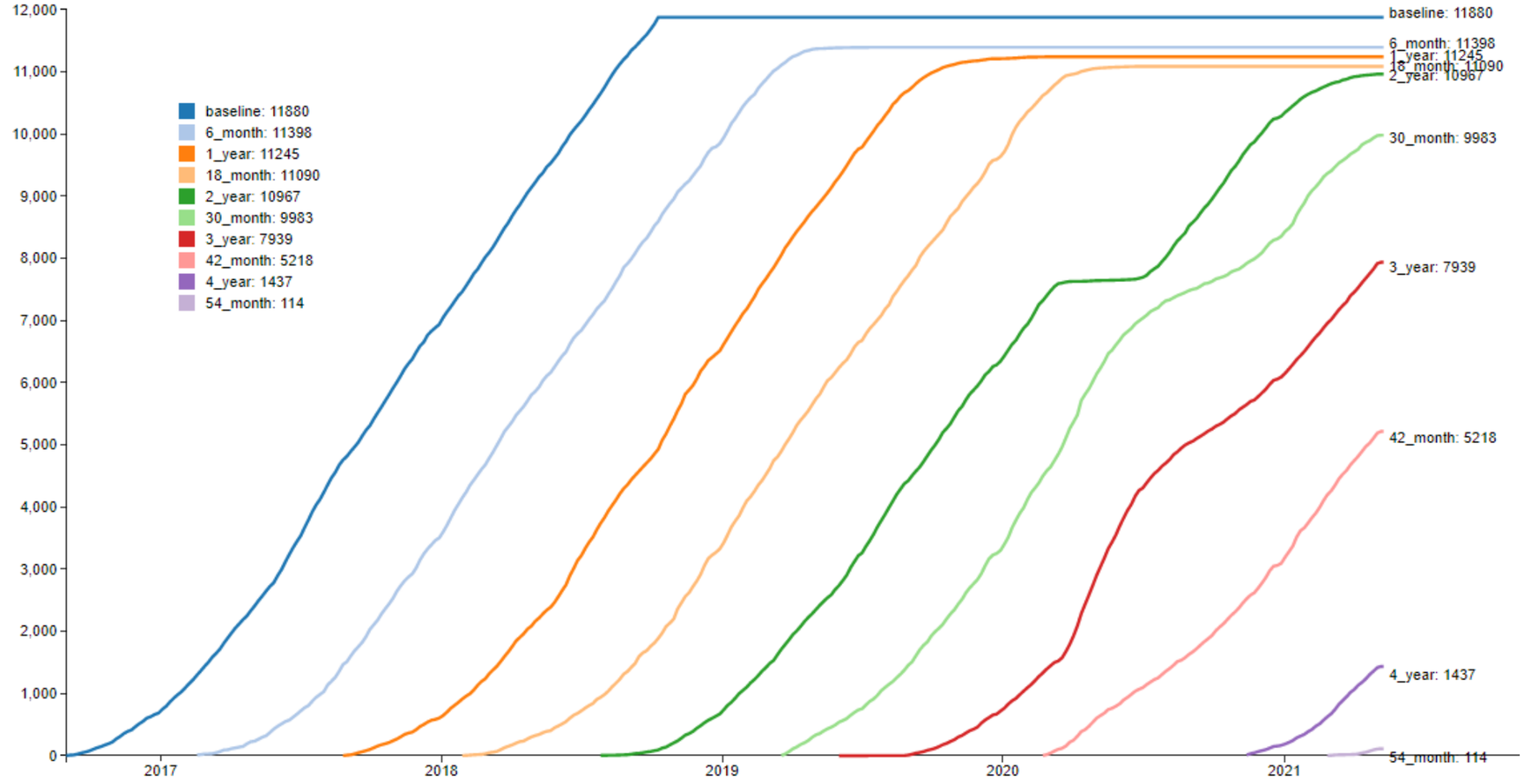
May 12, 2021

Adolescent Brain Cognitive Development®

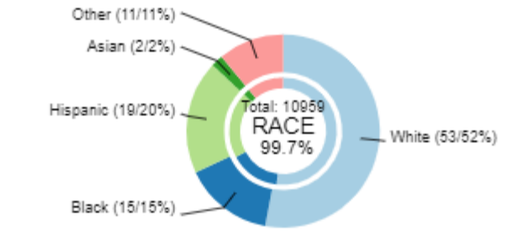
Teen Brains. Today's Science. Brighter Future.

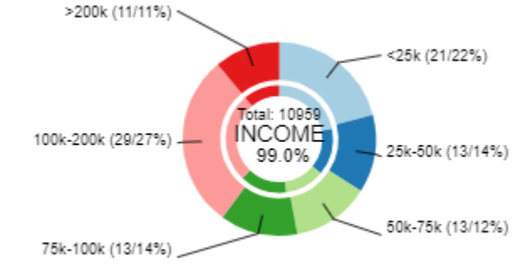
- Retention and COVID-19 impacts
- COVID-19 Data
- Data Sharing and Use
- ABCD Justice, Equity, Diversity, and Inclusion (JEDI) Efforts
- Meaningful Effects Meeting
- Recent findings

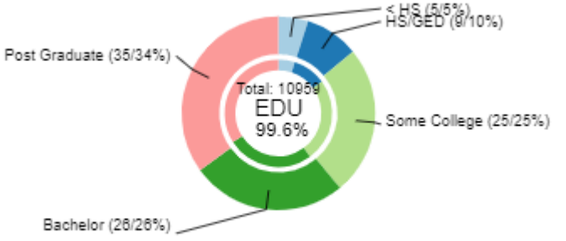
Retention - Visit Completion



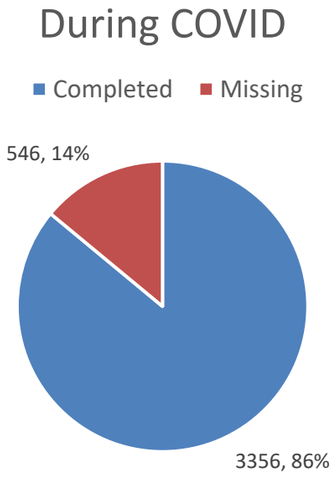
2-year follow-up

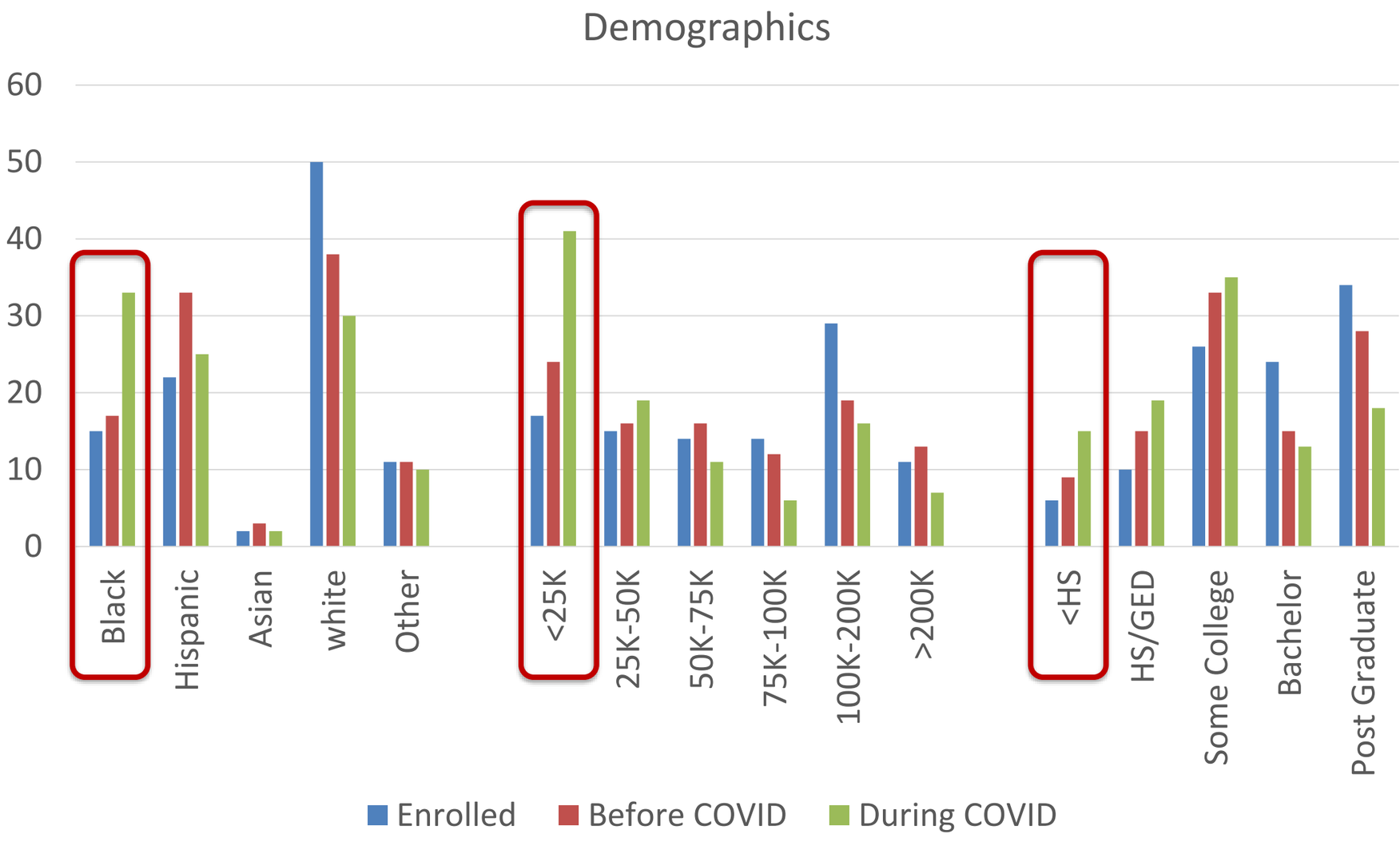




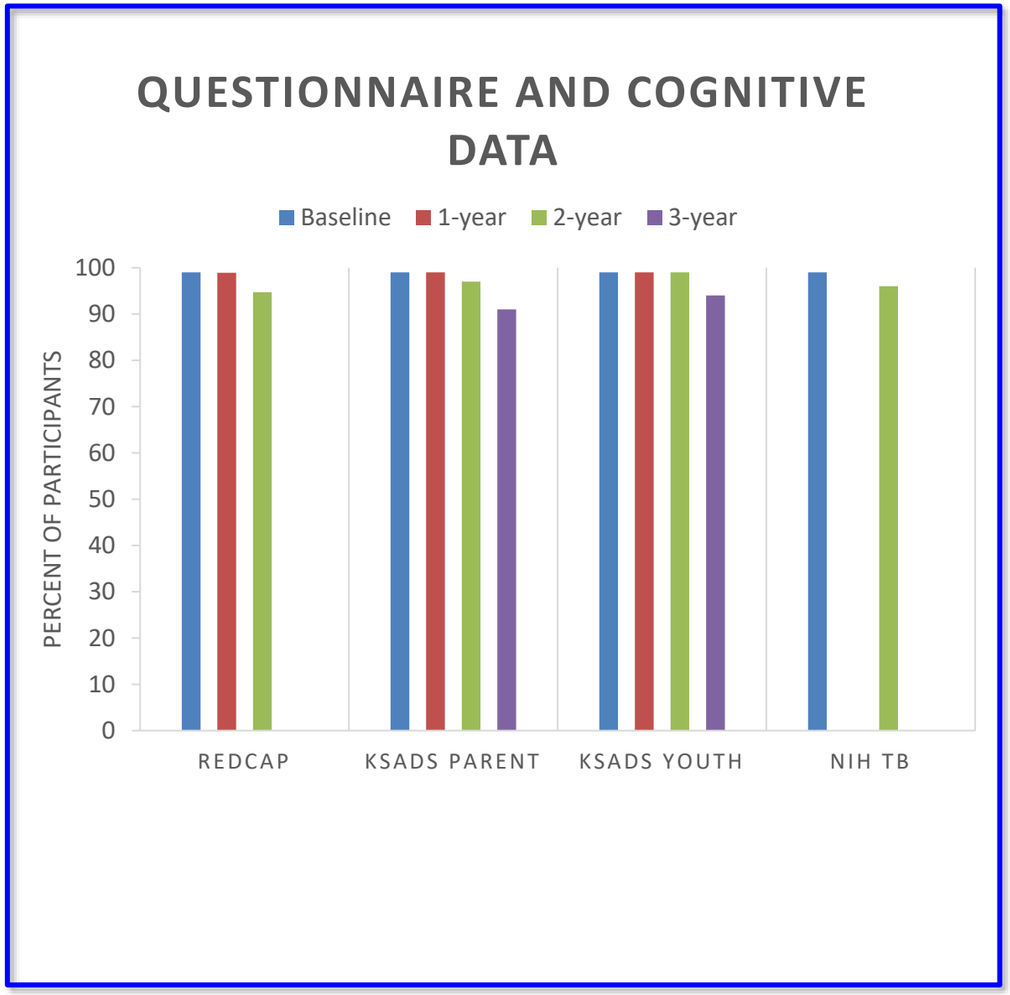


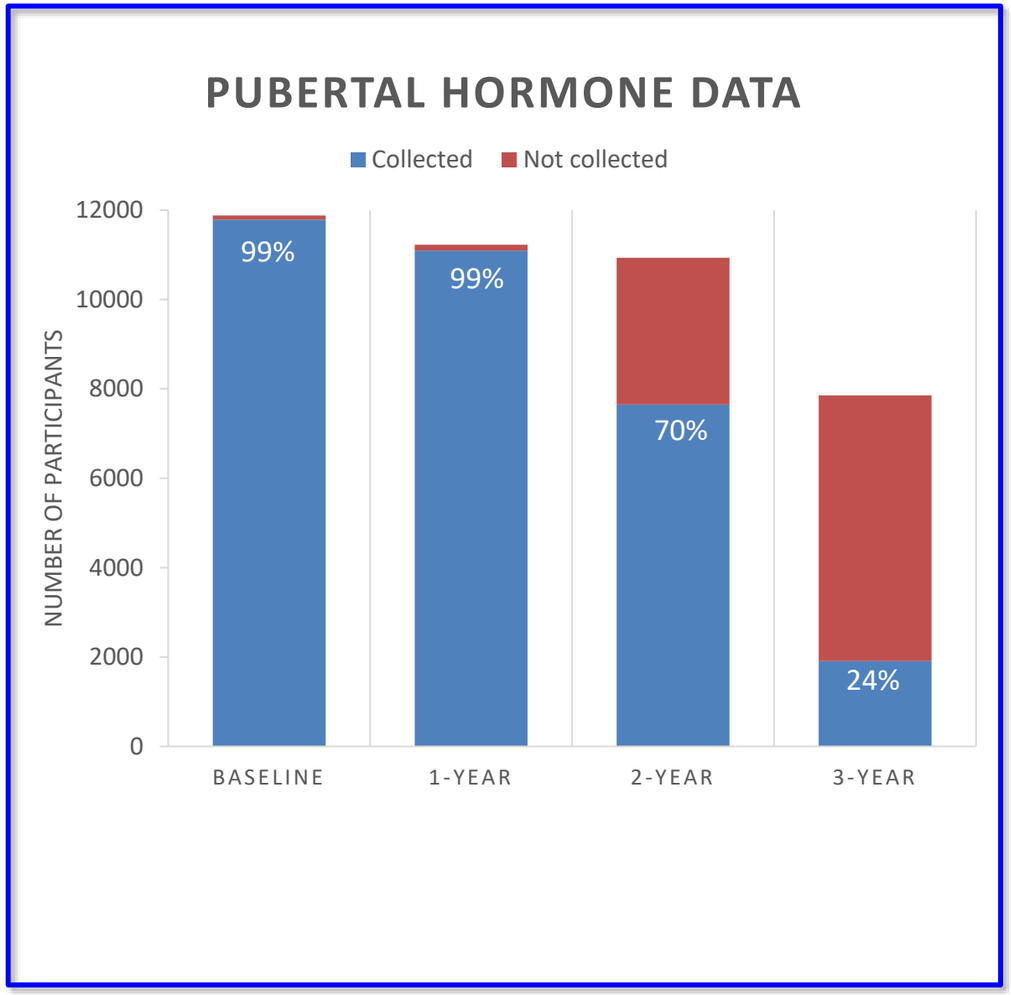
Retention – Missed 2-year Follow-Up Visits





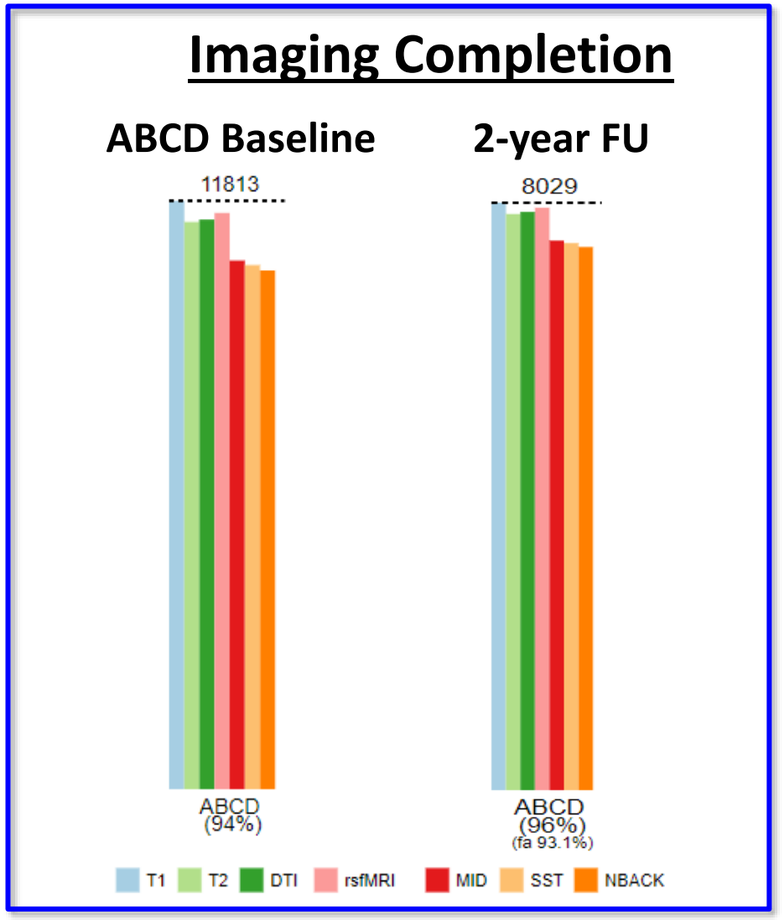
Data Collection



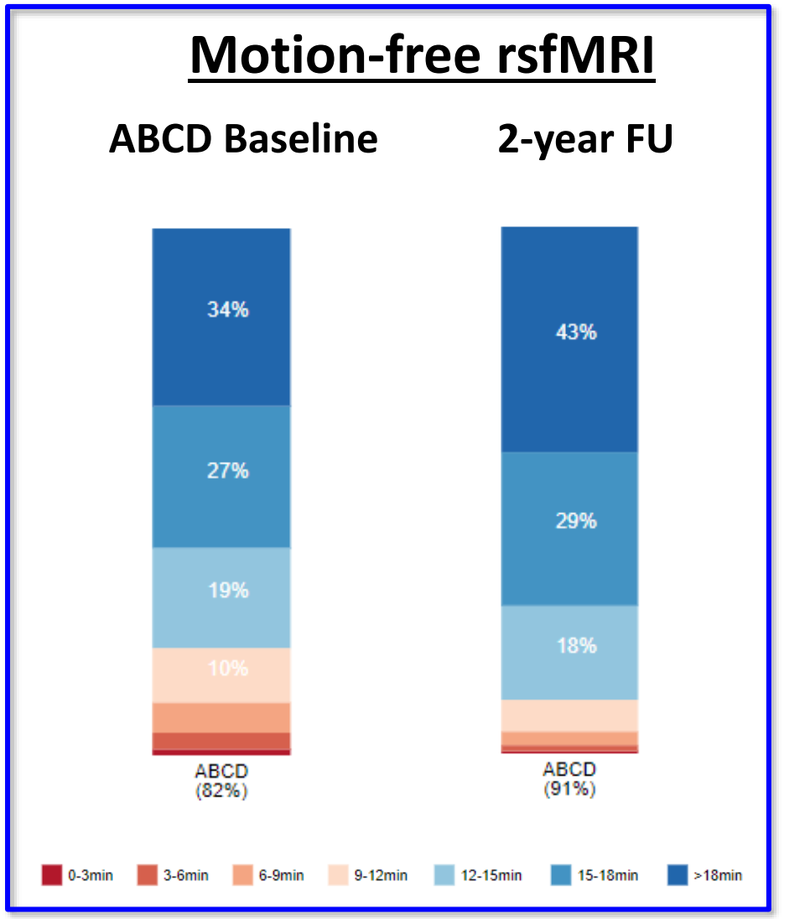


Imaging Data Quality

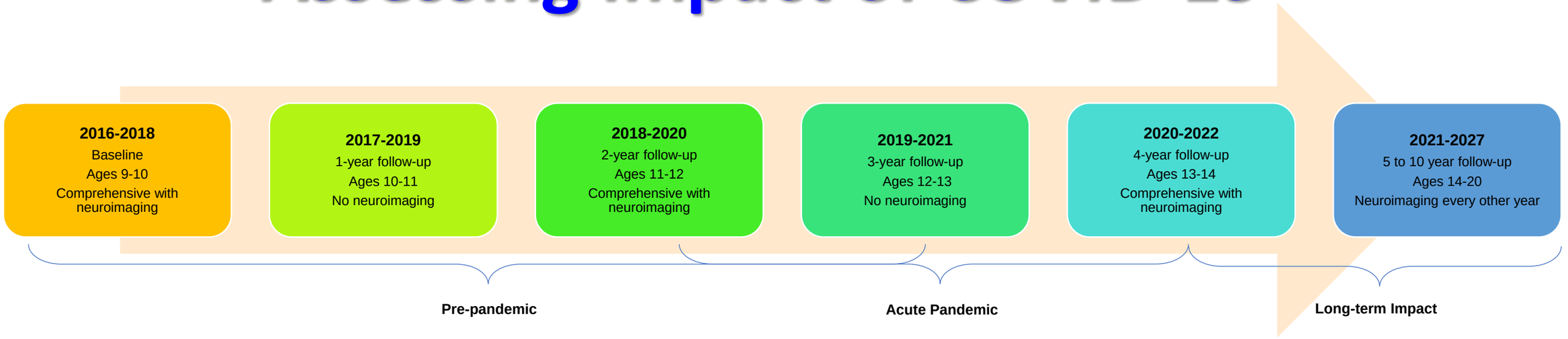
Imaging Completion



Motion-free rsfMRI



Assessing Impact of COVID-19



Design

- Questionnaires (May, June, Aug, Oct, Dec 2020) sent to all participants
- FitBit extension - Pre-post data on activity, sleep, heart rate
- Map variation in community impact to correlate with questionnaire data. Examples of existing datasets:
  - Prevalence relative to population density
  - Timing of implementation of state/local policies
  - Social distancing based on cell phone movement
  - Changes in unemployment

Domains covered in the ABCD COVID-19 questionnaire

	Youth	Parent
Family Situation: home composition, economic impact, food, illness, parent support	X	X
Youth's Schooling: quality, quantity, methods, and supervision	X	X
Youth's Routine: sleep and physical activity	X	X
Relationships: friends and family	X	
Attitudes & Adherence: COVID-19 public health directives	X	X
Mental Health & Stress: depression, anxiety, worry, post-traumatic stress	X	X
Substance Use: vaping of nicotine and cannabis, alcohol use, other intoxicant use	X	X
Screen Media Use: for school, socializing, other reasons	X	X
Media/News Exposure: to COVID-19	X	X
Youth's COVID-19 symptoms, diagnosis, and testing		X

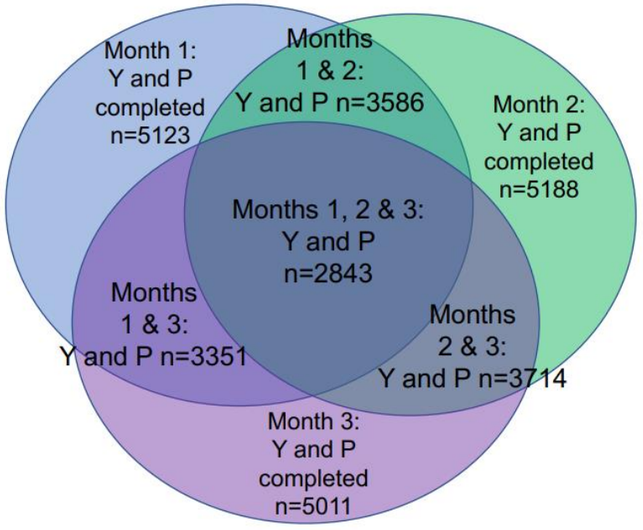
Assessing Impact of COVID-19

COVID Survey Month 1, 2, & 3 Response Rates

~9000 unique youth age 11-14

Completion rates by month

Month:	1	2	3
Parent Q	56%	57%	54%
Youth Q	46%	47%	45%
Both Y+P	43%	44%	42%



Family Income

	Sent	Completed 1	2	3
<25k	12%	7%	8%	7%
25- 50k	12%	10%	10%	10%
50- 75k	12%	12%	12%	11%
75-100k	12%	14%	14%	14%
100-200k	31%	35%	35%	37%
>200k	13%	16%	15%	16%
Refuse	5%	3%	3%	3%
Don't know	4%	3%	3%	3%

Primary Parent Education

	Sent	Completed 1	2	3
<HS	6%	3%	3%	3%
HS/GED	11%	7%	8%	7%
Some college	29%	25%	26%	25%
BA/BS	28%	32%	32%	33%
Masters	20%	24%	24%	24%
Prof school	3%	4%	3%	3%
Doctorate	4%	5%	4%	4%

Race/Ethnicity

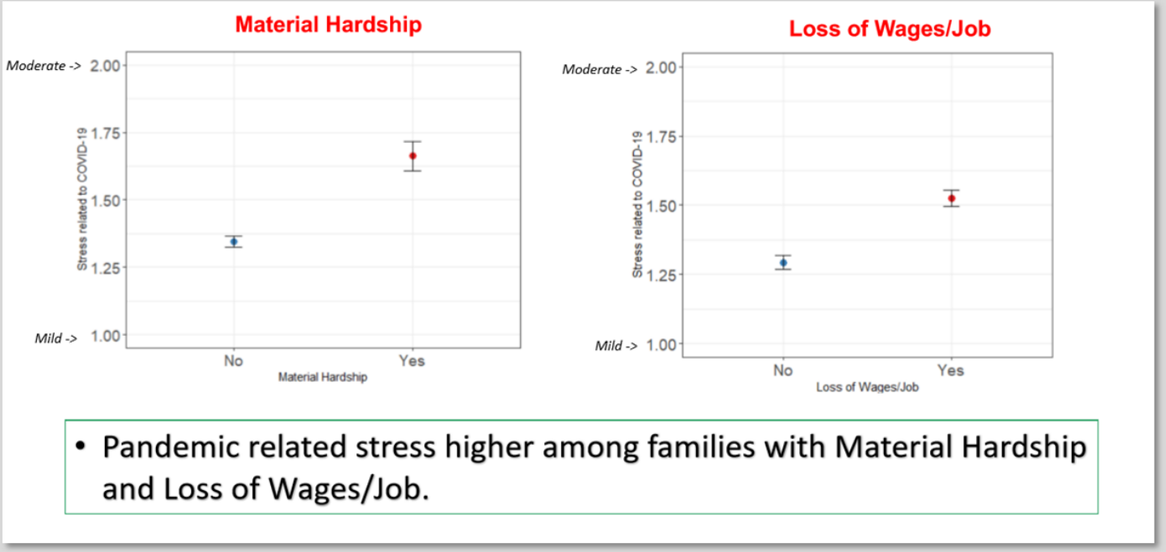
	Sent	Completed 1	2	3
White	53%	60%	61%	60%
Black	15%	9%	10%	9%
Hisp	19%	18%	17%	17%
Asian	2%	3%	3%	3%
Other	11%	11%	11%	11%

Courtesy of Susan Tapert, UCSD (unpublished)

Assessing Impact of COVID-19

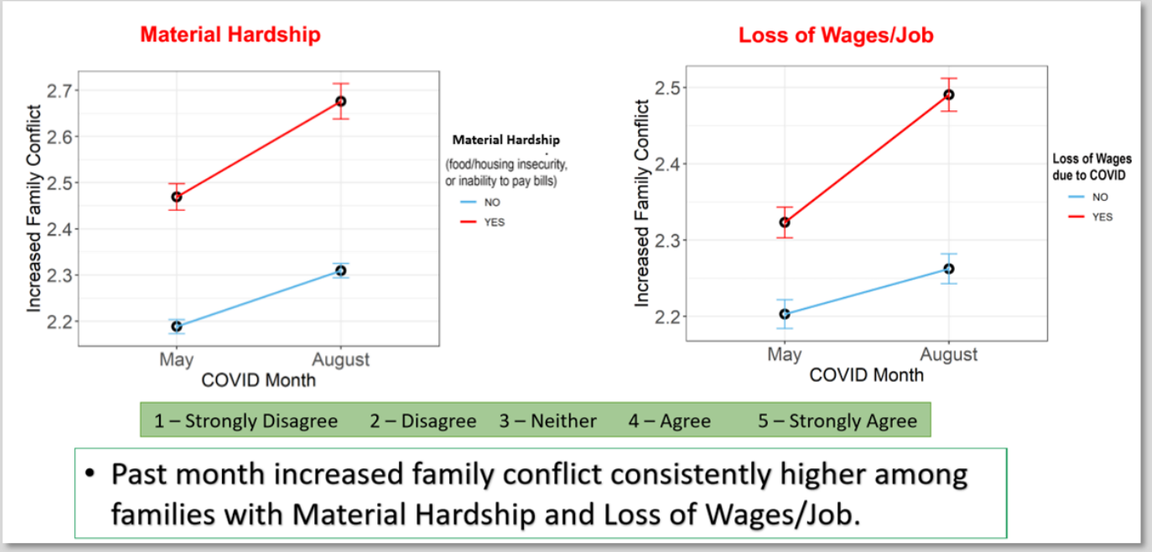
Impact of material hardship on stress and conflict (Surveys 1 & 3)

Pandemic related stress among parents



- Pandemic related stress higher among families with Material Hardship and Loss of Wages/Job.

Pandemic related family conflict



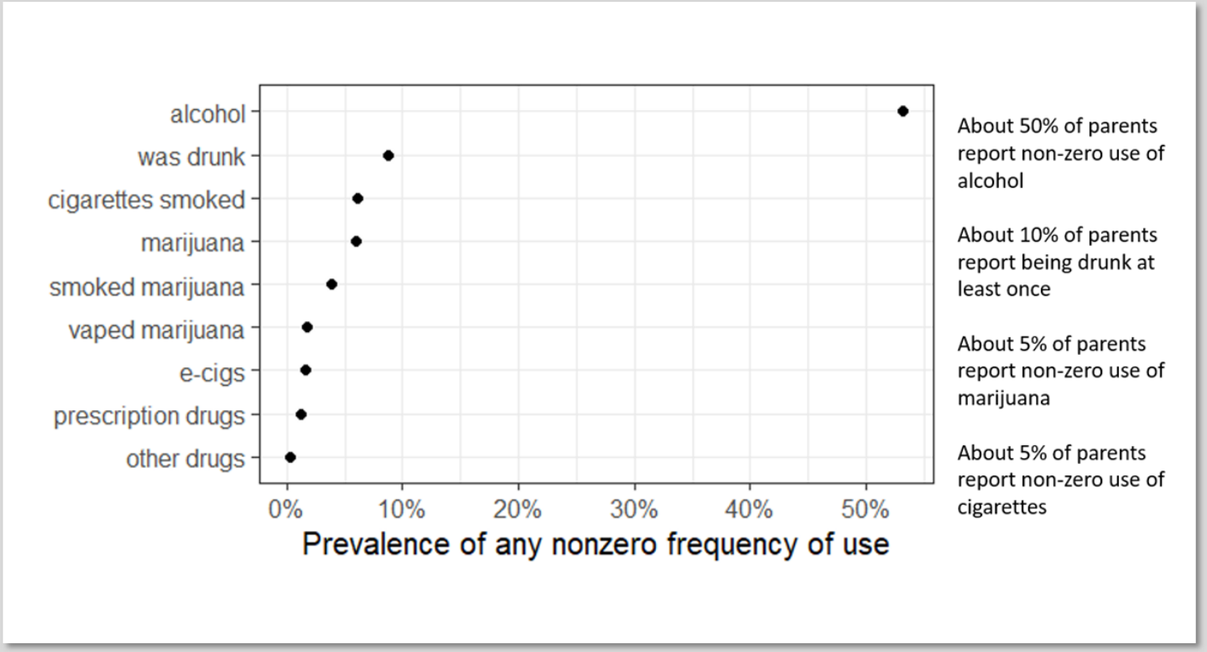
- Past month increased family conflict consistently higher among families with Material Hardship and Loss of Wages/Job.

Material hardship – Housing insecurity, food insecurity, or inability to pay bills

Courtesy of Marybel Gonzalez, UCSD (unpublished)
DOI: 10.15154/1520584

Assessing Impact of COVID-19

Parental alcohol use, stress, and family conflict

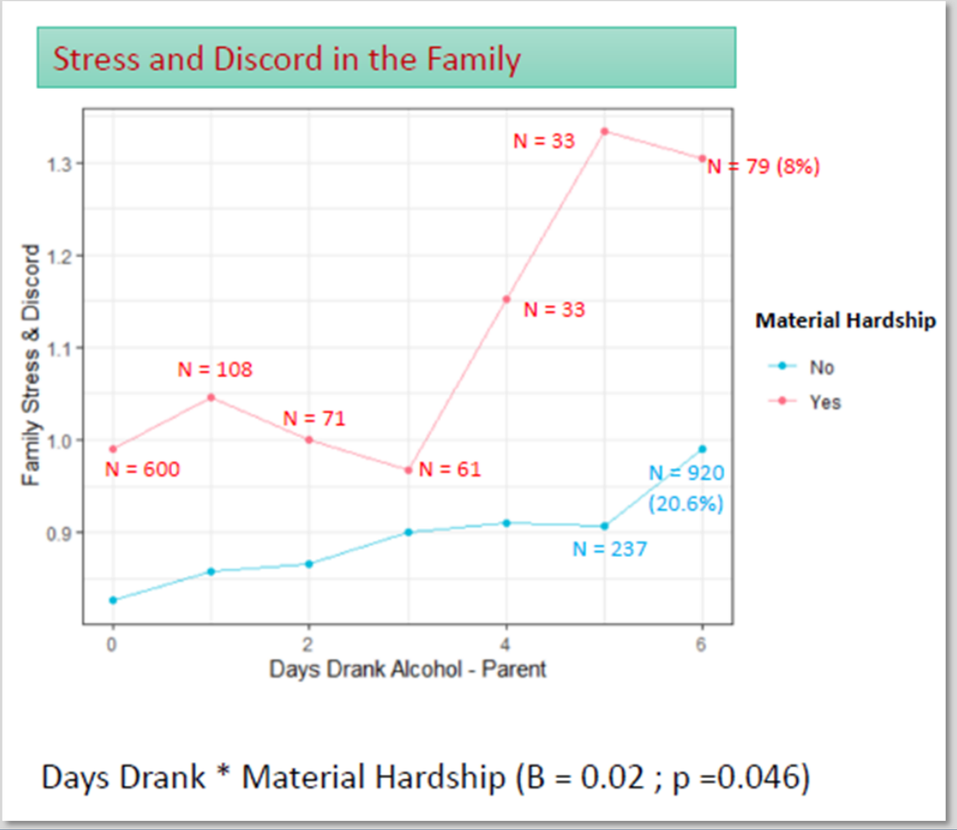


About 50% of parents report non-zero use of alcohol

About 10% of parents report being drunk at least once

About 5% of parents report non-zero use of marijuana

About 5% of parents report non-zero use of cigarettes



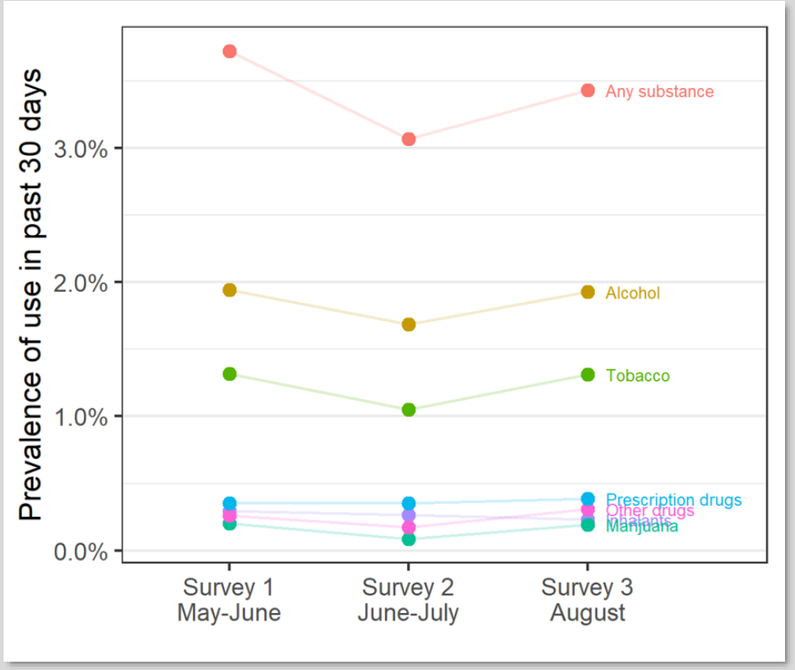
Days Drank in the past month (0, 2, 4, 6+)

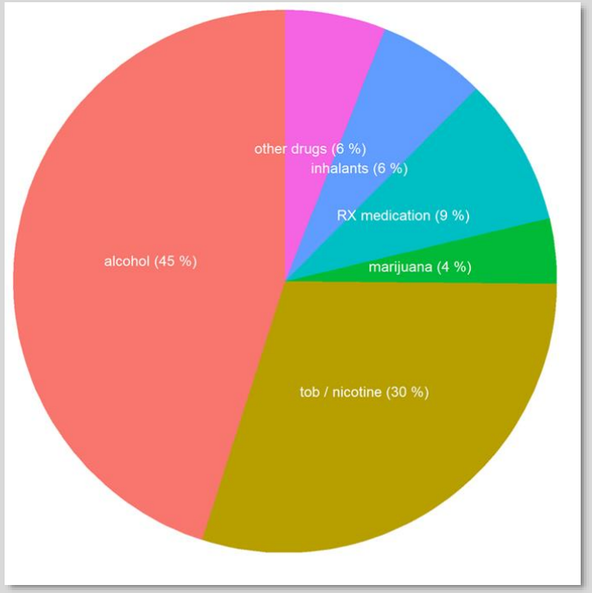
Courtesy of Will Pelham and Marybel Gonzalez, UCSD (unpublished)

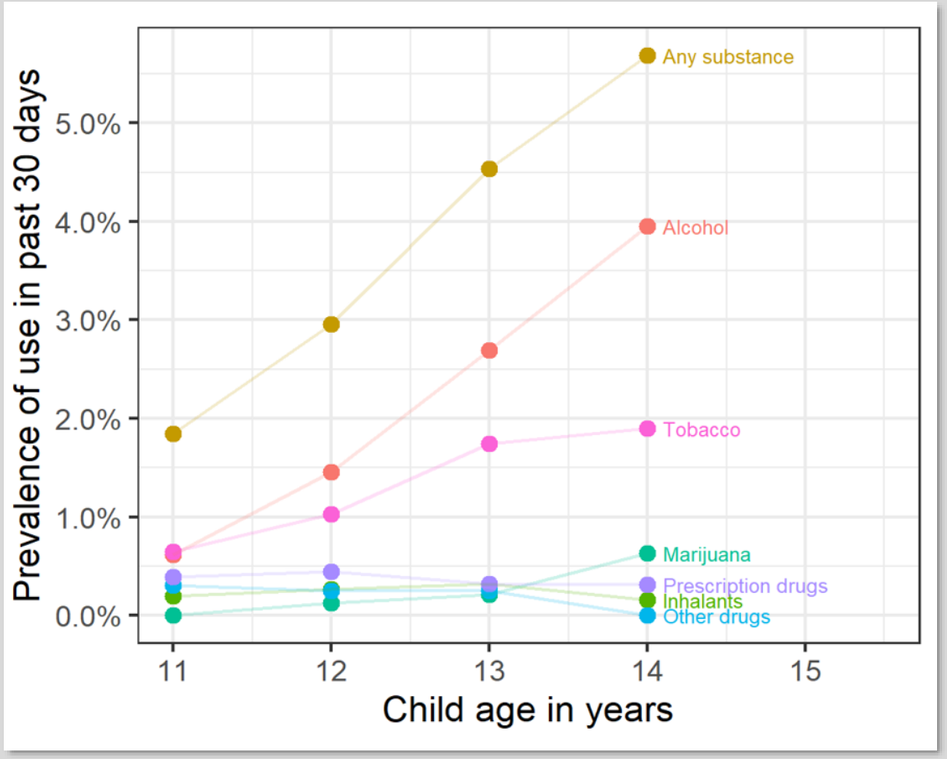
DOI: 10.15154/1520584

Assessing Impact of COVID-19

Youth substance use







Courtesy of Will Pelham, UCSD (unpublished)
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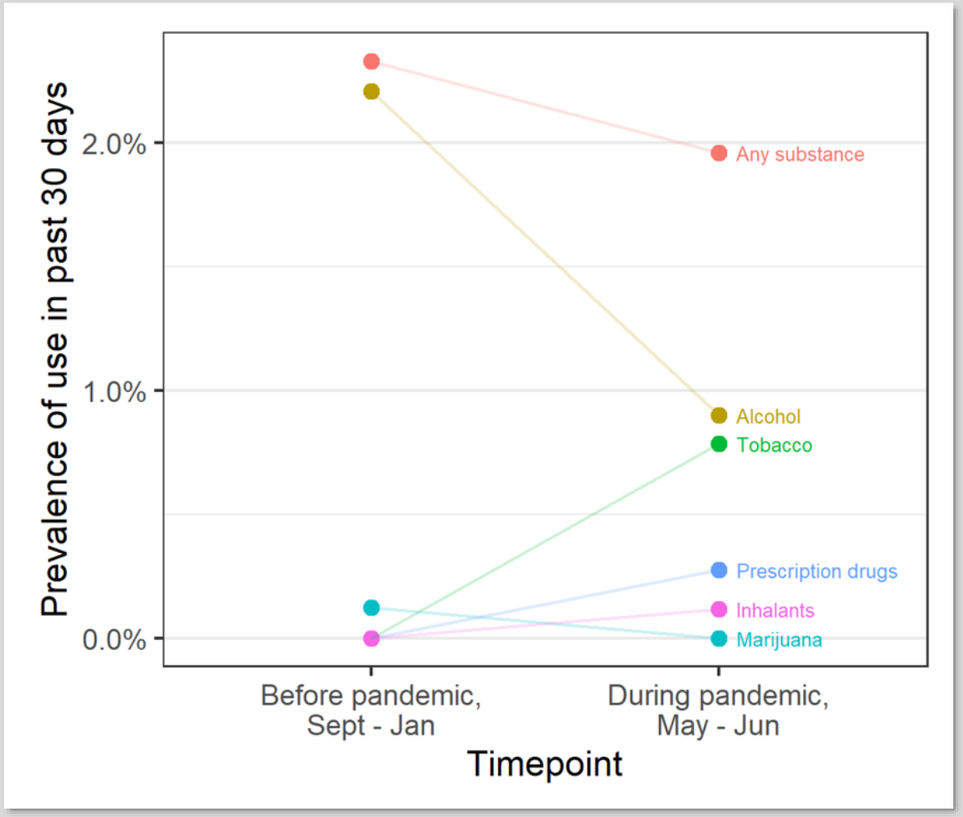
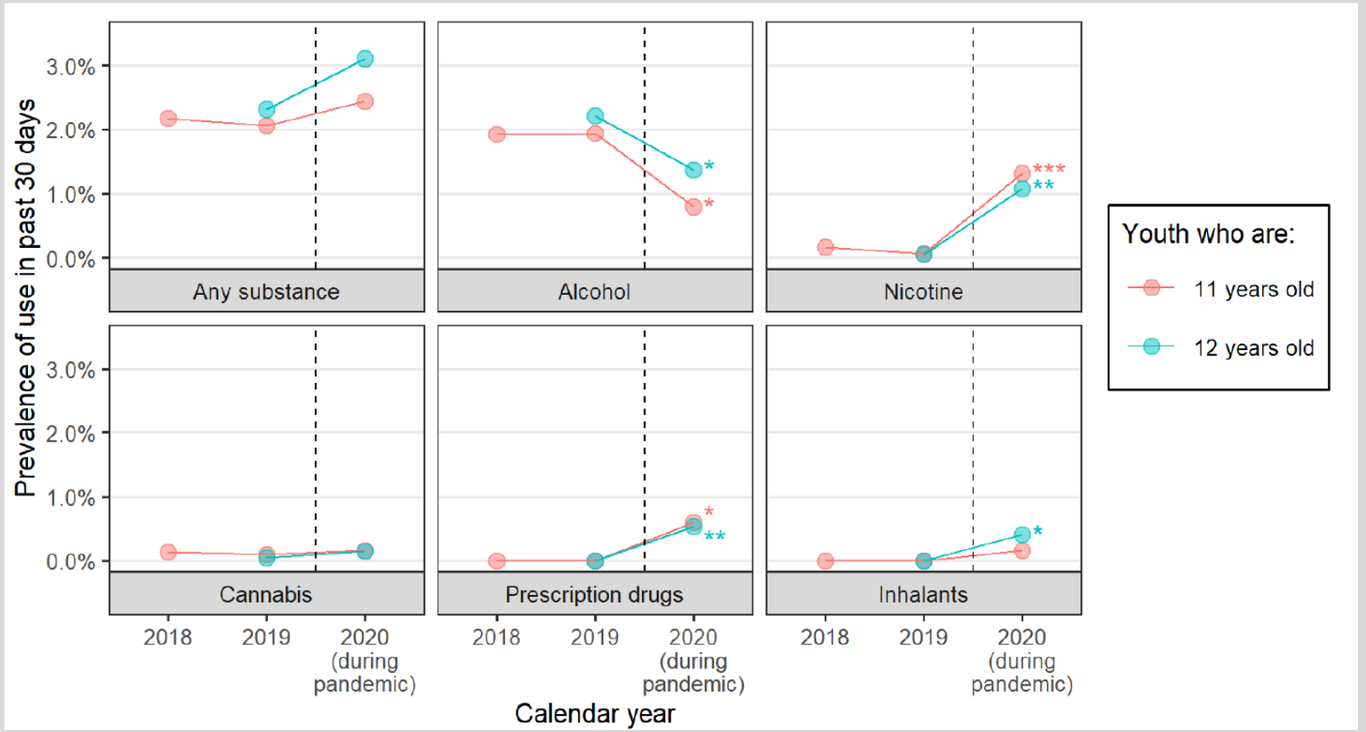
Assessing Impact of COVID-19

Youth substance use





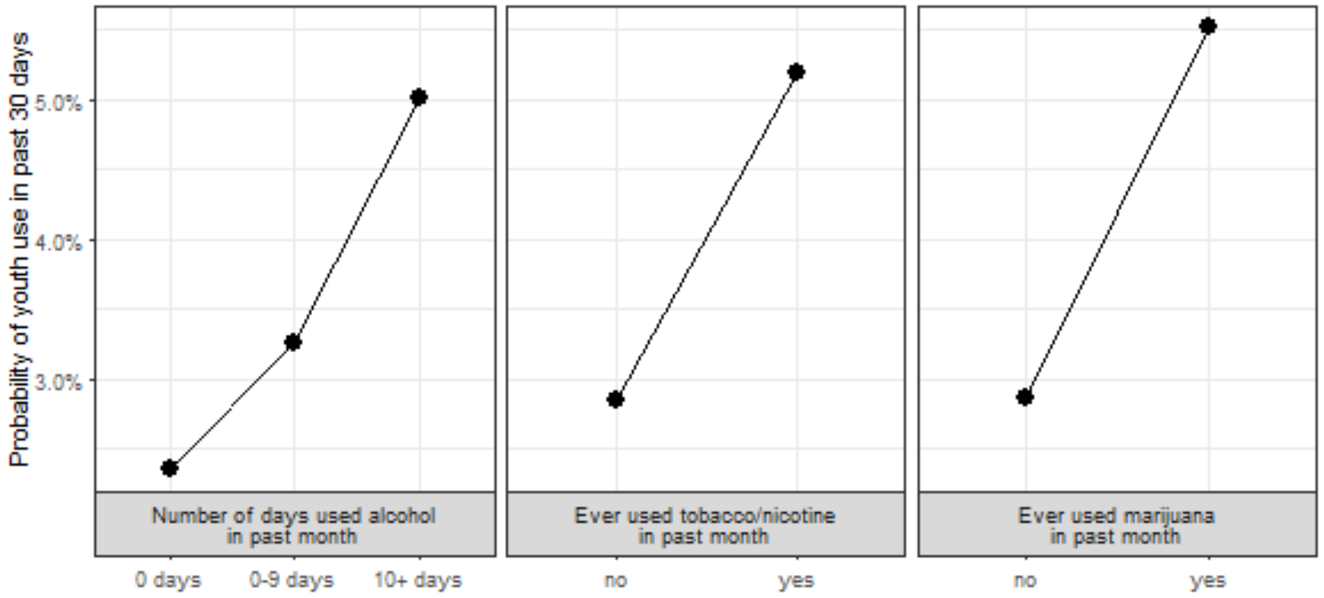
Linked data from N=1080 youth who completed survey #1 during pandemic and completed a main study visit between Sept 2019 and Jan 2020

Age-period design44: prevalence of substance use among participants who were 11- or 12-years-old in the years 2018, 2019, or (May/June) 2020 (total *n*=7,585 11-year-olds, 3,549 12-year-olds).

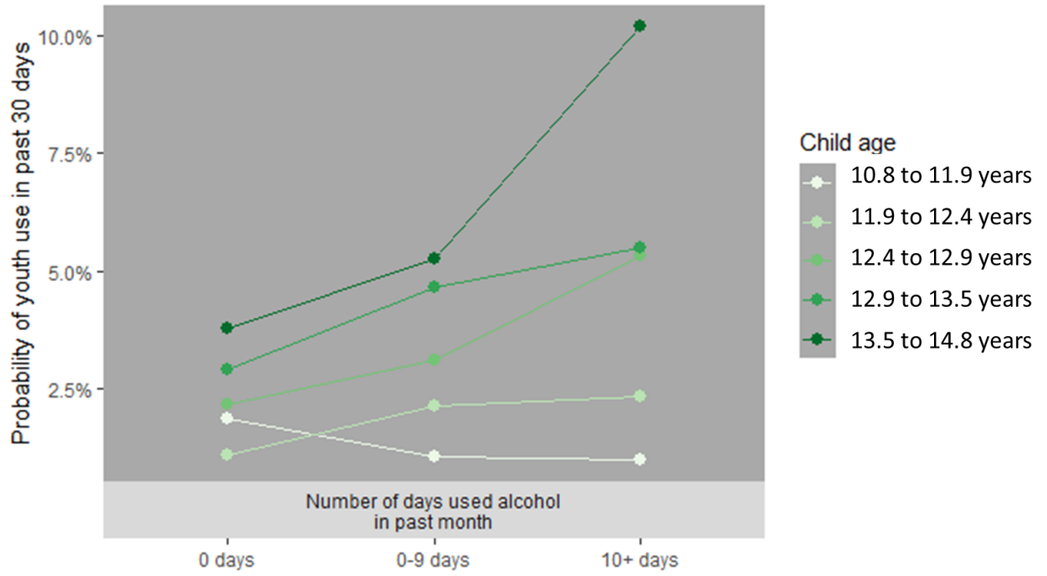
Courtesy of Will Pelham, UCSD (unpublished)
DOI: 10.15154/1520584

Assessing Impact of COVID-19

Relationship between youth and parent substance use



Significant ($p < .05$) association between youth use of ANY substance and parent's frequency of alcohol, tobacco, and marijuana use

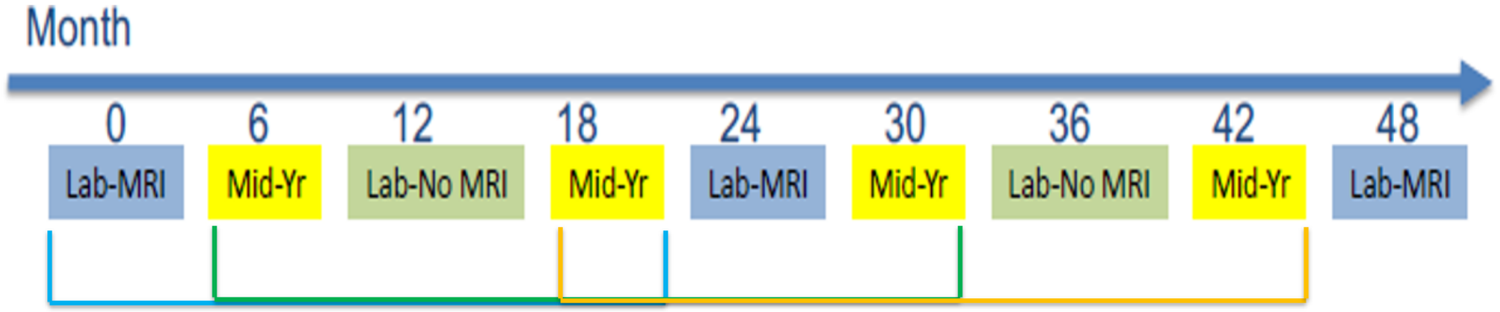


Associations of youth substance use with parent's alcohol use was **stronger** among **older** children

Courtesy of Will Pelham, UCSD (unpublished)
DOI: 10.15154/1520584

ABCD Annual Data Releases

Curated data are released annually via the NIMH Data Archive (https://nda.nih.gov/abcd)



2019 Data Release 2.0
- Full cohort baseline (with imaging)
- Hurricane Irma substudy
- Fitbit data
- Interim:
  - 6-month
  - 18-month
  - 1-year

2020 Data Release 3.0
- Full cohort 1-year follow-up
- Full cohort 6-month follow-up
- Interim:
  - 18-month
  - 30-month
  - 2-year (imaging)

2021 Data Release 4.0
- Full cohort 2-year follow-up (with imaging)
- Full cohort 18-month follow-up
- Interim:
  - 30-month
  - 42-month
  - 3-year

ABCD COVID-19 Supplemental Data Release is now available

This release consists of survey responses from ABCD families about the impact of the pandemic on their lives. Visit the NIMH Data Archive for more information.

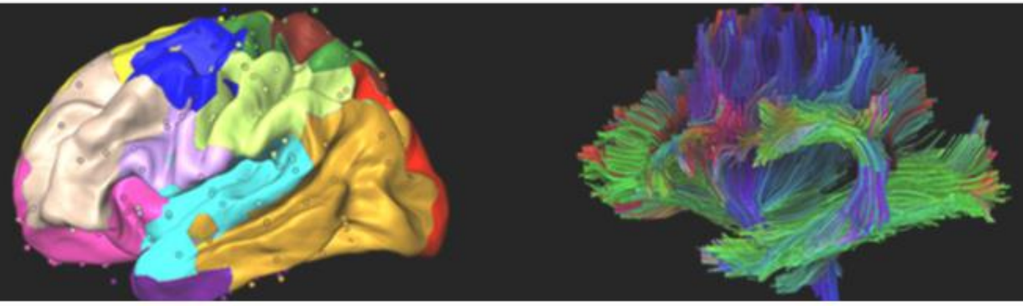
Welcome to the NIMH Data Archive

https://nda.nih.gov/abcd

PAR-19-162 — Accelerating the Pace of Child Health Research Using Existing Data from the ABCD Study (R01)
Participating ICs – NIDA, NINDS, NIMHD, NIMH, NCI, NICHD, ORWH
Standard dates apply

PAR-19-163 – Accelerating the Pace of Child Health Research Using Existing Data from the ABCD Study (R21)
Participating ICs – NIDA, NINDS, NIMHD, NIMH, NCI, NICHD, ORWH
Standard dates apply

Data Sharing



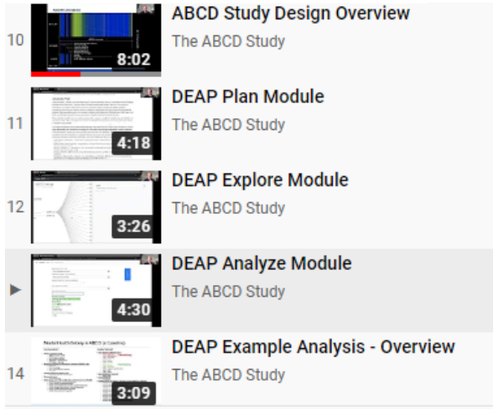
News & Upcoming Events

Diving DEAP into the Adolescent Brain Cognitive Development (ABCD) Study: An interactive workshop on the use of the ABCD Study® Data Exploration and Analysis Portal (DEAP). May 19, 2021

This virtual, interactive workshop, sponsored by the Pediatric Academic Societies annual meeting, will provide opportunities for attendees to learn how to analyze ABCD data using the Data Exploration and Analysis Portal (DEAP). Attendees will also learn about ABCD data that have been made available to the broader scientific community, and understand how data are organized in the NIMH Data Archive. The workshop will take place on Wednesday, May 19, 10 a.m. – noon ET. For more information and to register, click here.

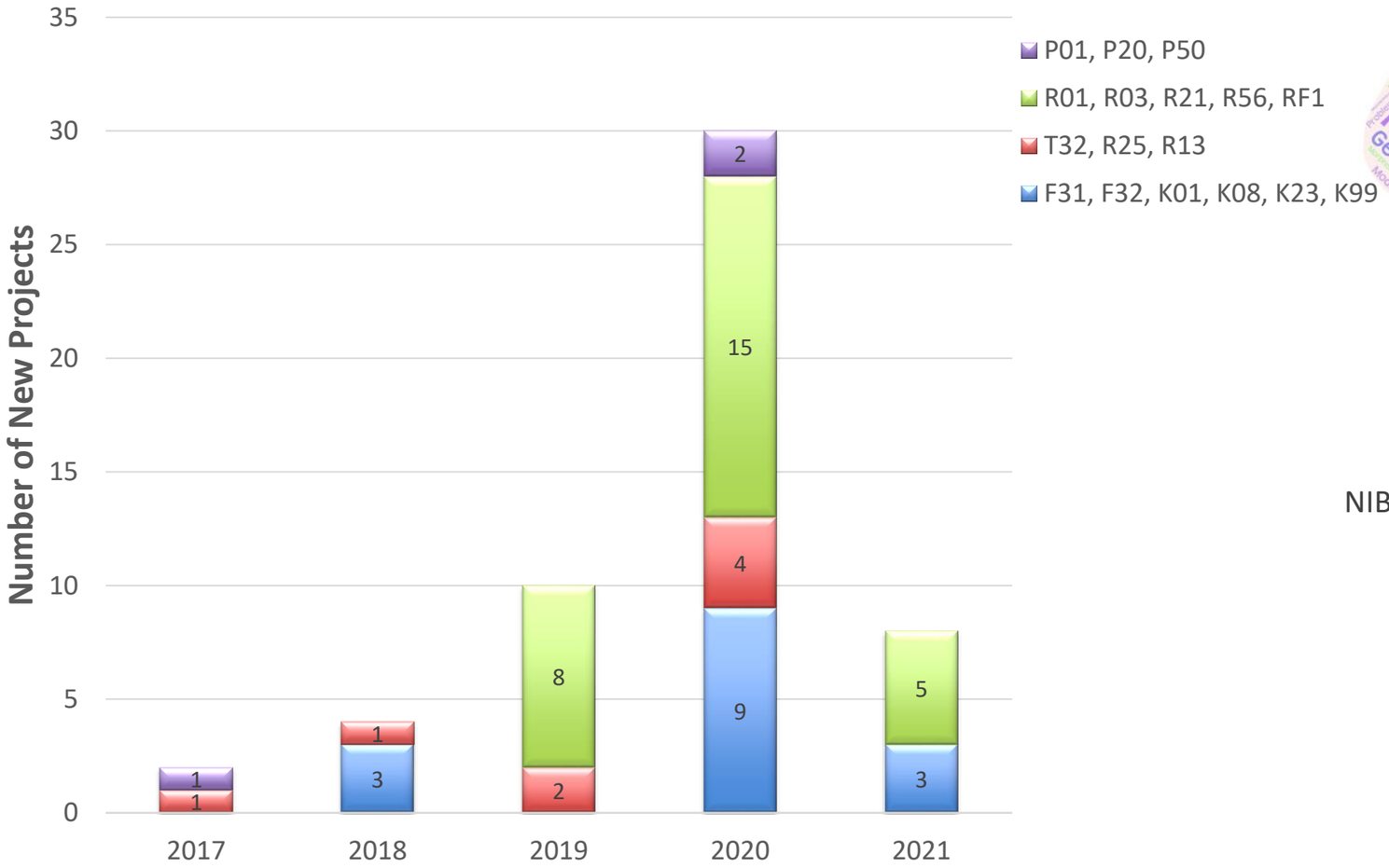
Attending a Diving DEAP workshop?

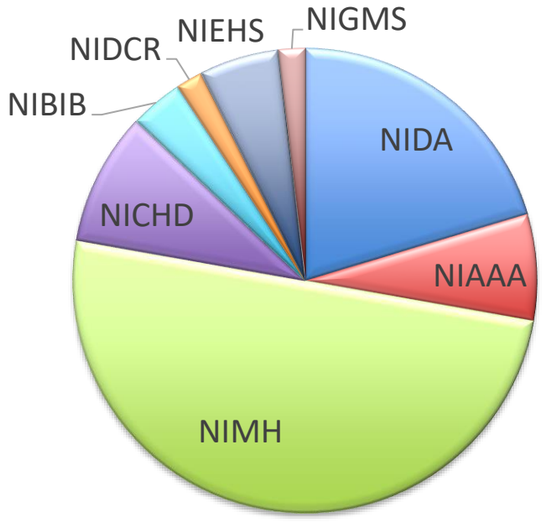
- In order to participate in the hands-on learning portion of the workshop, you must have approved access to the ABCD data repository on the NIMH Data Archive (NDA). Watch the following videos (NDA Overview and NDA Demo) to learn how to access ABCD data and submit your signed data use certification to the NDA.
- Watch these brief videos to learn about the extensive ABCD Non-Imaging Assessments Protocol and the Data Exploration and Analysis Portal (DEAP):
  - ABCD Non-Imaging Assessments
    - Overview
    - Substance Use
    - Neurocognition
    - Mental Health
    - Gender Identity and Sexual Health
    - Physical Health
    - Culture & Environment
    - Novel Technology
    - COVID Rapid Response Research



  - ABCD Design and DEAP Ontology
    - Design Overview
    - DEAP Plan Module
    - DEAP Explore Module
    - DEAP Analyze Module
  - DEAP Example Analysis
    - Overview
    - Importing Variables into DEAP
    - Creating Sets of Variables for Batch Analysis
    - Subsetting Data
    - Setting Up Analysis Models

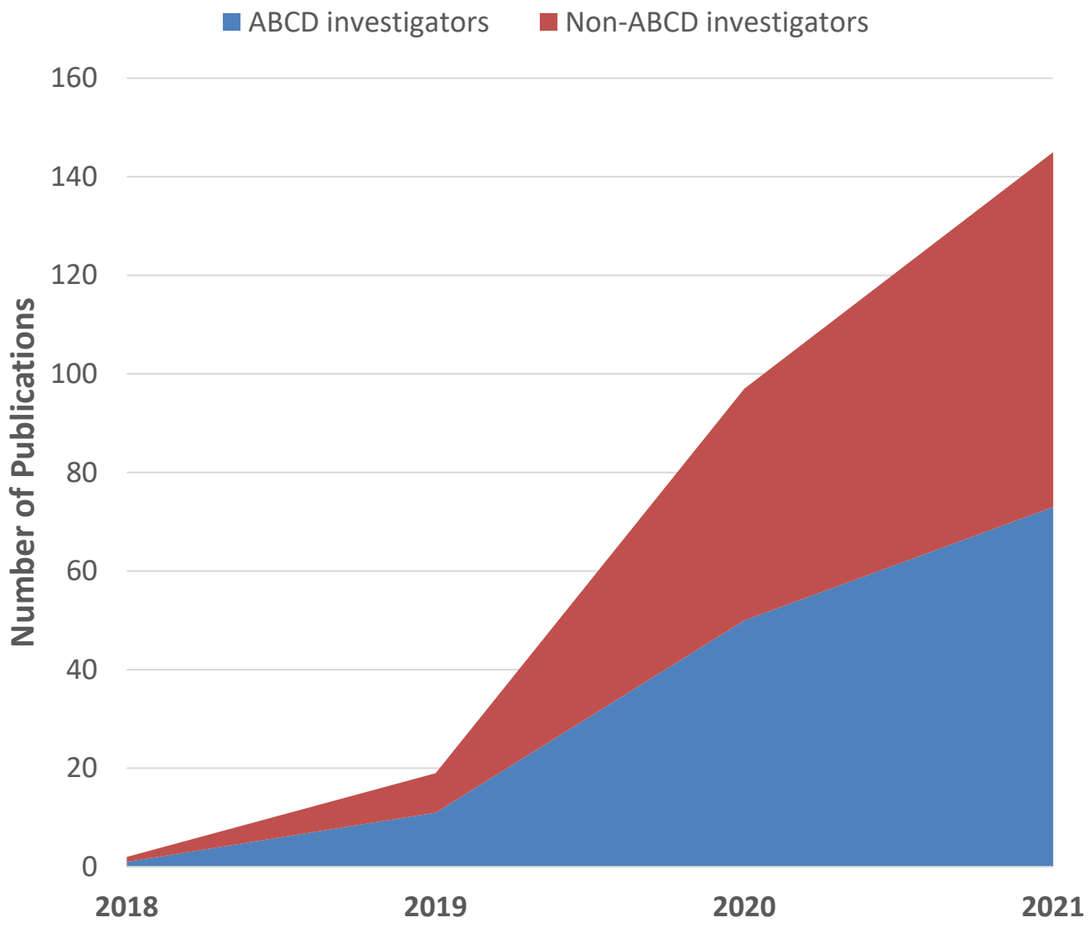
Funded Grants Using ABCD Data

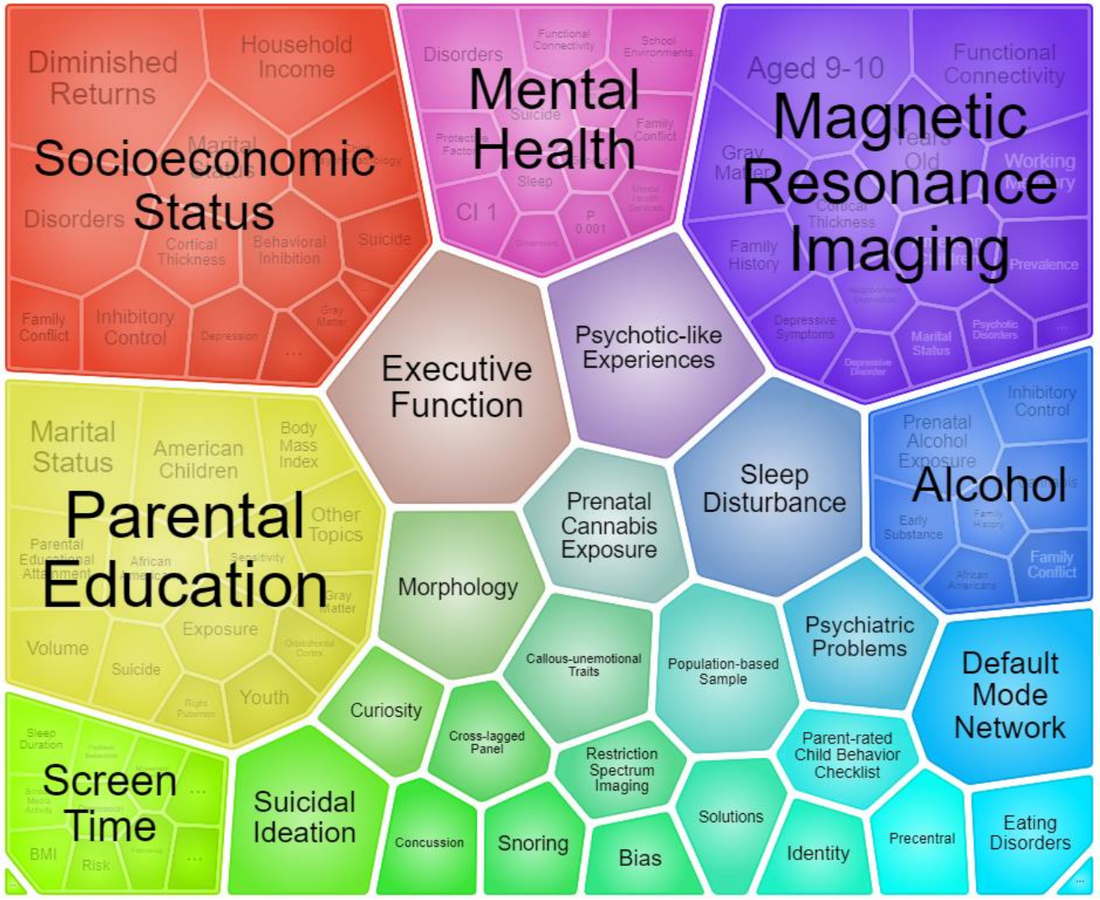




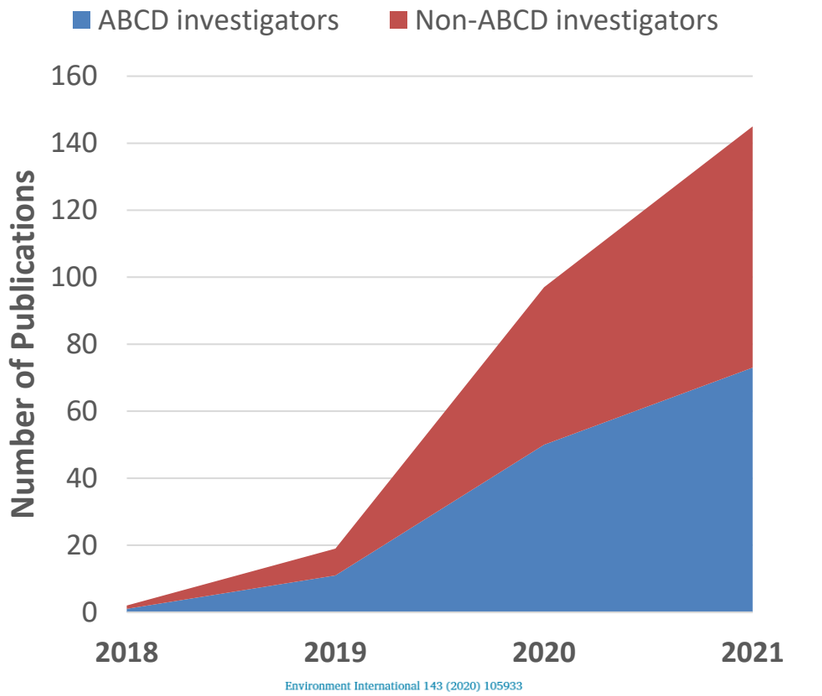
N=54

ABCD Publications





ABCD Publications



Environment International 143 (2020) 105933

Contents lists available at ScienceDirect

Environment International

journal homepage: www.elsevier.com/locate/envint

ELSEVIER

Fine particulate matter exposure during childhood relates to hemispheric-specific differences in brain structure

Dora Cserbik[a], Jiu-Chiuan Chen[a,b], Rob McConnell[a], Kiros Berhane[c], Elizabeth R. Sowell[d,e], Joel Schwartz[f], Daniel A. Hackman[g], Eric Kan[e], Chun C. Fan[h], Megan M. Herting[a,e,*]

RESEARCH ARTICLE

Developmental Psychobiology WILEY

Altered hippocampal microstructure and function in children who experienced Hurricane Irma

May I. Conley[1] | Lena J. Skalaban[1] | Kristina M. Rapuano[1] | Raul Gonzalez[2] | Angela R. Laird[3] | Anthony Steven Dick[2] | Matthew T. Sutherland[2] | Richard Watts[1] | B.J. Casey[1]

frontiers in Public Health

ORIGINAL RESEARCH

Breastfeeding Duration Is Associated With Domain-Specific Improvements in Cognitive Performance in 9–10-Year-Old Children

Daniel A. Lopez[1,2], John J. Foxe[2], Yunjiao Mao[3], Wesley K. Thompson[4], Hayley J. Martin[1] and Edward G. Freedman[2]*

nature COMMUNICATIONS

International Journal of EATING DISORDERS

ORIGINAL ARTICLE | Full Access

Gastric symptoms and low perceived maternal warmth are associated with eating disorder symptoms in young adolescent girls

Kara L. Kerr PhD, Christina Ralph-Nearman PhD, Janna M. Colaizzi PhD, Danielle C. DeVille MA, Florence J. Breslin MS, Robin L. Aupperle PhD, Martin P. Paulus MD, Amanda Sheffield Morris PhD

ARTICLE

https://doi.org/10.1038/s41467-021-22534-0 OPEN

Associations between frontal lobe structure, parent-reported obstructive sleep disordered breathing and childhood behavior in the ABCD dataset

Amal Isaiah[1,2], Thomas Ernst[3,4,5], Christine C. Cloak[3], Duncan B. Clark[6] & Linda Chang[3,4,5,7]

nature genetics ARTICLES

https://doi.org/10.1038/s41588-021-00827-w

Shared heritability of human face and brain shape

Sahin Naqvi[1,2,20], Yoeri Sleyp[3,20], Hanne Hoskens[3,4], Karlijne Indencleef[4,5], Jeffrey P. Spence[2], Rose Bruffaerts[6,7,8], Ahmed Radwan[4,9], Ryan J. Eller[10], Stephen Richmond[11], Mark D. Shriver[12], John R. Shaffer[13,14], Seth M. Weinberg[13,14,15], Susan Walsh[10], James Thompson[16], Jonathan K. Pritchard[2], Stefan Sunaert[4,9], Hilde Peeters[3], Joanna Wysocka[1,17,18,21] and Peter Claes[3,4,5,19,21]

ELSEVIER

Journal of the American Academy of Child & Adolescent Psychiatry

Available online 24 December 2020

In Press, Corrected Proof

THE LANCET Psychiatry

ARTICLES | VOLUME 7, ISSUE 12, P1032-1045, DECEMBER 01, 2020

A large-scale genome-wide association study meta-analysis of cannabis use disorder

Emma C Johnson, PhD * • Ditte Demontis, PhD * • Thorgeir E Thorgeirsson, PhD * • Raymond K Walters, PhD • Renato Polimanti, PhD • Alexander S Hatoum, PhD • et al. Show all authors • Show footnotes

New research

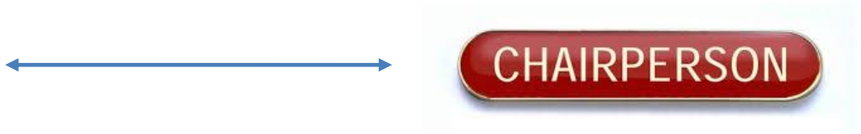
Racial Disparities in Elementary School Disciplinary Actions: Findings From the ABCD Study

Matthew C. Fadus MD [a], Emilio A. Valadez PhD [b], Brittany E. Bryant DSW [c], Alexis M. Garcia PhD [c], Brian Neelon PhD [c], Rachel L. Tomko PhD [c], Lindsay M. Squeglia PhD [c]

ABCD Justice, Equity, Diversity, Inclusion Initiative

Raul Gonzalez

Damien Fair



Bonnie Nagel

Workgroups

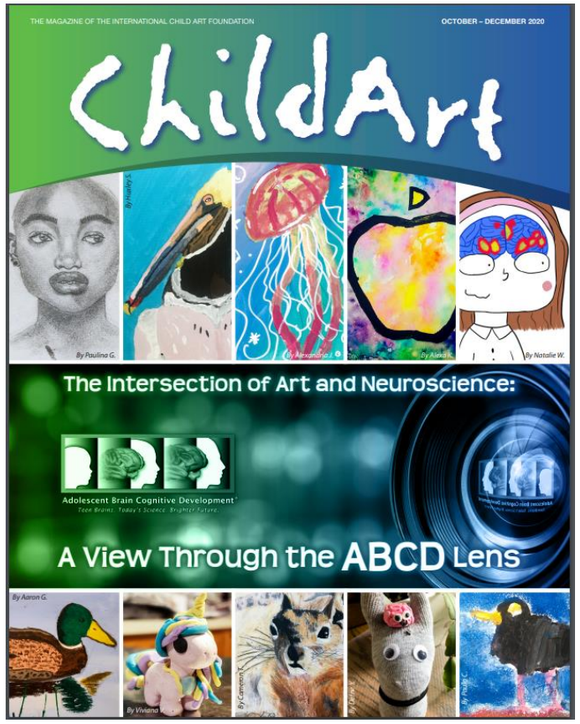
Investigators Trainees RAs Staff

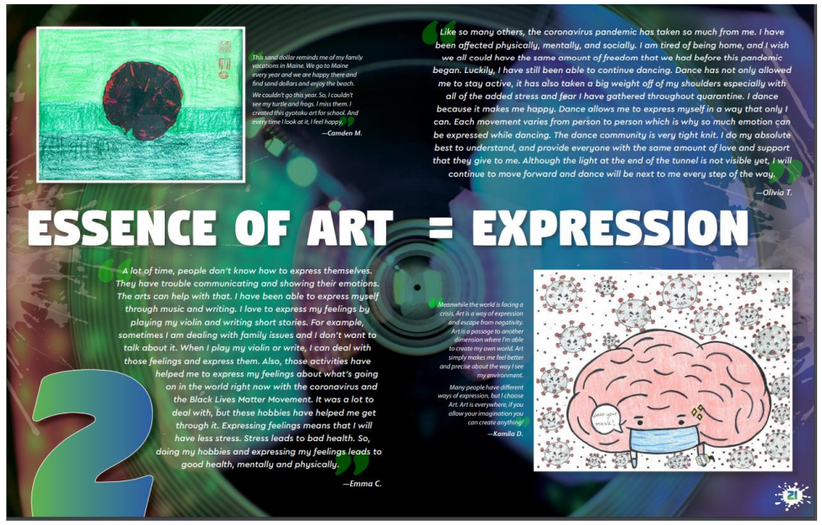
1. Diversity Sensitive Methods

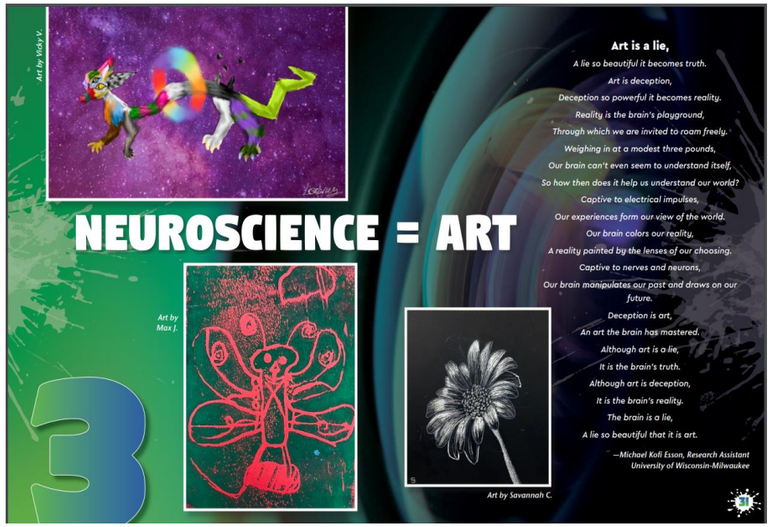
2. Diversity in ABCD

3. Responsible use of ABCD diversity data

ABCD Study® Issue of *ChildArt* Published!







Flipbook https://www.icaf.org/ABCDStudy/
PDF Publication https://icaf.org/childart/ChildArt_ABCDstudy_Oct-Dec2020.pdf

Beyond statistical significance: finding meaningful effects

virtual NIH meeting 09/02/20

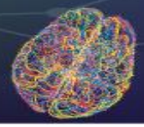
The emergence of population neuroscience has provided unprecedented opportunities for leveraging interdisciplinary expertise to understand behavior and to develop mechanistic models to explain it.

Large, heterogeneous samples:

↑ Statistical Significance ↓ Effect Size

Large cohort studies can reliably detect even small, non-null associations

How do we know when a small effect is meaningful? ⟶ unbiased and replicable
Does context matter – statistical, clinical, biological, public policy…



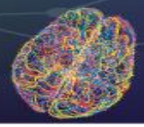
Objective: To develop best practice recommendations for identifying, analyzing and interpreting meaningful effects by engaging researchers from a range of disciplines in discussions of meaningful science that go beyond statistical significance.

Broad, concept-setting overviews

Topic-specific panel presentations

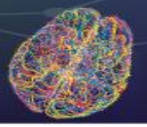
Focused, breakout group discussions

- Small effects
- Covariate control
- Exploratory vs. confirmatory data analysis frameworks



10:00 – 10:30 AM	**Welcome & Opening Remarks**
	Elizabeth A. Hoffman, Ph.D., Scientific Program Manager, Adolescent Brain Cognitive Development℠ Study, National Institute on Drug Abuse
	Nora D. Volkow, M.D., Director, National Institute on Drug Abuse
	George Koob, Ph.D., Director, National Institute on Alcohol Abuse and Alcoholism
	Josh Gordon, M.D., Ph.D., Director, National Institute of Mental Health
10:30 – 11:00 AM	**Keynote address**, Jessica Wapner, Science Journalist, "Putting the reader first: How to communicate meaning in a meaningful way."
11:00 AM – 12:15 PM	**Concept presentations**
11:00 – 11:20 AM	Mike Hawrylycz, Ph.D., Allen Institute for Brain Science, "Meaningful effects in single cell transcriptomics and epigenetics data"
11:20 – 11:40 AM	Ragini Verma, Ph.D., University of Pennsylvania, "Modeling meaningful effects in neuroimaging studies"
11:40 AM – 12:00 PM	Erin Dunn, Sc.D., Massachusetts General Hospital, "Identifying meaningful effects at the intersection between genes, life experiences, and development"
12:00 PM – 12:15 PM	**Discussion**
12:15 – 12:25 PM	**Break**
12:25 – 1:15 PM	**Panel presentations**
12:30 – 12:45 PM	Dana Hancock, Ph.D., RTI International, **Small Effect Sizes**. "Accumulating evidence from small effect sizes: examples in moving from genome wide association studies to biology and clinical prediction"
12:45 – 1:00 PM	Vince Calhoun, Ph.D., Georgia Institute of Technology, **Covariates/Collinearity**. "Strategies to model data in the presence of confounds: examples from brain imaging"
1:00 – 1:15 PM	Jenn Pfeifer, Ph.D., University of Oregon, **Exploratory, Confirmatory Frameworks**. "The power of boundaries: confirmatory versus exploratory research in developmental and clinical neuroscience"

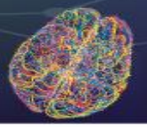
1:15 – 1:45 PM	**Lunch**
1:45 – 1:55 PM	**Breakout Sessions Charge & Logistics**
2:00 – 2:30 PM	**Breakout Sessions I** – Topics will be repeated for Breakout Sessions II and III. Participants will rotate through all three topics.
a. Small Effects:	• What is a "meaningful" effect? Even though differences may be highly statistically significant, the results may only account for a small proportion of the variance and/or have little ability to predict outcomes. • How can small effect sizes be interpreted in terms of causality or prediction? For example, does a small effect size in an observational study necessarily mean that a subsequent experimental manipulation or intervention will not be effective, or could not serve as an accurate outcome predictor? • Should there be different standards when interpreting results in terms of a detectable effect vs. an effect that could be the basis of an intervention? • Effects may sit on the edge of a nonlinear inflection point so that a little movement in one variable causes disproportionate movement in another. When is a non-linear analysis justified in evaluating a small linear effect?
b. Covariates/Collinearity:	• Some variables have been traditionally viewed as confounds or nuisance variables; however, with large datasets, they may be more aptly incorporated into analytic models as variables of interest. • Removing variance associated with one variable may impact other variables if the constructs are related. • What is the role of the control variable in the underlying theoretical model? How does the exclusion/inclusion of certain control variables inform the model?
c. Exploratory vs. Confirmatory Data Analysis Frameworks:	• Distinguishing between the value of exploratory (e.g., effect size estimation) vs. confirmatory (hypothesis-driven) analytic approaches is especially important for emerging areas of study • Exploratory approaches can inform confirmatory analyses, e.g., by building a strong base of effect size estimates to inform development of a theoretical construct. • Researcher degrees of freedom in confirmatory analyses (resulting from an extensive number of analysis decisions) can threaten inferences and impact Type 1 error. • Pre-specification of analysis strategies via hypothesis pre-registration or registered reports enhances transparency and reproducibility.
2:35 – 3:05 PM	**Breakout Sessions II**
3:10 – 3:40 PM	**Breakout Sessions III**
3:45 – 4:10 PM	**Break –** breakout session facilitators prepare for report out.
4:10 – 4:45 PM	**Report out from Breakouts**
4:45 – 5:45 PM	**Grand Discussion**
5:45 – 6:00 PM	**Wrap-up**



Guiding Questions – Small Effects

- **How can small effect sizes be interpreted in terms of causality or prediction?** For example, does a small effect size in an observational study necessarily mean that a subsequent experimental manipulation or intervention will not be effective, or could not serve as an accurate outcome predictor?
- **Should there be different standards when interpreting results in terms of a detectable effect vs. an effect that could be the basis of an intervention?**
- Effects may sit on the edge of a nonlinear inflection point so that a little movement in one variable causes disproportionate movement in another. **When is a non-linear analysis justified in evaluating a small linear effect?**

  - Are large effect sizes always “meaningful”?
  - Can small effect sizes be causal?
  - Small effects can be made even smaller with covariates – overfitting
  - Impact of non-normal distributions (zero inflation)
  - Non-linearity across time and development in long. analyses



Guiding Questions – Modeling Covariates

Determining which covariates to include in statistical models is complex and nuanced, especially in large datasets. Given the impact of covariate selection on replicability and reproducibility, these decisions must be made thoughtfully. Are there optimal strategies for selecting covariate controls? What factors must be considered?

- Domain knowledge
- Dividing confounds into “batches”
- Covariates can be proxies for many other things
- Should fields require default covariates?
- Sensitivity analyses
- Hold-out dataset
- Cross-validate, replicate results

Guiding Questions – Exploratory, Confirmatory Frameworks

- Exploratory approaches such as effect size estimation are especially useful for emerging areas of study. What are some of the barriers to greater adoption of exploratory approaches in our fields and how can we reduce those barriers?
- Pre-specification of analysis plans through the pre-registration and/or registered report processes can reduce researcher degrees of freedom and enhance transparency and reproducibility of results. What are perceived obstacles to pre-registration/registered reports, and what can be done to encourage adoption of these practices?
  - Pre-registration does not preclude changing methodological directions
  - Proposed cultural changes in funding agencies:
    - RFAs calling for exploratory approaches
    - Centralized data science resources for best practices and analytics
    - Incentivizing holdout samples to address issue of overfitting in exploratory analyses


What's
Next?

Positive Economic, Psychosocial, and Physiological Ecologies Predict Brain Structure and Cognitive Performance in 9–10-Year-Old Children

Gonzalez et al. (2021) Frontiers Human Neurosci

What factors contribute to effects of SES on cognition and brain structure?

Children in the US living in poverty

Impaired cognitive performance

Differences in cortical structure

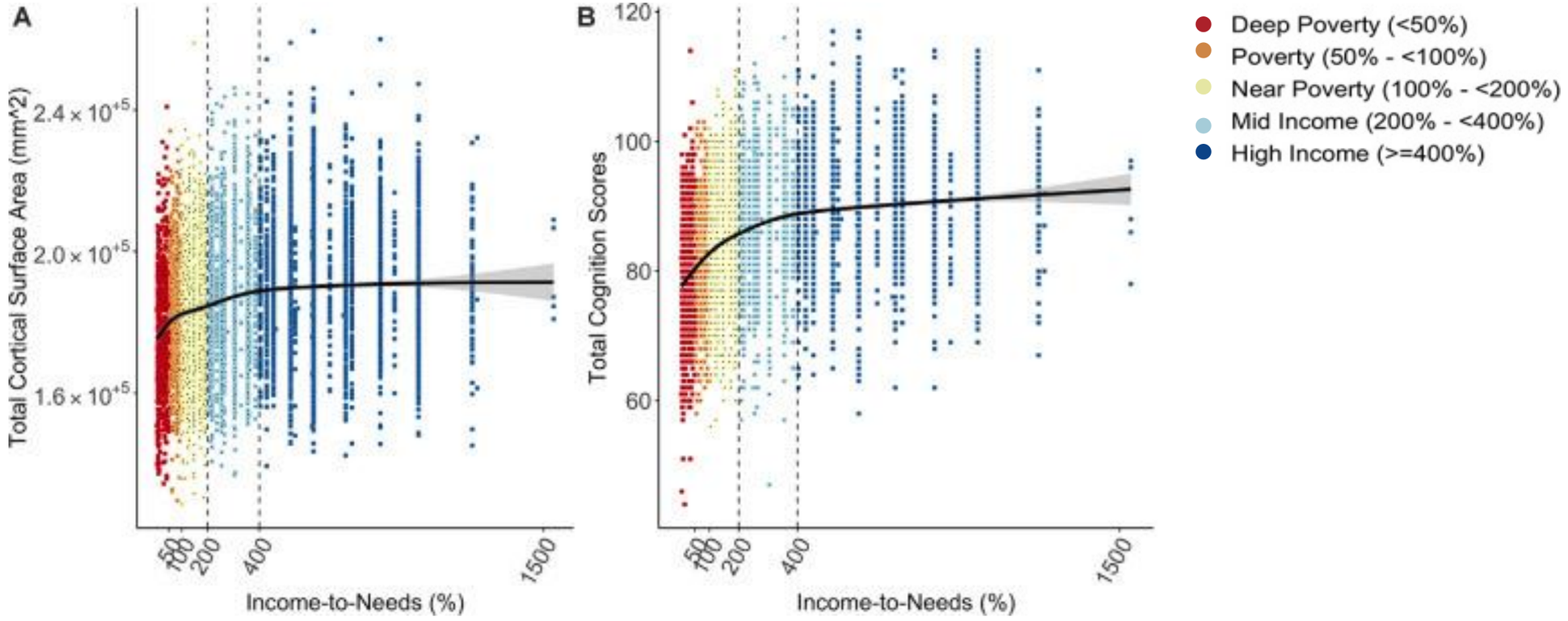
ACEs Economic insecurity School/community

Perinatal Adversity Physiological Parental

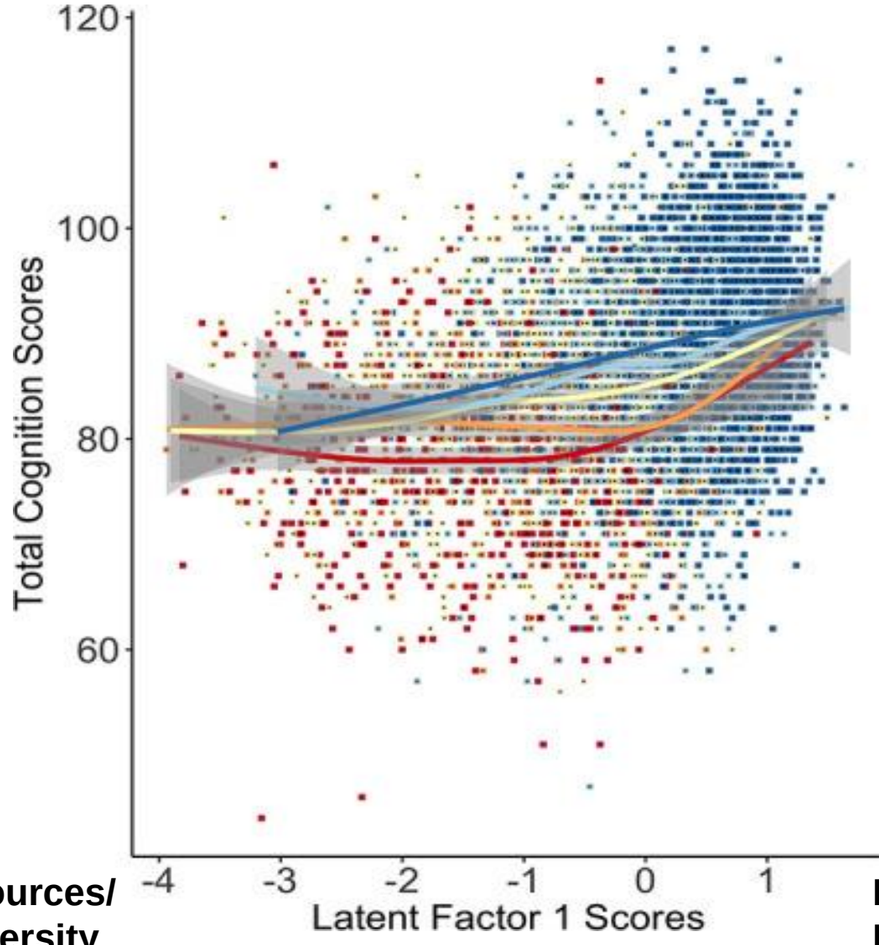
Design

- ABCD baseline data (8,158 participants met criteria)
  - Income-to-needs ratio (INR)
  - Group factor analysis – 22 measures across 6 domains
    - 3 Latent Factors – (LF1)resources-to-adversity, (LF2) youth perceived social support, (LF3) perinatal well-being
  - Mass univariate effect size estimation for cortical surface area

SES Associated With Total Cortical Surface Area and Cognition



SES Moderated Associations Between Latent Resource-to-Adversity and Cognitive Performance



Low resources/ High adversity

High resources/ Low adversity

Deep Poverty (<50%)
Poverty (50% - <100%)
Near Poverty (100% - <200%)
Mid Income (200% - <400%)
High Income (>=400%)

Higher LF1 scores:

- More access to social and economic resources
- Less perinatal adversity
- Less exposure to social adversity
- Less physiological adversity

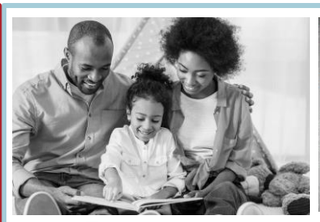
Conclusions, Implications, Opportunities

Children from lower income households with the highest resources-to-adversity scores showed comparable cognitive performance to their higher-income peers

- Opportunity to observe changes over time within our cohort


Perinatal Adversity

ACEs


Parental


Physiological


Economic insecurity


School/community

- Highlights the need to implement public policies that target systemic inequities for youth in poverty/deep poverty


Home visiting to pregnant women and families with newborns


Parenting training programs


Intimate partner violence prevention


Social support for parents


Parent support programs for teens and teen pregnancy prevention programs


Mental illness and substance abuse treatment

High quality child care

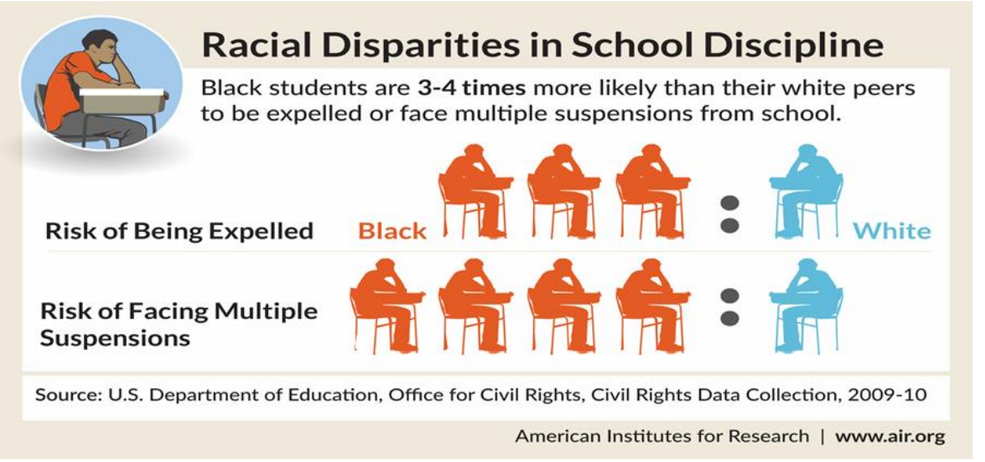

Sufficient Income support for lower income families

Racial disparities in elementary school disciplinary actions: findings from the ABCD Study

Fadus et al. (2021) JAACAP

Background

- **Do school disciplinary practices disproportionately affect youth from racial and ethnic minority backgrounds?**
- Suspensions and detentions are common disciplinary practices in school settings, despite evidence that they are largely ineffective (Losen et al. 2011; Fabelo et al. 2011). They also disproportionately affect Black youth
- They interfere with academic and social development, which can *decrease* motivation and *increase* the likelihood of academic failure (Losen et al. 2015)
- Disciplinary practices are significant risk factors for future juvenile justice system involvement, particularly for Black students (Balfanz et al. 2015)



Design & analysis

- 11,875 youth from the ABCD Study, age 9-10 years
- Data from Child Behavior Checklist, KSADS-5, and the Family Environment Scale to examine disparities in school detentions/suspensions while controlling for typical predictors
- **Outcome variable: "In the past year, did your child have and detentions/suspensions?"**
- Data analyzed with logistic regression

Predictors:
- Race/ethnicity
- Caregiver status (single vs. secondary)

Covariates:
- Parental education
- Household income
- Family conflict
- Special education services
- *Externalizing behavior problems*
- Age
- Sex at birth

Proportion of students receiving suspension/detention within previous year, by race, ethnicity & family structure

							Other	
	Full sample	**White**	**Black**	**Hispanic**	**Asian**	**Other: all**	**Multiracial Black**	**Multiracial non-Black**
All	5.4%	3.0%	15.2%	4.0%	< 1%	7.9%	13.2%	4.0%
Secondary caregiver	3.9%	2.5%	12.1%	3.3%	< 1%	5.9%	10.3%	3.4%
Single caregiver	11.5%	6.6%	18.8%	6.4%	< 1%	12.9%	17.7%	5.9%

Note: To protect confidentiality, participants < 1% are noted as such

Results

- Adjusting for covariates, youth from single-parent households had 1.4 greater odds of receiving detentions or suspensions than youth in homes with a secondary caregiver

- Black youth were 3.5 times more likely to receive a detention or suspension than their white peers (95% CI = 2.7 – 4.6)

Adjusted odds ratios based on logistic regression of detentions/suspensions

Variable	Adjusted Odds Ratio (AOR)	Lower 95% CI	Upper 95% CI	P
Race/ethnicity				
White	-	-	-	-
Black	3.5	2.7	4.6	< 0.001
Hispanic	1.1	0.8	1.6	0.4
Asian	0.3	0	1.9	0.18
Other: multiracial non-Black	1.3	0.8	2	0.35
Other: multiracial Black	3	2.1	4.3	< 0.001

Note: Adjusted odds ratios include covariates

Conclusions, Implications, Opportunities

- Disparities in disciplinary practices occur at 9-10 years, before drop-out and juvenile justice involvement
- Black and multiracial Black students were more likely to receive school discipline than white peers, even after controlling for typical predictors
- Students from single-parent households were more likely to receive school discipline
  - No differences across racial/ethnic groups
- **Longitudinal design of ABCD provides opportunities for examining long-term trajectories and consequences of disparities in school disciplinary actions**
  - Types of suspensions/detentions
  - School climate, linking to external databases

Adolescent Brain Cognitive Development®

Teen Brains. Today's Science. Brighter Future.

ABCDStudy.org

AdolescentBrain@mail.nih.gov