Supplemental Materials:

Methods:

Exclusion criteria: A full list of exclusion criteria determined by the ABCD Study® are listed elsewhere (Garavan et al., 2018), but additional exclusion criteria were applied to obtain a sample that was acceptable for these analyses and hypotheses (e.g., BMI measurement error, failed MRI preprocessing; see **Table S1**). Youth were excluded if they met the following at any of the time points (e.g., baseline, one-year or two-year follow-up): (1) Underweight (according to the Center for Disease Control's (CDC's) age-sex-height-weight-specific growth curves (Kuczmarski et al., 2002)) possibly due to restrictive eating or medical issues; (2) taking medications known to alter food intake (e.g., antipsychotics, insulin); (3) had caregiver report of neurological, psychiatric, or learning disabilities; (4) met diagnostic criteria for eating disorders (e.g., anorexia, binge eating disorder) as assessed by the caregiver-reported Kiddie Schedule for Affective Disorders and Schizophrenia (Kaufman et al., 1997); (5) mislabeled sex-assigned at birth and/or mismatched sex-specific pubertal questionnaires or transgender youth (i.e., due to sex-specific effects on brain function); (6) height measurement error (e.g., height year 2 < baseline); (7) invalid residential address (necessary for ADI metrics); (8) failed FreeSurfer segmentation; (9) failed T_1 quality control; and/or (10) missing ROI or covariate tabulated data from the National Institutes of Mental Health databases. Siblings were excluded to avoid issues with independence. The final sample consisted of 3,087 youth. **Table S2** displays the participant characteristics of the sample included in the analyses to the rest of the youth in ABCD.

Table S1. The number of subjects available based on each exclusion criterion applied.

	n
Number of subjects at Y2	10,415
Y2 available BMI data	7,702
Overlap with BMI data at Y2	6,779
No BMI measurement errors or outliers	6,553
Not underweight	6,224
No medications known to affect food intake	5,800
No eating disorders	5,093
Complete covariate data	4,801
Valid residential address	4,528
Passed T1 QC at Y2	4,111
Passed above criteria also at baseline	3,422
No siblings	3,087
Final sample	3,087

Note. Metrics were generated starting with a dataframe that consisted of baseline demographics and year 2 neuroimaging data. After quality control assessments of the year 2 data, the dataframe was merged with all available demographic and neuroimaging data from the baseline assessment (see line "Available data for all metrics …"). Y2= years 2; BMI = Body mass index.

Table S2. Participant characteristics

Variable	Subsample (n=3087) Mean	SD	The rest of ABCD (n=8791) Mean	SD	*p*
Age					
Baseline	118.9	7.4	119.4	7.5	0.001
Y2	142.8	7.6	143.4	7.8	<0.001
Puberty					
Baseline	2	0.8	1.9	0.8	0.264
Y2	2.7	1	2.7	1	0.162
BMI					
Baseline	18.7	3.1	18.7	4	0.663
Y2	20.5	3.7	20.5	4.8	0.785
Area deprivation index	38.5	25.9	38.8	26.1	0.499
	n	**%**			
Sex					
Male	1575	51	3919	52.6	0.139
Female	1512	49	3528	47.4	
Race					
White	2163	70.1	5049	68.6	0.047
Black	337	10.9	940	12.8	
Asian	62	2	174	2.4	
AIAN/NHPI	26	0.8	48	0.7	
Other	147	4.8	303	4.1	
Multi-race	352	11.4	843	11.5	
Ethnicity					
Hispanic	621	20.1	1433	19.5	0.476
Non-Hispanic	2466	79.9	5921	80.5	
Education					
<HS	116	3.8	299	4	<0.001
HS/GED	223	7.2	555	7.5	
Some College	763	24.7	1814	24.4	
BA degree	838	27.1	1981	26.6	
Postgraduate degree	1147	37.2	2629	35.3	0.476
Missing			168	2.3	
Baseline Weight Class					
Underweight			468	5.2	<0.001
Healthy Weight	2126	68.9	5702	63.3	
Overweight	547	17.7	1312	14.6	
Obese	414	13.4	1508	16.7	
Missing			16	0.2	
Y2 Weight Class					
Underweight			286	3.8	<0.001
Healthy Weight	2034	65.9	3008	39.9	

Overweight	582	18.9	694	9.2
Obese	471	15.3	841	11.1

Note. Baseline was assessed when the youth were 9- to 10-years-old. Y2= two-year follow up (age 9-10-years-old). BMI=Body mass index. AIAN/NHPI=American Indian, Alaskan Native/Native Hawaiian and Pacific Islanders. HS=high school; GED=Generalized education diploma. BA=Bachelor's degree. SD=standard deviation. *P*-values were generated from *t*-tests and chi-square analyses were appropriate.

Anthropometrics. Yearly height (nearest 0.1inch) and weight (nearest 0.1lb) assessments (measured twice, a third was collected in cases of large discrepancy) were gathered by a trained researcher. The closest two measurements were averaged and converted into BMI (kg/m^2) and BMI percentiles according to the CDC's sex-age-height-weight specific growth charts (Kuczmarski et al., 2002) for clinical interpretations, only as they are prone to several biases (Hendrickson & Pitt, 2021; Palmer et al., 2021).

Pubertal assessment. Puberty was assessed via caregiver and youth self-report sex-specific questionnaires and then averaged. Scores were converted into sex-specific Tanner staging categories (1=Prepubertal, 2=Early puberty; 3=Mid puberty; 4=Late puberty; 5=Postpubertal).

Demographic assessments. The caregiver reported the child's race, ethnicity, date of birth, and sex at birth. Race had 22 options, which were collapsed into six groups: White, Black, Asian, American Indian, Alaskan Native/Native Hawaiian, Pacific Islander (AIAN/NHPI), Other and multi-race. Ethnicity was assessed with two options: Hispanic or Non-Hispanic. Age at each visit was recorded in months. Highest household education was assessed by caregiver report across 29 education levels and collapsed into five groups: <High school (HS), HS/Generalized Education Diploma, Some college, Four-year degree (Bachelor's degree), Postgraduate education.

Pubertal assessment. Puberty was assessed via caregiver and self-report sex-specific questionnaires and then averaged. Scores were converted into sex-specific Tanner staging categories (1=Prepubertal, 2=Early puberty; 3=Mid puberty; 4=Late puberty; 5=Postpubertal).

Confirmatory Analysis, healthy weight subjects: Having overweight or obesity is associated with underlying differences in brain structure. Therefore, to ensure that our results were not being driven by youth with higher BMIs, we reran our analyses but excluded youth who were overweight or obese at baseline. This resulted in a new group of youth (n=2,162).

Results:

<u>*Confirmatory analysis – only health weight subjects*</u>. After removing youth who had overweight or obesity at baseline, the Ventral DC was still associated with ADI and BMI but only in the neuronal stress model (e.g., ADI → Brain structure → ΔBMI; see **Tables S7-S8**). In this model, the Ventral DC fully mediated the effect between ADI at 9/10 -years-old and BMI at 11/12-years-old (B=- 0.01, Bootstrapped 95% CI=[-0.03, -0.003]) and the direct effect of ADI on BMI at 11/12 was no longer significant (B=0.005, *p*=0.9, c path). ADI was negatively associated with subcortical volume of the Ventral DC (B=0.08, *p*=0.007, a path) while the Ventral DC was

positively associated with BMI at 11/12-years-old (B=0.15, p=0.002, b path).

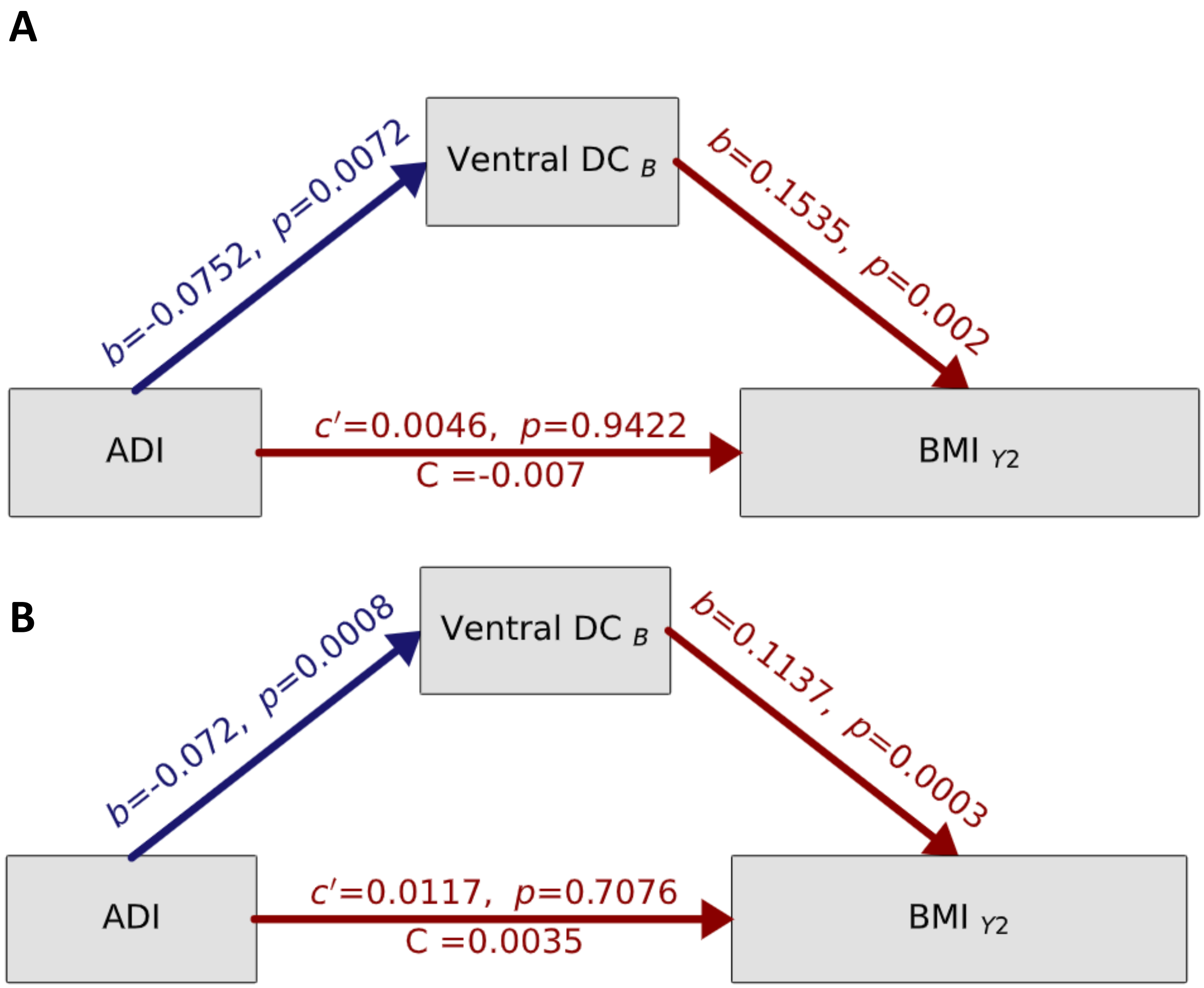

Figure S1. Testing the causal pathway of the neuronal stress theory of overeating in only healthy weight youth at baseline. **A)** Mediation models where the colored arrows reflect the strength (and direction) of the indirect effects, while controlling for sex, age, race, ethnicity, education, handedness and scanner ID. Total effects are represented by *c'*, direct effects of ADI are represented by C while *a* and *b* values refer to the association of ADI on brain structure at 9/10-years-old and brain structure at 9/10-years-old on BMI at 11/12-years-old, respectively. All *a, b, c,* and *c'* values are unstandardized regression coefficients. Significance testing was carried out by bias-corrected bootstrapping (n=10,000) 95% confidence intervals. **B)** The results of the mediation analyses while controlling for a difference in BMI and Ventral DC subcortical volume as well as sex, age, race, ethnicity, education, handedness and scanner ID. B=baseline (aged 9/10-years-old). Y2=two-year follow-up (aged 11/12-years-old). ADI = area deprivation index. BMI = body mass index

Immunologic model of self-regulation failure						
	Associations with BMI at 9/10-yrs			**Associations with ADI at 9/10-yrs**		
ROI (11/12-yrs)	**Beta**	**95%CI**	***p***	**Beta**	**95%CI**	***p***
Anterior cingulate (Caudal)	-0.001	[-0.006,0.005]	0.794	-0.002	[-0.009,0.005]	0.566
Anterior cingulate (Rostral)	0.005	[-0.0,0.01]	0.058	0.003	[-0.004,0.009]	0.44
Caudal middle frontal	-0.001	[-0.005,0.003]	0.537	0	[-0.006,0.005]	0.863
Cuneus	-0.002	[-0.007,0.002]	0.274	-0.008	[-0.014,-0.003]	0.003**a
Entorhinal	-0.001	[-0.01,0.007]	0.781	0.003	[-0.007,0.014]	0.543
Frontal pole	-0.012	[-0.019,-0.006]	<0.001***a	0	[-0.009,0.009]	0.947
Fusiform	0	[-0.004,0.003]	0.97	0	[-0.005,0.004]	0.874
Inferior parietal	0	[-0.003,0.004]	0.785	-0.005	[-0.009,0.0]	0.055
Inferior temporal	-0.001	[-0.005,0.003]	0.766	-0.003	[-0.008,0.003]	0.319
Insula	0.005	[0.001,0.009]	0.021*	0.006	[-0.0,0.011]	0.055
Isthmus cingulate	-0.005	[-0.01,-0.001]	0.019*	-0.003	[-0.009,0.002]	0.207
Lateral occipital	-0.002	[-0.005,0.002]	0.388	-0.008	[-0.013,-0.003]	0.002**a
Lateral orbitofrontal	-0.005	[-0.009,-0.002]	0.005**a	-0.001	[-0.006,0.003]	0.583
Lingual	-0.005	[-0.009,-0.001]	0.02*	-0.006	[-0.011,-0.0]	0.033*
Medial orbitofrontal	-0.005	[-0.008,-0.001]	0.016*	0	[-0.005,0.005]	0.927
Middle frontal (Rostral)	-0.009	[-0.013,-0.005]	<0.001***a	-0.001	[-0.006,0.004]	0.615
Middle temporal	-0.005	[-0.01,-0.001]	0.02*	-0.005	[-0.011,0.001]	0.105
Paracentral	-0.007	[-0.011,-0.003]	0.001**a	-0.007	[-0.013,-0.002]	0.008**
Parahippocampus	0.003	[-0.005,0.01]	0.489	-0.009	[-0.018,-0.0]	0.049*
Parsopercularis	-0.001	[-0.005,0.003]	0.587	0	[-0.005,0.005]	0.864
Parsorbitalis	-0.01	[-0.015,-0.005]	<0.001***a	-0.001	[-0.008,0.005]	0.714
Parstriangularis	-0.007	[-0.011,-0.003]	<0.001***a	-0.001	[-0.006,0.004]	0.679
Pericalcerine	0.001	[-0.004,0.005]	0.831	-0.01	[-0.016,-0.003]	0.002**
Postcentral	0.001	[-0.004,0.005]	0.741	-0.007	[-0.013,-0.001]	0.018*
Posterior cingulate	-0.003	[-0.007,0.0]	0.087	-0.003	[-0.007,0.002]	0.238
Precentral	0	[-0.004,0.004]	0.951	-0.006	[-0.012,-0.001]	0.025*
Precuneus	-0.003	[-0.006,0.0]	0.085	-0.002	[-0.007,0.002]	0.328
Superior frontal	-0.009	[-0.013,-0.005]	<0.001***a	-0.001	[-0.007,0.004]	0.621
Superior parietal	-0.001	[-0.004,0.003]	0.698	-0.003	[-0.008,0.001]	0.161
Superior temporal	-0.005	[-0.01,-0.001]	0.027*	-0.004	[-0.01,0.002]	0.242
Superior temporal (Banks)	0.001	[-0.003,0.006]	0.549	-0.009	[-0.015,-0.003]	0.004**a
Supramarginal	0.003	[-0.001,0.006]	0.191	-0.004	[-0.009,0.001]	0.115
Temporal pole	-0.001	[-0.009,0.007]	0.737	0.002	[-0.009,0.012]	0.749
Transverse temporal	-0.001	[-0.006,0.005]	0.839	0.001	[-0.006,0.007]	0.862

Table S3. Parameter estimates from the immunologic model of self-regulation failure (ADI → BMI_B → $Brain_{Y2}$) assessing the associations between ADI and BMI at 9/10-years-old and cortical thickness at 11/12-years-old. Linear random mixed effects covaried for puberty, sex, Race/ethnicity and education with a random effect of scanner type to identify ROIs at 11/12-years-old that were significantly associated with ADI and BMI at 9/10-years-old. Correction was conducted separated by model (e.g., ADI, BMI). [a]survived multiple correction testing using the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that showed significant associations with BMI and ADI.

Immunologic model of self-regulation failure						
	Associations with BMI at 9-10-yrs			Associations with ADI at 9-10-yrs		
ROI (11-12-yrs)	Beta	95%CI	*p*	Beta	95%CI	*p*
Accumbens area	0.367	[-2.985,3.719]	0.83	-7.239	[-11.583,-2.895]	0.001**a
Amygdala	-1.329	[-8.26,5.603]	0.707	-16.689	[-26.055,-7.324]	<0.001***a
Caudate	3.347	[-13.134,19.829]	0.691	-22.871	[-43.751,-1.991]	0.032*a
Hippocampus	3.584	[-9.855,17.023]	0.601	-34.164	[-51.51,-16.817]	<0.001***a
Pallidum	9.031	[1.656,16.406]	0.016*	-17.02	[-26.894,-7.147]	0.001**a
Putamen	-4.672	[-24.025,14.68]	0.636	-33.534	[-56.795,-10.273]	0.005**a
Thalamus	29.595	[4.699,54.491]	0.02*	-46.191	[-79.136,-13.246]	0.006**a
Ventral DC	27.956	[14.992,40.921]	<0.001***a	-24.828	[-40.985,-8.671]	0.003**a

Table S4. Parameter estimates from the Immunologic model of self-regulation failure looking at the associations between ADI and BMI at 9/10-years-old and subcortical volume at 11/12-years-old. Associations were tested using linear random mixed effects covaried for puberty, sex, Race/ethnicity and education with a random effect of scanner type was utilized to identify ROIs at 11/12-years-old that were significantly associated with ADI and BMI at 9/10-years-old. Significant effects were corrected separated by modality (e.g., cortical thickness, volume) and model (e.g., ADI, BMI). [a]survived multiple correction testing using the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that showed significant associations with BMI and ADI. Blue rows highlight regions that were significant but there was no overlap between BMI and ADI. Gray rows had no significant associations.

Neuronal stress theory of overeating						
	Associations with BMI at 11/12-yrs			**Associations with ADI at 9/10-yrs**		
ROI (9/10-yrs)	**Beta**	**95%CI**	***p***	**Beta**	**95%CI**	***p***
Anterior cingulate (Caudal)	-0.078	[-0.201,0.044]	0.21	0.014	[-0.03,0.058]	0.545
Anterior cingulate (Rostral)	0.06	[-0.066,0.186]	0.348	0.051	[0.005,0.097]	0.031*
Caudal middle frontal	-0.158	[-0.284,-0.033]	0.013*a	-0.022	[-0.068,0.025]	0.363
Cuneus	-0.16	[-0.286,-0.034]	0.013*a	-0.122	[-0.168,-0.077]	<0.001***a
Entorhinal	-0.011	[-0.134,0.112]	0.859	-0.003	[-0.049,0.043]	0.912
Frontal pole	-0.145	[-0.267,-0.022]	0.02*	0.027	[-0.018,0.073]	0.242
Fusiform	-0.047	[-0.171,0.077]	0.459	-0.044	[-0.089,0.001]	0.056
Inferior parietal	-0.062	[-0.191,0.066]	0.342	-0.049	[-0.095,-0.003]	0.036*
Inferior temporal	-0.09	[-0.214,0.034]	0.155	-0.032	[-0.078,0.014]	0.175
Insula	0.143	[0.015,0.27]	0.028*	0.029	[-0.017,0.075]	0.218
Isthmus cingulate	-0.136	[-0.258,-0.015]	0.028*	-0.057	[-0.107,-0.008]	0.024*
Lateral occipital	-0.187	[-0.332,-0.042]	0.011*a	-0.098	[-0.139,-0.057]	<0.001***a
Lateral orbitofrontal	-0.102	[-0.227,0.023]	0.11	-0.006	[-0.052,0.04]	0.803
Lingual	-0.175	[-0.302,-0.048]	0.007**a	-0.111	[-0.157,-0.065]	<0.001***a
Medial orbitofrontal	-0.055	[-0.182,0.072]	0.398	0.03	[-0.016,0.077]	0.203
Middle frontal (Rostral)	-0.402	[-0.528,-0.277]	<0.001***a	-0.01	[-0.056,0.037]	0.683
Middle temporal	-0.2	[-0.331,-0.07]	0.003**a	-0.058	[-0.104,-0.013]	0.012*a
Paracentral	-0.155	[-0.28,-0.031]	0.014*a	-0.082	[-0.126,-0.038]	<0.001***a
Parahippocampus	0.034	[-0.092,0.16]	0.597	-0.074	[-0.116,-0.032]	0.001**a
Parsopercularis	-0.061	[-0.186,0.064]	0.337	0.035	[-0.011,0.081]	0.135
Parsorbitalis	-0.168	[-0.292,-0.044]	0.008**a	0.018	[-0.026,0.062]	0.434
Parstriangularis	-0.278	[-0.401,-0.155]	<0.001***a	0.022	[-0.024,0.068]	0.345
Pericalcerine	-0.093	[-0.223,0.036]	0.158	-0.101	[-0.146,-0.056]	<0.001***a
Postcentral	-0.14	[-0.267,-0.014]	0.03*	-0.098	[-0.143,-0.052]	<0.001***a
Posterior cingulate	-0.047	[-0.169,0.076]	0.455	-0.02	[-0.065,0.024]	0.37
Precentral	-0.057	[-0.183,0.069]	0.378	-0.071	[-0.117,-0.025]	0.002**a
Precuneus	-0.087	[-0.211,0.037]	0.17	-0.06	[-0.106,-0.015]	0.009**a
Superior frontal	-0.32	[-0.445,-0.195]	<0.001***a	0.002	[-0.045,0.049]	0.937
Superior parietal	-0.135	[-0.263,-0.008]	0.037*	-0.061	[-0.107,-0.015]	0.01*a
Superior temporal	-0.21	[-0.336,-0.084]	0.001**a	-0.039	[-0.085,0.007]	0.1
Superior temporal sulcus	-0.019	[-0.143,0.104]	0.758	-0.094	[-0.14,-0.049]	<0.001***a
Supramarginal	-0.029	[-0.164,0.106]	0.671	-0.045	[-0.089,-0.0]	0.048*
Temporal pole	-0.077	[-0.201,0.046]	0.218	0.013	[-0.032,0.059]	0.568
Transverse temporal	-0.099	[-0.223,0.025]	0.117	-0.033	[-0.077,0.011]	0.137

Table S5. Parameter estimates from the neuronal stress theory of overeating (ADI → $Brain_B$ → BMI_{Y2}) assessing the associations between ADI and cortical thickness at 9/10-years-old and BMI at 11-to-12-year-old. Linear random mixed effects covaried for puberty, sex, race/ethnicity and education, scanner type (random effect) to identify ROIs at 9/10-years-old that were significantly associated with ADI at 9/10-years-old and BMI at 11/12-years-old. Correction was conducted separately by model (e.g., ADI, BMI). [a]survived multiple correction via the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that were significantly associated with BMI and ADI.

Neuronal stress theory of overeating						
	Associations with BMI at 11-12-yrs			**Associations with ADI at 9-10-yrs**		
ROI (9-10-yrs)	**Beta**	**95%CI**	***p***	**Beta**	**95%CI**	***p***
Accumbens area	-0.027	[-0.156,0.102]	0.684	-0.114	[-0.158,-0.07]	<0.001***a
Amygdala	-0.11	[-0.248,0.027]	0.115	-0.152	[-0.195,-0.11]	<0.001***a
Caudate	-0.051	[-0.177,0.075]	0.426	-0.123	[-0.171,-0.075]	<0.001***a
Hippocampus	-0.026	[-0.158,0.106]	0.699	-0.153	[-0.195,-0.11]	<0.001***a
Pallidum	0.117	[-0.015,0.249]	0.083	-0.102	[-0.146,-0.058]	<0.001***a
Putamen	-0.056	[-0.187,0.075]	0.401	-0.118	[-0.164,-0.072]	<0.001***a
Thalamus	0.115	[-0.019,0.249]	0.092	-0.107	[-0.149,-0.064]	<0.001***a
Ventral DC	0.226	[0.091,0.361]	0.001**a	-0.121	[-0.164,-0.078]	<0.001***a

Table S6. Parameter estimates from the neuronal theory of overeating (ADI → $Brain_B$ → BMI_{Y2}) looking at the associations between ADI and subcortical volume at 9/10-years-old and BMI at 11-to-12-year-old. Associations were tested using linear random mixed effects covaried for puberty, sex, Race/ethnicity and education with a random effect of scanner type was utilized to identify ROIs at 9/10-years-old that were significantly associated with ADI at 9/10-years-old and BMI at 11/12-years-old. Significant effects were corrected separated by modality (e.g., cortical thickness, volume) and model (e.g., ADI, BMI). [a]survived multiple correction testing using the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that showed significant associations with BMI and ADI.

Neuronal stress theory of overeating – healthy weight subjects at baseline						
	Associations with BMI at 11/12-yrs			**Associations with ADI at 9/10-yrs**		
ROI (9/10-yrs)	**Beta**	**95%CI**	***p***	**Beta**	**95%CI**	***p***
Anterior cingulate (Caudal)	-0.007	[-0.094,0.079]	0.871	-0.002	[-0.059,0.054]	0.932
Anterior cingulate (Rostral)	0.069	[-0.021,0.159]	0.132	0.027	[-0.031,0.085]	0.364
Caudal middle frontal	-0.057	[-0.146,0.032]	0.209	-0.015	[-0.073,0.044]	0.621
Cuneus	-0.089	[-0.179,0.002]	0.054	-0.091	[-0.146,-0.035]	0.001**a
Entorhinal	0.05	[-0.038,0.138]	0.266	0.013	[-0.044,0.071]	0.647
Frontal pole	-0.05	[-0.137,0.037]	0.258	0.036	[-0.021,0.094]	0.211
Fusiform	0	[-0.087,0.088]	0.996	-0.022	[-0.077,0.032]	0.422
Inferior parietal	-0.022	[-0.112,0.069]	0.641	-0.02	[-0.078,0.037]	0.485
Inferior temporal	0.035	[-0.053,0.123]	0.439	-0.018	[-0.074,0.039]	0.541
Insula	0.001	[-0.086,0.088]	0.983	0.009	[-0.048,0.067]	0.747
Isthmus cingulate	-0.003	[-0.089,0.083]	0.95	0.012	[-0.038,0.062]	0.628
Lateral occipital	-0.023	[-0.127,0.082]	0.669	-0.049	[-0.1,0.002]	0.061
Lateral orbitofrontal	0.001	[-0.087,0.089]	0.988	0.013	[-0.045,0.07]	0.661
Lingual	-0.045	[-0.136,0.045]	0.327	-0.044	[-0.101,0.013]	0.127
Medial orbitofrontal	0.017	[-0.072,0.106]	0.709	0.021	[-0.038,0.079]	0.491
Middle frontal (Rostral)	-0.137	[-0.226,-0.048]	0.003**	-0.004	[-0.062,0.054]	0.896
Middle temporal	-0.043	[-0.133,0.048]	0.358	-0.016	[-0.074,0.041]	0.579
Paracentral	-0.004	[-0.093,0.084]	0.925	-0.059	[-0.115,-0.004]	0.037*
Parahippocampus	0.044	[-0.045,0.133]	0.33	-0.045	[-0.096,0.007]	0.088
Parsopercularis	-0.008	[-0.095,0.08]	0.863	0.023	[-0.034,0.081]	0.428
Parsorbitalis	-0.012	[-0.099,0.075]	0.785	0.016	[-0.037,0.07]	0.551
Parstriangularis	-0.031	[-0.118,0.056]	0.482	0.029	[-0.029,0.086]	0.332
Pericalcerine	-0.027	[-0.115,0.061]	0.551	-0.077	[-0.133,-0.02]	0.008**
Postcentral	0.015	[-0.078,0.108]	0.751	-0.072	[-0.128,-0.015]	0.013*
Posterior cingulate	-0.054	[-0.141,0.033]	0.225	-0.008	[-0.065,0.049]	0.789
Precentral	0.005	[-0.084,0.094]	0.906	-0.06	[-0.117,-0.003]	0.039*
Precuneus	-0.013	[-0.101,0.075]	0.775	-0.032	[-0.087,0.024]	0.269
Superior frontal	-0.066	[-0.154,0.022]	0.143	-0.008	[-0.067,0.051]	0.781
Superior parietal	0.015	[-0.075,0.105]	0.737	-0.032	[-0.09,0.025]	0.268
Superior temporal	-0.023	[-0.111,0.066]	0.615	-0.012	[-0.069,0.045]	0.676
Superior temporal sulcus	0.011	[-0.076,0.098]	0.802	-0.057	[-0.112,-0.002]	0.042*
Supramarginal	-0.032	[-0.128,0.063]	0.504	-0.024	[-0.079,0.032]	0.404
Temporal pole	-0.037	[-0.125,0.05]	0.402	-0.003	[-0.06,0.054]	0.912
Transverse temporal	-0.039	[-0.126,0.049]	0.384	0.004	[-0.049,0.057]	0.885

Table S7. Parameter estimates from the neuronal stress theory of overeating (ADI → $Brain_B$ → BMI_{Y2}) assessing the associations between ADI and cortical thickness at 9/10-years-old and BMI at 11-to-12-year-old in subjects who at baseline, were of a healthy weight. Linear random mixed effects covaried for puberty, sex, race/ethnicity and education, scanner type (random effect) to identify ROIs at 9/10-years-old that were significantly associated with ADI at 9/10-years-old and BMI at 11/12-years-old. Correction was conducted separately by model (e.g., ADI, BMI). [a]survived multiple correction via the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that were significantly associated with BMI and ADI.

Neuronal stress theory of overeating – healthy weight subjects at baseline						
	Associations with BMI at 11-12-yrs			Associations with ADI at 9-10-yrs		
ROI (9-10-yrs)	**Beta**	**95%CI**	***p***	**Beta**	**95%CI**	***p***
Accumbens area	-0.025	[-0.115,0.065]	0.592	-0.076	[-0.131,-0.022]	0.006**a
Amygdala	0.015	[-0.083,0.112]	0.768	-0.068	[-0.121,-0.014]	0.013*a
Caudate	0.027	[-0.062,0.115]	0.554	-0.093	[-0.154,-0.032]	0.003**a
Hippocampus	-0.018	[-0.112,0.076]	0.707	-0.071	[-0.124,-0.019]	0.008**a
Pallidum	0.033	[-0.06,0.126]	0.491	-0.064	[-0.119,-0.009]	0.023*a
Putamen	0.031	[-0.061,0.123]	0.509	-0.041	[-0.091,0.01]	0.113
Thalamus	0.085	[-0.009,0.18]	0.076	-0.046	[-0.099,0.007]	0.092
Ventral DC	0.152	[0.056,0.248]	0.002**a	-0.058	[-0.108,-0.009]	0.021*a

Table S8. Parameter estimates from the neuronal theory of overeating (ADI → $Brain_B$ → BMI_{Y2}) looking at the associations between ADI and subcortical volume at 9/10-years-old and BMI at 11-to-12-year-old in subjects who at baseline, were of a healthy weight. Associations were tested using linear random mixed effects covaried for puberty, sex, Race/ethnicity and education with a random effect of scanner type was utilized to identify ROIs at 9/10-years-old that were significantly associated with ADI at 9/10-years-old and BMI at 11/12-years-old. Significant effects were corrected separated by modality (e.g., cortical thickness, volume) and model (e.g., ADI, BMI). [a]survived multiple correction testing using the Benjamini-Hochberg method. Salmon-colored rows highlight the ROIs that showed significant associations with BMI and ADI.