Examination of Pre-Pandemic Measures on Youth Well-Being During Early Stages of the COVID-19 Pandemic

Supplement

Supplemental Methods

Supplemental Table S1: Demographics of on-going longitudinal youth sample who filled out COVID-19 survey vs. those who did not fill out the COVID-19 survey

Demographics Measures	**Youth from on-going longitudinal study who completed COVID-19 Survey** (n=135; 61 females; 3 non-binary, 1 prefer not to say)	**Youth from on-going longitudinal study who did <u>not</u> complete COVID-19 Survey** (n=91; 39 female)
Mean age at time of COVID-19 survey (range)	15.17 (9.40-22.10)	15.72 (9.51-21.62)
Mean family household income	$142,088	$140,765
Race/Ethnicity Identities		
% White (not of Hispanic origin)	66%	59%
% Black (not of Hispanic origin)	3%	2%
% Hispanic/Latinx (not multiracial)	10%	11%
% Hispanic/Latinx (multiracial)	12%	14%
% Asian	1%	0%
% American Indian/Alaskan Native	2%	0%
% Multiracial	6%	6%
% N/A	0%	8%

Percentage with Mental Health Diagnosis	53.33%	51.65%

Notes. 72.6% of the surveyed sample (n=135) lived in Travis County, Texas, but spanned 10 counties in total. Families self-reported annual household income from their most recent in-laboratory visit, which ranged from $0-$1,500,000, with an average household income of $142,088. The most commonly reported education level reported by mothers or fathers was a bachelor's degree. A total of 91 participants from the original study did not complete the COVID-19 survey. We are missing income data for 6 participants in the non-surveyed group. Comparisons with the participants who did complete the COVID-19 survey were non-significant. Age t (224) =-1.38; p= 0.17; gender t (224) =0.67; p = 0.5; income t (212) =-0.08; p = 0.94 as determined by t-tests. Chi-squared test of race/ethnicity groupings was also not significant (X^2 (6, n) = 3.199; p = 0.78).

Supplemental Table S2: Diagnoses in surveyed youth (n=135)	
Diagnoses	**Count**
ADHD/ADD	36
ADHD/ADD; Anxiety	1
ADHD/ADD; Anxiety; ASD	1
ADHD/ADD; Anxiety; Dysgraphia; ODD	1
ADHD/ADD; Anxiety; Dyslexia	1
ADHD/ADD; Anxiety; PTSD	1
ADHD/ADD; ASD	3
ADHD/ ADD; Depression	2
ADHD/ ADD; Depression; Anxiety	1
ADHD/ ADD; Depression; Anxiety; Bipolar, ODD	1
ADHD/ADD; Dysgraphia	2
ADHD/ADD; Dyslexia	1
ADHD/ADD; Dyslexia; ASD	1
ADHD/ADD; OCD; Anxiety; ODD	1
ADHD/ADD; OCD; Depression; Anxiety	1
ADHD/ADD; OCD; TS/Tic Disorder	1
ADHD/ADD; Sensory Integration Disorder	1
ADHD/ ADD; TS/Tic Disorder	3
ASD	1
Dyslexia	6
Dyspraxia, Sensory Integration Disorder; ASD	1
OCD; Anxiety	1
OCD; Depression; Anxiety	1
OCD; TS/Tic Disorder; Anxiety	1
TS/Tic Disorder	2
None	63

Approach to multiple children within one household, when assessing parent-child interactions

When examining how a parent's education level impacted youth COVID-19 outcomes, for families with data from multiple siblings, we took an average of all of the youth scores within a family on CASPE subcategories and compared those averages to parent education levels. We compared these results to random selection of one child's data per family. To examine the question of household synchrony of COVID-19 response, we again used the average score on CASPE subcategories across surveyed youth within a family and compared those averages to the parent responses on the EPII.

Internal evaluation of (as yet) unpublished CASPE measures

To evaluate the internal validity of the CASPE sub-categories, we calculated the Cronbach's alpha for each subcategory: emotional (0.83), cognitive (0.561), social (0.593) and direct experiences (0.337). For the EPII subcategories, we also calculated the Cronbach's alpha: parent emotional and physical health and well-being in COVID-19 (0.882), and parent economic situation since COVID-19 (0.86). It is possible the alphas are low for cognitive, social, and direct experiences subcategories due to the small number of items within these subcategories.

Diagnostics of Statistical Models

To evaluate the robustness of our modeled regression coefficients and p-values, we assessed the degree to which each participant influenced the estimation of said statistics, and re-fit models without outliers. To determine if a participant substantially affected the results of our analyses, we evaluated each participant's Cook's distance and studentized residual using the version 3.0.9 of the car package (Fox & Weisberg, 2019) for R version 4.0.2 (R Core Team, 2020). The Cook's distance measures the degree to which a participant influenced the regression coefficients estimated for predictor variables in the model, while the studentized residuals measure the degree to which the residual associated with a given participant is significantly larger than expected. We defined outliers stringently based on a combination of criteria and thresholds applied to these values. Specifically, outliers were those subjects whose Cook's distances exceeded $4/n$ (where n is the sample size), whose Cook's distances were also 3 times larger than the mean Cook's distance, and whose studentized residuals were significantly larger than would be expected by chance when converted to a t-statistic (Fox & Weisberg, 2019).

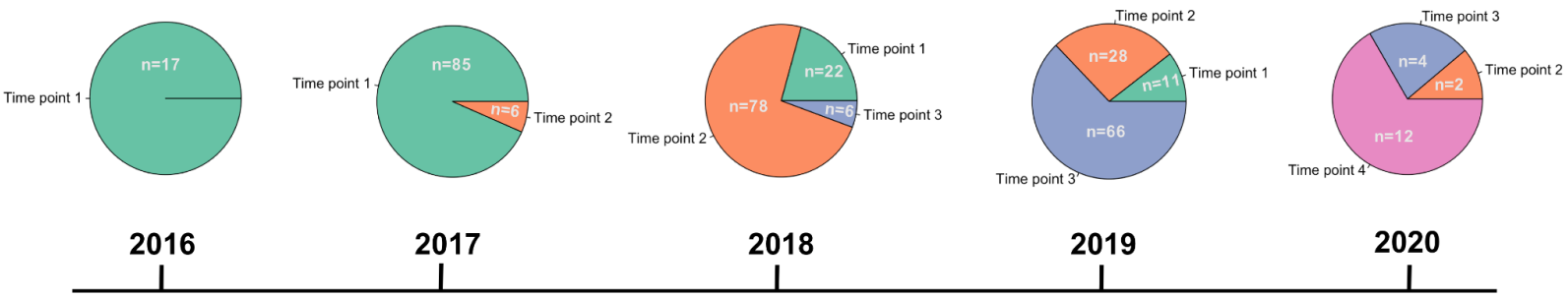
Supplemental Table S3 presents the results of this analysis. Each row corresponds to a model described in the article, and the first three columns define the predictor(s) of interest, the response variable, and lists any covariates included in the model. The fourth column provides how many tests were controlled for when adjusting p-values to control the family-wise False Discovery Rate. The fifth column provides the beta coefficient(s) for the predictor(s) of interest, R^2, and p-values for the models presented in the main analysis. Subsequently, we report the same statistics that were derived from refitting these models without any outliers (if identified as above), and lastly the final column shows how many participants were considered outliers. Because outliers did not substantively change any results, we chose to report results across the whole sample in the main manuscript.

Supplemental Table S3: Full Sample vs. No-Outlier Sample Statistics

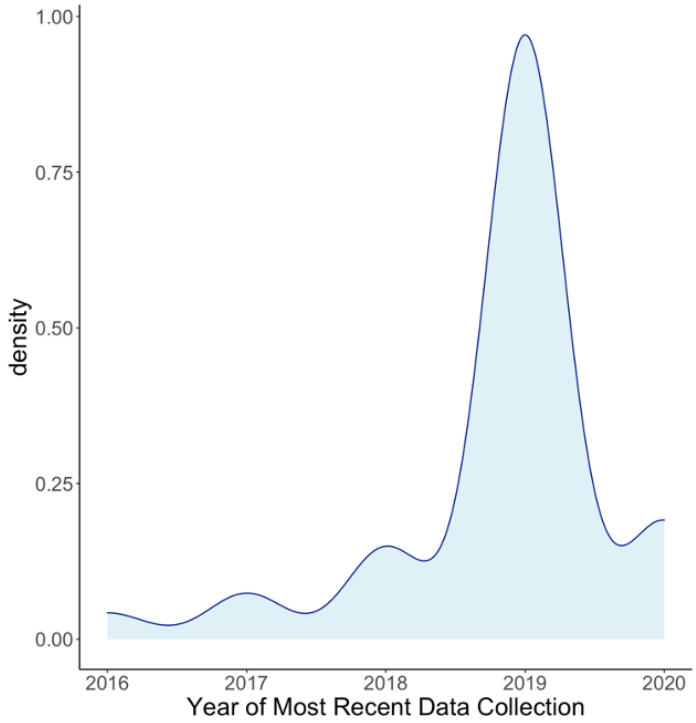
Predictor of Interest in Model	Outcome in Model	Covariates in Model	Number of tests corrected for using FDR	Full Sample Statistics	No-Outliers Sample Statistics	Number of Outliers Identified
Youth Self-Report ADHD Symptom Burden	CASPE Cognitive Well-being	Youth Age	4	ß =2.22, R^2 =0.10, p=0.003	ß =1.78, R^2 =0.10, p=0.008	4
Youth Self-Report ADHD Symptom Burden	CASPE Emotional Well-Being	Youth Age	4	ß = 1.81, R^2 =0.10, p=0.01	ß = 1.85, R^2 =0.17, p=0.007	5
Youth Self-Report ADHD Symptom Burden	CASPE Direct Experiences Related to COVID-19	Youth Age	4	ß = -0.11, R^2 =0.05, p =0.95	ß = 0.15, R^2 =0.06, p =0.87	3
Youth Self-Report ADHD Symptom Burden	CASPE Social Well-Being	Youth Age	4	ß = 0.04, R^2= 0.03, p=0.95	ß = - 0.11, R^2 =0.05, p =0.87	2
Parent Report on Youth ADHD Symptom Burden	CASPE Cognitive Well-Being	Youth Age	4	ß =0.97, R^2=0.06, p=0.15 (uncorrected p-value=0.04)	ß =0.92, R^2=0.05, p=0.20 (uncorrected p-value=0.049)	5
Parent Report on Youth ADHD Symptom Burden	CASPE Emotional Well-Being	Youth Age	4	ß =0.51, R^2=0.04, p=0.57	ß =0.57, R^2=0.05, p=0.45	4
Parent Report on Youth ADHD Symptom Burden	CASPE Direct Experiences Related to COVID-19	Youth Age	4	ß = -0.09, R^2=0.04, p=0.85	ß = -0.09, R^2=0.03, p=0.86	3
Parent Report on Youth ADHD Symptom Burden	CASPE Social Well-Being	Youth Age	4	ß =0.38, R^2=0.05, p=0.57	ß =0.30, R^2=0.05, p=0.70	2

Mental Health Burden	CASPE Cognitive Well-Being	Youth Age	4	ß = 1.83, R^2= 0.06, *p*=0.09 (uncorrected *p*-value= 0.02)	ß = 1.38, R^2= 0.06, *p*=0.13 (uncorrected *p*-value=0.06)	5
Mental Health Burden	CASPE Emotional Well-Being	Youth Age	4	ß = 1.07, R^2=0.06, *p*=0.27 (uncorrected *p*-value=0.17)	ß = 1.48, R^2=0.13, *p*=0.13 (uncorrected *p*-value=0.04)	5
Mental Health Burden	CASPE Direct Experiences Related to COVID-19	Youth Age	4	ß = 1.01, R^2= 0.06, *p*=0.27 (uncorrected *p*-value=0.20)	ß = 1.07, R^2= 0.07, *p*=0.23 (uncorrected *p*-value=0.17)	3
Mental Health Burden	CASPE Social Well-Being	Youth Age	4	ß =0.22, R^2=0.03, *p*=0.79	ß = -0.12, R^2=0.05, *p*=0.88	3
Youth Age	CASPE Emotional Well-Being	N/A	4	ß =0.07, R^2 = 0.04, *p*=0.03	ß=0.09, R^2=0.08, *p*=0.004	4
Youth Age	CASPE Direct Experiences Related to COVID-19	N/A	4	ß = 0.07, R^2 =0.05, *p*=0.03	ß = 0.07, R^2 =0.05, *p*=0.02	4
Youth Age	CASPE Social Well-Being	N/A	4	ß =0.05, R^2 =0.03, *p*=0.079 (uncorrected *p*-value=0.06)	ß =0.07, R^2 =0.05, *p*=0.02 (uncorrected *p*-value=0.01)	2
Youth Age	CASPE Cognitive Well-Being	N/A	4	ß = 0.05, R^2 =0.03, *p* =0.09 (uncorrected *p*-value=0.09)	ß =0.05, R^2 =0.02, *p*=0.08 (uncorrected *p*-value=0.08)	4
Parent Mean Education Level	EPII COVID Economic Situation	N/A	11	ß = -0.13, R^2 =0.06, *p* =0.04	ß = -0.17, R^2 =0.14, *p* =0.002	3
Father Education Level	EPII COVID Economic Situation	N/A	11	ß = -0.13, R^2 =0.09, *p*= 0.03	ß = -0.16, R^2 =0.15 , *p* =0.002	3
Mother Education Level	CASPE Cognitive Well-being	N/A	11	ß = -0.11, R^2 =0.05 , *p* =0.10 (uncorrected *p*-value=0.03)	ß = -0.10, R^2 =0.05, *p* =0.07 (uncorrected *p*-value=0.049)	2
Mother Education Level	EPII COVID Work and Employment	N/A	11	ß = -0.12, R^2 =0.06, *p* =0.09 (uncorrected *p*-value=0.03)	ß = -0.12, R^2 =0.06, *p* =0.09 (uncorrected *p*-value=0.03)	3

Parent Mean Education Level	EPII COVID Work and Employment	N/A	11	ß = -0.11, R^2 =0.06, p =0.09 (uncorrected p-value=0.059)	ß = -0.11, R^2 =0.04, p =0.10 (uncorrected p-value=0.079)	2
Emotional and Physical Health and Well-Being in COVID-19	CASPE Cognitive Well-being	N/A	4	ß = 0.35, R^2 =0.14, p=0.001	ß = 0.37, R^2 =0.17, p =0.0003	3
Emotional and Physical Health and Well-Being in COVID-19	CASPE Emotional Well-Being	N/A	4	ß =0.41, R^2 = 0.19, p=0.0003	ß =0.42, R^2 = 0.21, p=0.0002	4
Emotional and Physical Health and Well-Being in COVID-19	CASPE Direct Experiences Related to COVID-19	N/A	4	ß =0.30, R^2 =0.10, p=0.006	ß =0.25, R^2 = 0.08, p=0.02	4
Emotional and Physical Health and Well-Being in COVID-19	CASPE Social Well-Being	N/A	4	ß=0.19, R^2=0.04, p=0.10 (uncorrected p-value=0.10)	ß=0.17, R^2=0.03, p=0.12 (uncorrected p-value=0.12)	1



Supplemental Figure 1: Figure shows year of data collection for pre-pandemic longitudinal data for the 135 participants who responded to the COVID-19 impacts survey. Data is broken down by year of collection (i.e., 2016, 2017, 2018, 2019, 2020). Each year of data collection has counts of which timepoints (timepoint 1, 2, 3, 4) were collected that year. Enrollment in the pre-pandemic longitudinal study was on a rolling basis, meaning participants enrolled in the study during different years. All participants have at least 1 timepoint of pre-pandemic data, but some have up to 4 timepoints of pre-pandemic data.



Supplemental Figure 2: Figure shows density of most recent in person in-laboratory data broken down by year. A majority of participant's most recent pre-pandemic data comes from 2019, but spans collection from 2016-2020.

Supplemental References

John Fox and Sanford Weisberg (2019). An {R} Companion to Applied Regression, Third Edition. Thousand Oaks CA: Sage. URL: https://socialsciences.mcmaster.ca/jfox/Books/Companion/