

Adolescent Brain Cognitive Development[®]

Teen Brains. Today's Science. Brighter Future.

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Elizabeth Hoffman, Ph.D.
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May 12, 2021

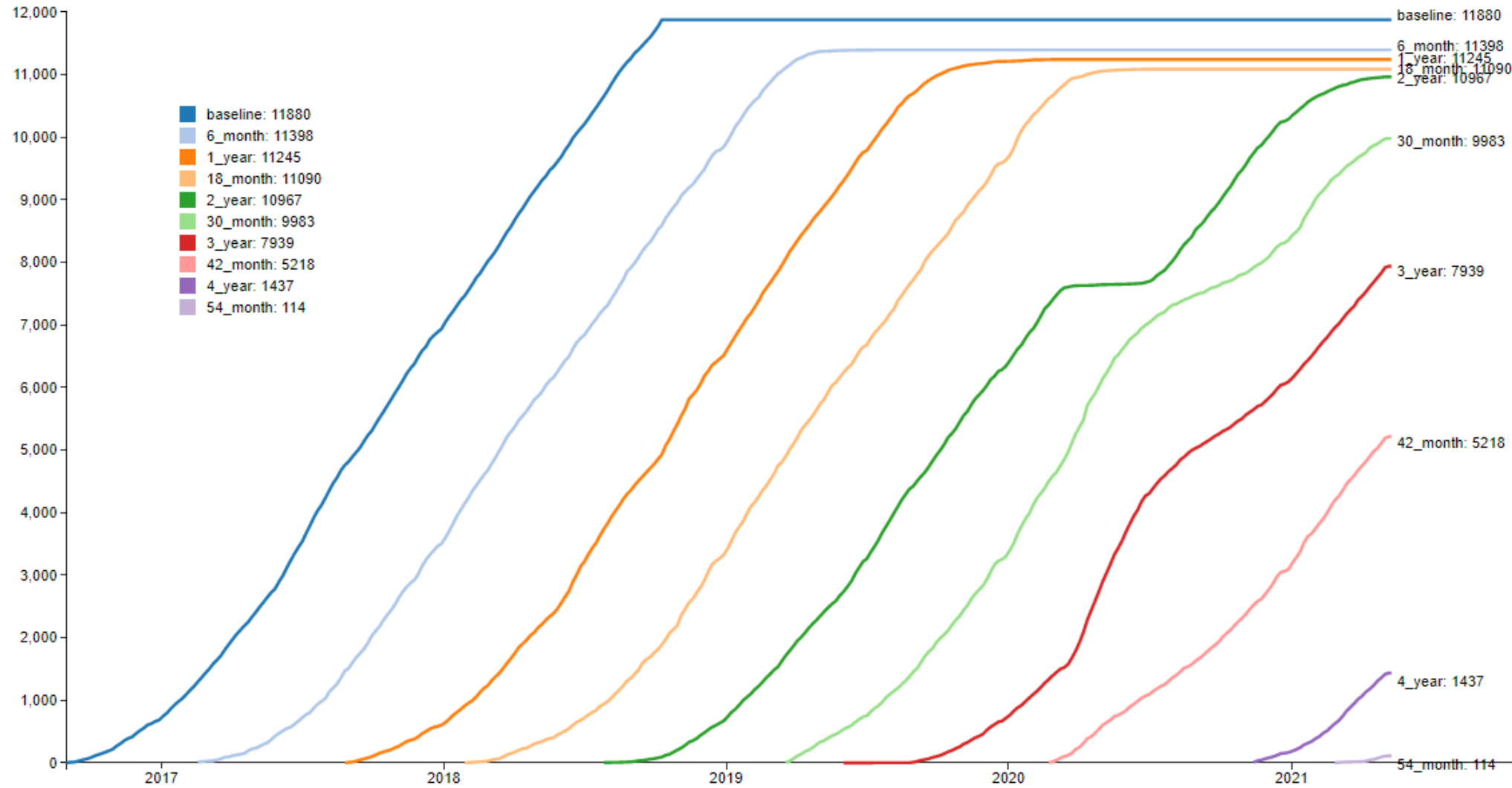


Adolescent Brain Cognitive Development[®]

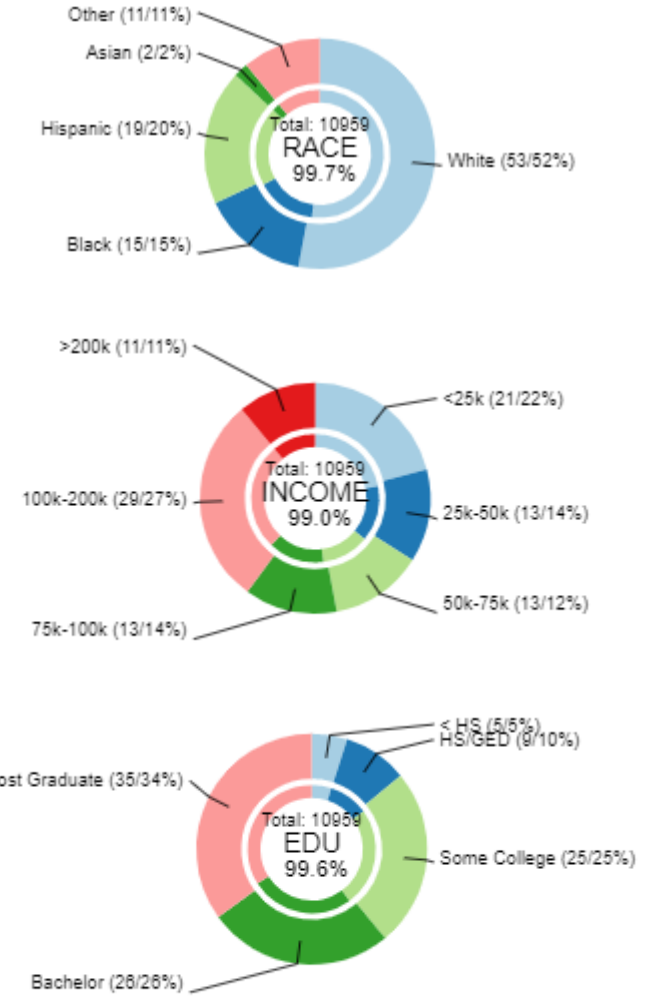
Teen Brains. Today's Science. Brighter Future.

- 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



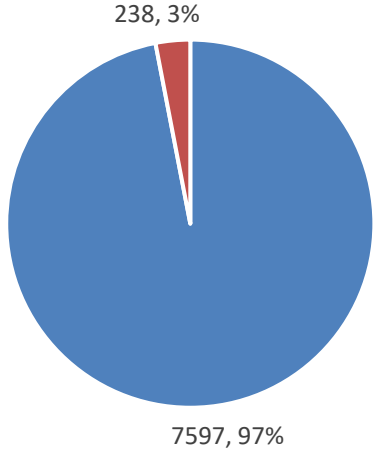
2-year follow-up



Retention – Missed 2-year Follow-Up Visits

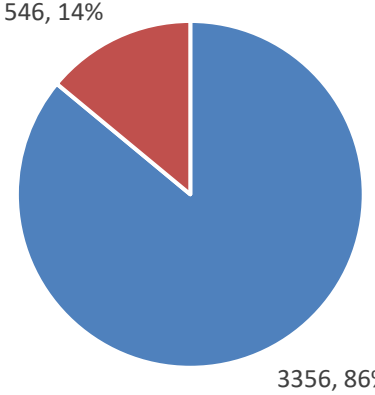
Before COVID

■ Completed ■ Missing

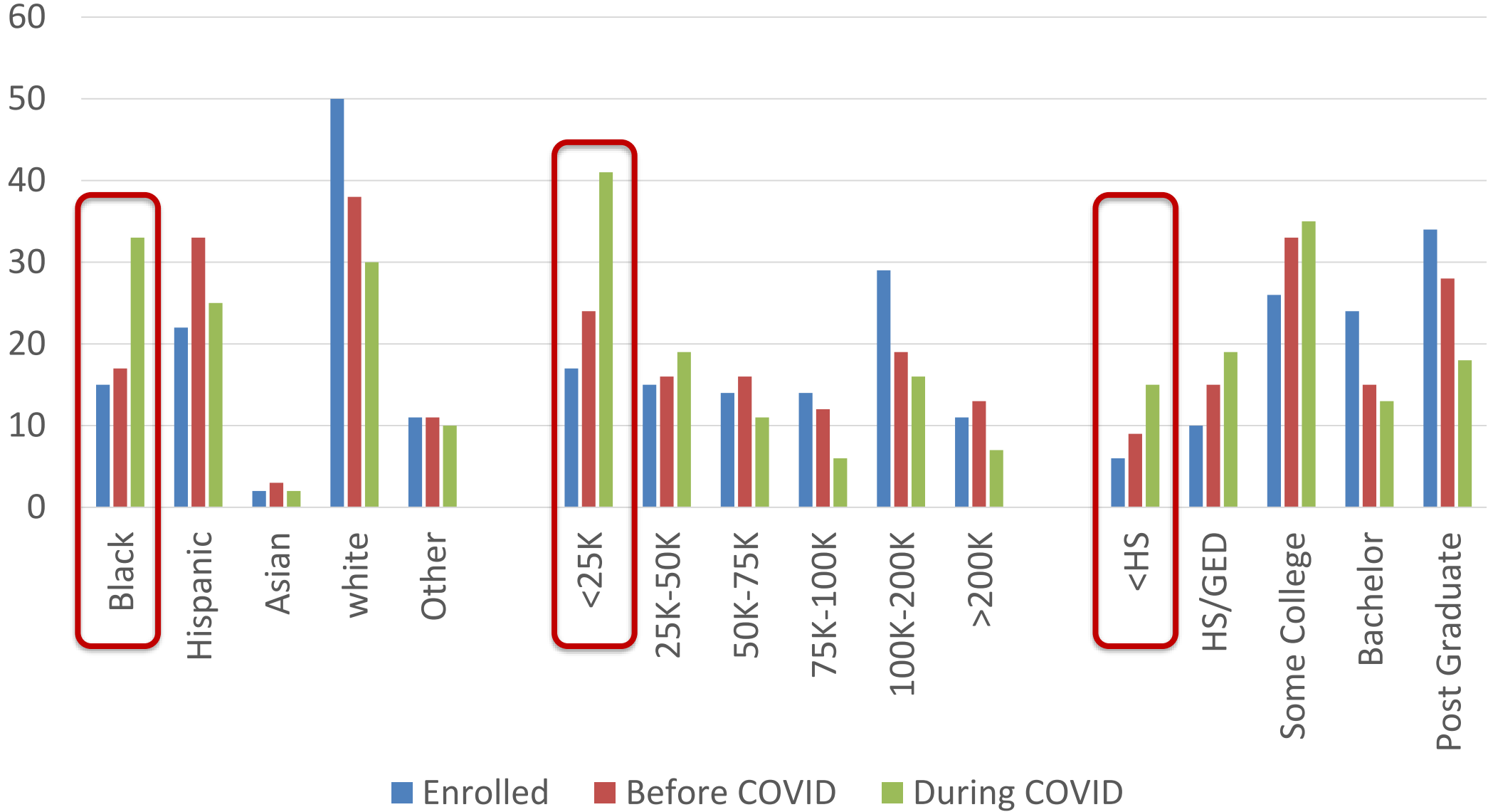


During COVID

■ Completed ■ Missing

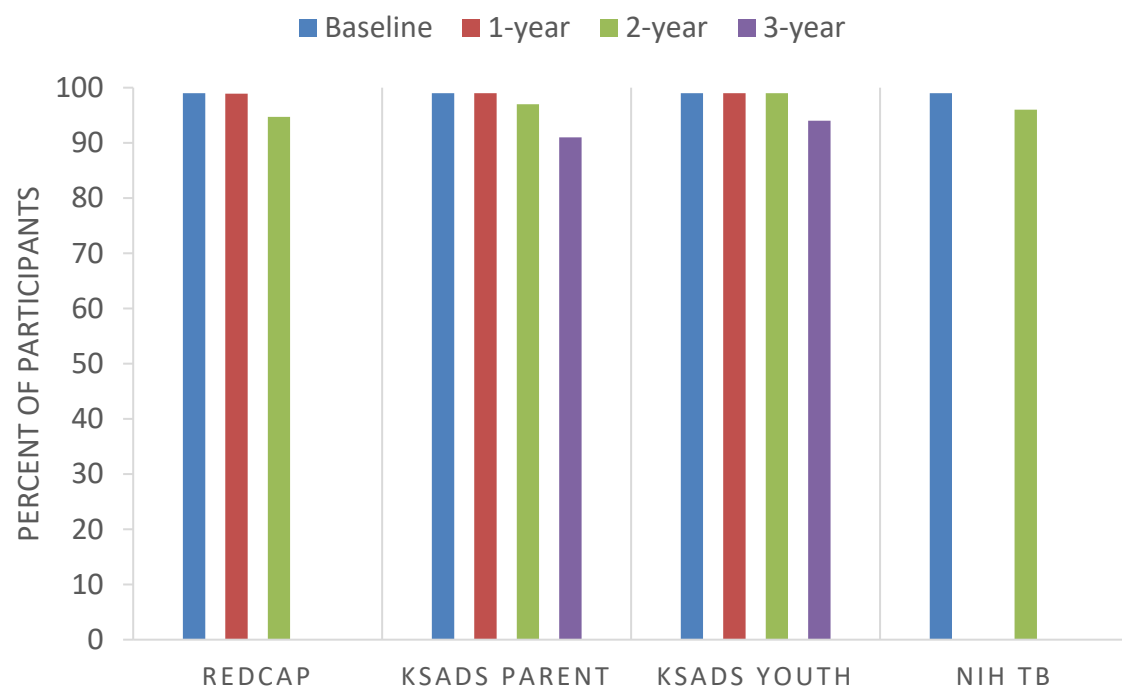


Demographics

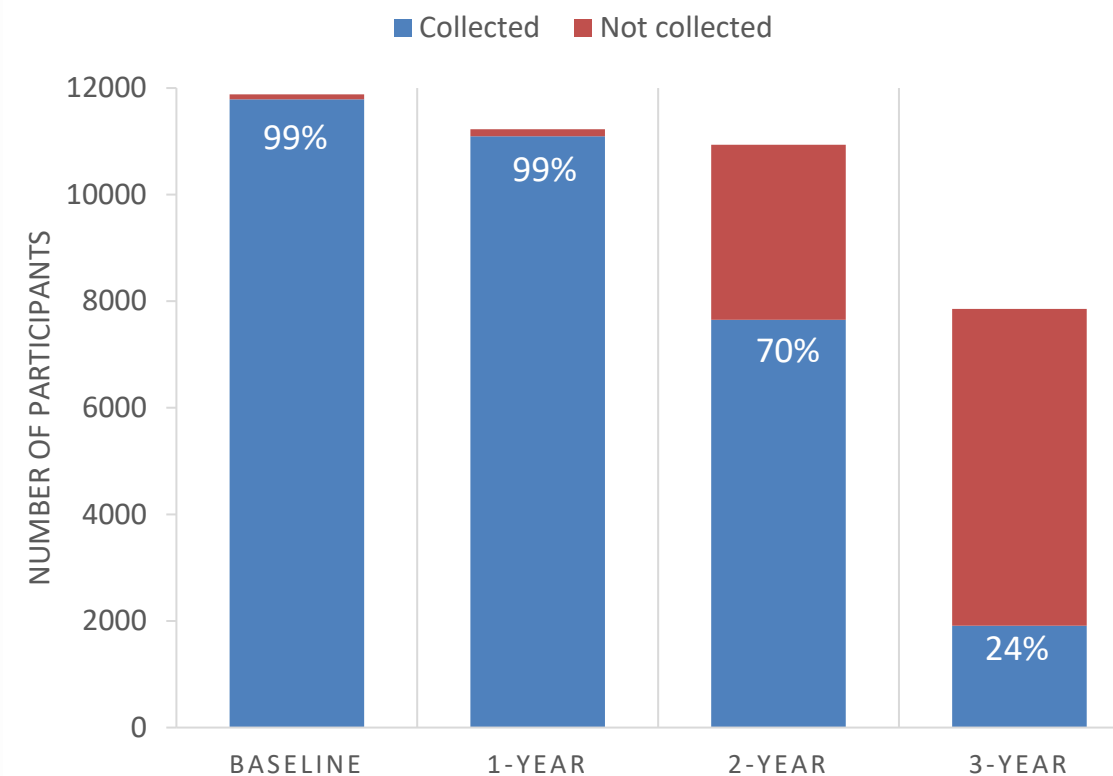


Data Collection

QUESTIONNAIRE AND COGNITIVE DATA



PUBERTAL HORMONE DATA





2017
ABCD STUDY

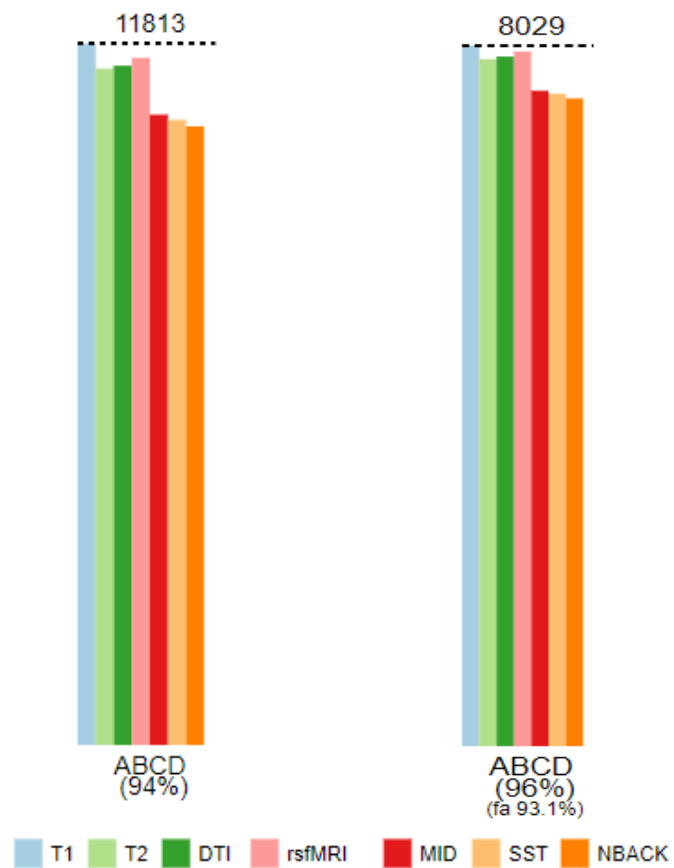
Imaging Data Quality



Imaging Completion

ABCD Baseline

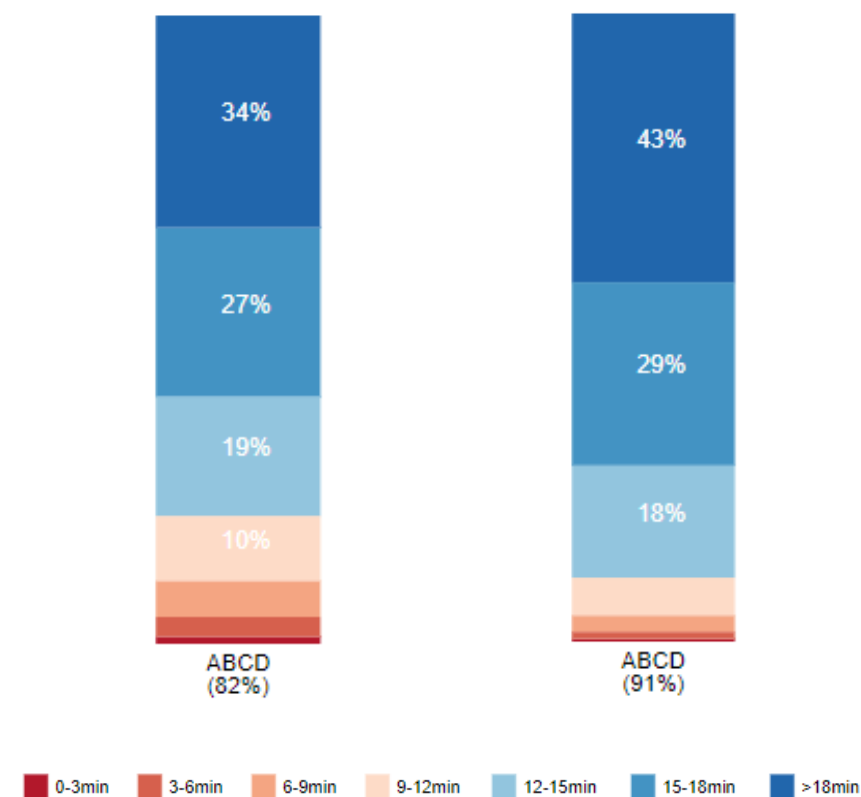
2-year FU



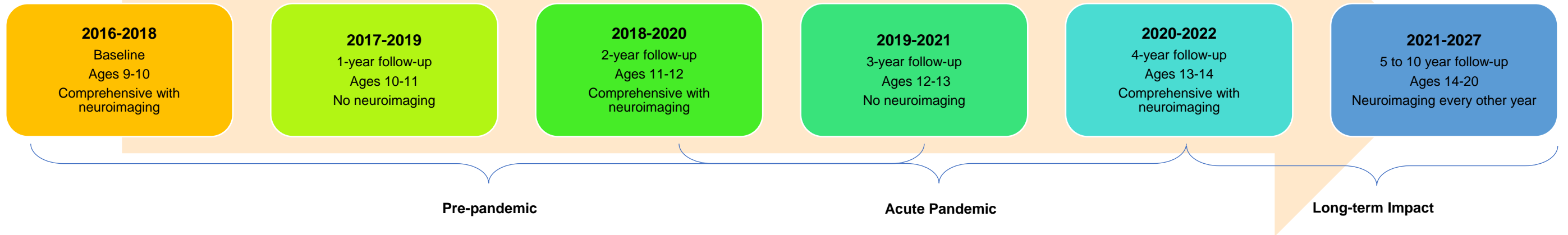
Motion-free rsfMRI

ABCD Baseline

2-year FU



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

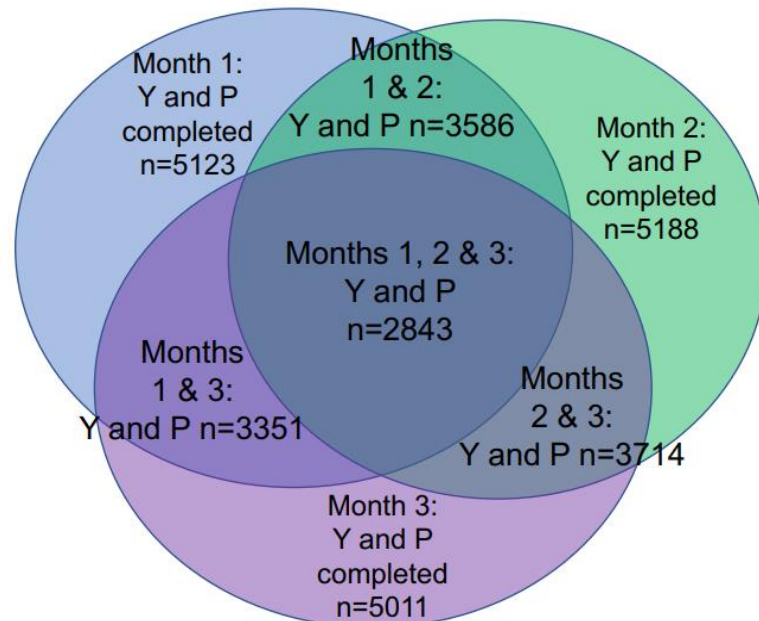
	Youth	Parent
Family Situation: home composition, economic impact, food, illness, parent support	X	X
Youth's Schooling: quality, quantity, methods, and supervision	X	X
Youth's Routine: sleep and physical activity	X	X
Relationships: friends and family	X	
Attitudes & Adherence: COVID-19 public health directives	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%



	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%

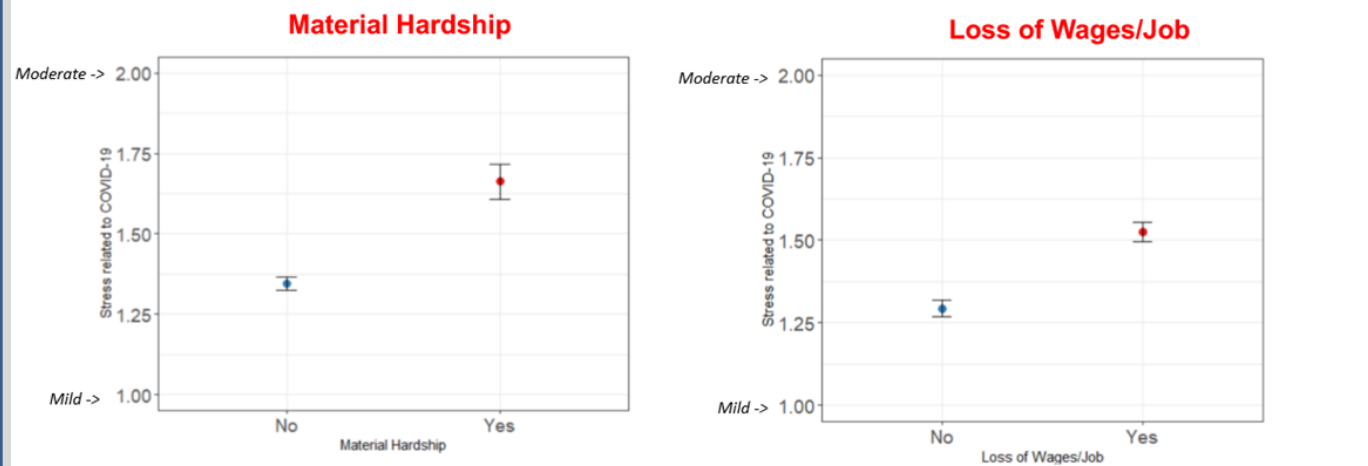
	Sent	Completed		
		1	2	3
<HS	6%	3%	3%	3%
HS/GED	11%	7%	8%	7%
Some college	29%	25%	26%	25%
BA/BS	28%	32%	32%	33%
Masters	20%	24%	24%	24%
Prof school	3%	4%	3%	3%
Doctorate	4%	5%	4%	4%

	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%

Assessing Impact of COVID-19

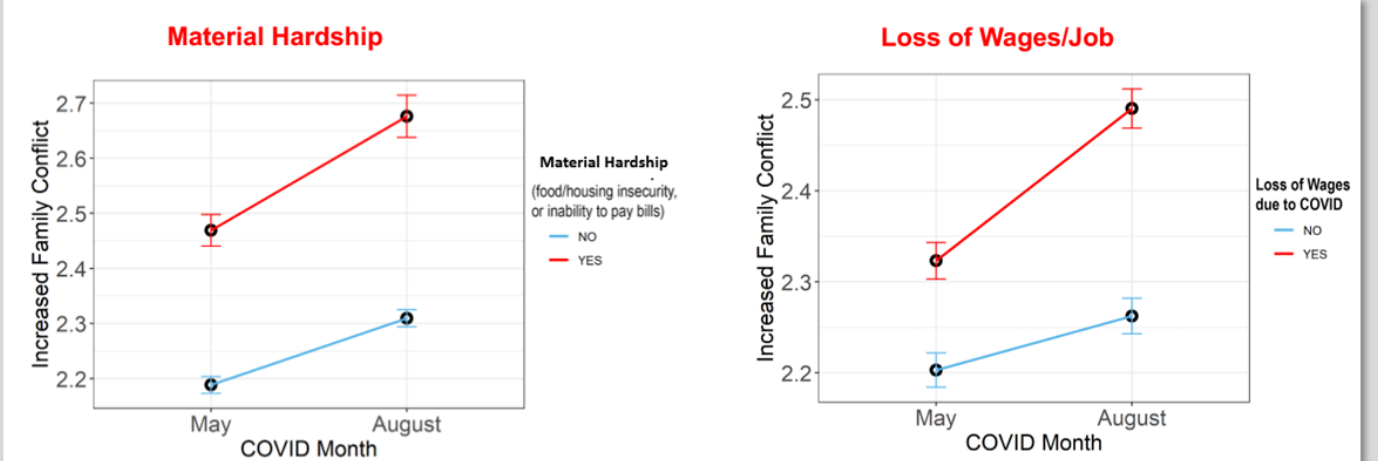
Impact of material hardship on stress and conflict (Surveys 1 & 3)

Pandemic related stress among parents



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

Pandemic related family conflict

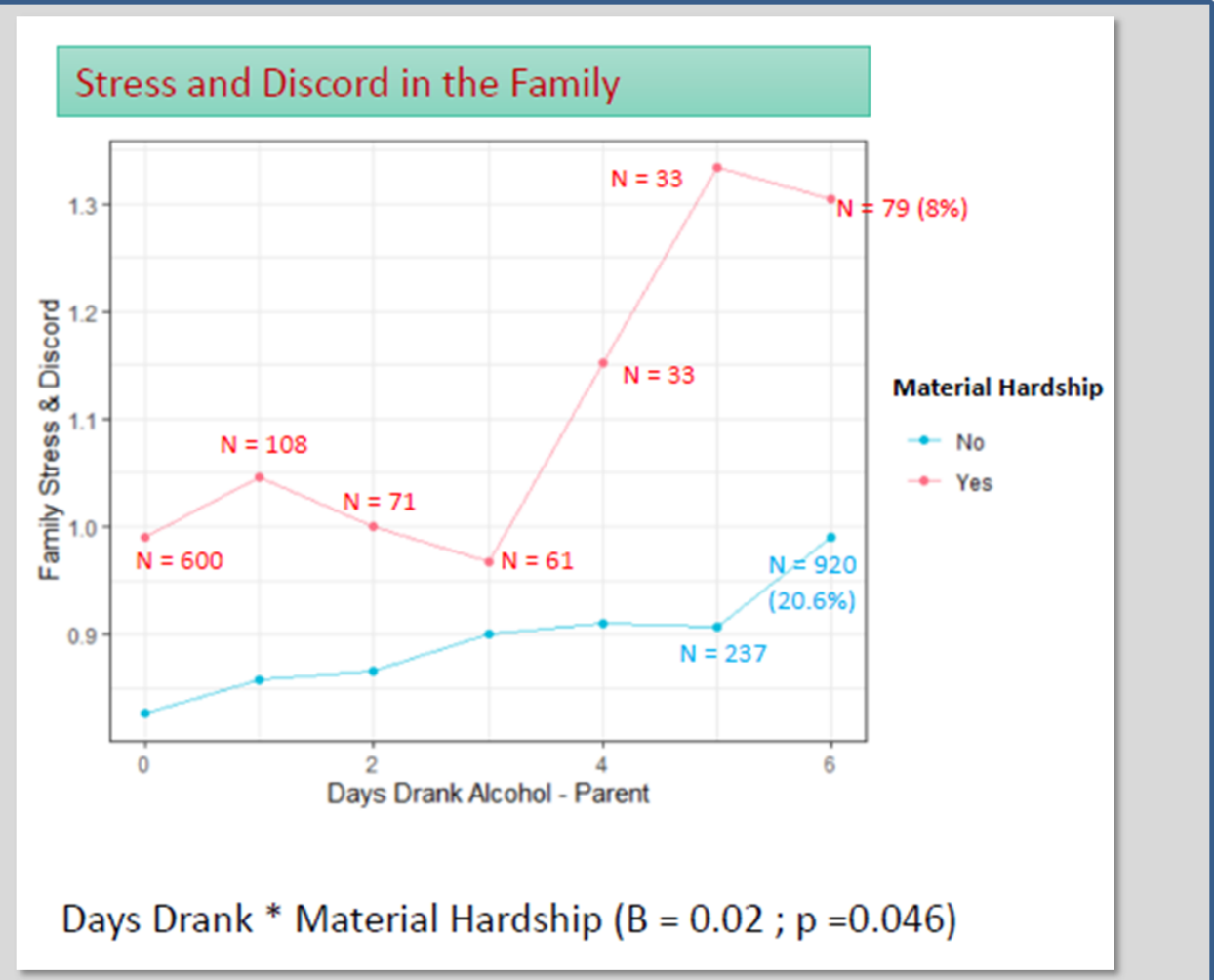
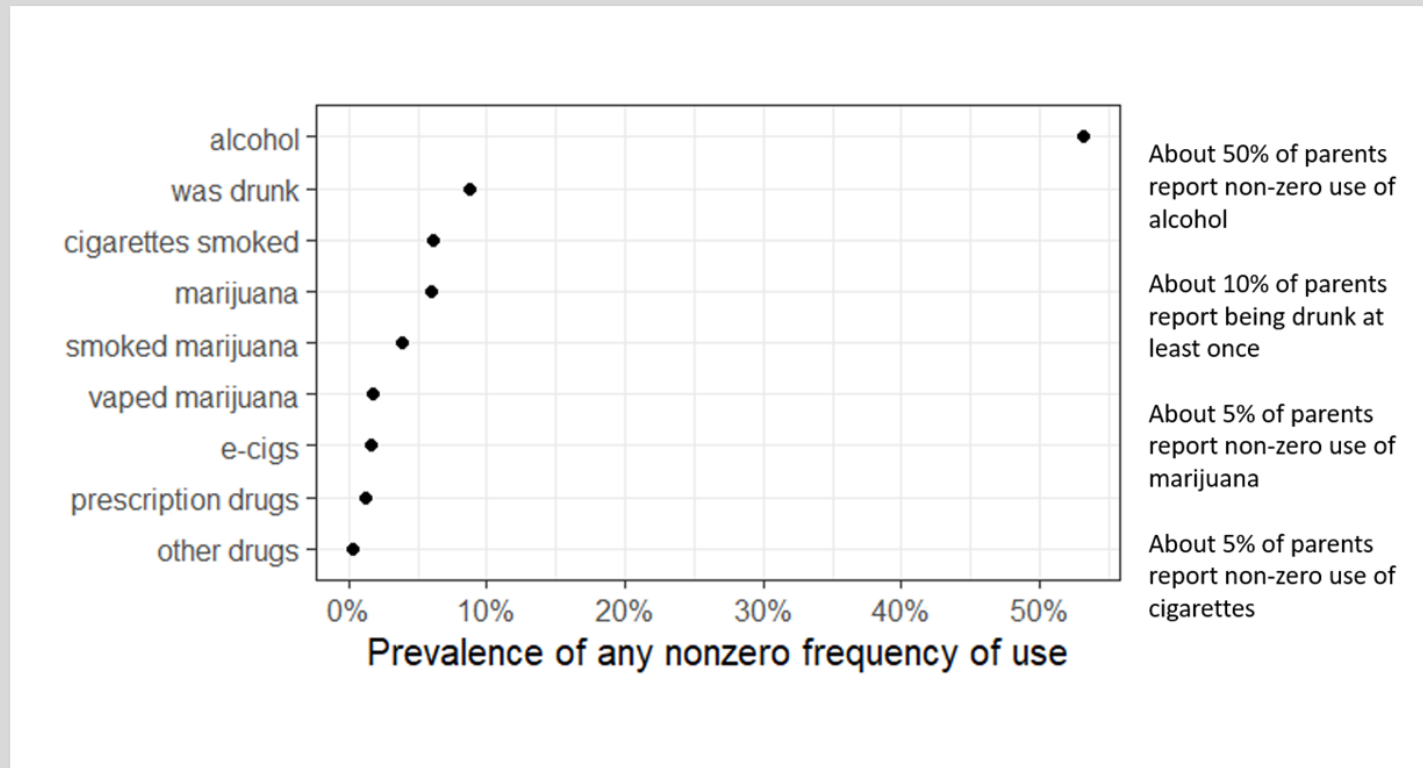


1 – Strongly Disagree 2 – Disagree 3 – Neither 4 – Agree 5 – Strongly Agree

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

Assessing Impact of COVID-19

Parental alcohol use, stress, and family conflict

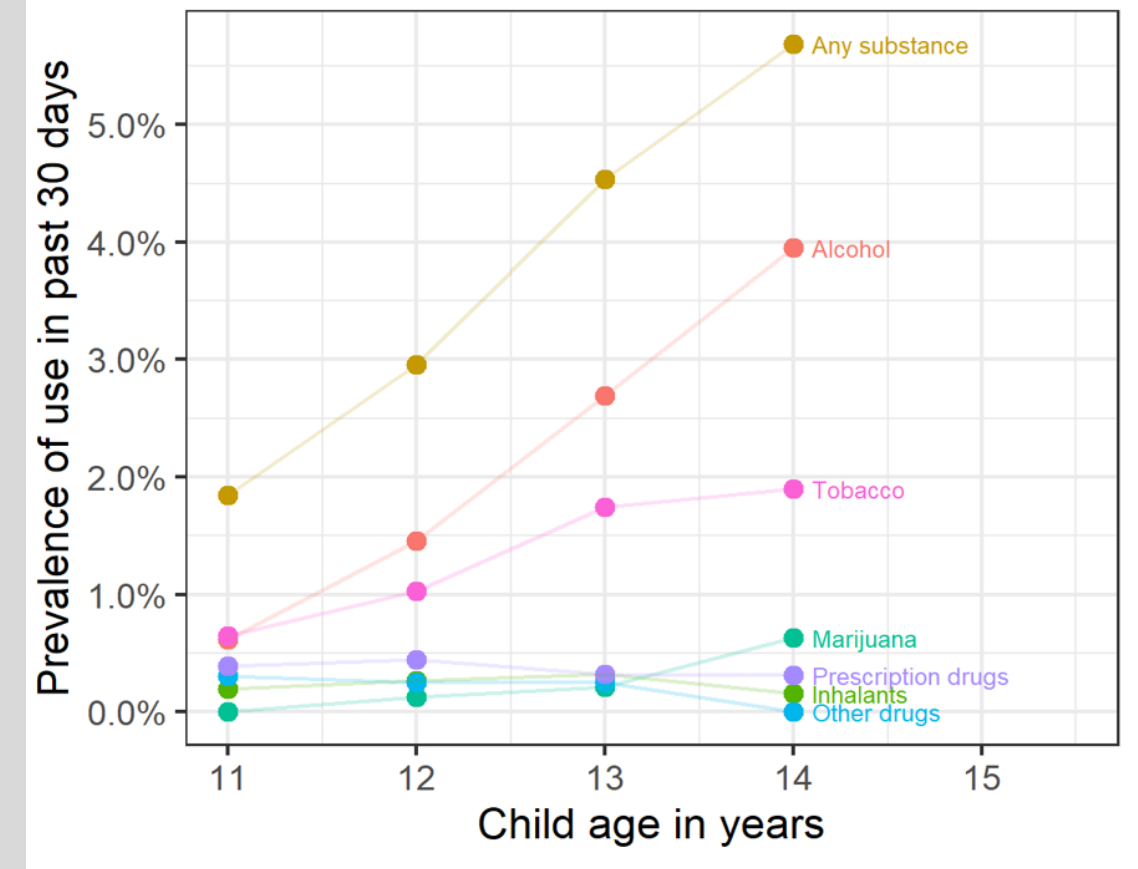
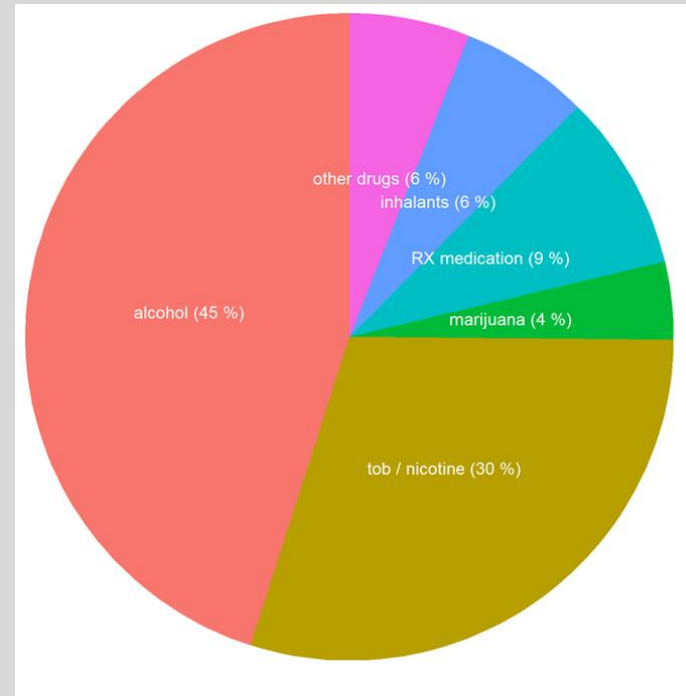
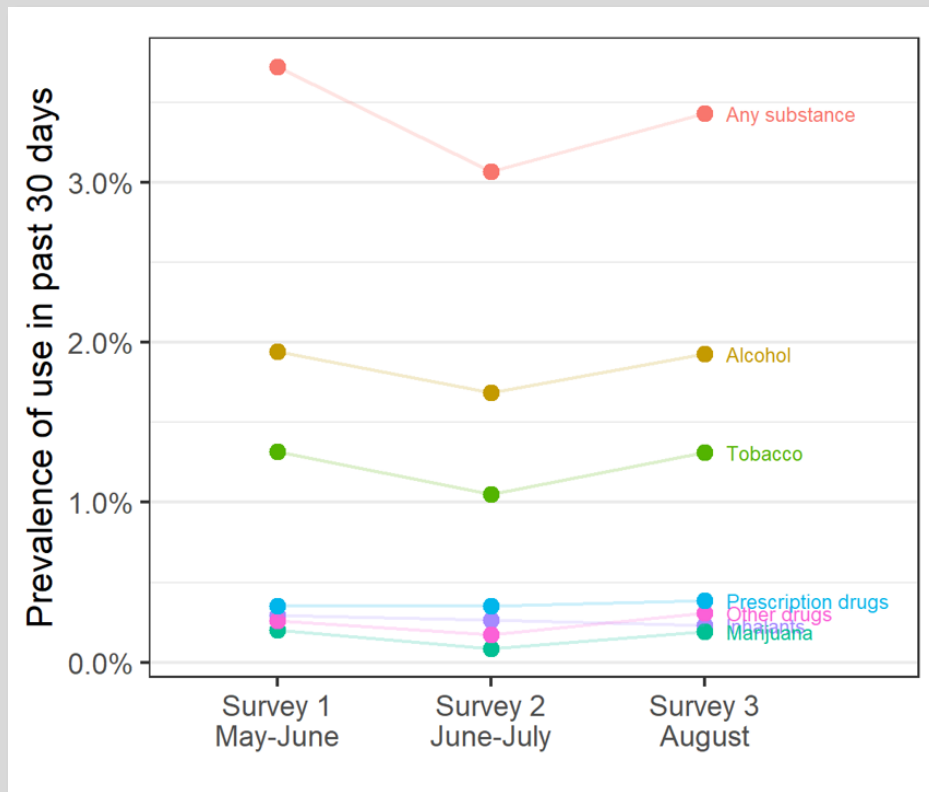


Days Drank in the past month (0, 2, 4, 6+)

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

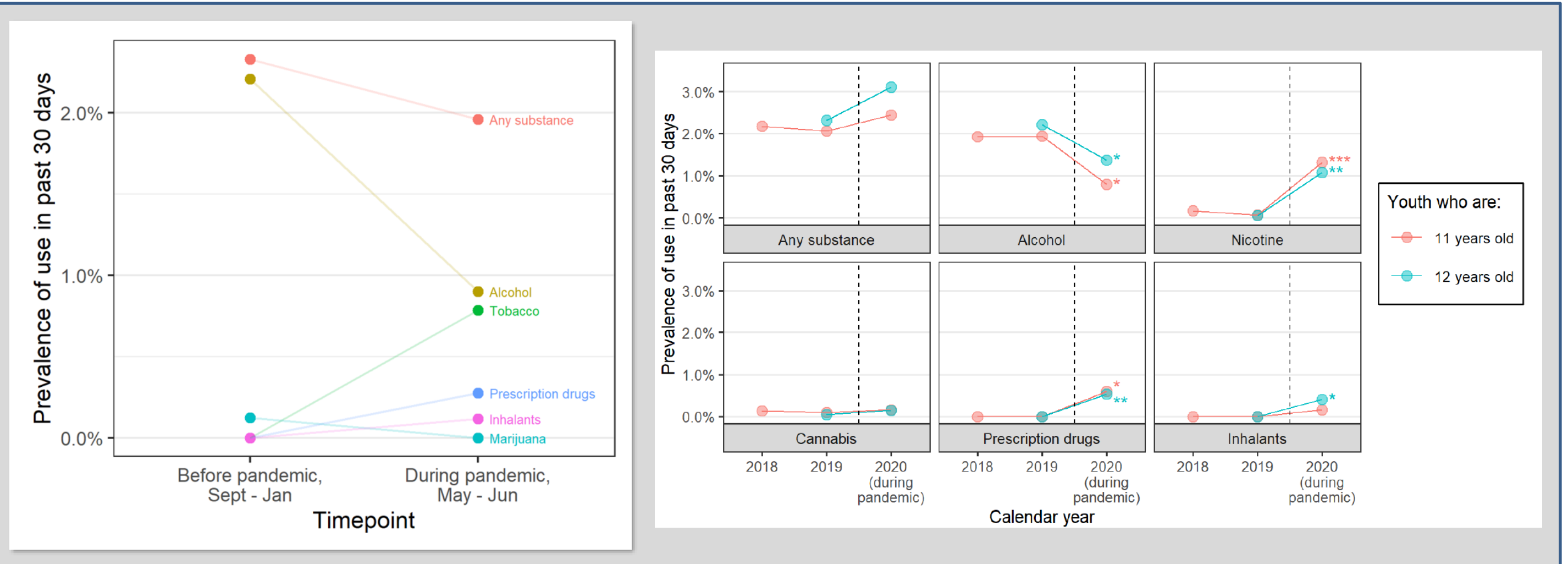
Assessing Impact of COVID-19

Youth substance use



Assessing Impact of COVID-19

Youth substance use



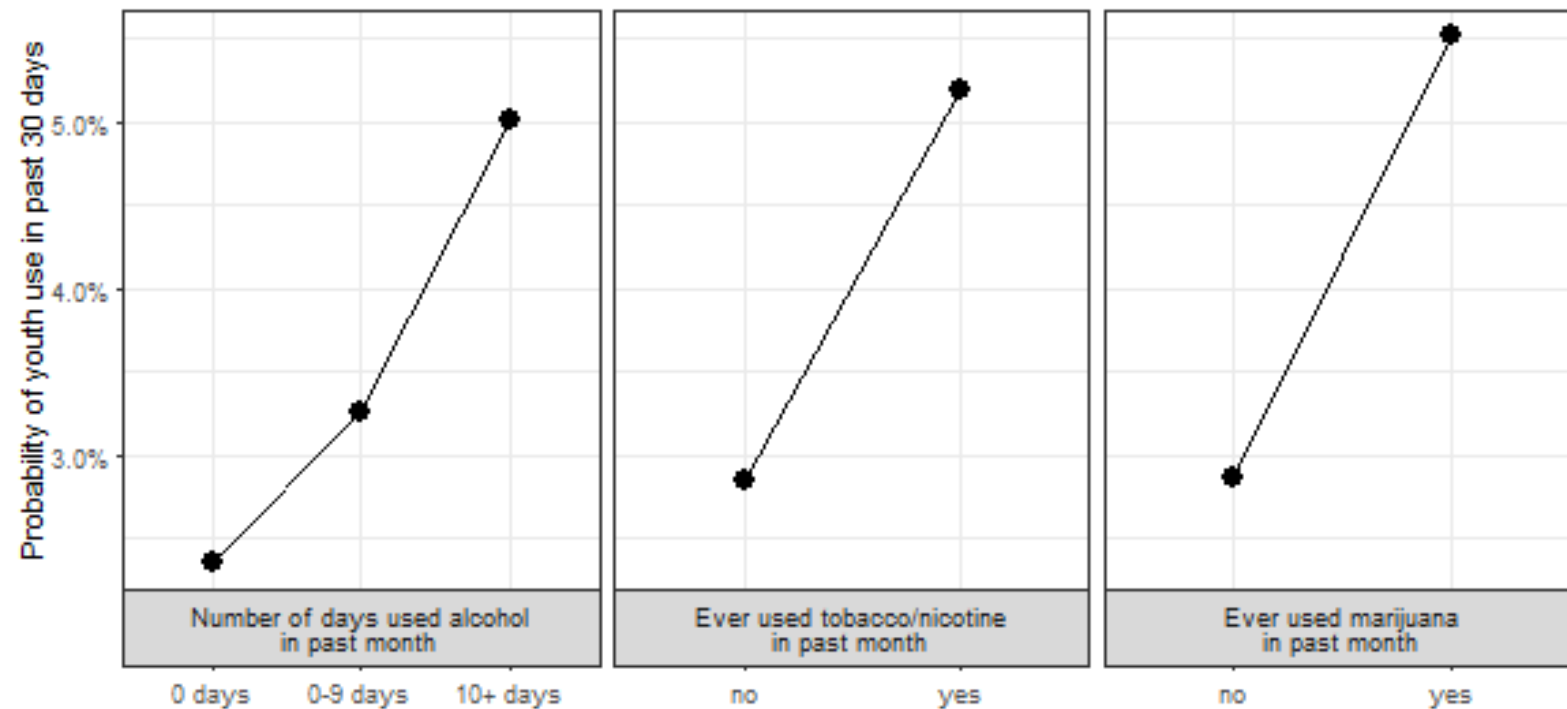
Linked data from N=1080 youth who completed survey #1 during pandemic and completed a main study visit between Sept 2019 and Jan 2020

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).

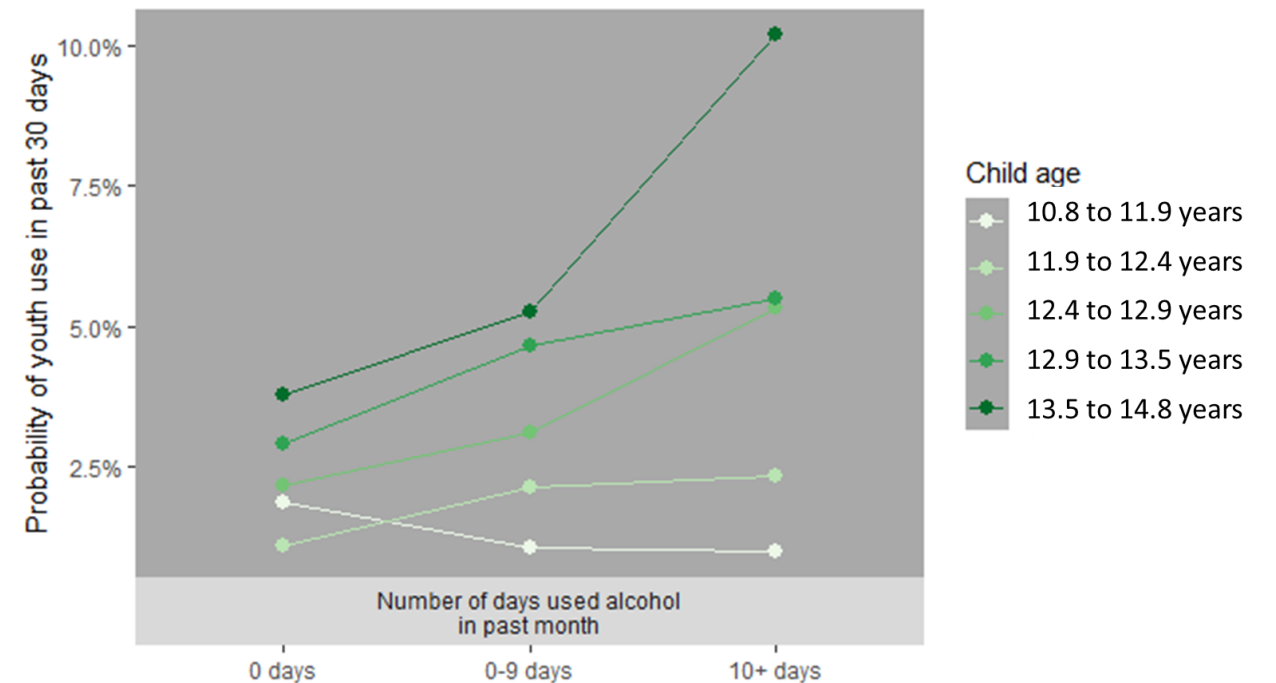
Courtesy of Will Pelham, UCSD (unpublished)
DOI: 10.15154/1520584

Assessing Impact of COVID-19

Relationship between youth and parent substance use



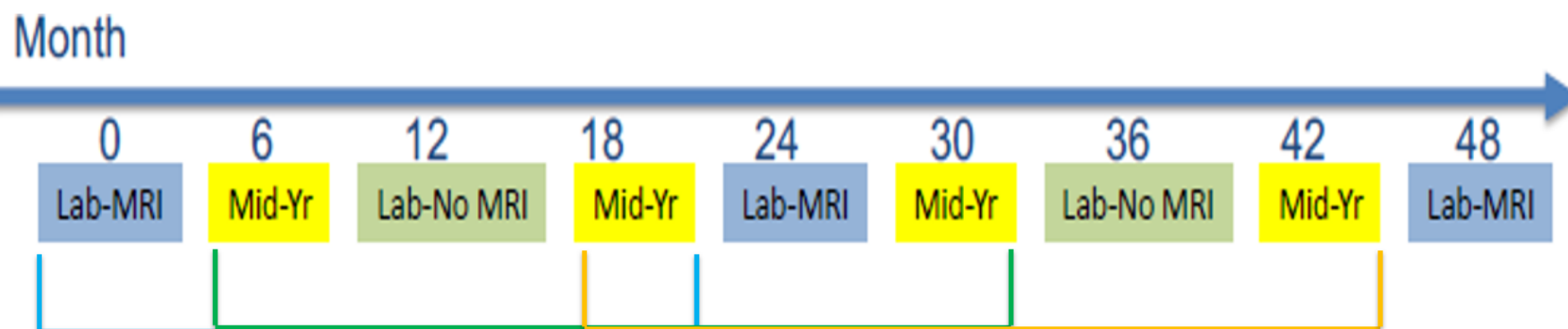
Significant ($p < .05$) association between youth use of ANY substance and parent's frequency of alcohol, tobacco, and marijuana use



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

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

AVAILABLE
NOW

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

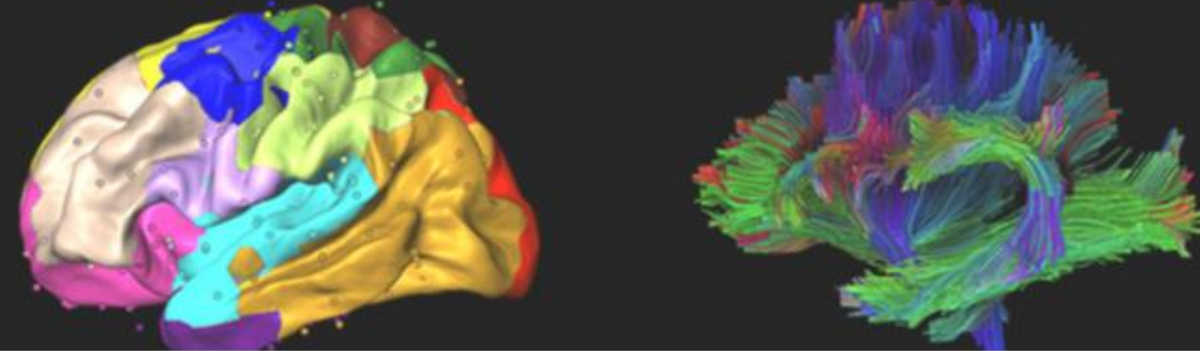
PAR-19-163 – Accelerating the Pace of Child Health Research Using Existing Data from the ABCD Study (R21)

Participating ICs – NIDA, NINDS, NIMHD, NIMH, NCI, NICHD, ORWH

Standard dates apply



Data Sharing



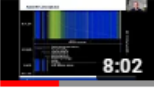




News & Upcoming Events

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](#).

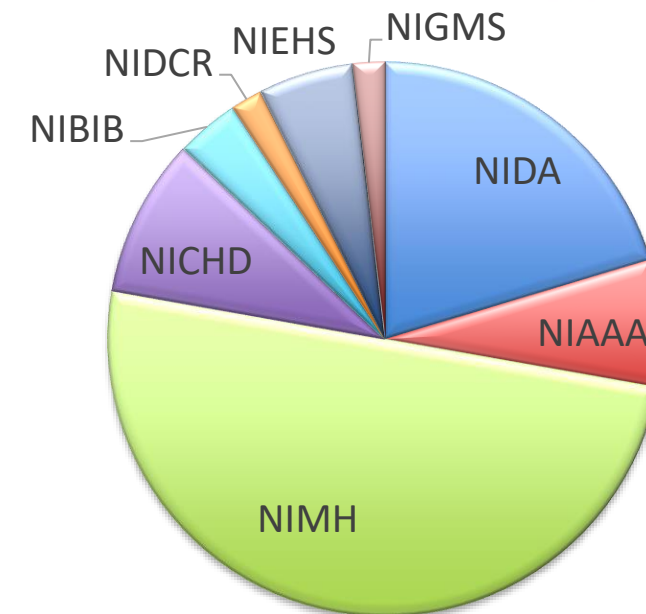
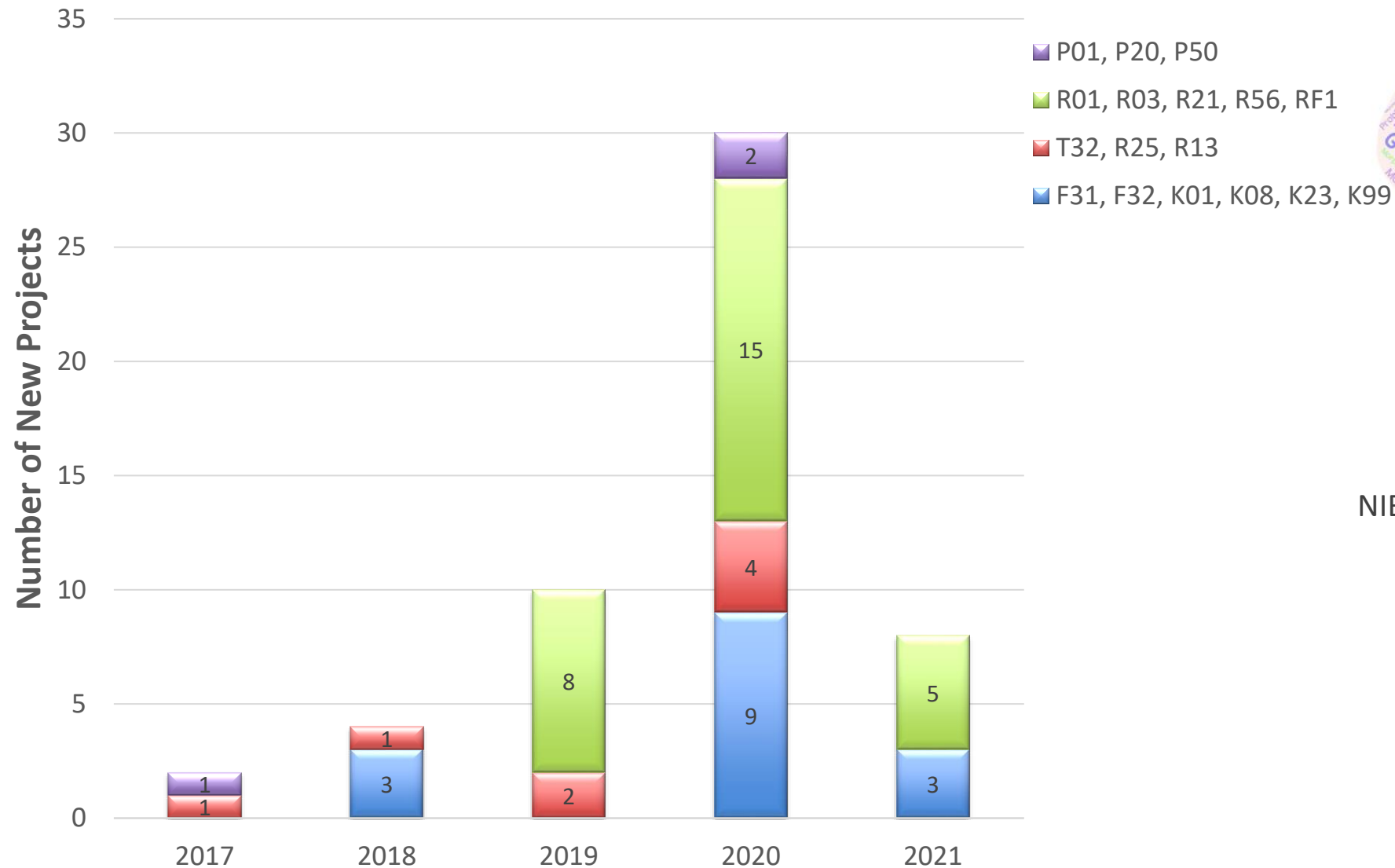
Attending a Diving DEAP workshop?

- 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](#)

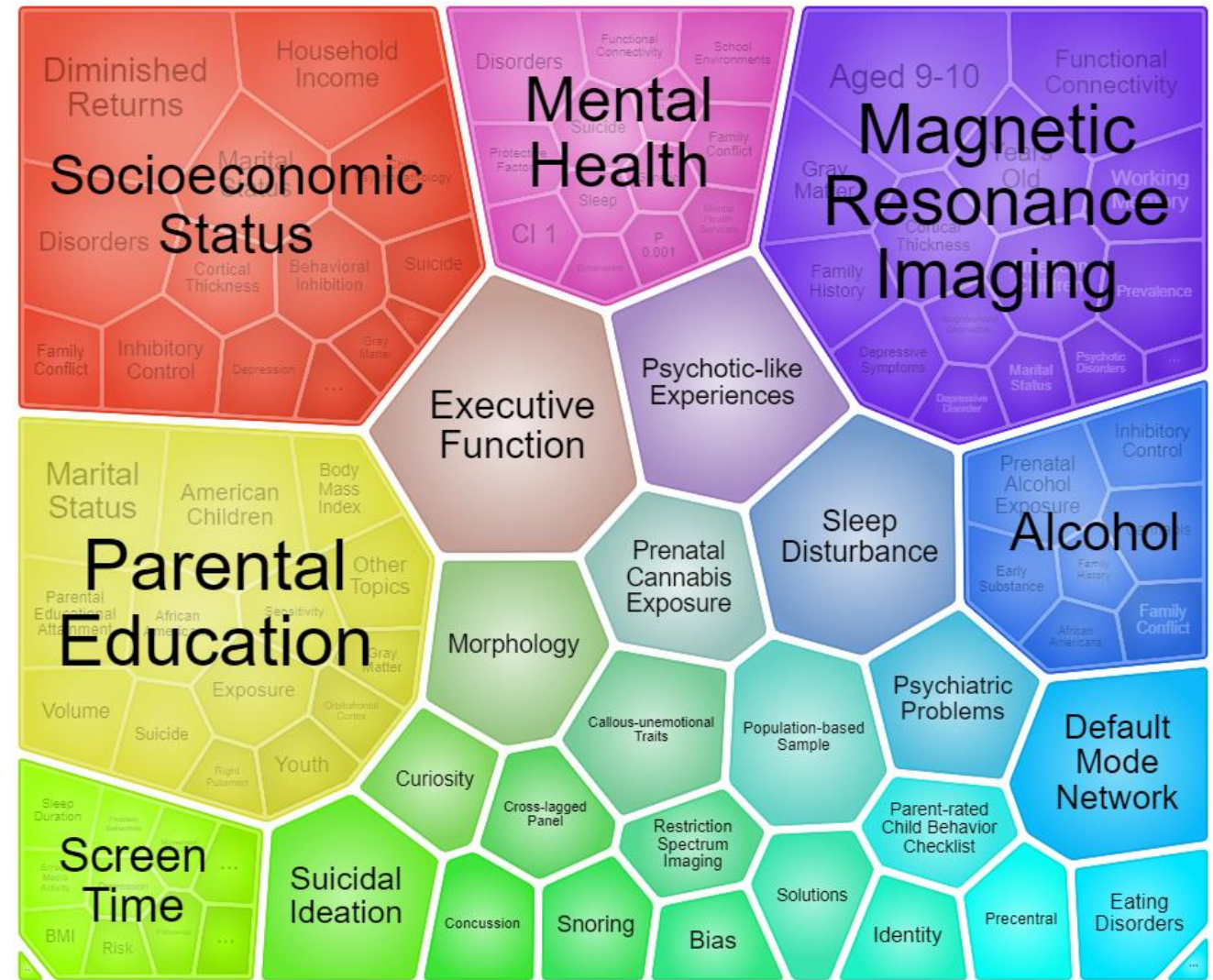
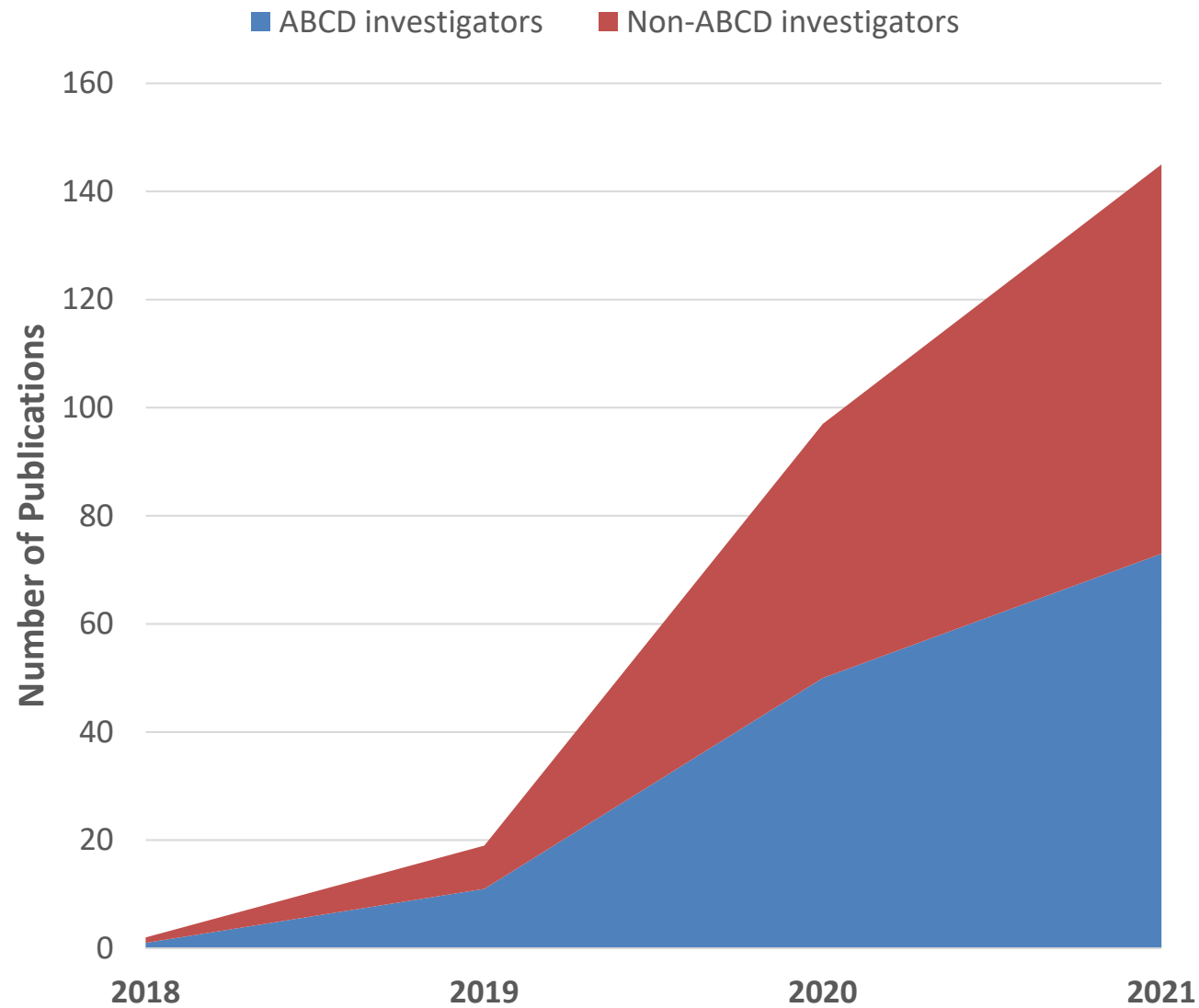
10		ABCD Study Design Overview The ABCD Study	8:02
11		DEAP Plan Module The ABCD Study	4:18
12		DEAP Explore Module The ABCD Study	3:26
		DEAP Analyze Module The ABCD Study	4:30
14		DEAP Example Analysis - Overview The ABCD Study	3:09

- 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



ABCD Publications



ABCD Publications



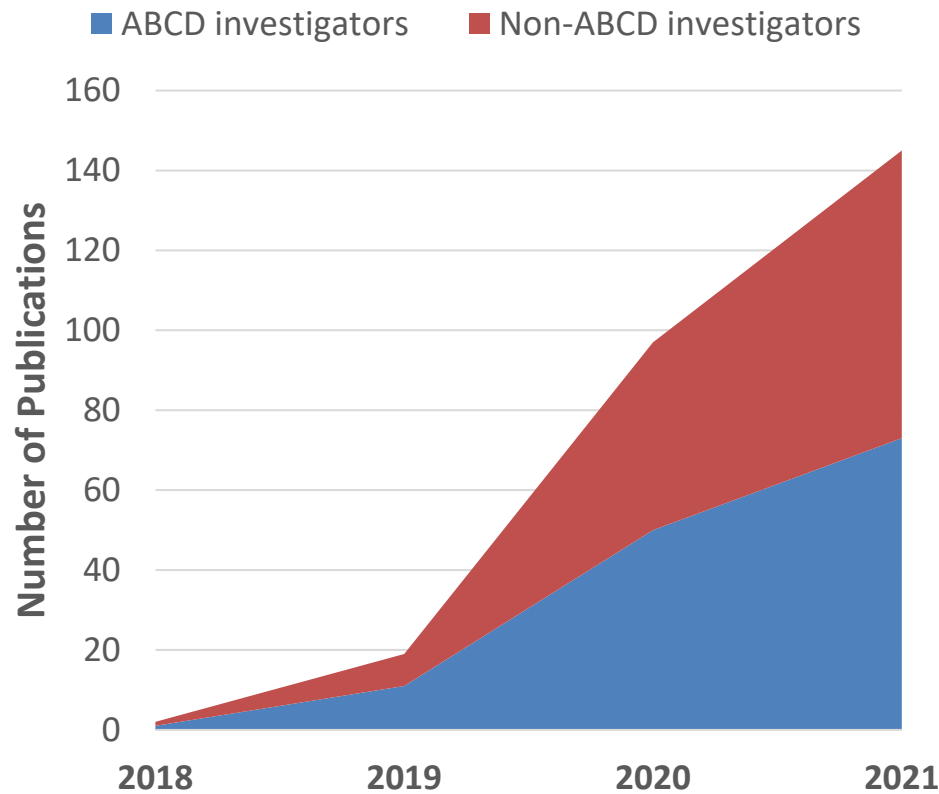
RESEARCH ARTICLE

Altered hippocampal microstructure and function in children who experienced Hurricane Irma

May I. Conley¹ | Lena J. Skalaban¹ | Kristina M. Rapuano¹ | Raul Gonzalez² | Angela R. Laird³ | Anthony Steven Dick² | Matthew T. Sutherland² | Richard Watts¹ | B.J. Casey¹

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

Daniel A. Lopez^{1,2}, John J. Foxe², Yunjiao Mao², Wesley K. Thompson⁴, Hayley J. Martin¹ and Edward G. Freedman^{2*}



Environment International 143 (2020) 105933



Contents lists available at ScienceDirect

Environment International

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



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^a, Megan M. Herting^{a,e,*}



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



ARTICLES

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



Shared heritability of human face and brain shape

Sahin Naqvi^{1,2,20} , Yoeri Slepy^{3,20} , Hanne Hoskens^{3,4} , Karlijn Indenleef^{4,5} , Jeffrey P. Spence^{6,7} , Rose Bruffaerts^{6,7,8} , Ahmed Radwan^{4,9} , Ryan J. Eller¹⁰ , Stephen Richmond¹¹ , Mark D. Shriver¹² , John R. Shaffer^{13,14} , Seth M. Weinberg^{13,14,15} , Susan Walsh¹⁰ , James Thompson¹⁶ , Jonathan K. Pritchard¹⁷ , Stefan Sunaert^{4,9} , Hilde Peeters³ , Joanna Wysocka^{11,17,18,21} and Peter Claes^{3,4,5,19,21}

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](#)



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. Cloak³ , Duncan B. Clark⁶ & Linda Chang^{3,4,5,7}



Journal of the American Academy of Child & Adolescent Psychiatry

Available online 24 December 2020

In Press, Corrected Proof



New research

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

Matthew C. Faddis MD ^a , Emilio A. Valadez PhD ^b , Brittany E. Bryant DSW ^c , Alexis M. Garcia PhD ^d , Brian Neelon PhD ^e , Rachel L. Tomko PhD ^f , Lindsay M. Squeglia PhD ^g

ABCD Justice, Equity, Diversity, Inclusion Initiative



Raul Gonzalez



Damien Fair



CHAIRPERSON



Bonnie Nagel

Workgroups

Investigators

Trainees

RAs

Staff

1. Diversity Sensitive Methods

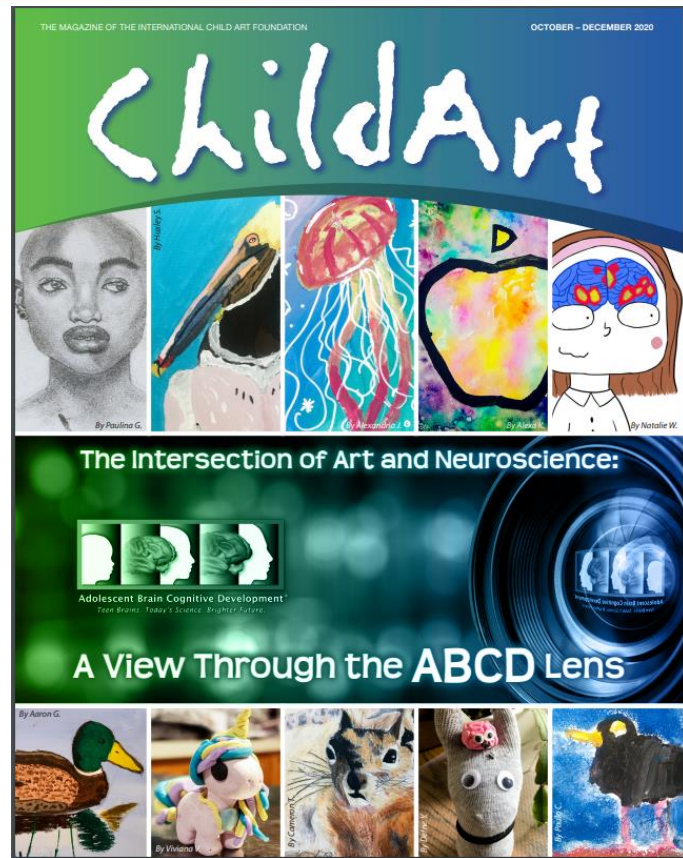


2. Diversity in ABCD



3. Responsible use of ABCD diversity data





ABCD Study[®] Issue of *ChildArt* Published!

VOLUME 20, ISSUE 2, NUMBER 60 OCTOBER - DECEMBER 2020

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Disclaimer: Adolescent Brain Cognitive Development Study is supported by grants from the National Institutes of Health (NIH), but the content of this magazine does not necessarily reflect the views of NIH. References or links in this magazine to an external website or any specific commercial products, processes, services, manufacturers, or companies do not constitute endorsement or recommendation by the NIH or any of the ABCD Study Sites.
 ABCD Study[®], Teen Brains, Today's Science, Brighter Future[™], and the ABCD Study Logos are registered marks of the U.S. Department of Health and Human Services (HHS). Adolescent Brain Cognitive Development[™] Study is a service mark of the U.S. Department of Health and Human Services (HHS). The views and opinions expressed in this Special Issue are those of the authors only and do not necessarily represent the views, official policy, or position of the U.S. Department of Health and Human Services or any of its affiliated institutions or agencies.

ART + SCIENCE = POWER

1 What types of art do you see in nature?

I see art in nature. Sometimes I see it in a leaf that looks like it's been painted. Sometimes it's the way a squirrel moves. I think water is very much like a dance—water reflects trees and plants, but also flowers, and sometimes dances are supposed to look like flowers. Water moves. The way it moves looks like a dance. The sky, that's another brilliant piece of art. I love the way clouds move, but my favorite part about the sky is that in sunrise and sunset the sky changes colors. I like to paint nature landscapes because trees look very different from each other, mountains are tall. Also, there are many colors in a natural landscape. That's what makes them so fun to paint.

—Michelle C.

Art relaxes me, it helps me take my mind off things and allows me to re-center myself. It's gratifying to start with an image in my mind and develop it as different components come to me while I'm working.

Art also helps me see the world differently. For instance, when looking at a landscape (in real life, a photograph, or a painting), I can identify the three "grounds": foreground, middle ground, and background. This allows me to appreciate everything I see around me much more deeply.

—Emma C.

How has art helped you during this COVID-19 time?

Art helps me see the world differently. For instance, when looking at a landscape (in real life, a photograph, or a painting), I can identify the three "grounds": foreground, middle ground, and background. This allows me to appreciate everything I see around me much more deeply.

—Emma C.

Art by Cricket L.

Art by Aaron C.

ESSENCE OF ART = EXPRESSION

2 Like so many others, the coronavirus pandemic has taken so much from me. I have been affected physically, mentally, and socially. I am tired of being home, and I wish we all could have the same amount of freedom that we had before this pandemic began. Luckily, I have still been able to continue dancing. Dance has not only allowed me to stay active, it has also taken a big weight off of my shoulders especially with all of the added stress and fear I have gathered throughout quarantine. I dance because it makes me happy. Dance allows me to express myself in a way that only I can. Each movement varies from person to person which is why so much emotion can be expressed while dancing. The dance community is very tight knit. I do my absolute best to understand, and provide everyone with the same amount of love and support that they give to me. Although the light at the end of the tunnel is not visible yet, I will continue to move forward and dance will be next to me every step of the way.

—Olivia T.

A lot of time, people don't know how to express themselves. They have trouble communicating and showing their emotions. The arts can help with that. I have been able to express myself through music and writing. I love to express my feelings by playing my violin and writing short stories. For example, sometimes I am dealing with family issues and I don't want to talk about it. When I play my violin or write, I can deal with those feelings and express them. Also, those activities have helped me to express my feelings about what's going on in the world right now with the coronavirus and the Black Lives Matter Movement. It was a lot to deal with, but these hobbies have helped me get through it. Expressing feelings means that I will have less stress. Stress leads to bad health. So, doing my hobbies and expressing my feelings leads to good health, mentally and physically.

—Emma C.

Meanwhile the world is facing a crisis, Art is a way of expression and escape from negativity. Art is a passage to another dimension where I'm able to create my own world. Art simply makes me feel better and precise about the way I see my environment. Many people have different ways of expression, but I choose Art. Art is everywhere, if you allow your imagination you can create anything!

—Kamila D.

Art by Wicky Y.

NEUROSCIENCE = ART

3 Art is a lie, A lie so beautiful it becomes truth. Deception so powerful it becomes reality. Reality is the brain's playground, Through which we are invited to roam freely. Weighing in at a modest three pounds, Our brain can't even seem to understand itself, So how then does it help us understand our world? Captive to electrical impulses, Our experiences form our view of the world. Our brain colors our reality. A reality painted by the lenses of our choosing. Captive to nerves and neurons, Our brain manipulates our past and draws on our future. Deception is art, An art the brain has mastered. Although art is a lie, It is the brain's truth. Although art is deception, It is the brain's reality. The brain is a lie, A lie so beautiful that it is art.

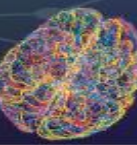
—Michael Kofi Esson, Research Assistant University of Wisconsin-Milwaukee

Art by Wicky Y.

Art by Max J.

Art by Savannah C.

Flipbook <https://www.icafe.org/ABCDStudy/>
 PDF Publication https://icafe.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:



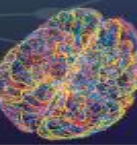
Statistical Significance



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



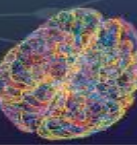
Topic-specific panel presentations



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 SM 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

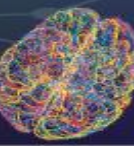
Report out from Breakouts

4:45 – 5:45 PM

Grand Discussion

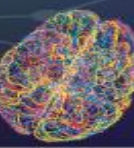
5:45 – 6:00 PM

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



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?



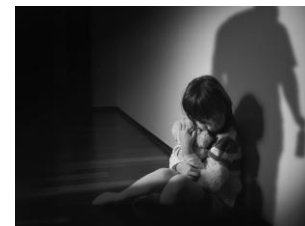
Children in the US living in poverty



Impaired cognitive performance



Differences in cortical structure



ACEs



Economic insecurity



School/community



Perinatal Adversity



Physiological

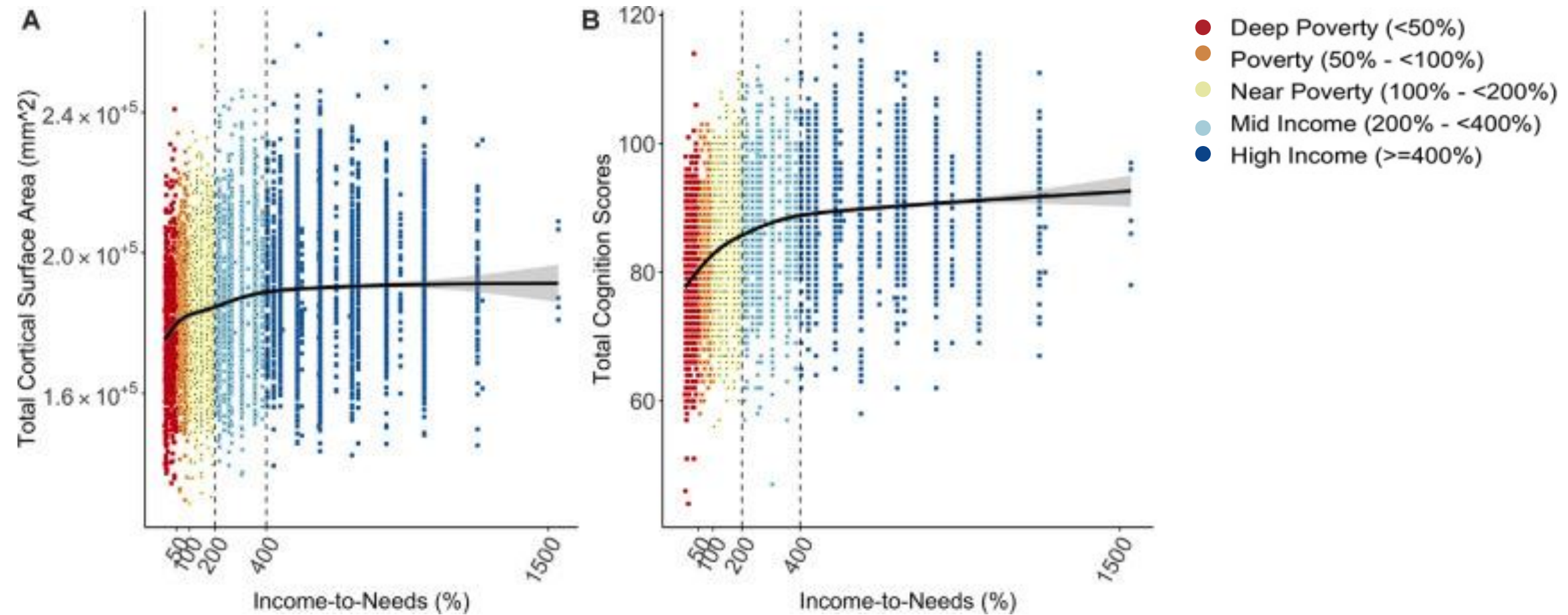


Parental

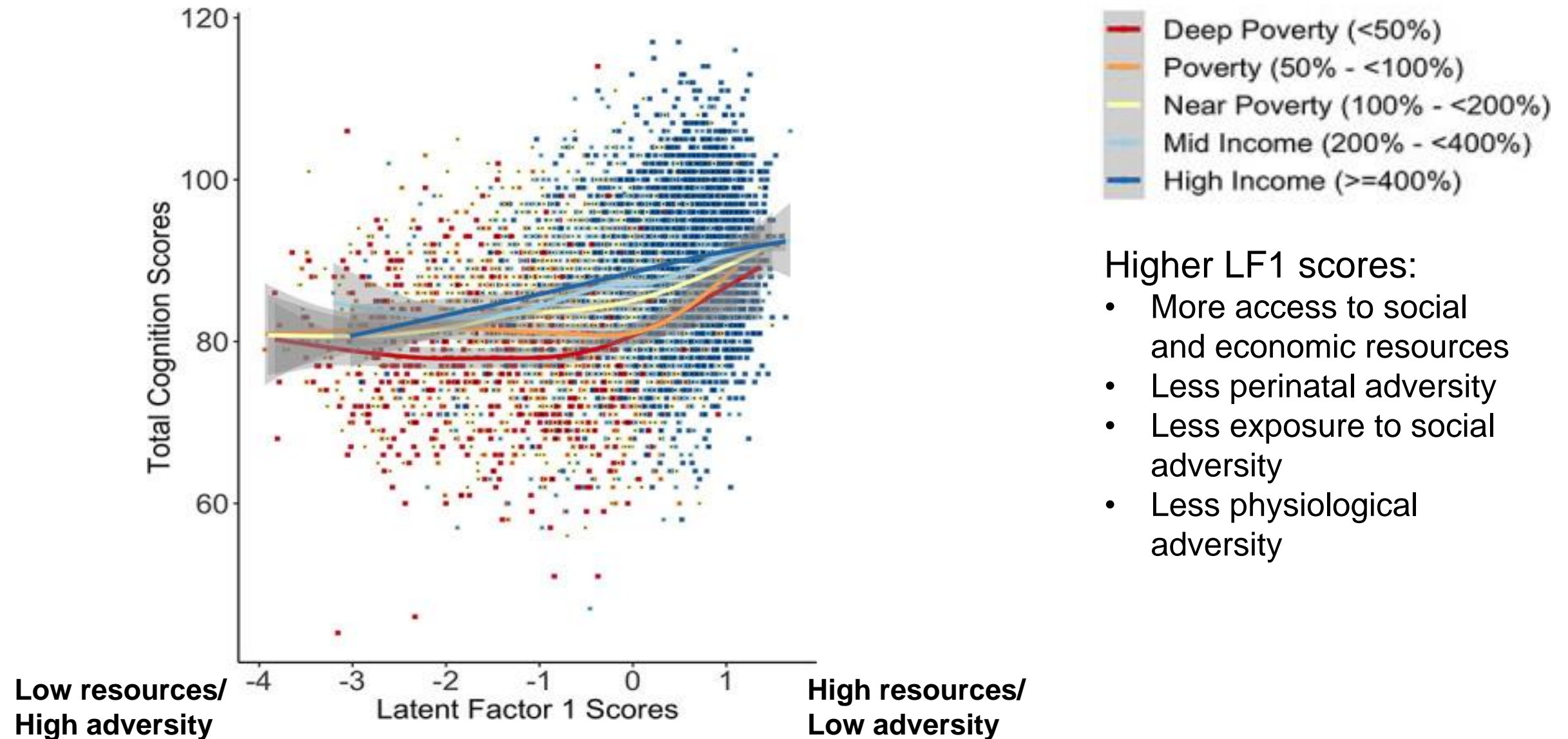
Design

- 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



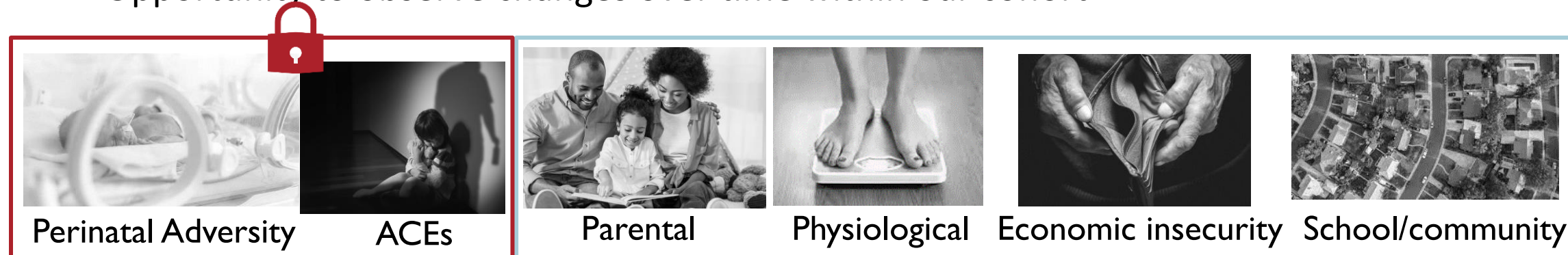
SES Moderated Associations Between Latent Resource-to-Adversity and Cognitive Performance



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



- 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



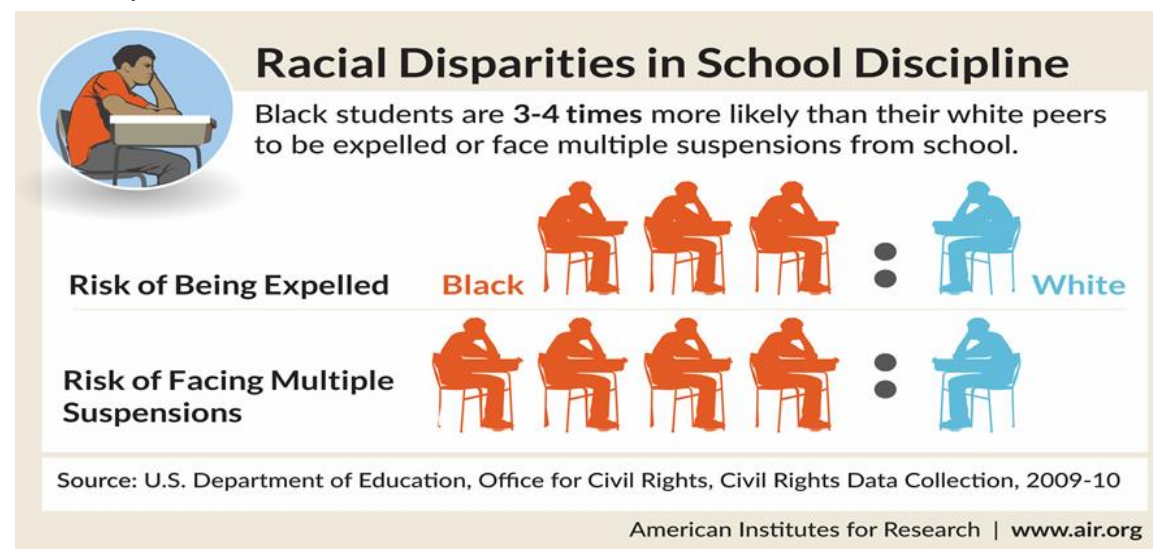
Sufficient Income support for lower income families

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

	Full sample	White	Black	Hispanic	Asian	Other: all	Other 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

IES : NCES National Center for Education Statistics 

 *School Survey on Crime and Safety (SSOCS)*
Publications & Products | SSOCS & SCS Table Library | Staff



CRDC
Civil Rights Data Collection

Wide-Ranging Education Data Collected
from our Nation's Public Schools



Adolescent Brain Cognitive Development[®]

Teen Brains. Today's Science. Brighter Future.

ABCDSStudy.org

AdolescentBrain@mail.nih.gov