

Supplemental Information

Supplemental Results

Table S1. Demographic and clinical details for the non-right handed subjects. IQ data were available on 71 of the non-right handed subjects. There were no anxiety disorders diagnosed in this group.

	ADHD	Controls	Test of significance
Sex: Males, N (%)	29 (64.4%)	18 (62.1%)	$\chi^2 = 0.04, p = 0.83$
Number of subjects at each scan, mean age (SD) yr			
Scan 1	N = 45 9.5 (3.1)	N = 29 11.0 (3.9)	$t = 1.8, p = 0.07$
Scan 2	N = 25 12.8 (3.6)	N = 10 14.1 (2.7)	$t = 0.98, p = 0.33$
Scan 3	N = 9 14.0 (3.8)	N = 1 14.6	NA
Scan 4	N = 4 19.6 (2.9)	None	NA
Age range	5.2 to 23.0	5.4 to 16.1	
IQ mean (SD)	108 (15)	106 (11)	$t = 0.83, p = 0.41$
Range	83 -136	83-128	
Type of ADHD			
Combined	43 (95.6%)	NA	
Hyperactive/impulsive	1 (2.2%)	NA	
Inattentive	1 (2.2%)	NA	
ODD	14 (31.1%)	NA	
CD	1 (2.2%)	NA	
Tics	2 (4.4%)	NA	
Mood disorder	1 (2.2%)	NA	
Learning disability	6 (13.3%)	NA	

ADHD, attention-deficit/hyperactivity disorder; CD, conduct disorder; NA, not applicable; ODD, oppositional defiant disorder.

Table S2. Estimated growth rates, in percent change per year in area, with standard errors, in non-right handed typically developing and ADHD participants.

	Typically Developing	ADHD	Difference
	Estimate (SE)	Estimate (SE)	t (p)
Region I	0.74 (0.48)	0.92 (0.24)	0.34 (0.73)
Region II	1.02 (0.59)	1.39 (0.33)	0.55 (0.59)
Region III	1.79 (0.64)	2.61 (0.44)	1.06 (0.29)
Region IV	3.24 (0.89)	3.21 (0.59)	0.13 (0.89)
Region V	1.65 (0.41)	1.98 (0.19)	0.68 (0.49)
Total CC	1.18 (0.37)	1.61 (0.18)	1.06 (0.29)

Table S3. Unadjusted baseline area (in mm²) in non right-handed participants by diagnostic group.

	Typically Developing	ADHD	Difference
	Mean (SD)	Mean (SD)	t (p)
Region I	160 (26.3) 118.1 to 225	154.7 (28) 105.5 to 223.6	0.81 (0.42)
Region II	144 (24.8) 109.6 to 223.5	137.5 (23.9) 91.4 to 192.6	1.12 (0.26)
Region III	53.7 (10.7) 35.2 to 84.4	49.7 (9) 33.7 to 68.9	1.77 (0.08)
Region IV	26.4 (6.2) 16.9 to 40.8	23.4 (5.9) 12.6 to 36.6	2.0 (0.04)
Region V	167.7 (29.1) 118.1 to 226.4	167.3 (27.1) 112.5 to 219.3	0.07 (0.94)
Total CC	551.9 (82.2) 427.5 to 755.2	532.5 (78.2) 402.2 to 690.5	1.0 (0.31)

Table S4. Baseline area (in mm²), adjusted for intracranial volume, in non right-handed participants by diagnostic group.

	Typically Developing	ADHD	Difference
	Estimate (SE)	Estimate (SE)	F, p
Region I	157.3 (4.2)	158.1 (.39)	F = 0.02, p = 0.9
Region II	141.7 (4.1)	139.2 (3.6)	F = 0.22, p = 0.64
Region III	52.8 (1.7)	50.4 (1.4)	F = 1.2, p = 0.28
Region IV	25.7 (0.97)	23.9 (0.84)	F = 1.9, p = 0.17
Region V	164.9 (4.7)	170.5 (4.1)	F = 0.78, p = 0.38
Total CC	542 (12.7)	542.1 (10.9)	F = 0.001, p = 0.98

Correlates of Psychostimulant Treatment

Baseline analyses. At study entry medication details were available on 151 of the right handed individuals with ADHD. At baseline, methylphenidate preparations were most common (85%); amphetamine preparations constituted the remaining 15%. The 113 subjects who were taking psychostimulants were significantly older (mean age 11.6, SD 2.9) than their unmedicated counterparts (mean age 8.8, SD 2.9; $t = 5.1, p < 0.001$), but did not differ significantly in sex or IQ. Analyses were thus adjusted for age and ICV and are shown in Table S5. There was also no significant correlation between lifetime dosage of psychostimulants (expressed in methylphenidate equivalents and CC areas at study entry: for Region I: $r = 0.11, p = 0.25$; Region II: $r = 0.18, p = 0.06$; Region III: $r = 0.13, p = 0.18$; Region IV: $r = 0.17, p = 0.08$; Region V: $r = 0.14, p = 0.1$).

Table S5. Baseline areas, adjusted for age and intracranial volume.

	On psychostimulants	Unmedicated	Difference
	Estimate (SE)	Estimate (SE)	F, <i>p</i>
Region I	157.3 (5.6)	158.8 (8.0)	$F = .04, p = 0.85$
Region II	142.9 (1.9)	148.7.3 (3.4)	$F = 1.94, p = 0.17$
Region III	54.0 (0.97)	54.3 (1.7)	$F = 0.02, p = 0.86$
Region IV	25.4 (0.58)	25.4 (1)	$F < 0.001, p = 0.99$
Region V	174.5 (2.5)	172.9 (4.3)	$F = 0.09 p = 0.76$
Total CC	554.3 (6.7)	559.7 (11.7)	$F = 0.15, p = 0.70$

Longitudinal analyses. We compared a group of right handed ADHD subjects who were continuously medicated between two scans with psychostimulants (mean age at first scan 12.1, SD 1.9; mean age at second scan 16.2, SD 2.1) against subjects who were unmedicated (mean age at first scan 13.1, SD 2.2; mean age at second scan 17.2, SD 2.4). These ages of scan acquisition did not differ significantly. Cortical growth in these subjects has been reported upon in a previous paper (1). We found no significant group differences in growth rates, as shown in Table S6.

Table S6. Growth rates.

	On psychostimulants (N = 22) Estimate (SE)	Unmedicated (N = 12) Estimate (SE)	Difference t (p)
Region I	0.54 (0.36)	-0.2 (0.47)	1.32 (0.19)
Region II	1.31 (0.49)	0.27 (0.65)	1.27 (0.21)
Region III	2.58 (1.0)	0.42 (1.3)	1.26 (0.22)
Region IV	1.73 (1.1)	-0.63 (1.4)	1.35 (0.18)
Region V	1.53 (0.31)	1.14 (0.4)	0.78 (0.44)
Total CC	1.1 (0.26)	0.43 (0.34)	1.59 (0.12)

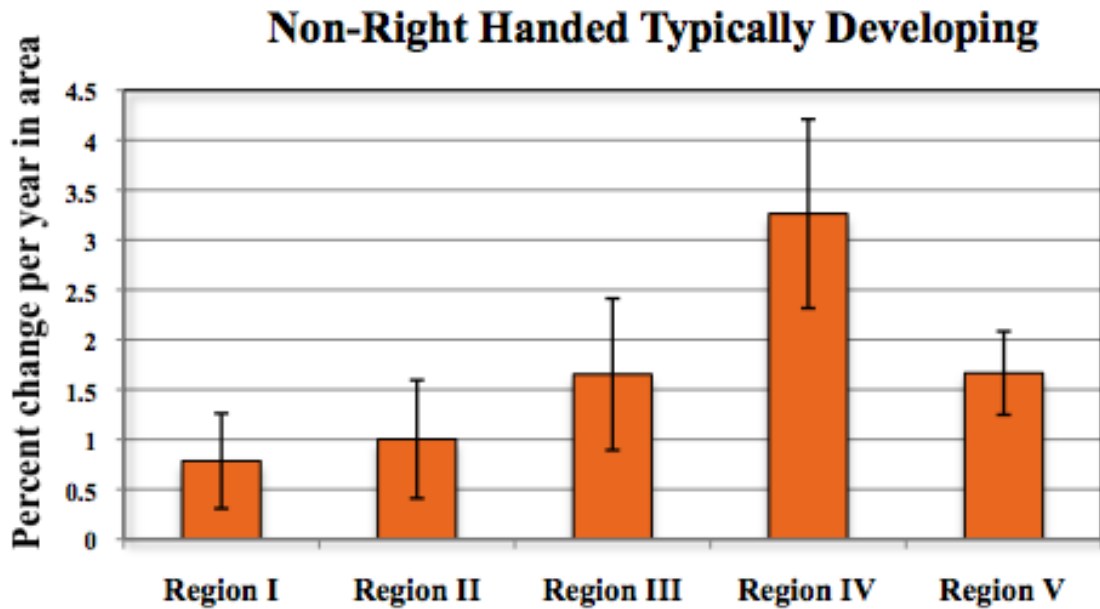


Figure S1. Estimated growth rates in non-right handed, typically developing participants. Bar indicates estimated percent change per year in area and lines indicate \pm SE.

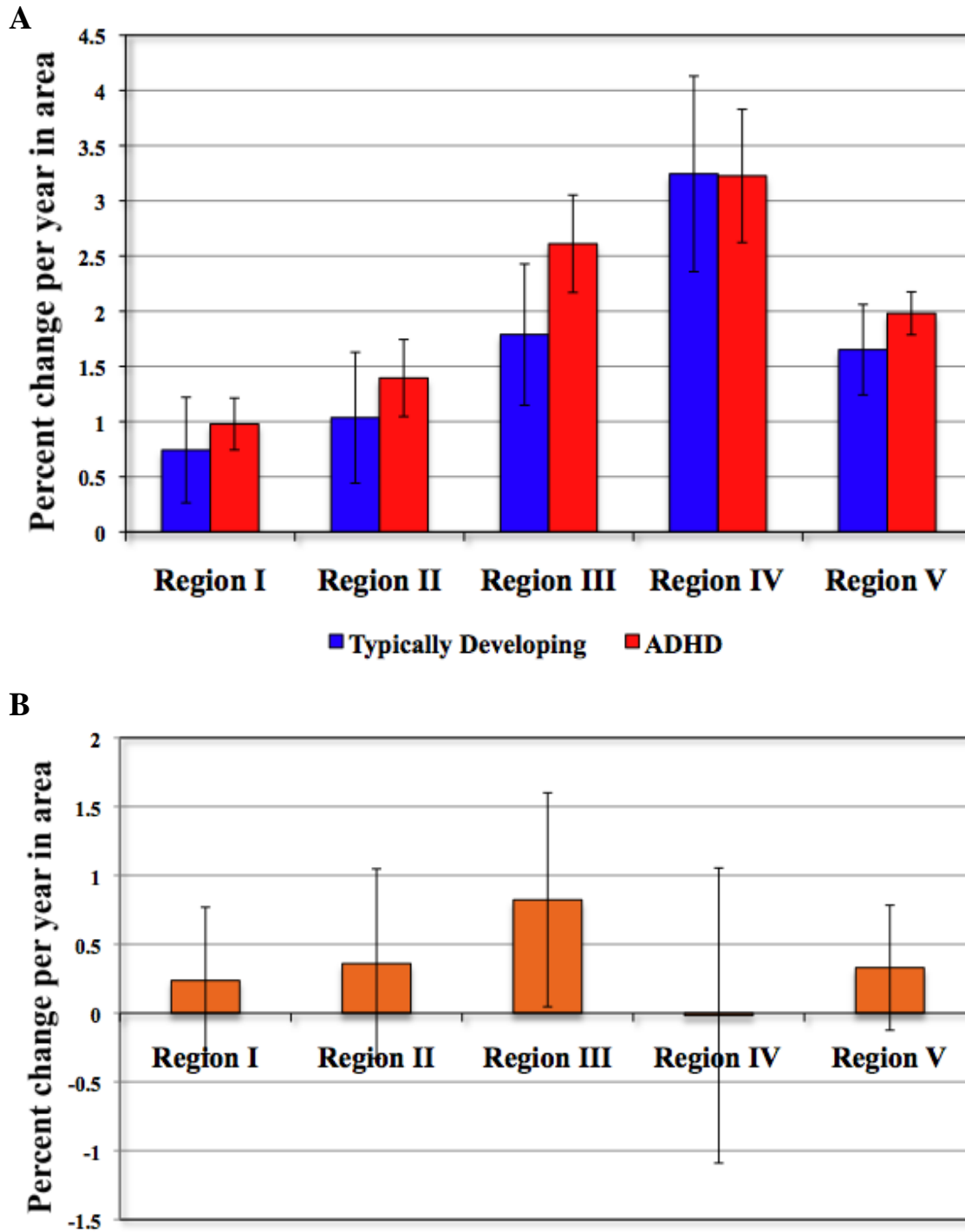


Figure S2. (A) Estimated growth rates in non-right handed participants with ADHD and typically developing controls. Bars indicate estimated percent change per year in area. Lines indicate \pm SE. (B) Difference in percentage growth rates between participants with ADHD and typically developing controls (non-right handed participants). Bars indicate estimated percent change per year in area. Lines indicate \pm SE.

Supplemental References

1. Shaw P, Lalonde F, Lepage C, Rabin C, Eckstrand K, Sharp W, *et al.* (2009): Development of cortical asymmetry in typically developing children and its disruption in attention-deficit/hyperactivity disorder. *Arch Gen Psychiatry* 66:888-896.