

Figure 1. Regional gray matter volumes (GMV) significantly associated with Total Psychopathy Checklist–Youth Version (PCL–YV) scores, controlling for brain volume (BV), age at scan, and substance dependence. Note: These regions are significant in the whole brain at $p < .05$, uncorrected for multiple comparisons, with an extent threshold of 1643 voxels, yielding a corrected threshold of $p < .05$, accounting for spatial correlations between GMVs in neighboring voxels. Coordinates are in Montreal Neurological Institute (MNI) space. The color bar represents t -values. GMV increases are in yellow/orange/red and decreases are in green/blue. Negatively associated clusters can be found in the orbitofrontal cortex (OFC), extending into parahippocampal cortex and the temporal poles, and in the posterior cingulate cortex (PCC). There is a positively associated cluster in the prefrontal cortex.

Figure 2. Regional gray matter volumes (GMV) negatively associated with the Hare Psychopathy Checklist–Youth Version (PCL–YV) Factor 1 scores (Panel A) and negatively (blue) and positively (red) associated with PCL–YV Factor 2 scores (Panel B), controlling for brain volume (BV), age at scan, and substance dependence. Note: These regions are significant in the whole brain at $p < .05$ and 1643-voxel extent. Numeric values indicate the Montreal Neurological Institute (MNI) z-coordinate of the slice, and the color bar represents t -values.

Figure S1. Distribution of Psychopathy Checklist–Youth Version (PCL–YV) Total scores ($n=191$).

Figure S2. Regional gray matter volumes significantly associated with Total Psychopathy Checklist–Youth Version (PCL–YV) scores, controlling for brain volume (BV), age at scan, and regular substance use. Note: These regions are significant in the whole brain at $p < .05$, uncorrected for multiple comparisons, with an extent threshold of 1,643 voxels, yielding a corrected threshold of $p < .05$, accounting for spatial correlations between gray matter volumes (GMVs) in neighboring voxels. Coordinates are in Montreal Neurological Institute (MNI) space. The color bar represents t -values.

Table 1. Descriptive statistics for analyzed sample ($N=191$).

Table S1. Zero-order correlations (and two-tailed p -values) among Psychopathy Checklist–Youth Version (PCL-YV) Total, Factor 1 scores, Factor 2 scores, and control variables.

Variable	n	Total Scores	Factor 1 Scores	Factor 2 Scores
IQ	178	-.04 (.63)	.10 (.21)	-.13 (.08)
TBI History	191	.08 (.63)	.02 (.88)	.09 (.20)
TBI Duration	188	.10 (.16)	.03 (.68)	.13 (.09)
Handedness ^a	191	-.03 (.64)	-.05 (.49)	-.001 (.99)
Substance Dependence	191	.24 (.001)	.17 (.02)	.24 (.001)
Regular Use	184	.37 (<.001)	.25 (<.001)	.37 (<.001)
Age at scan	191	-.12 (.10)	-.03 (.70)	-.17 (.02)
Brain Volume	191	-.01 (.92)	<.001 (.997)	-.004 (.95)
Gray Matter Volume	191	-.01 (.94)	-.004 (.95)	-.003 (.97)
White Matter Volume	191	-.01 (.91)	.005 (.95)	-.005 (.94)

Note: The two substance use measures, substance dependence and regular use, were significantly positively correlated, $r=.48$, $p<.001$. As is typical^{1,2}, Factor 1 and Factor 2 scores were significantly positively correlated, $r=.52$, $p<.001$. TBI=traumatic brain injury.

^aSpearman's rho.

Table S2. Negative associations between Total Psychopathy Checklist–Youth Version (PCL-YV) scores and gray matter volumes (GMV) in anatomical regions of interest (ROI) using small volume correction (SVC).

		Gray Matter Volumes				
		MNI Coordinates				
Paralimbic Region	H	x	y	z	t	FWE
Lateral OFC	L	-12	32	-24	4.23	.007
	R	12	18	-18	3.24	.134
Medial OFC	—	-10	32	-22	4.15	.004
ACC	—	6	26	18	2.20	.647
Temporal Pole	L	-32	8	-30	3.32	<i>.069</i>
	R	42	16	-22	3.04	<i>.156</i>
Parahippocampal Gyrus	L	-16	6	-20	2.59	.218
	R	20	8	-20	3.12	<i>.076</i>
Amygdala	L	-16	2	-16	2.57	<i>.070</i>
	R	20	6	-18	2.57	<i>.076</i>
Hippocampus	L	-16	-4	-22	1.97	.524
	R	26	-4	-22	2.33	.337
PCC	—	4	-46	12	2.36	.294

Note: Brain volume (BV), age at scan, and regular substance use were included in the model as covariates. Montreal Neurological Institute (MNI) x, y, and z coordinates, *t*-values, and family wise error rate (FWE) *p*-values are for the peak voxel in each region. Significant regions ($p < .05$) are indicated in **bold** and marginal regions ($p < .10$) are indicated in *italics*. ACC=anterior cingulate cortex; H=Hemisphere; L=Left; OFC=orbitofrontal cortex; PCC=posterior cingulate cortex; R=Right.

Table S3. Negative associations between Total Psychopathy Checklist–Youth Version (PCL-YV) scores and gray matter volumes (GMV) in regions of interest (ROI) using small volume correction (SVC; 10mm diameter spheres).

Region	H	Peak for Search (from adults)			Peak within Volume			t-value	p (unc.)	FWE
		x	y	z	x	y	z			
Lateral OFC	L	-26	32	-20	-26	28	-22	2.48	.007	.053
	R	28	48	-18	24	46	-16	2.60	.005	.042
Medial OFC	—	4	52	-20	2	52	-24	1.53	.062	.247
ACC	—	-2	48	2	2	46	0	-1.06	.575	.629
Temporal Pole	L	-38	12	-40	-40	8	-38	2.51	.006	.050
	R	34	20	-38	36	16	-36	1.88	.030	.156
Parahippocampal	L	-32	-2	-28	-34	2	-30	2.40	.009	<i>.062</i>
	R	34	-8	-24	32	-10	-20	0.48	.270	.519
PCC	—	-6	-54	32	-8	-52	28	1.95	.026	.141

Note: Brain volume (BV), age at scan, and regular substance use were included in the model as covariates. Montreal Neurological Institute (MNI) x, y, and z coordinates, t-values, and p-values are for the peak voxel in each region. Significant regions ($p < .05$) are indicated in **bold** and marginal regions ($p < .10$) are indicated in *italics*. Search coordinates based on an independent adult sample³ (N=254). ACC=anterior cingulate cortex; FWE=family wise error rate; H=Hemisphere; L=Left; OFC=orbitofrontal cortex; PCC=posterior cingulate cortex; R=Right; unc.=uncorrected.

Supplemental References

1. Hare RD. Manual for the Hare Psychopathy Checklist-Revised. 2nd ed. Toronto: Multi-Health Systems; 2003.
2. Hare RD. Manual for the Hare Psychopathy Checklist: Toronto: Multi-Health Systems; 1991.
3. Ermer E, Cope LM, Nyalakanti PK, Calhoun VD, Kiehl KA. Aberrant paralimbic gray matter in criminal psychopathy. *J Abnorm Psychol.* 2012;121:649–658.