

### Child Longitudinal Data Collection Guide

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\*Actigraphy not collected for all participants due to availability of equipment and participant willingness.

Assessments by Visit	Baseline Visit	Follow-UP Visits
Consent	✓	✓
Demographic Questionnaire	✓	✓
Weight/Height, Vital Signs, Hip/Waist Measurement	✓	✓
Blood Draw	✓	✓
Tanner Scale	✓	✓
Medications/Medical Conditions	✓	✓
Urine Drug Test (11+)	✓	✓
Penn CNP~	✓	✓
KSADS~	✓	✓
6-Minute Bike Test	✓	✓
MRI	✓	✓
MRI-Questionnaire (13+)	✓	✓
ANT~	✓	✓
DKEFS~ – Verbal Fluency (8+)~	✓	✓
DKEFS~ – Trails (8+)~	✓	✓
DKEFS~ – Design Fluency (8+)~	✓	✓
DKEFS~ – Color-Word (8+)~	✓	✓
DKEFS~ – Tower (8+)~	✓	✓
RAVLT~ (8+)	✓	✓
Grooved Pegboard	✓	✓
Digit Span	✓	✓
BIRD~	✓	✓
Dot Probe	✓	✓
Vineland	✓	
WASI~	✓	
WIAT~	✓	
Actigraphy***	✓	✓
Color Vision	✓	
Grip Strength	✓	
ASSQ~	✓	✓
ASR~ (18+)		✓
ATQ~ (16+)	✓	✓
BASC ~(7-17)	✓	✓
BDI~ (18+)		✓
BISQ~	✓	✓
CASI~ (11+)	✓	✓
CBCL~ (7-17)	✓	✓
CBCL-Adaptive Fx~ (7-17)	✓	✓
CBQ-VSF~ (6-8)	✓	✓
CDI-2~ (11-17)	✓	✓
CEBQ~ (7-11)	✓	✓
CFQ~ (16+)	✓	✓
Child/Adult Satisfaction Questionnaire	✓	✓
CHRLS~ (18+)		✓
Connors Parent~ (7-17)	✓	✓
Connors Youth~	✓	✓

CY-BOCS~ (6-17)**	✓	
Demographics Supplement*	✓	
EATQ~ (9-15)	✓	✓
EDEQ~ (13+)	✓	✓
EHQ~ (6-17)*	✓	
Family History Questionnaire - Parent*	✓	
FTND~ (18+)		✓
FTQA~ (13-17)	✓	✓
ICU-P~ (7-17)	✓	✓
ICU-Y~ (13+)	✓	✓
IPAQ~ (15+)	✓	✓
IRI~ (13+)	✓	✓
MASC~	✓	✓
Medical History Questionnaire - Child	✓	✓
NEO~ (12-17)*	✓	
NIDA~ (11+)	✓	✓
PDI~ (13+)	✓	✓
PhenX Sex History (13+)	✓	✓
PSQI~ (13+)	✓	✓
RBS-R~	✓	✓
SES~*	✓	
Sex Role Identity Scale (13+)	✓	✓
Sexual Orientation Scale (13+)	✓	✓
SRS~ (7-17)	✓	✓
STAI~ (18+)		✓
SWAN~	✓	✓
TFEQ~ (12+)	✓	✓
TSC-C~ (11-17)	✓	✓
TSC-40~ (18+)		✓
UCLA Parent~	✓	✓
UCLA Child~	✓	✓
UPPS~ (18+)		✓
YGTSS~ (6-17)**	✓	✓
YSR~ (11-17)	✓	✓
YSR Adaptive Fx~ (11-17)	✓	✓
YSRBS-MS/HS~ (12+)	✓	✓
Zip Code*	✓	
Mock Scan**	✓	

~ Acronym is defined below in the Assessment Dictionary

\*\*These assessments were dropped in 2015, not all participants will have these data.

\*\*\*Actigraphy not collected for all participants due to availability of equipment and participant willingness.

## Assessment Dictionary

ANT	Attention Network Test
ASR/OASR	Adult Self-Report/Older Adult Self-Report
ASSQ	The High-Functioning Autism Spectrum Screening Questionnaire
ATQ (16+)	Adult Temperament Questionnaire
BASC (7-17)	Behavior Assessment System for Children, 2 <sup>nd</sup> Edition – Parent Rating Scale
BDI	Beck Depression Inventory - II
BIRD	The Behavioral Indicator of Resiliency to Distress
BISQ	Brain Injury Screening Questionnaire
CASI (11+)	The Comprehensive Addiction Severity Index for Adolescents
CBCL (7-17)	The Child Behavior Checklist
CBCL-Adaptive Fx (7-17)	The Child Behavior Checklist – Adaptive Functioning
CBQ (6-8)	The Children’s Behavior Questionnaire
CDI (11-17)	The Children’s Depression Index
CEBQ (7-11)	The Children’s Eating Behavior Questionnaire
CFQ (16+)	The Cognitive Failures Questionnaire
CHRLS	The Cambridge-Hopkins Restless Legs Syndrome
Connors Parent (7-17)	The Connors ADHD Rating Scale 3 – Parent Short Form
Connors Youth	The Connors ADHD Rating Scale 3 – Youth Short Form
CYBOCS (6-17)	Children’s Yale-Brown Obsessive Compulsive Scale
DKEFS	Delis-Kaplan Executive Functioning System
EATQ (9-15)	The Early Adolescent Temperament Questionnaire
EDEQ (13+)	Eating Disorder Examination Questionnaire
EHQ (6-17)	Edinburgh Handedness Questionnaire
FTND	Fagerstrom Test for Nicotine Dependence
FTQA (13-17)	Modified Fagerstrom Tolerance Questionnaire - Adolescents
ICU-P (7-17)	Inventory of Callous-Unemotional Traits – Parent Version
ICU-Y (13+)	Inventory of Callous-Unemotional Traits – Youth Self Report
IPAQ (15+)	International Physical Activity Questionnaire
IRI (13+)	Interpersonal Reactivity Index
KSADS	Kiddie Schedule for Affective Disorders and Schizophrenia (Present & Lifetime Version) DSM-IV Edition
MASC	Multidimensional Anxiety Scale for Children
NEO (12-17)	NEO Five Factor Inventory - 3
NIDA (11+)	National Institute on Drug Abuse Questionnaire
PDI (13+)	The 21-Item Peters et al. Delusions Inventory
PENN CNP / GUR	Penn’s Computerized Neurocognitive Battery
PSQI (13+)	Pittsburgh Sleep Quality Index
RAVLT	Rey Auditory Verbal Learning Test
RBS-R	Repetitive Behaviors Scale – Revised
SES	Hollingshead Four-Factor Index of Socioeconomic Status
SRS (7-17)	Social Responsiveness Scale – Parent Report
STAI	State Trait Anxiety Inventory

SWAN	Strengths and Weaknesses of Attention-Deficit/Hyperactivity Disorder Symptoms and Normal Behavior Scale
TFEQ (12+)	Three-Factor Eating Questionnaire
TSC-40	Trauma Symptoms Checklist for Adults
TSC-C (11-17)	Trauma Symptom Checklist for Children
UCLA Parent	University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index - Parent
UCLA PTSD – child	University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index – Child
UPPS	Impulsive Behavior Scale
WASI	Weschler Abbreviated Scale of Intelligence Second Edition
WIAT	Weschler Individual Achievement Test – Second Edition Abbreviated
YGTSS (6-17)	Yale Global Tic Severity Scale
YSR (11-17)	Youth Self-Report
YSR Adaptive Fx (11-17)	Youth Self-Report Adaptive Functioning
YRBSS-MS/HS (12+)	Youth Risk Behavior Surveillance System Middle School/High School

### Order of Administration: CLG Baseline Visit (2-day protocol)

	CLG 2-Day Baseline: Track A			CLG 2-Day Baseline: Track B		
	Day 1		Day 2	Day 1		Day 2
8:30 AM	Consent		Participant Arrives/ Welcome Back	Consent		DKEFS
8:45 AM						
9:00 AM	Bloods		Bloods			
9:15 AM						
9:30 AM	Breakfast		MRI (MRI Time: 9:00 am)	Breakfast		
9:45 AM	PENN CNP	KSADS		Digit Span/WASI/WIAT	Parent Measures	
10:00 AM						
10:15 AM						
10:30 AM			MRI-Q (age 13+), MRN			
10:45 AM						
11:00 AM	KSADS			6-Minute Bike Test		
11:15 AM	Mock Scan (11:00 am)		CYBOCS, YGTSS	Mock Scan (11:00 am)		MRN
11:30 AM						
11:45 AM						
12:00 PM	BIRD		ANT	Family History		ANT
12:15 PM	Family History		Dot Probe	Lunch		Dot Probe
12:30 PM	Lunch		Lunch	BIRD		Lunch
12:45 PM						
1:00 PM	Digit Span/WASI/WIAT	Parent Measures, Vineland	DKEFS	PENN CNP	KSADS	MRI (MRI Time: 1:00 pm)
1:15 PM						
1:30 PM						
1:45 PM						
2:00 PM	6-Minute Bike Test		KSADS			
2:15 PM	MRN			MRN	Parent Measures, Vineland	MRI-Q and Satisfaction Q
2:30 PM						
2:45 PM						
3:00 PM						
3:15 PM					Debrief	

#### CLG Baseline Visit (2-day) Protocol Labels Defined:

- **Consent:** Demographics questionnaire and consent
- **Bloods:** Weight/Height, Vital Signs, Hip/Waist Measurement, Tanner Scale, Medications/Medical Conditions, Urine Drug Test (11+), Grip Strength, Color Vision, Blood Draw
- **MRN:** ATQ (16+), CASI (11+), CDI (11-17), CFQ (16+), Connors Youth, EATQ (9-15), EDEQ (13+), EHQ, FTQA (13-17), ICU-Y, IPAQ (15+), IRI (13+), MASC, NEO (12-17), NIDA (11+), PDI (13+), PhenX Sex History (13+), PSQI (13+), Sex Role Identity Questionnaire, Sexual Orientation Questionnaire, TFEQ (12+), TSC-C (11-17), UCLA Child, YSR (11-17), YSR Adaptive Fx (11-17), YRBSS-MS/HS (12+)
- **Parent Measures:** ASSQ, BASC (7-17), BISQ, CBCL (7-17), CBCL-Adaptive Fx (7-17), CBQ (6-8), CEBQ (7-11), Connors Parent (7-17), Demographics supplement, ICU-P, Med Hx, RBS-R, SES, SRS, SWAN, UCLA Parent, Zip Code

### Order of Administration: CLG Baseline Visit (1-day protocol)

	CLG Baseline (9:00AM MRI TIME)		CLG Baseline (10:30AM MRI TIME)		CLG Baseline (12:30pm MRI TIME)	
8:30 AM	Re-Consent & Bloods		Re-Consent & Bloods		Re-Consent & Bloods	
8:45 AM						
9:00 AM	MRI (MRI TIME: 9:00AM)	Parent Measures, Vineland, and Family Hx	Neuropsych	KSADS	Neuropsych	Parent Measures, Vineland, and Family Hx
9:15 AM						
9:30 AM			MRN		MRN	
9:45 AM						
10:00 AM			KSADS			
10:15 AM	MRI-Q (ages 13+)	KSADS	MRI (MRI TIME: 10:30AM)		ANT	
10:30 AM						
10:45 AM	Penn CNP					
11:00 AM						
11:15 AM					Penn CNP	
11:30 AM						
11:45 AM	KSADS					
12:00 PM	Lunch		MRI-Q (ages 13+)		Lunch	
12:15 PM			Lunch			
12:30 PM	Neuropsych		ANT	Parent Measures, Vineland, and Family Hx	MRI (MRI TIME: 12:30PM)	KSADS
12:45 PM						
1:00 PM			Penn CNP			
1:15 PM						
1:30 PM	6-Minute Bike Test					
1:45 PM	MRN				MRI-Q (ages 13+)	
2:00 PM					KSADS	
2:15 PM	ANT		6-Minute Bike Test			
2:30 PM			BIRD and Dot Probe		6-Minute Bike Test	
2:45 PM	BIRD and Dot Probe				BIRD and Dot Probe	
3:00 PM			Satisfaction Q child	Satisfaction Q parent		
3:15 PM	Satisfaction Q child	Satisfaction Q parent			Satisfaction Q child	Satisfaction Q parent

#### CLG Baseline Visit (1-day) Protocol Labels Defined:

- **Re-consent:** Demographics questionnaire and re-consent
- **Bloods:** Weight/Height, Vital Signs, Hip/Waist Measurement, Tanner Scale, Medications/Medical Conditions, Urine Drug Test (11+), Blood Draw
- **MRN:** ATQ (16+), CASI (11+), CDI (11-17), CFQ (16+), Child Satisfaction Questionnaire, Connors Youth, EATQ (9-15), EDEQ (13+), EHQ, FTQA (13-17), ICU-Y, IPAQ (15+), IRI (13+), MASC, NEO (12-17), NIDA (11+), PDI (13+), PhenX Sex History (13+), PSQI (13+), Sex Role Identity Questionnaire, Sexual Orientation Questionnaire, TFEQ (12+), TSC-C (11-17), UCLA Child, YSR (11-17), YSR Adaptive Fx (11-17), YRBSS-MS/HS (12+)
- **Parent Measures:** Adult Satisfaction Questionnaire, ASSQ, BASC (7-17), BISQ, CBCL (7-17), CBCL-Adaptive Fx (7-17), CBQ (6-8), CEBQ (7-11), Connors Parent (7-17), Demographics supplement, ICU-P, Med Hx, RBS-R, SES, SRS, SWAN, UCLA Parent, Zip Code
- **Neuropsych:** DKEFS (8+), WASI, WIAT, Digit Span, RAVLT (8+), Pegboard

### Order of Administration: CLG Follow-Up Visits

	CLG Follow-Up (9:00AM MRI)		CLG Follow-Up (10:30AM MRI)		CLG Follow-Up (12:30AM MRI)			
8:30 AM	Re-Consent		Re-Consent		Re-Consent			
8:45 AM	MRI 9:00AM)		Bloods		Bloods			
9:00 AM			MRN	KSADS	Digit Span/ DKEFS/ RAVLT	Parent Measures		
9:15 AM								
9:30 AM								
9:45 AM								
10:00 AM	MRI-Q (13+)	KSADS	KSADS		Penn CNP			
10:15 AM								
10:30 AM					Penn CNP	MRI (MRITIME: 10:30AM)	MRN	KSADS
10:45 AM								
11:00 AM								
11:15 AM								
11:30 AM	KSADS							
11:45 AM	Bloods				KSADS			
12:00 PM	Lunch		MRI-Q,		Lunch			
12:15 PM			Lunch					
12:30 PM	Digit Span/ DKEFS/ RAVLT	Parent Measures	Digit Span/ DKEFS/ RAVLT	Parent Measures	MRI (MRI TIME: 12:30pm)			
12:45 PM								
1:00 PM	6-Minute Bike Test		Penn CNP		MRI-Q,			
1:15 PM								
1:30 PM	ANT				ANT			
1:45 PM	MRN				BIRD and Dot Probe			
2:00 PM								
2:15 PM	BIRD and Dot Probe		BIRD and Dot Probe		6-Minute Bike Test			
2:30 PM								
2:45 PM	6-Minute Bike Test							
3:00 PM								
3:15 PM								

#### CLG Follow-Up Visit Protocol Labels Defined:

- **Re-consent:** Demographics questionnaire and re-consent
- **Bloods:** Weight/Height, Vital Signs, Hip/Waist Measurement, Tanner Scale, Medications/Medical Conditions, Urine Drug Test (11+), Blood Draw
- **MRN:** ASR (18+), ATQ (16+), BDI (18+), CASI (11+), CDI (11-17), CFQ (16+), Child Satisfaction Questionnaire, CHRLS (18+) Connors Youth, EATQ (9-15), EDEQ (13+), FTQA (13-17), FTND (18+) ICU-Y, IPAQ (15+), IRI (13+), MASC, NEO (12-17), NIDA (11+), PDI (13+), PhenX Sex History (13+), PSQI (13+), Sex Role Identity Questionnaire, Sexual Orientation Questionnaire, TFEQ (12+), TSC-C (11-17), TSC-40 (18+), UCLA Child, YSR (11-17), YSR Adaptive Fx (11-17), YRBSS-MS/HS (12+)
- **Parent Measures:** Adult Satisfaction Questionnaire, ASSQ\*, BASC (7-17), BISQ, CBCL (7-17), CBCL-Adaptive Fx (7-17), CBQ (6-8), CEBQ (7-11), Connors Parent (7-17), ICU-P, Med Hx\*, RBS-R, SES, SRS, SWAN\*, UCLA Parent

\*Participants over the age of 18 complete these assessments as part of MRN at follow-up appointments. Other parent measures are not completed.



### **Color Vision Test**

**Assessment Used:** Ishihara's Tests for Colour Deficiency (24 Plates Edition) 2007

Reference: Ishihara, S. The Series of Plates Designed as a Test for Colour-Deficiency. Tokyo, Japan: Kanehara Trading Inc. (1936).

**Test Administration:** The colour deficiency test was administered in the NKI-RS outpatient research department medical examination room to ensure the room is lit adequately by daylight. The Ishihara's Tests for Colour Deficiency stimulus book plates were held 75cm from the subject and tilted so that the plate of the paper is at a right angle to the line of vision. The participant was asked to state (out loud) the number which is printed on the back of the plate. Responses were recorded indicating whether the subject could read the numeral(s).

**Family History Questionnaires**

**Assessment Used:** Family History Questionnaire, custom created by NKI-RS investigators

**Test Administration:** The family history questionnaires were completed in a private testing room and a white noise machine was turned on outside of the testing room to ensure participant confidentiality. Participant was asked to identify their living or deceased biological family members (i.e., Mom, Dad, Siblings, Children). Participant then recorded family history questionnaires on paper assessments for each family member and returned completed questionnaires to research assistant when completed. These data are not available through the Data Usage Agreement due to privacy concerns.

**Hollingshead SES**

**Assessment Used:** Hollingshead Four-Factor Index of Socioeconomic Status (SES)

Reference: Hollingshead, A. A. (1975). Four-factor index of social status. Unpublished manuscript, Yale University, New Haven, CT.

**Test Administration:** The Hollingshead SES was completed in a private testing room and a white noise machine was turned on outside of the testing room to ensure participant confidentiality. Participants were asked their highest level of education, highest grade completed, and highest level of occupation for themselves, their spouse, their mother, and their father (if known/applicable). Answers were recorded by the research assistant onto a paper version of the Hollingshead SES and were scored thereafter.

**Vineland**

**Assessment Used:** Vineland Adaptive Behavior Scales, Second Edition

Reference: Sparrow, S., Cicchetti, D. & Balla, D. (2006). Vineland Adaptive Behavior Scales – Second Edition. Pearson Education.

**Test Administration:** Vineland was completed by participants parents/guardians in the presence of research staff in a private room. Research staff read through Vineland directions from the test booklet with participant parent/guardians. For each section, research identified the start point (based on child's age) and pointed it out to the parent/guardian. Parents then completed each section with minimal interaction with staff. After entire form was completed, research staff checked each section to ensure that basal requirement was met (4 consecutive items scored 2). If not, the form was returned to the parent and the parent was instructed to complete items that preceded the start point in reverse order until the basal requirement was satisfied.

**Grip Strength**

**Instrument used:** Sammons Preston Jamar Plus+ Digital Hand Dynamometer

**Administration:** Participants were asked to squeeze the dynamometer as hard as possible, three times on each hand, switching back and forth between their left and right hands. All three measurements were averaged for each hand, and participants reported which hand was dominant.

### **Mock Scan**

**Instrument used:** OT Mock Scanner, MoTrack Head Motion Tracking System, Brain Logics MR Digital Projection System, 32 Channel head coil, noise-cancelling headphones.

**Administration:** Participants were informed that they would be completing a mock scan, where they would be entering the MRI tunnel and looking at different movies and images on a screen without the machine taking any pictures of their brain. Staff explained that unlike the real scan, the mock scan would be performed in a different room and would not require them to wear ear plugs. Participants were assured that they would be able to speak with staff at any point if they became uncomfortable or claustrophobic during the mock scans.

After this orientation, participants were set up with the MoTrack device and headphones. After securing the coil, helmet, and knee cushion, participants were brought into the tunnel.

Participants were then read the following instruction to orient themselves to the task:

*“Now we are going to practice lying still inside the scanner. You will see an X. Your job is to keep that X in the green circle by staying as still as possible. You will see that if you move your head, the X will move. If you move outside of the green circle, a noise will remind you to stay still. Please do so, and I will put the X back in the middle of the green circle for you. Don’t try to put it back yourself, because you would be moving a lot then! So sometimes you’ll see the X jumping. That’s me putting it back in the green circle for you. Do you have any questions?”*

The participant then completed one practice trial and three mock scans, during which they were read the following instructions:

Computer Trial	What to say
Practice	“Try moving your head so you can hear the beep. Good job! Now try keeping your head still but moving your arms and legs. As you can see, when you move other parts of your body, your head will still move sometimes. That’s why you need to keep your entire body still when you hear the noises. Do you have any questions?”
Target	“Now you are going to practice lying still while I play some sounds in the background. This first scan is three minutes, so just make sure you try and keep that X in the green circle by staying as still as you can.”
Cartoon	“Now you are going to watch a cartoon just to give you more practice lying still. When you watch the cartoon this time, you will see that whenever you move, the cartoon stops. Just like the last scan when you had to stay still to keep the X in the green circle, now you have to stay still to see the whole cartoon. Remember to stay still so that the cartoon finishes quickly! Any questions? Are you ready?”
6 Minute Rest	“Now you are going to practice one of the scans that you are going to do in the real scanner so that you get really good at it. We are going to ask you to lie as still as you can for 6 minutes while you keep your eyes open and look at a white cross. You will see ‘Relax’ on the screen and after about 20 seconds, it will switch to the cross”

NOTE: Mock scans were only completed as part of 2-day baseline visit procedures; they were removed from protocol during 1-day baseline visits.

## **ACDS**

### **Assessment Used:** Adult ADHD Clinical Diagnostic Scale (ACDS)

Reference: Kessler, R. C., Green, J. G., Adler, L. A., Barkley, R. A., Chatterji, S., Faraone, S. V., . . . Van Brunt, D. L. (2010). Structure and diagnosis of adult attention-deficit/hyperactivity disorder: Analysis of expanded symptom criteria from the adult ADHD clinical diagnostic scale. *Archives of General Psychiatry*, 67(11), 1168-78.

**Administration:** The ACDS was completed in a private testing room and a white noise machine was turned on outside of the testing room to ensure participant confidentiality. The participant was asked to focus on the “period of time before they became a teenager, roughly the time corresponding to elementary or primary school.” The research assistant was then asked questions A1 – A21 aloud and responses were recorded on paper according to the ACDS scoring guidelines. The participant was then asked to “think about only the past twelve months, that is, since [month, year].” The research assistant was then asked questions B1 – B21 aloud and responses were recorded on paper according to the ACDS scoring guidelines. ACDS was typically administered alongside the SCID, only to participants ages 18+.



**Demos**

**Assessments Used:** Demographics Form

**Administration:** Participant's (<18 years of age) parents or guardians were given the demographics form and asked to fill in their child's age, date of birth, sex, ethnicity, race, and native language at each annual visit. If the information given changed year to year, this was clarified with the participant and responses were adjusted as needed to ensure accuracy. Native language was defined as the primary language learned and spoken during childhood.

**Height, Weight, and Vital Signs**

**Administration:** The participant's height, weight, and vital signs were taken in the medical room in the outpatient research department. The participant stepped onto a weighted scale and weight was recorded in pounds (and converted into kilograms thereafter). Blood pressure was taken using a digital sphygmomanometer (American Diagnostic Corporation e-sphyg) with a research assistant listening with a stethoscope simultaneously to ensure accuracy. A radial pulse was also recorded by the digital sphygmomanometer. Waist and hip measurements were also recorded in centimeters during this time.

**Medications & Medical Conditions**

**Administration:** All medications and supplements taken on a regular basis were recorded in a private testing room. All medications and supplements were recorded in their generic forms. A white noise machine was turned on outside of the testing room to ensure participant confidentiality. Participant's parents or guardians were also asked to report any chronic illnesses or health conditions that their children experience. This was cross-referenced with the primary indications on the medications form to ensure accuracy of the parent's report.

**Tanner Scale**

**Assessments Used:** Tanner Scale

References:

Marshall, W. A., Tanner, J., M. (1970). Variations in pattern of pubertal changes in boys. Archives of Disease in Childhood, 45 (239), 13.

Marshall W.A., Tanner J.M. (1996). Variations in pattern of pubertal changes in girls. Archives of Disease in Childhood, 44, 291-303.

**Administration:** Participants ages 12+ were asked to fill in the developmental scale by circling the image that best corresponded to their stage of development. For children under the age of 12, the scale was administered either to them or their parent/guardian, depending on a subjective assessment of the child's level of comfort and maturity.

### **Blood Collection & Genetics Sample Collection**

**Collection:** Vials of blood were collected in the same order at each visit to perform the following analyses:

<b>Vial</b>	<b>Panel(s)</b>	<b>Tests</b>
Vacurette 8mL Z Serum Sep Clot Activator (Red-top tube)	SMAC	Albumin Total Bili Alk Phos Total Protein BUN Triglycerides Potassium Cholesterol Ratio GFR Chloride CO2 m Glucose LDH Phosphorus Uric Acid Globulin SGOT (AST) SGPT (ALT) A/G Creatine Sodium
	Thyroid Panel 1	TSH, Free T4
Vacurette 4 ml K3E K3eDTA tube* (Lavender-top tube)	CBC	CBC (Dif + Platelets)
5 ml K <sup>2</sup> EDTA tube* (Tan-top tube)	Lead level (ages 6-17 only)	Lead level
Vacurette 8mL Z Serum Sep Clot Activator (Red-top tube)	DHEA, Free Testosterone, Estradiol	DHEA Free Testosterone Estradiol (females only)
BD Vacutainer 8.5 ml ACD Solution A tubes ( <b>x2</b> ) (Yellow-top tube)	Metabolites	Tryptophan Leucine Quinolinic acid Phenylalanine Tyrosine Valine Isoleucine Kynurenine

\*Collected at baseline visit (Visit A) only

After the blood collection, the two metabolite tubes were spun down in a centrifuge at 4000 rpm for 10 minutes at room temperature. Plasma was transferred to cryogenic tubes and stored in a -70°C freezer. All other tubes were brought to the OMH Clinical Laboratory at NKL for processing. Samples collected over the weekend were either spun down (8 mL tubes) or refrigerated (4 mL tubes) and brought to the lab immediately upon its reopening the following Monday.

Three additional vials containing genetics samples were collected at one visit (typically Visit 4). Immediately after collection, the genetics samples were packaged and sent to the RUCDR- Nelson Labs to be processed and made available through the NIMH Genetics Repository.

### **Urine Toxicology**

**Test used:** CLIAwaived, Inc Rapid Drug Test Cup (CLIA-14-RDTC)

**Administration:** For all participants ages 11+, a urine sample was collected, typically at the beginning of the day, and tested for the presence of amphetamine, barbiturates, benzodiazepines, buprenorphine, cocaine, ecstasy, methadone, methamphetamine, marijuana, opiates, oxycodone, phencyclidine, propoxyphene, tricyclic antidepressants. Test lids were read approximately 5 minutes after activation.

**Urine Pregnancy Test**

**Test used:** Sure-View Urine hCG Strips (Fischer HealthCare)

**Administration:** All female participants who had begun menstruation were tested for pregnancy prior to the MRI with urine test strips. These were the only cases in which urine was occasionally collected from participants under 11 years old. The test strips were then read after 3-4 minutes and a positive or negative result was determined and recorded. A positive test was a contraindication for the MRI.

## **Actigraphy**

**Instruments used:** Philips Respironics Actiwatch 2

References: Gironde, R. J., Lloyd, J., Clark, M. E., & Walker, R. L. (2007). Preliminary evaluation of reliability and criterion validity of actiwatch-score. *J Rehabil Res Dev*, 44(2), 223-30.

**Administration:** The units were given to participants on the morning of the first visit. They were then asked to wear it on their non-dominant wrist until they return for their second visit. Actigraphy data was obtained for a minimum of 24 hours and up to 1 week, depending on how far apart a participant's first and second visits are. Participants were asked to wear the actigraphy unit continuously (unit is waterproof) and asked to press the event marker button right before they are about to go to sleep.



## **MRI & MRI Questionnaire**

**Instruments:** 3T Siemen’s MRI scanner, Linux computer, Lumina Box, AcqKnowledge 4.2 BIOPAC program, “Memory of Trees” CD by Enya, Biopac Systems Disposable RT electrodes, Biopac Systems Respiratory Efforts Transducer, Brain Logics MR Digital Projection System, 32 Channel head coil, noise-cancelling headphones, disposable earplugs

**Task Administration:** Prior to scanning, participants were screened for contraindications including specific medical conditions and metal artifacts in or on their person to ensure safety. MRI screeners were administered to parents/guardians in the presence of their child. After the participants were cleared for the MRI, the research assistant provided instructions for each scan (included in the list below) upon walking participants to the scanner. Participants were asked to remove everything from their pockets as well as bags, jewelry, belts, hearing aids, dentures, hair clips, or piercings. Participants’ belongings were stored and locked in a secure room. If applicable, the time of participants’ caffeine intake prior to scanning was recorded.

To prepare participants for scanning, the research assistants provided practice instructions and related stimuli for each scan on a Linux computer. The participants were then taken into the scanning room by the MRI technician(s) and were fitted with a respiration belt around their waist, a pulse transducer, and electrodes on their fingers to record their respiration rate, pulse rate, and galvanic skin response (GSR), respectively. Additionally, participants were provided with ear plugs and headphones to reduce noise in the scanner. Participants were given an emergency button to alert the research assistant and technician(s) if they felt that they could no longer continue scanning. For specific scans, participants were also given a pad with four buttons to press in response to applicable stimuli.

Upon entering the MRI tunnel, the research assistant ensured that the participants were prepared for scanning via microphone, and checked that the microphone was at an appropriate volume for the participants. On the computer, the research assistant completed a calibration period in which they reviewed the respiration, pulse, and GSR waveforms through the AcqKnowledge 4.2 computer program to verify that the signals were clear. Throughout scanning, the research assistant provided the specific length and instructions to the participants for each upcoming scan by reading an established script verbatim. BIOPAC data were saved for each applicable scan by the research assistant from the AcqKnowledge program. Participants were reminded to remain as still as possible throughout scanning and were able to speak to the research assistant via microphone in between each scan.

If a child was able to complete a full scan, they were invited to return within the next month for an MRI retest visit, to ensure reliability of data. Retest visits could be completed after baseline or follow-up visits, but there was only one retest visit per participant.

The following table includes the names, lengths, and instructions for each scan that participants completed. During scans with music, a “Memory of Trees” CD by Enya was played.

Name of Scan	BIOPAC Data	Music	Stimuli	Instructions
BIOPAC Calibration	Waveforms reviewed, data not saved	Off	None	Participants were asked to inhale, hold their breath for 1-2 seconds, and exhale for a short period of time. MRI technicians adjusted participants’ sensors as necessary.
Localizer (1 minute)	Off	On	None	Participants were informed that the scan would be 1 minute long and would include music. Participants were instructed to keep their eyes open or closed, whichever was more comfortable.
REST_645	On	Off	Fixation	Participants were informed that the scan would be 10 minutes long and that they should keep their eyes fixated on the cross.
MPRAGE	Off	On	Fixation	Participants were informed that the scan would be 4 minutes long and would include music. They were told that they could keep their eyes open or closed.
REST_1400	On	Off	Fixation	Participants were informed that the scan would be 10 minutes long and that they should keep their eyes fixated on the cross.
REST_CAP	On	Off	Fixation	Participants were informed that the scan would be 5 minutes long and that they should keep their eyes fixated on the cross.
CHECKER_645	On	Off	Checkerboard	Participants were told to keep their eyes focused on a red dot on the screen and to press any button each time they saw the checkerboard appear behind the dot. They were informed that the scan was 2 minutes long.
CHECKER_1400	On	Off	Checkerboard	Participants were told to once again keep their eyes focused on a red dot on the screen and to press any button each time they saw the checkerboard appear

				behind the dot. They were informed that the scan was 2 minutes long.
BREATH_HOLD_1400	On	Off	Breath Hold	Participants were instructed to follow the prompts on the screen for the duration of the 4 minute scan. They were reminded that they should breathe normally whenever they saw the word “rest” and that they should keep as still as possible when taking deep breaths. They were advised not to worry if they could not hold their breathe for the full interval indicated by the prompts, but to try their best.
PCASL_REST	On	Off	Fixation	Participants were informed that the scan would be 5 minutes long and that they should keep their eyes fixated on the cross.
DIFF_137	On	On	Fixation	Participants were informed that the scan would be 6 minutes long and include music. They were told that they would feel the table shake and vibrate, but that this was normal. They were also told to keep their eyes open or closed, whichever they preferred.
HCP_SPACE & FLAIR	Off	On	Fixation	Participants were informed that the final scan would be seven minutes long. They were reminded that they could keep their eyes open or closed.

Immediately after the scan, all participants aged 13+ completed the MRI-Questionnaire (MRI-Q), a short survey detailing their experiences and thoughts during the MRI scan.

**Calculated Age**

**Administration:** Participant's exact age at the time of the MRI scan was calculated based on the date of the appointment and their date of birth. All calculations were made using 12-month years and 30-day months.

**BIRD**

**Assessments used:** The Behavioral Indicator of Resiliency to Distress

Reference: Lejuez CW, Daughters SB, Danielson CW, Ruggiero K. The Behavioral Indicator of Resiliency to Distress (BIRD) 2006 Unpublished manual.

**Administration:** Participants were given the following instruction:

*“You will see ten numbered boxes (1-10) on the computer screen, as well as an image of a bird in a cage. A green dot will appear in one of the numbered boxes. Your job is to use the computer mouse to click on the numbered box where the green dot appears, before the green dot jumps to another number. Each time you manage to do that you get a point.*

*The first level will last 3 minutes. The better you do, the faster the green dot will jump.*

*The second level will last 4 minutes. It is more difficult than the first level.*

*The third and final level will last up to 5 minutes. During this level, you will always have an escape option. That is, you can end the game by clicking the “Quit Game” button on the computer screen at any time.”*

All participants were given noise-cancelling headphones to wear during testing. Subjects heard a pleasant sound and were awarded points each time they succeeded in the clicking the correct box. However, an unpleasant sound is played whenever the subjects did not click the box in time. Subjects were able to click a button to abort the game during the final portion of the test.

### **Dot Probe**

References: Abend, R., Pine, D.S., Bar-Haim, Y. (2014). The TAU-NIMH Attention Bias Measurement Toolbox. Retrieved from <http://people.socsci.tau.ac.il/mu/anxietytrauma/research/>.

MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology*, 95, 15-20. doi:10.1037/0021-843X.95.1.15

**Administration:** In this task, a pair of faces, one threat-related and one either neutral or happy, were shown briefly side-by-side. A small probe replaced one of the faces immediately following offset. Participants were then required to respond as quickly as possible by pressing keys on a keyboard to indicate which face was replaced by a dot without compromising accuracy. The face stimuli were usually photographs of 16 different individuals (8 male, 8 female) taken from the NimStim set.

Instructions were read verbatim to the participant directly from the Dot Probe task on the computer screen. All participants were given noise-cancelling headphones to wear during testing to prevent background noises from distracting them or interfering with the task.

## **MRN**

A set of self assessment questionnaires completed through the Mind Research Network (MRN) online interface. A description of each assessment can be found here: [http://fcon\\_1000.projects.nitrc.org/indi/enhanced/assessments/master\\_list.html](http://fcon_1000.projects.nitrc.org/indi/enhanced/assessments/master_list.html)

**Administration:** Both participants and their parents/guardians (when participants were <18 years old) were separately given surveys to complete online. They were seated in front of a computer and given the following instruction:

*"You're going to be answering a lot of questionnaires about several different topics. You'll notice the questionnaires are a bit repetitive, they are supposed to be that way to maintain validity for all responses. If you have any questions, feel free to ask."*

Questionnaires were then completed with research staff available to clarify any questions. In some cases in which participants struggled with reading or had attentional difficulties, research staff read questions and response options out loud to participants and recorded their verbal responses. Responses were later reviewed by research staff to check for completion.

Assessments completed were as follows:

Baseline Visit	Follow-Up Visits
ASSQ*	ASR(18+)
ATQ (16+)	ASSQ*
BASC (7-17)*	ATQ (16+)
BISQ*	BASC (7-17)
CASI (11+)	BDI (18+)
CBCL (7-17)*	BISQ*
CBCL-Adaptive Fx (7-17)*	CASI(11+)
CBQ (6-8)*	CBCL(7-17)*
CDI (11-17)	CBCL-Adaptive Fx (7-17)*
CEBQ (7-11)*	CBQ (6-8)*
CFQ (16+)	CDI (11-17)
Child/Adult Satisfaction Questionnaire	CEBQ (7-11)*
Connors Parent (7-17)*	CFQ (16+)
Connors Youth	CHRLS (18+)
CYBOCS (6-17)*	Connors Parent (7-17)*
Demographics Supplement*	Connors Youth
EATQ (9-15)*	EATQ (9-15)*
EDEQ (13+)	EDEQ (13+)
EHQ (6-17)*	FTND (18+)
Family History Questionnaire - Parent*	FTQA (13-17)
FTQA (13-17)	ICU-P (7-17)*
ICU-P (7-17)*	ICU-Y (13+)
ICU-Y (13+)	IPAQ (15+)
IPAQ (15+)	IRI (13+)
IRI (13+)	MASC
MASC	Medical History Questionnaire – Child*
Medical History Questionnaire – Child*	NIDA (11+)
NEO (12-17)*	PDI (13+)
NIDA (11+)	PhenX Sex History (13+)
PDI (13+)	PSQI (13+)
PhenX Sex History (13+)	RBS-R *
PSQI (13+)	Sex Role Identity Scale (13+)
RBS-R*	Sexual Orientation Scale (13+)
SES*	SRS (7-17)*
Sex Role Identity Scale (13+)	STAI (18+)
Sexual Orientation Scale (13+)	SWAN*
SRS (7-17)*	TFEQ (12+)
SWAN*	TSC-40(18+)
TFEQ (12+)*	TSC-C (11-17)
TSC-C (11-17)	UCLA Parent*
UCLA Parent*	UCLA PTSD Child



UCLA Child	UPPS (18+)
YGTSS (6-17)*	YSR (11-17)
YSR (11-17)	YSR Adaptive Fx (11-17)
YSR Adaptive Fx (11-17)	YSRBS-MS/HS (12+)
YSRBS-MS/HS (12+)	Child/Adult* Satisfaction Questionnaire
Zip Code*	

\* Indicates an assessment completed by parent/guardian only

## **PENN CNP**

**Assessment Used:** University of Pennsylvania Computerized Neuropsychological Testing

References: Gur, R.C., et al. (2009). A cognitive neuroscience-based computerized battery for efficient measurement of individual differences: Standardization and initial construct validation. *Journal of Neuroscience Methods*, 187(2010), 254-262.

**Task Administration:** The following instruction was provided to the participant:

*“We will now do some memory and puzzle-like games on the computer. Some are easy and some are more difficult. Don’t worry if you make mistakes- everyone does. Try your hardest, work accurately and quickly. Some questions may take more time than others, and that’s OK. Just do your best for each one. I will let you know when you can take a break, if you want one. Do you have any questions?”*

All participants were given noise-cancelling headphones to wear during testing to prevent background noises from distracting them or interfering with the task.

The PENN CNP Battery was administered in the following order:

- Motor Praxis Test
- Emotional Recognition
- Penn Continuous Performance Test

### OPTIONAL BREAK

- Penn Face Memory
- Penn Word Memory for Children
- Short Letter N-Back

### OPTIONAL BREAK

- Penn Conditional Exclusion Test
- Measured Emotion Differentiation
- Short Finger Tapping (SKIPPED)

### OPTIONAL BREAK

- Short Visual Object Learning Test
- Penn Verbal Reasoning

Throughout testing, participants were actively monitored by examiners. Extra assistance was provided as needed by providing verbatim instructions clearly as participants moved through the practice rounds. Extra assistance was only provided during the practice rounds and never during the tests themselves. Coaching or assistance was never provided during Penn Conditional Exclusion Task.

## **ANT**

### **Assessment Used:** Attention Network Task

References: Fan, J., McCandliss, B. D., Sommer, T., Raz, A., & Posner, M. I. (2002). Testing the efficiency and independence of attentional networks. *Journal of Cognitive Neuroscience*, 14(3), 340-7. doi:10.1162/089892902317361886

**Administration Test:** Participants ages 13+ were given the following instruction:

*“This is an experiment investigating attention. You will be shown an arrow on the screen pointing either to the left or to the right. Your task is to press the left arrow key on the keyboard when the middle arrow points left and the right arrow when the middle arrow points right. Use your index finger for the left arrow and your right index finger for the right arrow”*

*“Sometimes the middle arrow will be surrounded by two arrows to the left and right. Your task is to respond only to the direction of the central arrow. Please make your response as quickly and accurately as possible.”*

*“There will be a cross in the center of the screen and the arrows will appear either above or below the cross. You should try to look at the cross throughout the experiment. On some trials there will be asterisks indicating when or where the arrow will occur. You may look at these asterisks when they appear”*

*“There is one practice session, which takes 2 minutes. Then there are 3 test sessions; each are 5 minutes long. You can take a short break between the sessions if you’d like. If you have any questions, please ask the experimenter. If you understand these instructions, you may start the practice session.”*

If participants began using one hand to select the arrow keys, they were reminded to use their right and left index fingers for the right and left arrow keys, respectively. All testing was performed in a quiet environment with active monitoring by an examiner.

Participants under 13 were given a nearly identical task, but the arrows were instead represented by fish, which were “fed” by the participant with each correct response. For this version of the test, instructions were read verbatim from the ANT task on the computer screen.

All participants were given noise-cancelling headphones to wear during testing to prevent background noises from distracting them or interfering with the task.

### **Diagnostic Summary & Consensus Diagnosis**

**Assessment Used:** Structured Clinical Interview for DSM-IV-TR (SCID) Axis I Disorders (Nonpatient Edition), Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS)

#### References:

Kaufman, J., et al. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(7), 980-988).

First, M., B., Spitzer, R. L., Gibbon, M., and Williams, J.B.W.: Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient edition (SCID-I/NP, 1/2010 revision). New York: Biometrics Research, New York State Psychiatric Institute, November 2002.

**Administration:** KSADS and SCID were completed in accordance with the official interviewing and scoring guidelines outlined in the training materials published by the APA. During KSADS, participants under 18 years of age and their parents/guardians were interviewed separately in private rooms by trained research staff to determine past and present diagnoses. White noise machines were placed outside the door to ensure privacy. SCID was administered to all participants ages 18+. Consensus diagnoses were given only in the event that the examiner's overall impression of a diagnosis differed from the diagnoses obtained through KSADS or SCID scoring.

## **Neuropsych Battery: Overview**

**Assessments used:** Delis Kaplan Executive Function System (DKEFS; Verbal Fluency, Trails, Design Fluency, Color-Word Interference, Tower), Rey Auditory Verbal Learning Test (RAVLT), Digit Span (Forward and Backward), Grooved Pegboard, Wechsler Abbreviated Scale of Intelligence II (WASI-II), Wechsler Individual Achievement Test - IIA (WIAT-IIA).

**Test administration:** Prior to testing, participants were asked to turn off their cell phones (if applicable) to limit any potential distractions or interruptions. Participants were encouraged to take short breaks as needed in between assessments to prevent interruptions during individual parts of the battery. White noise machines were turned on outside of the testing room to limit any background noise coming from other parts of the testing center and ensure privacy. Participants were seated directly across from the examiner and all testing materials were hidden from participants' view when not in use.

For participants ages 8+, the order of administration was as follows:

1. DKEFS Verbal Fluency
2. RAVLT (Immediate Recall)
3. DKEFS Trails
4. Digit Span (Forward & Backward)
5. DKEFS Design Fluency
6. DKEFS Color-Word Interference
7. DKEFS Tower
8. Grooved Pegboard
9. RAVLT (Delayed Recall)
10. WASI\*
11. WIAT-IIA\*

For participants ages 6-7, the order of administration was as follows:

1. Digit Span
2. WASI\*
3. WIAT\*
4. Grooved Pegboard

\*Administered only at baseline (A) visit.

Each individual assessment was administered and scored according to the official administration and scoring guidelines for that test or subtest. These materials were provided by the administration manuals published for the Delis Kaplan Executive Function System, Rey Auditory Verbal Learning Test, Digit Span, Grooved Pegboard, Wechsler Abbreviated Scale of Intelligence II, and Wechsler Individual Achievement Test. All assessments were double scored by research staff prior to entry.

Neuropsych batteries were typically completed first thing in the morning or directly after lunch. Assessments were not typically administered directly before or after computerized cognitive tests (ANT, Penn CNP, BIRD, Dot Probe). If this did occur due to scheduling conflicts, participants were provided with a 15-minute break in between the neuropsych battery and computerized testing.

**6 minute bike****Bike Used:** Precor (RBK 10: HCOM 815)**Test administration:**

1. A resistance level and estimated wattage at 70 RPM were determined based on participants' age and gender.

	Resistance	Estimated Wattage at 70 RPM
<b>Males</b>	<b>8</b>	<b>133.16</b>
<b>Females</b>	<b>7</b>	<b>121.89</b>

2. A pulse oximeter was applied to the participant's finger to monitor heart rate throughout testing. Participants were also instructed to grip the heart rate monitor on the bike's handles throughout testing as a secondary way of measuring their pulse rate.
3. Participant's initial heart rate was recorded from the bike and pulse oximeter.
4. Participants were instructed to begin pedaling at 70 rpm and the appropriate resistance level was set.
5. Participants were asked to cycle for 6 minutes, during which they were monitored to ensure that their speed was between 68-72 rpms. If the participant was unable to complete the full 6-minute interval, failure time was recorded.
6. Final heart rate was recorded from the bike and pulse oximeter at the end of the 6-minute interval, or at time of failure.