

SUPPLEMENTARY INFORMATION

Title: The adhesio interthalamica as a neuroanatomical marker of structural differences in healthy adult population.

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METHODS

AI group × Sex interaction analysis

To evaluate differences by sex and the presence or absence of the AI in the whole-brain GM volume, we performed an additional interaction analysis. A full factorial 2×2 ANCOVA (Sex \times AI Group) was conducted in SPM in order to examine the interaction effect between the AI Group (AbsentAI vs. PresentAI) and sex (males vs. females). Covariates of no interest were TIV and age (we included the latter due to its statistically significant intragroup difference, as we reported in the main text). We followed the same statistical procedures described in the main text: the threshold masking was set at 0.12, and the statistical inference was applied by using threshold-free cluster enhancement (TFCE; Smith & Nichols, 2009), establishing the critical threshold to control the family-wise error (FWE) at $p < 0.05$ (5000 permutations). Subsequently, we extracted the GM volume segments within each of the resulting clusters via a MATLAB script (http://www0.cs.ucl.ac.uk/staff/g.ridgway/vbm/get_totals.m) to interpret the interaction effects. To this end, we carried out a GLM in SPSS, selecting the GM volume from the different clusters as dependent variable, sex and AI group as fixed factors, and TIV and age as covariates. Finally, the results from this model were plotted to visually inspect the direction of the interaction effects.

RESULTS

AI group × Sex interaction results

After analyzing the full factorial model results, a significant interaction effect was observed. In particular, when investigating the positive interaction Sex \times AI Group T-contrast (T₁₀₄), significant effects were found in the Anterior Cingulate Cortex (ACC; BA32) and left insula (BA48). See **Supplementary Table 1** and **Supplementary Figure 1** for more details. The results were corrected for multiple comparisons using a threshold set at $p < 0.05$ FWE via TFCE ($k > 10$). No negative interactions were found when the opposite contrast was tested. For both the ACC and insula, the results from the GLM were very similar, drawing a differential pattern between males and females based on the presence or absence of the AI. Whereas males with absent AI were found to have greater GM volume in both structures compared to males with present AI, this pattern was reversed in females (see **Supplementary Figure 1A and 1B**).

It is important to note, however, that the use of a full factorial model (2 x 2) inevitably implied a sample reduction for each group (males with absent AI = 18, males with present AI = 29; females with absent AI = 13, females with present AI = 50). Thus, due to the limited number of participants in some groups, these results should be interpreted cautiously.

Supplementary Table 1: Brain regions showing a positive Sex × AI Group interaction effect. The results were corrected for multiple comparisons using a threshold set at $p < 0.05$ FWE via TFCE ($k > 10$).

Brain Region	Hemisphere	Brodmann's Area	MNI coordinates (x y z)	Cluster Size <i>k</i>	p-value FWE-corr
ACC	Right	32	14 36 29	393	0.039
Insula	Left	48	-45 -3 2	236	0.044

$p < 0.05$ FWE via TFCE. ACC = Anterior Cingulate Cortex

Supplementary Figure 1: Brain regions showing a Sex × AI Group interaction. A) Anterior Cingulate Cortex (ACC) cluster; B) Left insula cluster. Results were corrected for multiple comparisons using a threshold set at $p < 0.05$ FWE via TFCE. Color bar represents TFCE-values. Differential effects were found in males with absentAI (more GM volume) in comparison with males with presentAI, whereas this effect was reversed in females.

