Development of Amygdala Functional Connectivity During Infancy and Its Relationship with 4-year Behavioral Outcomes

Supplemental Information

Table of Contents

Image Preprocessing. Functional data were preprocessed using the FMRIB Software Library (FSL v5.0.8; (1)) and the Analysis of Functional NeuroImages suite (AFNI v16.0.10 2-25-2016; (2)). Steps included discarding the first 10 volumes, slice-timing correction, rigid-body motion correction, bandpass filtering (0.01– 0.08 Hz), and regression of white matter (WM), cerebral spinal fluid (CSF), and whole-brain (i.e. the global) signals, as well as the six parameters corresponding to rigid-body motion correction. Data scrubbing included 0.5% signal change and 0.5 mm frame-wise displacement (3). Subjects with less than 3 minutes of data were excluded (N = 11). For each subject we also computed an overall motion parameter; the residual frame-wise displacement (rFD) divided by the total number of volumes post-scrubbing. Spatial normalization was achieved using a two-step approach; 1) subject-specific linear (FSL flirt) plus age-specific non-linear (FSL FNIRT) warping and, 2) between-age-group linear transformations. Publicly available infant templates were used for age-specific registration (4). The 2-year template served as the final target for spatial normalization. Functional connectivity analyses were conducted in age-specific space; however, the resulting measures were subsequently aligned to the 2-year template space for cross-sectional and longitudinal functional connectivity analyses. The between age-group transformations (i.e. NEO-to-1YR-to-2YR) were computed using the segmented template images (cost function = normalized mutual information, 12 degrees-of-freedom).

Network-level analysis. The network-level FC analyses were based on adult canonical resting-state networks (RSNs) (5). The non-cerebellum RSNs were warped into infant space using established methodology (4). Briefly, the MNI152 template was aligned to the 2-year infant template using segmented images and nonlinear registration (6). The resulting deformation field was then applied to the RSNs. Once warped, RSN masks were created using a Z-threshold = 5 (**Figure S1**).

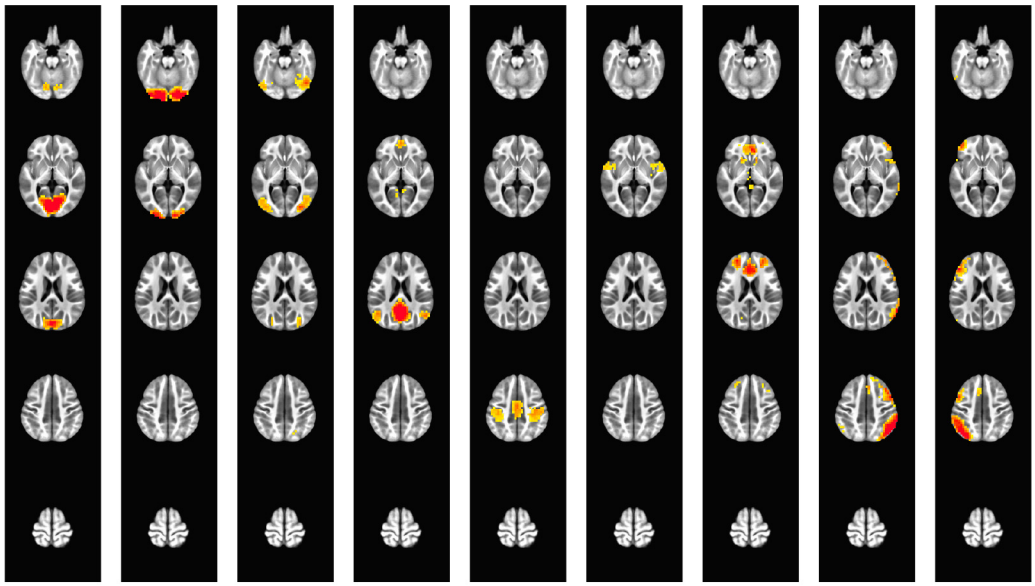

Figure S1. Smith resting-state networks (RSNs) warped into 2YR UNC template space. RSNs used in network-level analyses. Left-to-right: primary visual (V_a), middle visual (V_b), lateral visual (V_c), default-mode network (DMN), sensorimotor (SM), auditory (AUD), salience (SAL), and right/left executive control (CON-R/L).

Behavioral Assessment Information

Emotional and cognitive assessment at 4 years of age. We obtained both parent-reported and task-based laboratory assessments of children's behaviors at 4 years. The primary emotion-related outcome variables were ratings of anxiety and emotional/self-control assessed using Behavior Assessment System for Children – 2nd edition (BASC-2; (7)) and Behavior Rating Inventory of Executive Function – Preschool version (BRIEF-P; (8)), respectively. Moreover, 4-year IQ was also assess using Stanford-Binet Intelligence Scales – 5th edition as an index of cognitive development (9).

Behavior Assessment System for Children – 2nd edition (BASC-2). Parents completed the preschool (ages 2-5 years) version of the BASC-2, rating each of 134 items based on a four-point scale (never, sometimes, often, almost always). The BASC-2 parent-report preschool form generates 12 clinical scales which comprise 4 composite scales. For each scale, item scores are summed and converted to T scores standardized by age and sex. The Anxiety scale used in this study includes 13 items that describe behavior such as worry or fear about real or imagined problems. A T-score of 60 or greater indicates that a child is "at risk," and 70 or greater is considered "clinically significant." A high score on the Anxiety scale by itself is generally not sufficient for the diagnosis of an anxiety disorder, but elevated anxiety levels as reported on the BASC-2 may be related to the manifestation of any number of other disorders. Here 16 subjects were at risk and 5 reached potential clinical significance. The Anxiety scale has strong test-retest reliability

(r = .78) and internal consistency (α = .81). Higher scores represent more problematic behaviors.

Behavior Rating Inventory of Executive Function – Preschool version (BRIEF-P). The BRIEF-P is a 63-item parent-report inventory designed to measure executive function behaviors in children aged 2-5 years. Parents rate children on a three-point scale (never, sometimes, often), and scores are summed to generate five subscales. These subscales combine to create three indices and a global composite, all of which are converted to T-scores standardized by age and sex. This study utilizes the Inhibitory Self-Control Index (ISCI), which is comprised of the Inhibit and Emotional Control subscales. This scale measures a child's ability to regulate behavioral and emotional responses across different situations. These behaviors are crucial for developing self-regulation and metacognition. Scores may not be indicative of absolute levels of abilities, as they reflect a child's behaviors relative parent's or caregiver's expectations. A T-score of 65 or higher on any of the BRIEF-P scales is indicative of "potential clinical significance"; thirteen (N = 13) subjects had ISCI scores falling in this range. The ISCI has strong test-retest reliability (r = .90) and internal consistency (α = .92). Higher scores on this scale represent higher degrees of executive function difficulties.

Stanford-Binet Intelligence Scales – 5th edition. The Stanford-Binet is a series of tasks administered individually in a structured setting. These scales were designed to assess intelligence across the lifespan (it is appropriate for individuals aged 2 through 85 years), specifically focusing on five major domains. In the current study, the Abbreviated IQ

(ABIQ) score was used as a measure of general cognitive ability. This IQ score is calculated from performance on two routing subtests: a nonverbal test involving object or sequence/pattern recognition and a verbal test of vocabulary. The Abbreviated IQ score provides a quick estimate of a child's general cognitive ability, and as it requires the administration of only two subtests, it is easier to obtain than the full-scale IQ, especially for 4-year-old children. The ABIQ score has shown strong test-retest (r = .87) reliability. The Stanford-Binet scales also have strong interrater reliability (ranging from .74-.97 across all scales).

Table S1: Breakdown of behavioral measurements.

Time-point			**Behavioral Measure**		
NEO	*1YR*	*2YR*	*4YR-ANX*	*4YR-ISC*	*4YR-IQ*
0	0	1	15	16	16
0	1	0	16	16	17
0	1	1	15	15	15
1	0	0	36	36	36
1	0	1	5	5	5
1	1	0	18	18	20
1	1	1	20	20	20
Model Type					
Cross-sectional					
NEO			79	79	81
1YR			69	69	72
2YR			55	56	56
Longitudinal					
NEO→1YR			110	110	113
1YR→2YR			89	90	93

Left versus right amygdala FC. Similarities and differences in FC between the left and right amygdala growth patterns were further evaluated by performing a simple union analysis of significant clusters detected for each longitudinal model (NEO→1YR & 1YR→2YR) and direction of growth [positive and negative, i.e. ± β•log(age)] – **Figure S2**.

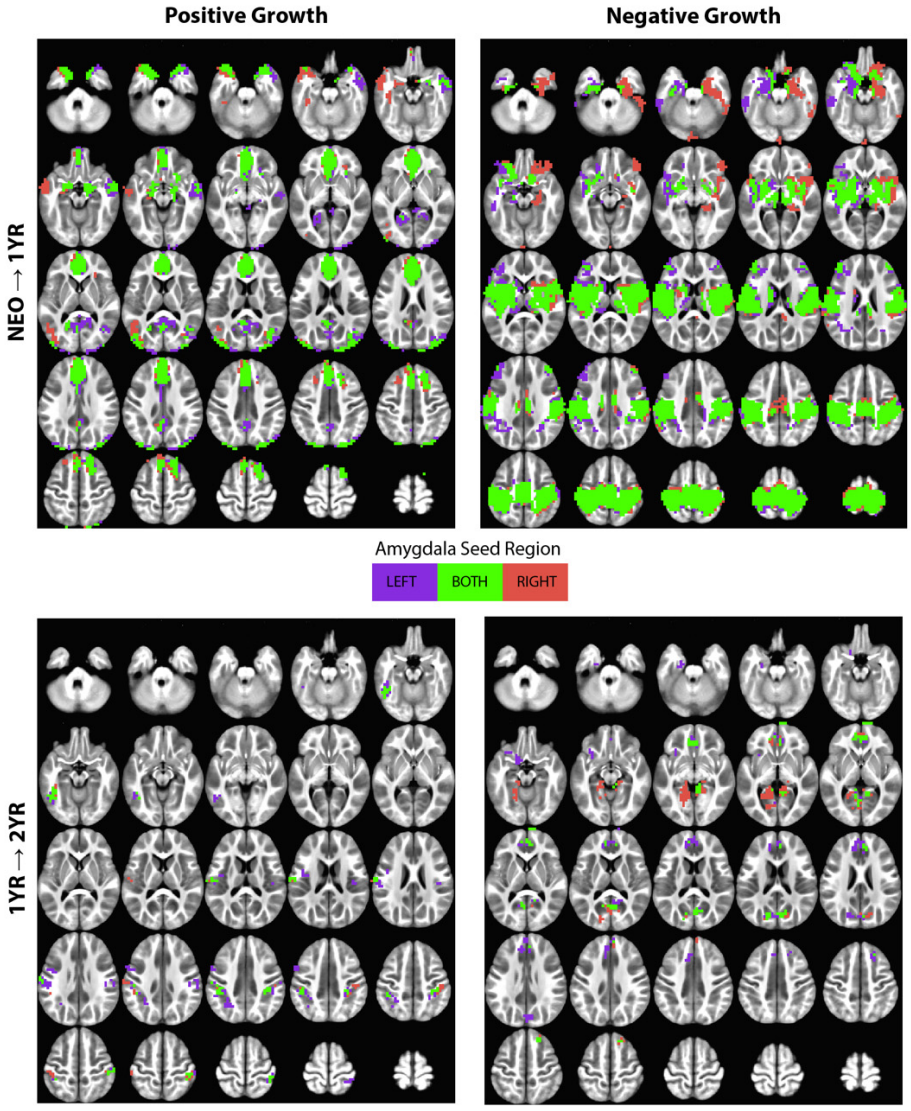

Figure S2: Similarity in left and right amygdala functional connectivity growth in the first (NEO→1YR) and second (1YR→2YR) years. Positive or negative significant growth [i.e. ± β•log(age)] clusters (see Figure 2 in main text) color-coded by seed-region; left = purple, right = reddish-pink, and both = green.

Sex and amygdala functional connectivity (FC). In the linear-mixed-effect (LME) growth models we further explored potential sex effects using the cluster-based approach. Sex-effects were modeled as main-effects (i.e. specifically looking at the covariate in the context of all other variables) or sex-by-growth interactions (i.e. does sex modulate growth rates, again controlling for other factors). Three sex-specific FC effects were detected (**Figure S3**); (red cluster) left amygdala FC with itself and neighboring para/hippocampal gyrus (PHG/HIP-L) showed greater FC in females (NEO & 1YR), (blue cluster) females (1YR & 2YR) demonstrated more negative FC between the left amygdala and right supramarginal gyrus (SMG-R) / rolandic operculum (ROL-R), and (yellow cluster) females showed lower growth rates than males between the left amygdala and left inferior frontal gyrus triangular (IFGtriang-L) / middle frontal gyrus (MFG-L) during the first year (NEO→1YR).

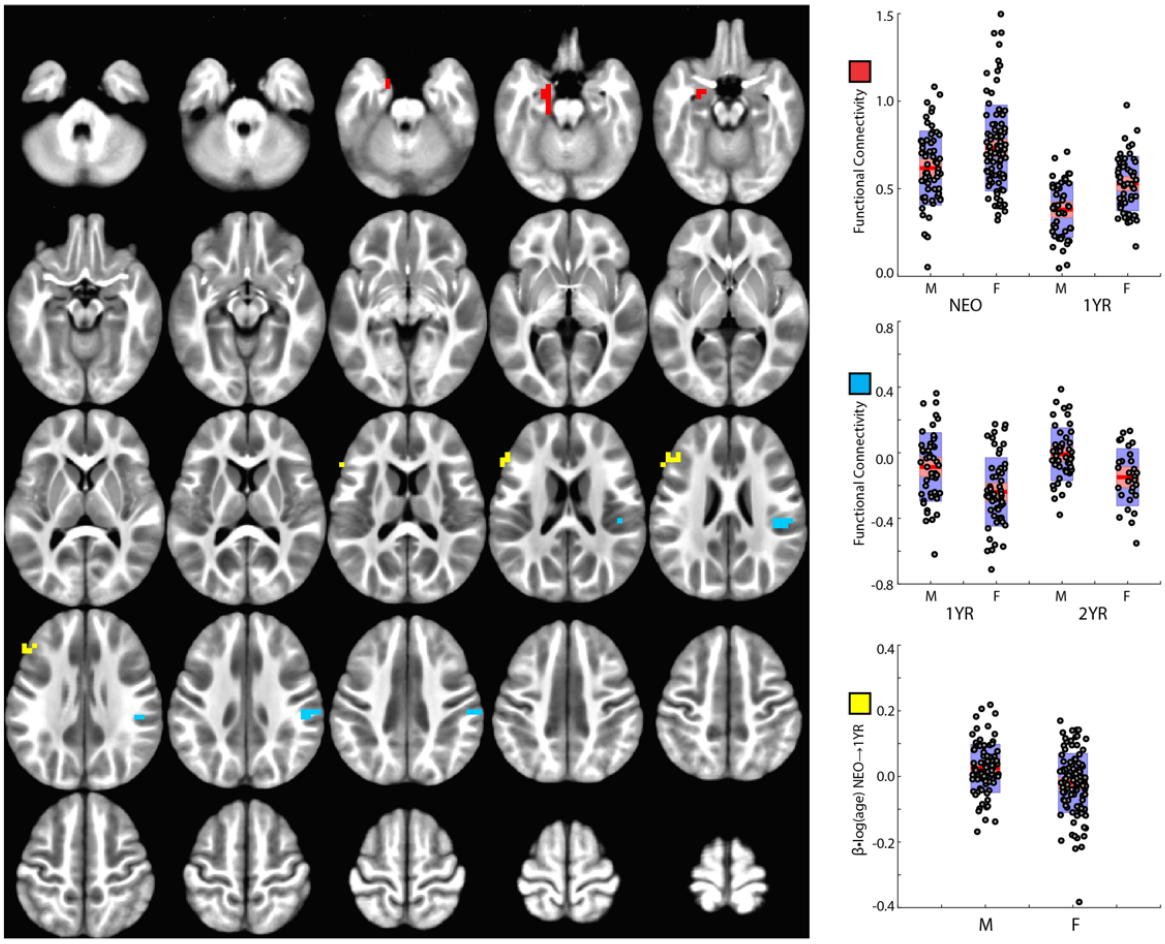

Figure S3: Sex-specific effects involving left amygdala functional connectivity (FC). Significant clusters (α = 0.05, see methods) showing sex effects [β•Sex or β•Sex:log(age)] illustrated on the left with corresponding group distributions based on voxel-wise averages shown on the right. Red cluster (13 voxels); peak-voxel-statistics (PVS): t = 3.89, β = 0.14, XYZ = [19, -1, -21]. Cyan cluster (19 voxels); PVS: t = -4.78, β = -0.19, XYZ = [-49, 23, 31]. Yellow cluster (15 voxels); PVS: t = -4.62, β = -0.24, XYZ = [51, -21, 19]. Distribution plots show individual subjects (grey markers), means (red line), standard errors of the means (SEM; shaded red), and standard deviations (SD; shaded blue).

Table S2: AAL-regions used in cluster descriptions.

Region		Hemisphere	Abbreviation
Precentral gyrus		left	PreCG-L
Precentral gyrus		right	PreCG-R
Superior frontal gyrus	(dorsal)	left	SFGdor-L
Superior frontal gyrus	(dorsal)	right	SFGdor-R
Orbitofrontal cortex	(superior)	left	ORBsup-L
Orbitofrontal cortex	(superior)	right	ORBsup-R
Middle frontal gyrus		left	MFG-L
Middle frontal gyrus		right	MFG-R
Orbitofrontal cortex	(middle)	left	ORBmid-L
Orbitofrontal cortex	(middle)	right	ORBmid-R
Inferior frontal gyrus	(opercular)	left	IFGoperc-L
Inferior frontal gyrus	(opercular)	right	IFGoperc-R
Inferior frontal gyrus	(triangular)	left	IFGtriang-L
Inferior frontal gyrus	(triangular)	right	IFGtriang-R
Orbitofrontal cortex	(inferior)	left	ORBinf-L
Orbitofrontal cortex	(inferior)	right	ORBinf-R
Rolandic operculum		left	ROL-L
Rolandic operculum		right	ROL-R
Supplementary motor area		left	SMA-L
Supplementary motor area		right	SMA-R
Olfactory		left	OLF-L
Olfactory		right	OLF-R
Superior frontal gyrus	(medial)	left	SFGmed-L
Superior frontal gyrus	(medial)	right	SFGmed-R
Orbitofrontal cortex	(medial)	left	ORBmed-L
Orbitofrontal cortex	(medial)	right	ORBmed-R
Rectus gyrus		left	REC-L
Rectus gyrus		right	REC-R
Insula		left	INS-L
Insula		right	INS-R
Anterior cingulate gyrus		left	ACG-L
Anterior cingulate gyrus		right	ACG-R
Middle cingulate gyrus		left	MCG-L
Middle cingulate gyrus		right	MCG-R
Posterior cingulate gyrus		left	PCG-L
Posterior cingulate gyrus		right	PCG-R
Hippocampus		left	HIP-L
Hippocampus		right	HIP-R
ParaHippocampal gyrus		left	PHG-L
ParaHippocampal gyrus		right	PHG-R
Amygdala		left	AMYG-L
Amygdala		right	AMYG-R
Calcarine cortex		left	CAL-L
Calcarine cortex		right	CAL-R
Cuneus		left	CUN-L
Cuneus		right	CUN-R
Lingual gyrus		left	LING-L
Lingual gyrus		right	LING-R
Superior occipital gyrus		left	SOG-L
Superior occipital gyrus		right	SOG-R
Middle occipital gyrus		left	MOG-L
Middle occipital gyrus		right	MOG-R
Inferior occipital gyrus		left	IOG-L
Inferior occipital gyrus		right	IOG-R
Fusiform gyrus		left	FFG-L
Fusiform gyrus		right	FFG-R
Postcentral gyrus		left	PoCG-L
Postcentral gyrus		right	PoCG-R
Superior parietal gyrus		left	SPG-L
Superior parieta lgyrus		right	SPG-R
Inferior parietal lobule		left	IPL-L
Inferior parietal lobule		right	IPL-R
Supramarginal gyrus		left	SMG-L
Supramarginal gyrus		right	SMG-R
Angular gyrus		left	ANG-L
Angular gyrus		right	ANG-R
Precuneus		left	PCUN-L
Precuneus		right	PCUN-R
Paracentral lobule		left	PCL-L
Paracentral lobule		right	PCL-R
Caudate		left	CAU-L
Caudate		right	CAU-R
Putamen		left	PUT-L
Putamen		right	PUT-R
Pallidum		left	PAL-L
Pallidum		right	PAL-R
Thalamus		left	THA-L
Thalamus		right	THA-R
Heschl gyrus		left	HES-L
Heschl gyrus		right	HES-R
Superior temporal gyrus		left	STG-L
Superior temporal gyrus		right	STG-R
Temporal pole	(superior)	left	TPOsup-L
Temporal pole	(superior)	right	TPOsup-R
Middle temporal gyrus		left	MTG-L
Middle temporal gyrus		right	MTG-R
Temporal pole	(middle)	left	TPOmid-L
Temporal pole	(middle)	right	TPOmid-R
Inferior temporal gyrus		left	ITG-L
Inferior temporal gyrus		right	ITG-R

Table S3: Cross-sectional positive clusters.

Group	Seed	Cluster	t	Z	XYZ	Area	Size	Coverage
NEO	LEFT	1	42.81	1.02	23,-1,-21	AMYG-L	4180	INS-L, THA-L, PUT-L, HIP-L, PHG-L, PoCG-L, PHG-R, THA-R, PUT-R, TPOsup-L, INS-R, PoCG-R, STG-L, ORBinf-L, FFG-L, CAU-L, ITG-L, MTG-L, AMYG-L, HIP-R, CAU-R, OLF-R, OLF-L, ROL-L, ROL-R, FFG-R, PAL-L, TPOsup-R, ORBinf-R, TPOmid-L, PreCG-R, AMYG-R, PAL-R, PCL-L, STG-R, IFGoperc-L, IFGtriangl-L, SMA-L, REC-R, LING-R, PreCG-L, TPOmid-R, SMA-R, ITG-R, REC-L, LING-L, HES-L, ORBsup-L, ACG-L, IFGoperc-R, ORBsup-R, HES-R, SMG-R, PCL-R, MCG-L, PCUN-L, MCG-R, ACG-R, PCUN-R, IPL-L, ORBmed-R, PCG-L, SMG-L, IFGtriang-R, PCG-R, SFGdor-R, ORBmed-L
1YR	LEFT	1	40.42	1.18	19,-1,-13	AMYG-L	3292	ACG-L, ACG-R, SFGmed-L, PHG-R, HIP-L, TPOsup-L, PHG-L, INS-L, HIP-R, THA-L, MTG-L, TPOsup-R, FFG-L, TPOmid-R, AMYG-L, FFG-R, SFGmed-L, TPOmid-L, MTG-R, OLF-L, OLF-R, AMYG-R, THA-R, PUT-L, ORBmed-R, SFGdor-R, CAU-L, PUT-R, ORBinf-L, INS-R, ITG-L, ORBmed-L, CAU-R, ORBinf-R, PCUN-R, REC-L, PCUN-L, LING-R, STG-L, MCG-R, LING-L, ITG-R, PAL-L, MCG-L, REC-R, STG-R, CAL-L, MFG-R, PCG-R, PAL-R, PCG-L, SFGdor-L, CAL-R, SMA-R, ORBsup-L, ORBsup-R, MGF-L, SMA-L, CUN-R, CUN-L, IFGtriangl-L
1YR	LEFT	2	5.04	0.12	35,79,19	MOG-L	11	MOG-L
2YR	LEFT	1	25.37	0.88	19,3,-9	AMYG-L	1963	ACG-L, HIP-L, ACG-R, TPOsup-L, INS-L, PHG-R, FFG-L, HIP-R, THA-L, TPOsup-R, AMYG-L, PHG-L, TPOmid-L, TPOmid-R, OLF-R, OLF-L, FFG-R, AMYG-R, CAU-L, MTG-L, INS-R, ITG-L, PUT-L, MTG-R, THA-R, SFGmed-L, CAU-R, STG-L, PUT-R, STG-R, ORBmed-R, ITG-R, ORBinf-L, REC-L, ORBinf-R, ORBmed-L, SFGmed-L, LING-R, PAL-L, REC-R, LING-L, ORBsup-R, ROL-L, ORBsup-L, PAL-R, MCG-L, IOG-L, PCG-R, MCG-R
2YR	LEFT	2	4.18	0.10	-17,79,-17	LING-R	16	IOG-R, LING-R, MOG-R
2YR	LEFT	3	4.11	0.14	-53,3,31	PoCG-R	8	PoCG-R, PreCG-R
NEO	RIGHT	1	43.61	0.60	-21,3,-13	AMYG-R	4598	PHG-R, INS-L, INS-R, ITG-R, FFG-R, HIP-R, PUT-R, THA-R, STG-R, TPOsup-R, PUT-L, MTG-R, THA-L, HIP-L, PHG-L, PoCG-L, ORBinf-R, TPOmid-R, PoCG-R, STG-L, TPOsup-L, ORBinf-L, ROL-R, FFG-L, OLF-R, AMYG-R, CAU-R, ITG-L, MTG-L, CAU-L, ROL-L, OLF-L, AMYG-L, PreCG-R, PAL-L, LING-R, PAL-R, TPOmid-L, ACG-R, REC-R, IFGoperc-R, ORBsup-R, SMG-R, REC-L, HES-R, MCG-R, HES-L, LING-L, ORBsup-L, PreCG-L, IFGtriang-R, IFGoperc-L, PCUN-R, ORBmed-R, PCL-R, PCG-R, SMA-R, PCL-L, IFGtriangl-L, IPL-L, PCUN-L, SMG-L, PCG-L, ACG-L, CAL-R, ORBmed-L, ORBmid-R
1YR	RIGHT	1	39.75	0.82	-17,3,-9	AMYG-R	3584	MTG-R, PHG-R, ACG-R, ACG-L, TPOsup-L, TPOsup-R, HIP-R, FFG-R, TPOmid-R, MTG-L, HIP-L, SFGmed-L, SFGmed-L, AMYG-R, FFG-L, TPOmid-L, PHG-L, ITG-R, OLF-R, INS-L, THA-R, ORBmed-R, AMYG-L, STG-R, SFGdor-R, THA-L, OLF-L, ITG-L, INS-R, ORBinf-R, PUT-R, CAU-L, STG-L, ORBinf-L, CAU-R, ORBmed-L, REC-L, PCUN-R, PUT-L, REC-R, LING-R, MFG-R, MCG-R, LING-L, MOG-R, PCUN-L, ANG-R, PCG-R, SMA-R, ORBsup-R, CAL-L, PAL-L, PAL-R, SFGdor-L, ORBsup-L, CAL-R, PCG-L, MCG-L, IFGtriang-R, ORBmid-R, CUN-R
1YR	RIGHT	2	5.04	0.12	43,43,11	MTG-L	107	MTG-L, MOG-L, STG-L, ANG-L
1YR	RIGHT	3	4.74	0.12	-13,83,-13	CAL-R	28	CAL-R, IOG-R, LING-R, MOG-R
1YR	RIGHT	4	4.14	0.10	11,87,-13	CAL-L	12	CAL-L, MOG-L, IOG-L
1YR	RIGHT	5	4.72	0.10	-37,-13,27	IFGoperc-R	10	IFGoperc-R, IFGtriang-R
2YR	RIGHT	1	30.20	0.97	-17,3,-9	AMYG-R	2086	TPOsup-L, TPOsup-R, HIP-R, PHG-R, ACG-R, FFG-R, FFG-L, TPOmid-R, ACG-L, HIP-L, AMYG-R, INS-L, MTG-L, OLF-R, ITG-L, MTG-R, TPOmid-L, AMYG-L, STG-R, PHG-L, ITG-R, INS-R, OLF-L, THA-R, PUT-R, CAU-L, THA-L, STG-L, ORBmed-R, CAU-R, SFGmed-L, PUT-L, ORBinf-R, SFGmed-L, REC-L, REC-R, ORBmed-L, ORBinf-L, IOG-L, ORBsup-R, PAL-R, LING-R, ROL-L, MCG-R, PAL-L, ORBsup-L, PCG-R, ROL-R
2YR	RIGHT	2	5.95	0.16	-21,75,-13	IOG-R	89	IOG-R, MOG-R, ITG-R, LING-R, CAL-R, FFG-R, MTG-R, SOG-R
2YR	RIGHT	3	5.68	0.18	-53,39,11	MTG-R	77	MTG-R, STG-R
2YR	RIGHT	4	5.47	0.12	15,79,-17	CAL-L	52	MOG-L, IOG-L, CAL-L, LING-L, SOG-L, FFG-L
2YR	RIGHT	5	5.61	0.16	-1,-33,43	SFGmed-L	20	SFGmed-L, SFGdor-R, SFGmed-L
2YR	RIGHT	6	4.46	0.12	43,63,-5	MOG-L	9	MTG-L, MOG-L
2YR	RIGHT	7	4.53	0.11	-33,-9,23	IFGoperc-R	9	IFGoperc-R, PreCG-R
2YR	RIGHT	8	6.20	0.18	-17,-21,-1	CAU-R	8	CAU-R
2YR	RIGHT	9	4.53	0.14	-41,-25,23	IFGtriang-R	8	IFGtriang-R, IFGoperc-R

Group: neonate (NEO), 1-year (1YR), and 2-year (2YR) old. **Seed**: left or right amygdala. **Cluster:** label within group and seed for positive cross-sectional clusters. **t**: t-statistic at cluster peak. **Z**: Fisher's Z-transformed correlation measure at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: AAL areas included in cluster extent.

Table S4: Cross-sectional negative clusters.

Group	Seed	Cluster	t	Z	XYZ	Area	Size	Coverage
NEO	LEFT	1	-10.45	-0.26	3,63,59	PCUN-R	1711	PCUN-L, PCUN-R, SPG-R, SPG-L, IPL-L, ANG-R, MOG-R, SOG-R, SOG-L, IPL-R, MOG-L, CUN-R, CUN-L, ANG-L, MCG-R, CAL-R, MCG-L, SMG-L, PCG-L, MTG-R, CAL-L
NEO	LEFT	2	-4.42	-0.11	-1,-57,-5	ORBmed-R	26	ORBmed-R, REC-R, ORBmed-L, ORBsup-R, REC-L
NEO	LEFT	3	-5.57	-0.05	15,-21,-33	TPOmid-L	22	TPOmid-L, TPOsup-L, FFG-L, PHG-L
1YR	LEFT	1	-11.94	-0.26	23,47,43	SPG-L	2807	IPL-L, SPG-R, PoCG-L, PoCG-R, SPG-L, IPL-R, SMG-R, PCUN-L, PCUN-R, ANG-L, PreCG-L, SMG-L, ANG-R, PreCG-R, SMA-R, MCG-R, PCL-L, MOG-L, ROL-R, SMA-L, CUN-L, PCL-R, CAL-L, ROL-L, STG-L, SOG-R, STG-R, SOG-L, SFGdor-L, SFGdor-R, LING-R, CUN-R, HES-R, LING-L, INS-L, MOG-R, IFGoperc-L, INS-R, PCG-R, MGF-L, HES-L, CAL-R
1YR	LEFT	2	-8.36	-0.18	39,-41,19	MGF-L	238	MGF-L, IFGtriangl-L, ORBmid-L, SFGdor-L, ORBinf-L, ORBsup-L
1YR	LEFT	3	-7.41	-0.16	-29,-41,31	MFG-R	120	MFG-R, IFGtriang-R, SFGdor-R
1YR	LEFT	4	-5.72	-0.09	55,35,-25	ITG-L	84	ITG-L, MTG-L, IOG-L, MOG-L
1YR	LEFT	5	-5.80	-0.15	-45,51,-21	ITG-R	74	ITG-R, MTG-R, IOG-R, FFG-R
1YR	LEFT	6	-6.37	-0.15	-49,-13,11	IFGoperc-R	62	ROL-R, IFGoperc-R, PreCG-R, IFGtriang-R, TPOsup-R
1YR	LEFT	7	-5.02	-0.12	-17,67,7	CAL-R	16	CAL-R, SOG-R, CUN-R, LING-R
1YR	LEFT	8	-5.27	-0.14	11,27,27	MCG-L	16	MCG-L
1YR	LEFT	9	-5.33	-0.15	-17,79,23	SOG-R	14	SOG-R, MOG-R, CUN-R
1YR	LEFT	10	-5.31	-0.13	27,67,-1	MOG-L	11	MOG-L, SOG-L
1YR	LEFT	11	-4.51	-0.09	35,-53,-5	ORBmid-L	10	ORBmid-L, ORBinf-L
2YR	LEFT	1	-8.01	-0.21	23,55,47	SPG-L	1569	PCUN-L, SPG-L, PoCG-L, PCUN-R, IPL-L, SPG-R, PoCG-R, PCL-L, ANG-L, SOG-L, CUN-L, CUN-R, PreCG-R, PreCG-L, PCL-R, SMG-L, SMA-R, MCG-R, SMA-L, SOG-R, IPL-R, MOG-L, ROL-L, SFGdor-L, INS-L, SFGdor-R, MCG-L, ANG-R, CAL-L
2YR	LEFT	2	-6.14	-0.18	-41,55,35	ANG-R	57	IPL-R, ANG-R, SMG-R
2YR	LEFT	3	-5.05	-0.13	-17,-57,23	SFGdor-R	46	MFG-R, SFGdor-R
2YR	LEFT	4	-5.64	-0.13	23,-53,19	MGF-L	41	MGF-L, SFGdor-L
2YR	LEFT	5	-5.25	-0.15	15,-61,-1	ORBsup-L	10	ORBsup-L, SFGdor-L, ORBmed-L
2YR	LEFT	6	-4.93	-0.12	-9,-65,7	SFGmed-L	10	ORBsup-R, SFGmed-L, SFGdor-R, ORBmed-R
2YR	LEFT	7	-4.86	-0.15	-1,79,-21	CAL-L	7	CAL-L, LING-R
2YR	LEFT	8	-4.44	-0.11	-41,31,27	SMG-R	7	SMG-R
2YR	LEFT	9	-3.97	-0.11	35,-29,35	MGF-L	7	MGF-L
2YR	LEFT	10	-4.61	-0.14	3,11,59	SMA-L	7	SMA-L, SMA-R
NEO	RIGHT	1	-9.66	-0.23	7,79,39	PCUN-L	1107	PCUN-L, SPG-L, SPG-R, PCUN-R, IPL-L, SOG-L, ANG-R, SOG-R, MOG-R, CUN-L, MOG-L, CUN-R, ANG-L, MCG-L, IPL-R, PCG-L, MCG-R
NEO	RIGHT	2	-6.61	-0.14	3,-21,43	SFGmed-L	86	SFGmed-L, SMA-L, SFGmed-L, ACG-L
NEO	RIGHT	3	-4.90	-0.11	23,-9,43	MGF-L	46	MGF-L, SFGdor-L
NEO	RIGHT	4	-7.81	-0.07	15,-21,-33	TPOmid-L	30	TPOmid-L, TPOsup-L, FFG-L, PHG-L
1YR	RIGHT	1	-10.72	-0.24	27,47,47	IPL-L	3051	IPL-L, PoCG-L, SPG-L, PoCG-R, PCUN-L, SPG-R, PreCG-L, IPL-R, PCUN-R, SMG-R, PCL-L, SMA-L, PreCG-R, SMA-R, ANG-L, SMG-L, MCG-L, MCG-R, PCL-R, ANG-R, ROL-L, CUN-L, CAL-L, STG-L, SFGdor-L, ROL-R, MOG-L, SOG-L, LING-R, CUN-R, STG-R, SFGdor-R, IFGoperc-L, HES-R, SOG-R, LING-L, INS-L, INS-R, PCG-L, MGF-L, PCG-R, IFGtriangl-L, TPOsup-L
1YR	RIGHT	2	-7.96	-0.13	39,-45,23	MGF-L	231	MGF-L, IFGtriangl-L, SFGdor-L, ORBmid-L, ORBsup-L
1YR	RIGHT	3	-6.26	-0.08	-29,-41,35	MFG-R	73	MFG-R
1YR	RIGHT	4	-6.48	-0.18	-49,-13,7	IFGoperc-R	44	IFGoperc-R, ROL-R, PreCG-R, TPOsup-R
1YR	RIGHT	5	-5.61	-0.12	27,-41,-13	ORBinf-L	16	ORBinf-L, ORBmid-L, ORBsup-L
1YR	RIGHT	6	-4.48	-0.10	55,23,-25	ITG-L	10	ITG-L, MTG-L
2YR	RIGHT	1	-9.83	-0.24	3,35,59	PCL-L	1785	PCUN-L, PoCG-L, SPG-L, PCUN-R, PoCG-R, PCL-L, CUN-L, IPL-L, SPG-R, SMA-L, CUN-R, SMA-R, PreCG-R, PreCG-L, MCG-L, PCL-R, SOG-L, ANG-L, MCG-R, SMG-L, SOG-R, SFGdor-L, IPL-R, SFGdor-R, CAL-L, STG-L
2YR	RIGHT	2	-6.43	-0.15	23,-61,15	SFGdor-L	98	MGF-L, SFGdor-L, ORBsup-L, ORBmid-L
2YR	RIGHT	3	-5.11	-0.15	-37,55,35	ANG-R	14	IPL-R, ANG-R, SMG-R
2YR	RIGHT	4	-4.85	-0.16	31,27,19	INS-L	13	ROL-L, INS-L, PoCG-L
2YR	RIGHT	5	-4.86	-0.14	7,47,-5	CAL-L	12	LING-L, CAL-L
2YR	RIGHT	6	-5.45	-0.15	-9,-65,3	ORBsup-R	11	ORBsup-R, SFGmed-L, SFGdor-R, ORBmed-R
2YR	RIGHT	7	-5.49	-0.17	-1,83,-13	CAL-L	8	CAL-L, LING-R
2YR	RIGHT	8	-5.08	-0.15	-29,-57,11	MFG-R	8	MFG-R
2YR	RIGHT	9	-5.17	-0.17	-29,23,19	ROL-R	8	ROL-R, INS-R, HES-R

Group: neonate (NEO), 1-year (1YR), and 2-year (2YR) old. **Seed**: left or right amygdala. **Cluster:** label within group and seed for negative cross-sectional clusters. **t**: t-statistic at cluster peak. **Z**: Fisher's *Z*-transformed correlation measure at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: AAL areas included in cluster extent.

Table S5: Longitudinal positive clusters.

Group	Seed	Cluster	t	β	XYZ	Area	Size	Coverage
NEO→1YR	LEFT	1	12.04	0.29	7,-25,-1	ACG-L	772	ACG-L, ACG-R, SFGmed-L, ORBmed-R, SFGmed-L, SFGdor-R, ORBmed-L, MFG-R, MCG-R, REC-L, MCG-L, SMA-L, OLF-L, OLF-R, REC-R, CAU-L, SMA-R
NEO→1YR	LEFT	2	7.47	0.18	-25,79,39	SPG-R	223	MOG-R, ANG-R, SOG-R, MTG-R, SPG-R, CUN-R, CAL-R
NEO→1YR	LEFT	3	5.70	0.15	19,51,7	CAL-L	187	PCUN-R, PCUN-L, CAL-L, PCG-L, MCG-R, CUN-L, CAL-R, PCG-R, CUN-R, MCG-L, SOG-L
NEO→1YR	LEFT	4	10.41	0.18	-13,-13,-33	TPOmid-R	177	MTG-R, TPOmid-R, TPOsup-R, STG-R, PHG-R, FFG-R, ITG-R
NEO→1YR	LEFT	5	7.85	0.16	35,79,31	MOG-L	109	MOG-L, SOG-L, SPG-L, IPL-L, ANG-L, CUN-L, PCUN-L, MTG-L
NEO→1YR	LEFT	6	9.42	0.33	19,-17,-33	TPOmid-L	75	TPOmid-L, TPOsup-L, FFG-L, PHG-L
NEO→1YR	LEFT	7	22.25	0.39	-17,3,-9	AMYG-R	36	AMYG-R, HIP-R, PHG-R, OLF-R
NEO→1YR	LEFT	8	24.70	0.60	23,-1,-13	AMYG-L	25	AMYG-L, OLF-L, HIP-L, PAL-L, PHG-L, CAU-L
NEO→1YR	LEFT	9	16.63	0.36	-21,-9,-9	OLF-R	16	INS-R, ORBinf-R, OLF-R, ORBsup-R
NEO→1YR	LEFT	10	7.02	0.13	-1,31,-5	LING-R	12	PCG-R, LING-R, PCUN-R
NEO→1YR	RIGHT	1	11.94	0.24	7,-25,-1	ACG-L	779	SFGmed-L, ACG-L, ACG-R, SFGmed-L, SFGdor-R, ORBmed-R, ORBmed-L, MFG-R, REC-L, MCG-R, SMA-L, OLF-L, CAU-L, MCG-L, OLF-R, REC-R, SMA-R, SFGdor-L, ORBsup-L
NEO→1YR	RIGHT	2	11.53	0.36	19,-17,-33	TPOmid-L	153	TPOmid-L, TPOsup-L, MTG-L, FFG-L, PHG-L
NEO→1YR	RIGHT	3	6.65	0.18	19,83,35	SOG-L	123	MOG-L, MTG-L, SOG-L, SPG-L, IPL-L, ANG-L, PCUN-L
NEO→1YR	RIGHT	4	7.07	0.18	-25,79,39	SPG-R	120	MOG-R, ANG-R, SPG-R, SOG-R, MTG-R, CUN-R
NEO→1YR	RIGHT	5	5.09	0.14	3,47,19	PCG-L	50	PCUN-L, PCG-L, PCUN-R, MCG-R, MCG-L, CAL-L, CUN-L
NEO→1YR	RIGHT	6	11.77	0.22	-13,-13,-33	TPOmid-R	45	TPOmid-R, TPOsup-R, PHG-R, FFG-R
NEO→1YR	RIGHT	7	25.88	0.52	23,-1,-13	AMYG-L	36	AMYG-L, HIP-L, OLF-L, PHG-L, CAU-L, PAL-L, TPOsup-L
NEO→1YR	RIGHT	8	33.61	0.64	-17,3,-9	AMYG-R	32	AMYG-R, HIP-R, OLF-R, PHG-R
NEO→1YR	RIGHT	9	5.97	0.18	-53,-1,-13	MTG-R	31	MTG-R, STG-R, TPOmid-R
NEO→1YR	RIGHT	10	18.90	0.44	-21,-9,-9	OLF-R	17	INS-R, ORBinf-R, OLF-R, ORBsup-R, IFGtriang-R
NEO→1YR	RIGHT	11	4.37	0.13	19,-17,39	SFGdor-L	16	MGF-L, SFGdor-L
NEO→1YR	RIGHT	12	6.32	0.15	35,11,-17	ITG-L	14	FFG-L, ITG-L
NEO→1YR	RIGHT	13	4.26	0.11	19,51,7	CAL-L	12	CAL-L, CUN-L, PCUN-L, SOG-L
1YR→2YR	LEFT	1	4.94	0.58	39,35,-13	ITG-L	45	ITG-L, MTG-L, FFG-L, IOG-L
1YR→2YR	LEFT	2	5.52	0.69	47,27,27	SMG-L	41	PoCG-L, SMG-L, STG-L, ROL-L, IPL-L
1YR→2YR	LEFT	3	5.32	0.65	35,35,35	IPL-L	32	IPL-L, PoCG-L
1YR→2YR	LEFT	4	4.62	0.59	51,-1,39	PreCG-L	26	PreCG-L, ROL-L, INS-L
1YR→2YR	LEFT	5	5.59	0.66	-33,31,35	SMG-R	25	PoCG-R, SMG-R, IPL-R
1YR→2YR	LEFT	6	4.78	0.67	-37,39,55	IPL-R	25	PoCG-R, IPL-R, SPG-R, SMG-R
1YR→2YR	LEFT	7	4.73	0.54	23,55,35	SPG-L	20	IPL-L, SPG-L, MOG-L
1YR→2YR	LEFT	8	4.36	0.62	-41,23,31	SMG-R	10	ROL-R, SMG-R, PoCG-R
1YR→2YR	LEFT	9	3.99	0.46	-53,19,31	SMG-R	9	SMG-R, PoCG-R
1YR→2YR	RIGHT	1	4.97	0.55	-33,31,35	SMG-R	46	PoCG-R, IPL-R, SMG-R, SPG-R
1YR→2YR	RIGHT	2	4.24	0.57	43,35,39	IPL-L	31	IPL-L, PoCG-L, SMG-L
1YR→2YR	RIGHT	3	5.22	0.71	51,15,15	STG-L	28	PoCG-L, STG-L, SMG-L, ROL-L
1YR→2YR	RIGHT	4	5.77	0.56	35,27,-13	ITG-L	27	ITG-L, FFG-L, IOG-L, MTG-L

Group: first year (NEO→1YR) and second year (1YR→2YR). **Seed**: left or right amygdala. **Cluster:** label within group and seed for positive growth clusters. **t**: t-statistic at cluster peak. **β**: beta estimate (i.e. log(age) growth term) at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: AAL areas included in cluster extent.

Table S6: Longitudinal negative clusters.

Group	Seed	Cluster	t	β	XYZ	Area	Size	Coverage
NEO→1YR	LEFT	1	-18.81	-0.36	-17,-1,-5	PAL-R	3259	PoCG-L, PoCG-R, IPL-L, PreCG-R, INS-L, ROL-R, PUT-L, SMG-R, PreCG-L, STG-L, ROL-L, PCL-L, THA-L, SMA-R, THA-R, PUT-R, INS-R, PHG-L, SMG-L, SMA-L, ORBinf-L, SPG-R, IPL-R, CAU-L, PCL-R, PAL-L, MCG-R, SPG-L, HIP-L, IFGoperc-L, FFG-L, PAL-R, IFGoperc-R, STG-R, PCUN-L, TPOsup-L, PCUN-R, HES-R, HES-L, AMYG-L, ANG-L, ORBsup-L, CAU-R, SFGdor-R, MOG-L, SFGdor-L, OLF-R, MTG-L, OLF-L, IFGtriangl-L, ORBinf-R, ORBmid-L, REC-L, ORBsup-R, ANG-R, TPOsup-R, REC-R, ITG-L, MCG-L, MOG-R, IFGtriang-R, SOG-R
NEO→1YR	LEFT	2	-6.42	-0.18	35,-37,19	MGF-L	127	MGF-L, IFGtriangl-L
NEO→1YR	LEFT	3	-8.45	-0.22	35,-9,-41	TPOmid-L	44	ITG-L, FFG-L, TPOmid-L, TPOsup-L
NEO→1YR	LEFT	4	-5.89	-0.16	51,23,-21	ITG-L	44	ITG-L, MTG-L
NEO→1YR	LEFT	5	-5.13	-0.14	-37,-33,27	MFG-R	39	MFG-R, IFGtriang-R
NEO→1YR	LEFT	6	-11.27	-0.31	-9,3,-21	PHG-R	19	PHG-R, FFG-R
NEO→1YR	LEFT	7	-6.59	-0.17	-21,-5,-45	FFG-R	15	ITG-R, FFG-R
NEO→1YR	LEFT	8	-5.98	-0.17	11,11,31	MCG-L	15	MCG-L
NEO→1YR	RIGHT	1	-16.16	-0.34	-17,-1,-5	PAL-R	3025	PoCG-L, PoCG-R, PreCG-R, ROL-R, SMG-R, PreCG-L, IPL-L, INS-R, PUT-R, PUT-L, INS-L, SMA-R, ROL-L, PCL-L, THA-R, SMA-L, STG-R, STG-L, IPL-R, MCG-R, SPG-R, SMG-L, PCL-R, THA-L, ORBinf-L, IFGoperc-R, PAL-R, PAL-L, HES-R, SPG-L, PCUN-L, CAU-L, HES-L, IFGoperc-L, PCUN-R, PHG-L, CAU-R, SFGdor-L, TPOsup-R, TPOsup-L, HIP-R, MCG-L, SFGdor-R, HIP-L, ORBsup-L, ORBmid-L, OLF-L, PCG-R, LING-R, ANG-L, PHG-R, ACG-R, REC-L, IFGtriang-R, ORBinf-R, MGF-L, MTG-L
NEO→1YR	RIGHT	2	-13.90	-0.39	-25,3,-25	PHG-R	378	PHG-R, ITG-R, FFG-R, ORBinf-R, HIP-R, ORBsup-R, OLF-R, TPOmid-R, AMYG-R, TPOsup-R, REC-R, ORBmid-R
NEO→1YR	RIGHT	3	-7.72	-0.19	15,3,-33	PHG-L	34	FFG-L, PHG-L, ITG-L
NEO→1YR	RIGHT	4	-5.38	-0.15	39,-37,23	MGF-L	33	MGF-L, IFGtriangl-L
NEO→1YR	RIGHT	5	-4.73	-0.14	-37,-37,31	MFG-R	23	MFG-R
NEO→1YR	RIGHT	6	-6.99	-0.19	11,11,31	MCG-L	19	MCG-L
NEO→1YR	RIGHT	7	-5.61	-0.15	-1,87,-17	CAL-L	17	CAL-L, LING-R
NEO→1YR	RIGHT	8	-6.97	-0.19	31,-5,-45	ITG-L	15	ITG-L, TPOmid-L, FFG-L
1YR→2YR	LEFT	1	-5.70	-0.72	-5,-41,3	ORBmed-R	122	SFGmed-L, ACG-L, ACG-R, ORBmed-R, SFGmed-L, ORBmed-L, MCG-L
1YR→2YR	LEFT	2	-4.54	-0.53	-9,59,15	CUN-R	94	PCUN-R, CUN-R, CUN-L, PCUN-L, LING-R, CAL-L, CAL-R, PCG-L
1YR→2YR	LEFT	3	-4.49	-0.58	-21,-21,43	MFG-R	14	MFG-R, SFGdor-R
1YR→2YR	LEFT	4	-4.79	-0.63	27,-17,-9	INS-L	12	ORBinf-L, INS-L
1YR→2YR	LEFT	5	-4.72	-0.42	-13,-65,-1	ORBsup-R	11	ORBsup-R, SFGmed-L, SFGdor-R, ORBmed-R
1YR→2YR	LEFT	6	-4.61	-0.56	15,-13,-17	ORBinf-L	10	OLF-L, ORBinf-L
1YR→2YR	LEFT	7	-5.34	-0.70	19,3,-29	PHG-L	9	PHG-L, HIP-L
1YR→2YR	RIGHT	1	-5.81	-0.67	3,51,7	PCUN-L	125	LING-L, CAL-L, PCUN-L, CUN-R, PCUN-R, CAL-R, PHG-L, CUN-L, HIP-L, PCG-L, THA-L
1YR→2YR	RIGHT	2	-5.22	-0.68	-5,-41,3	ORBmed-R	45	ACG-L, ORBmed-R, ACG-R, ORBmed-L, SFGmed-L, SFGmed-L
1YR→2YR	RIGHT	3	-4.78	-0.65	-9,35,-1	PCUN-R	41	LING-R, PCUN-R, CAL-R, PCG-R, HIP-R, THA-R
1YR→2YR	RIGHT	4	-4.54	-0.55	11,63,15	CUN-L	13	CUN-L, PCUN-L
1YR→2YR	RIGHT	5	-4.34	-0.53	-5,-37,23	ACG-R	12	ACG-R, SFGmed-L
1YR→2YR	RIGHT	6	-4.13	-0.59	-17,-21,51	SFGdor-R	11	SFGdor-R, MFG-R
1YR→2YR	RIGHT	7	-5.36	-0.45	-9,-65,3	ORBsup-R	10	ORBsup-R, SFGmed-L, SFGdor-R, ORBmed-R

Group: first year (NEO→1YR) and second year (1YR→2YR). **Seed**: left or right amygdala. **Cluster:** label within group and seed for negative growth clusters. **t**: t-statistic at cluster peak. **β**: beta estimate (i.e. log(age) growth term) at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: AAL areas included in cluster extent.

Table S7: Regional-level 4YR-ANX effects co-varying for IQ.

Group	Seed	Cluster	t	β	XYZ	Area	Size	Coverage	Behavior							
									4YR-ANX ~ FC + 4YR-IQ							
									FC				4YR-IQ			
									e	se	t	p	e	se	t	p
1YR→2YR	LEFT	5	5.59	0.66	-33,31,35	SMG-R	25	PoCG-R, SMG-R, IPL-R	-9.43	3.95	-2.39	0.019	0.06	0.08	0.68	0.501
1YR→2YR	LEFT	6	4.78	0.67	-37,39,55	IPL-R	25	PoCG-R, IPL-R, SPG-R, SMG-R	-6.22	2.58	-2.41	0.018	0.05	0.08	0.60	0.553
1YR→2YR	LEFT	2	-4.54	-0.53	-9,59,15	CUN-R	94	PCUN-R, CUN-R, CUN-L, PCUN-L, LING-R, CAL-L, CAL-R, PCG-L	10.64	4.11	2.59	0.011	0.07	0.08	0.85	0.397
1YR→2YR	RIGHT	1	-5.81	-0.67	3,51,7	PCUN-L	125	LING-L, CAL-L, PCUN-L, CUN-R, PCUN-R, CAL-R, PHG-L, CUN-L, HIP-L, PCG-L, THA-L	19.49	7.54	2.58	0.011	0.06	0.08	0.79	0.430
1YR→2YR	RIGHT	3	-4.78	-0.65	-9,35,-1	PCUN-R	41	LING-R, PCUN-R, CAL-R, PCG-R, HIP-R, THA-R	25.80	9.01	2.86	**0.005**	0.07	0.08	0.86	0.391

Group: first year (NEO→1YR), and second year (1YR→2YR). **Seed**: left or right amygdala. **t**: t-statistic at cluster peak. **β**: beta estimate (i.e. log(age) growth term) at cluster peak. **Cluster:** label within group, seed, and sign (from Tables 2-6). **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: AAL areas included in cluster extent. **Behavior**: summary statistics (e: estimate, se: standard error, t: t-statistic, and p: p-value) for multiple linear regression involving parented reported anxiety (4YR-ANX), functional connectivity (FC), and cognitive outcome (4YR-IQ). Bold p-values indicate < 0.01

Table S8: Summary of regional-level 4YR-ANX and 4YR-ISC effects.

Group	Seed	Cluster	t	Z or β	XYZ	Area	Size	Coverage	Behavior							
									4YR-ANX				4YR-ISC			
									e	se	t	p	e	se	t	p
1YR	LEFT	1	-11.94	-0.26	23,47,43	SPG-L	2807	IPL-L, SPG-R, PoCG-L, PoCG-R, SPG-L, IPL-R, SMG-R, PCUN-L, PCUN-R, ANG-L, PreCG-L, SMG-L, ANG-R, PreCG-R, SMA-R, MCG-R, PCL-L, MOG-L, ROL-R, SMA-L, CUN-L, PCL-R, CAL-L, ROL-L, STG-L, SOG-R, STG-R, SOG-L, SFGdor-L, SFGdor-R, LING-R, CUN-R, HES-R, LING-L, INS-L, MOG-R, IFGoperc-L, INS-R, PCG-R, MGF-L, HES-L, CAL-R					40.13	18.72	2.14	0.036
1YR	LEFT	5	-5.80	-0.15	-45,51,-21	ITG-R	74	ITG-R, MTG-R, IOG-R, FFG-R	19.74	8.26	2.39	0.020				
2YR	LEFT	2	-6.14	-0.18	-41,55,35	ANG-R	57	IPL-R, ANG-R, SMG-R					13.75	6.55	2.10	0.041
2YR	LEFT	4	-5.64	-0.13	23,-53,19	MGF-L	41	MGF-L, SFGdor-L					20.87	8.00	2.61	0.012
2YR	RIGHT	5	-4.86	-0.14	7,47,-5	CAL-L	12	LING-L, CAL-L	16.82	8.13	2.07	0.044	-15.72	6.95	-2.26	0.028
2YR	RIGHT	8	-5.08	-0.15	-29,-57,11	MFG-R	8	MFG-R					18.23	6.89	2.65	0.011
NEO→1YR	LEFT	1	12.04	0.29	7,-25,-1	ACG-L	772	ACG-L, ACG-R, SFGmed-L, ORBmed-R, SFGmed-L, SFGdor-R, ORBmed-L, MFG-R, MCG-R, REC-L, MCG-L, SMA-L, OLF-L, OLF-R, REC-R, CAU-L, SMA-R					-63.81	27.66	-2.31	0.023
NEO→1YR	LEFT	3	5.70	0.15	19,51,7	CAL-L	187	PCUN-R, PCUN-L, CAL-L, PCG-L, MCG-R, CUN-L, CAL-R, PCG-R, CUN-R, MCG-L, SOG-L					-68.44	26.45	-2.59	0.011
NEO→1YR	LEFT	6	9.42	0.33	19,-17,-33	TPOmid-L	75	TPOmid-L, TPOsup-L, FFG-L, PHG-L					-48.69	19.14	-2.54	0.012
1YR→2YR	LEFT	3	5.32	0.65	35,35,35	IPL-L	32	IPL-L, PoCG-L	-5.12	2.55	-2.01	0.047				
1YR→2YR	LEFT	5	5.59	0.66	-33,31,35	SMG-R	25	PoCG-R, SMG-R, IPL-R	-10.14	3.83	-2.65	**0.010**				
1YR→2YR	LEFT	6	4.78	0.67	-37,39,55	IPL-R	25	PoCG-R, IPL-R, SPG-R, SMG-R	-6.70	2.48	-2.70	**0.008**				
NEO→1YR	LEFT	4	-5.89	-0.16	51,23,-21	ITG-L	44	ITG-L, MTG-L					62.73	26.03	2.41	0.018
NEO→1YR	RIGHT	8	-6.97	-0.19	31,-5,-45	ITG-L	15	ITG-L, TPOmid-L, FFG-L	14.77	6.91	2.14	0.035				
1YR→2YR	LEFT	2	-4.54	-0.53	-9,59,15	CUN-R	94	PCUN-R, CUN-R, CUN-L, PCUN-L, LING-R, CAL-L, CAL-R, PCG-L	11.20	4.04	2.77	**0.007**				
1YR→2YR	LEFT	3	-4.49	-0.58	-21,-21,43	MFG-R	14	MFG-R, SFGdor-R					4.88	2.28	2.14	0.035
1YR→2YR	LEFT	4	-4.79	-0.63	27,-17,-9	INS-L	12	ORBinf-L, INS-L	-27.40	13.17	-2.08	0.040				
1YR→2YR	RIGHT	1	-5.81	-0.67	3,51,7	PCUN-L	125	LING-L, CAL-L, PCUN-L, CUN-R, PCUN-R, CAL-R, PHG-L, CUN-L, HIP-L, PCG-L, THA-L	20.65	7.38	2.80	**0.006**				
1YR→2YR	RIGHT	3	-4.78	-0.65	-9,35,-1	PCUN-R	41	LING-R, PCUN-R, CAL-R, PCG-R, HIP-R, THA-R	25.25	8.97	2.81	**0.006**				

Group: neonate (NEO), 1-year (1YR), 2-year (2YR), first year (NEO→1YR), and second year (1YR→-2YR). **Seed**: left or right amygdala. **Cluster:** label within group, seed, and sign (from Tables 2-5). **t**: t-statistic at cluster peak. **Z** or **β**: Fisher's Z-transformed correlation (NEO, 1YR, 2YR) or beta estimate (i.e. log(age) growth term for NEO-1YR, 1YR-2YR)) at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: other AAL areas included in cluster extent. **Behavior**: summary statistics (e: estimate, se: standard error, t: t-statistic, and p: p-value,) corresponding to linear relationship between parent reported measures at 4-years [anxiety (4YR-ANX) and inhibitory self-control (4YR-ISC]) and cluster-level functional connectivity estimates. Bold p-values indicate < 0.01.

Table S9: Summary of regional-level 4YR-IQ effects.

Group	Seed	Cluster	t	Z or β	XYZ	Area	Size	Coverage	4YR-IQ			
									e	se	t	p
NEO	LEFT	2	-4.42	-0.11	-1,-57,-5	ORBmed-R	26	ORBmed-R, REC-R, ORBmed-L, ORBsup-R, REC-L	-14.42	6.29	-2.29	0.025
1YR	LEFT	4	-5.72	-0.09	55,35,-25	ITG-L	84	ITG-L, MTG-L, IOG-L, MOG-L	-26.52	12.23	-2.17	0.034
2YR	LEFT	2	-6.14	-0.18	-41,55,35	ANG-R	57	IPL-R, ANG-R, SMG-R	-23.34	8.90	-2.62	0.012
2YR	LEFT	7	-4.86	-0.15	-1,79,-21	CAL-L	7	CAL-L, LING-R	23.99	10.62	2.26	0.029
NEO→1YR	LEFT	8	24.70	0.60	23,-1,-13	AMYG-L	25	AMYG-L, OLF-L, HIP-L, PAL-L, PHG-L, CAU-L	-29.04	14.60	-1.99	0.049
1YR→2YR	LEFT	3	5.32	0.65	35,35,35	IPL-L	32	IPL-L, PoCG-L	-8.57	3.07	-2.79	**0.006**
NEO→1YR	LEFT	4	-5.89	-0.16	51,23,-21	ITG-L	44	ITG-L, MTG-L	-75.31	32.95	-2.29	0.024

Group: neonate (NEO), 1-year (1YR), 2-year (2YR), first year (NEO→1YR), and second year (1YR→2YR). **Seed**: left or right amygdala. **Cluster:** label within group, seed, and sign (from Tables 2-5). **t**: t-statistic at cluster peak. **Z** or **β**: Fisher's Z-transformed correlation (NEO, 1YR, 2YR) or beta estimate (i.e. log(age) growth term for NEO-1YR, 1YR-2YR)) at cluster peak. **XYZ**: spatial coordinates of cluster peak. **Area**: AAL area associated with cluster peak (see Table S2). **Size**: cluster size in voxels. **Coverage**: other AAL areas included in cluster extent. **Behavior**: summary statistics (e: estimate, se: standard error, t: t-statistic, and p: p-value) corresponding to linear relationship between cognitive outcome (4YR-IQ) and cluster-level functional connectivity estimates. Bold p-values indicate < 0.01.

Table S10: Summary of network-level brain-behavior relationships.

Group	Seed	RSN	4YR Behavior	e	se	t	p
2YR	LEFT	CON-L	ISC	42.47	11.24	3.78	**0.000**
2YR	LEFT	CON-L	IQ	-50.39	16.22	-3.11	**0.003**
1YR→2YR	LEFT	CON-R	IQ	-385.12	143.30	-2.69	**0.009**
2YR	RIGHT	CON-R	ISC	36.61	13.72	2.67	**0.010**
2YR	LEFT	CON-R	IQ	-45.89	17.77	-2.58	0.013
1YR→2YR	LEFT	CON-L	IQ	-47.28	20.36	-2.32	0.022
1YR	LEFT	SM	ISC	23.39	10.42	2.24	0.028
2YR	RIGHT	CON-L	ISC	27.59	12.35	2.23	0.030
1YR	RIGHT	Va	ANX	-26.69	12.44	-2.15	0.036
NEO→1YR	LEFT	DMN	ISC	-29.70	14.13	-2.10	0.038
Neo	LEFT	SAL	IQ	-21.14	10.10	-2.09	0.040
1YR→2YR	LEFT	DMN	ANX	5.14	2.50	2.06	0.043
1YR→2YR	LEFT	SM	ISC	-27.07	13.19	-2.05	0.043
2YR	LEFT	CON-R	ANX	-31.61	15.30	-2.07	0.044
1YR→2YR	LEFT	CON-R	ANX	-235.00	116.10	-2.02	0.046

Group: neonate (NEO), 1-year (1YR), 2-year (2YR), first year (NEO→1YR), and second year (1YR→2YR). **Seed**: left or right amygdala. **RSN:** resting-state network (see Figure S2). **4YR Behavior**: summary statistics (e: estimate, se: standard error, t: t-statistic, and p: p-value) corresponding to linear relationship between behavioral outcome [parent reported anxiety (ANX), inhibitory self-control (ISC), and cognitive development (IQ)] and network-level functional connectivity estimates. Bold p-values indicate < 0.01.

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