SUPPLEMENTARY MATERIAL

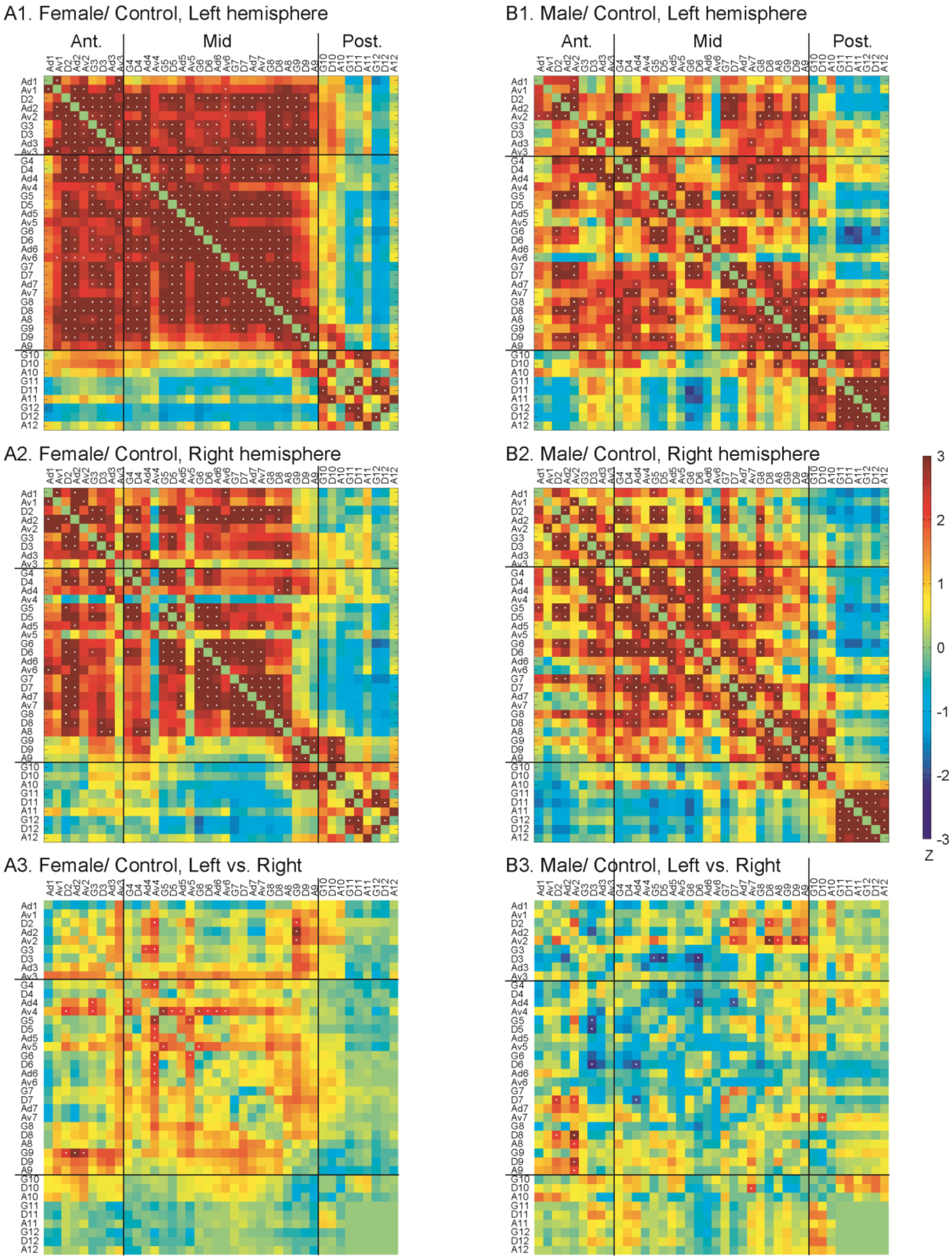

Figure S1. **Comparison of intra-insular functional connectivity between the left and right hemisphere in the control groups.** Inter-regional correlation matrices show qualitatively similar pattern of connectivity across hemisphere in female (A1, A2) and male (B1, B2) control groups. Only a few correlation coefficients show statistically significant differences between the left and right hemisphere (A3, B3, Fisher's Z transform). Statistical significance is marked with white dot ($P < 0.05$).

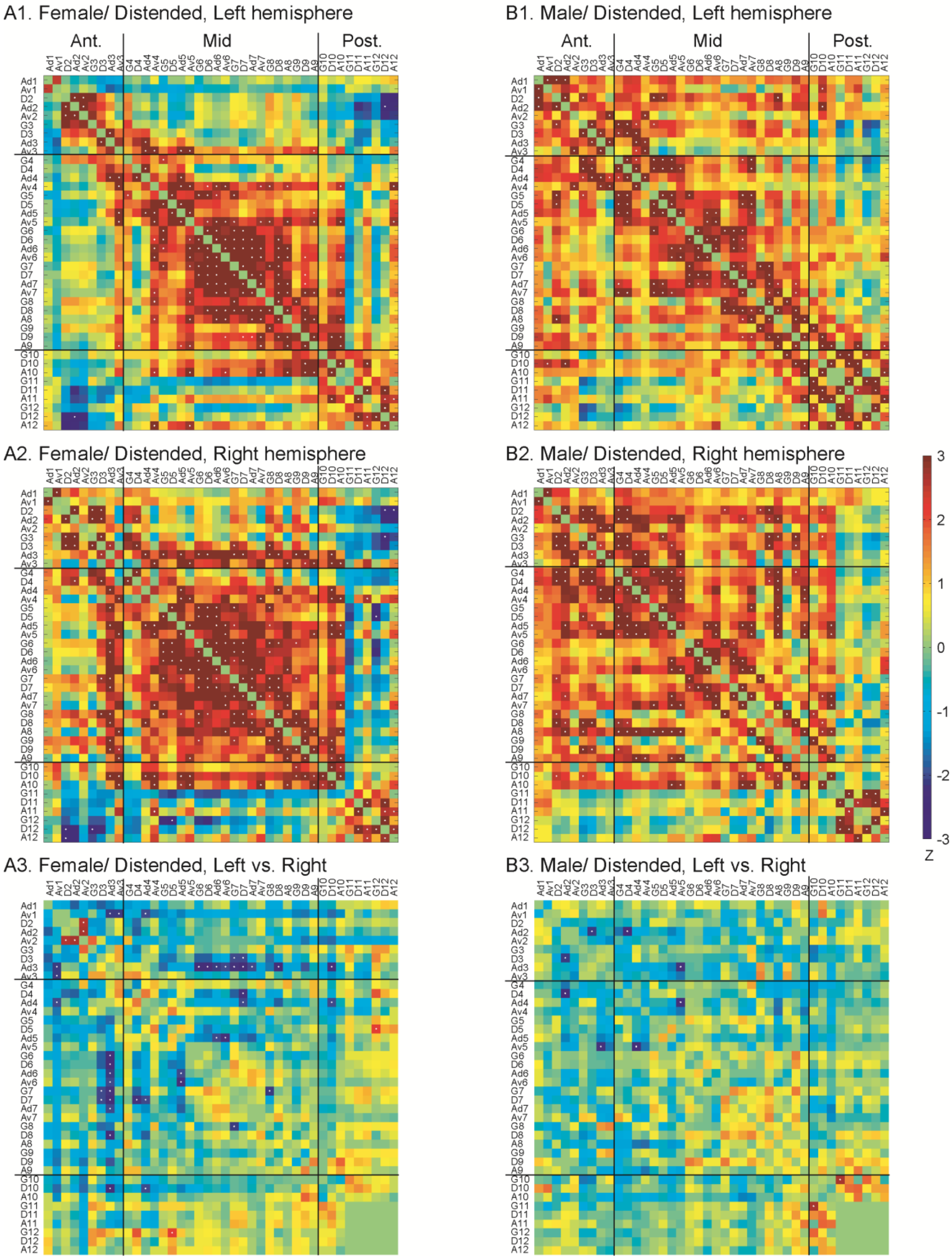

Figure S2. **Comparison of intra-insular functional connectivity between the left and right hemisphere in the distended groups.** Inter-regional correlation matrices show qualitatively similar pattern of connectivity across hemisphere in female (A1, A2) and male (B1, B2) distended groups. Only a few correlation coefficients show statistically significant differences between the left and right hemisphere (A3, B3, Fisher's Z transform). Statistical significance is marked with white dot ($P < 0.05$).

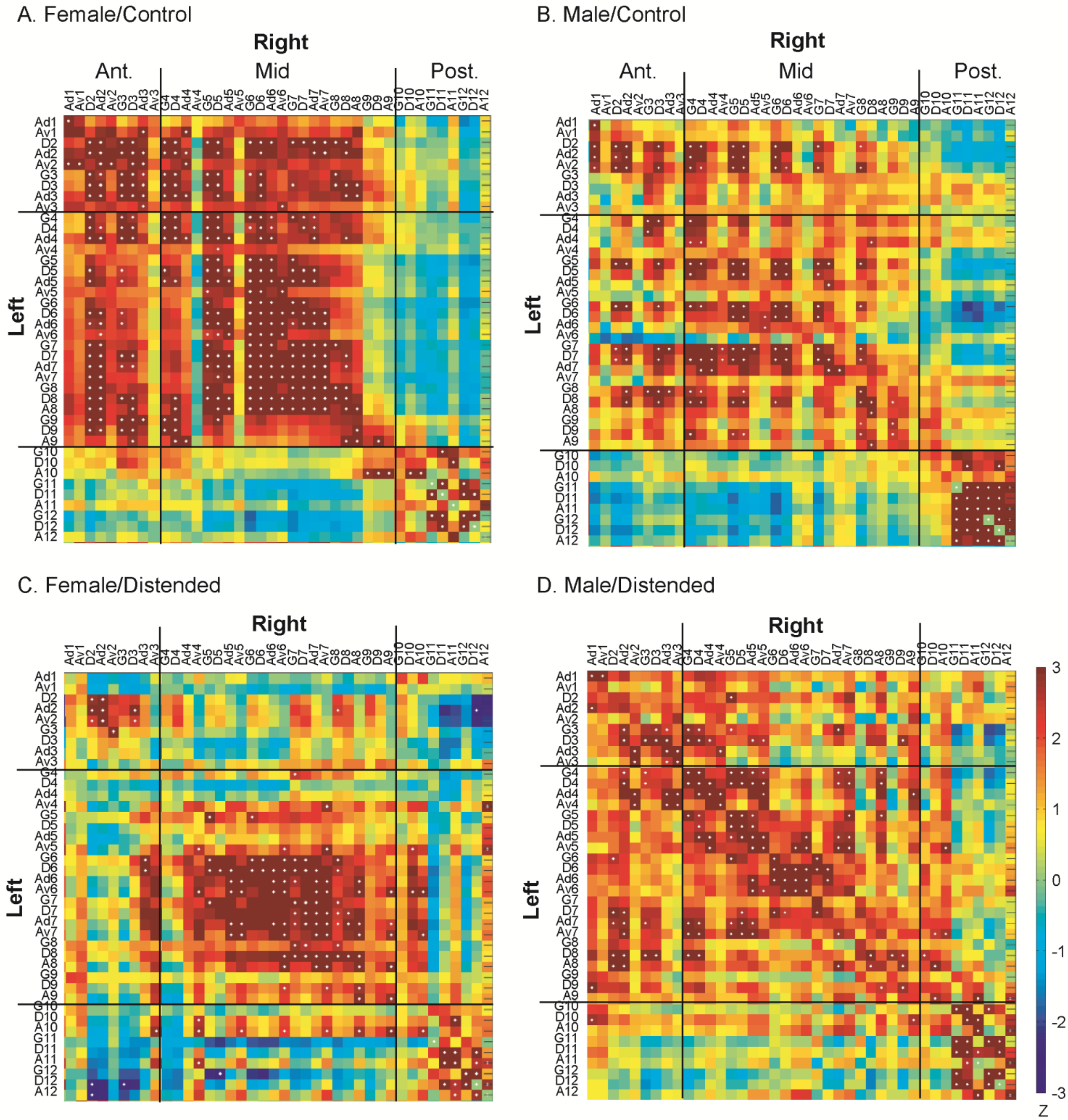

Figure S3. Cross-hemispheric intra-insular functional connectivity. Correlation matrices between the left and right insular are color-coded. Statistically significant correlations are marked with white dots. The general pattern of connectivity shows remarkable similarity to that within the left INS across the groups.

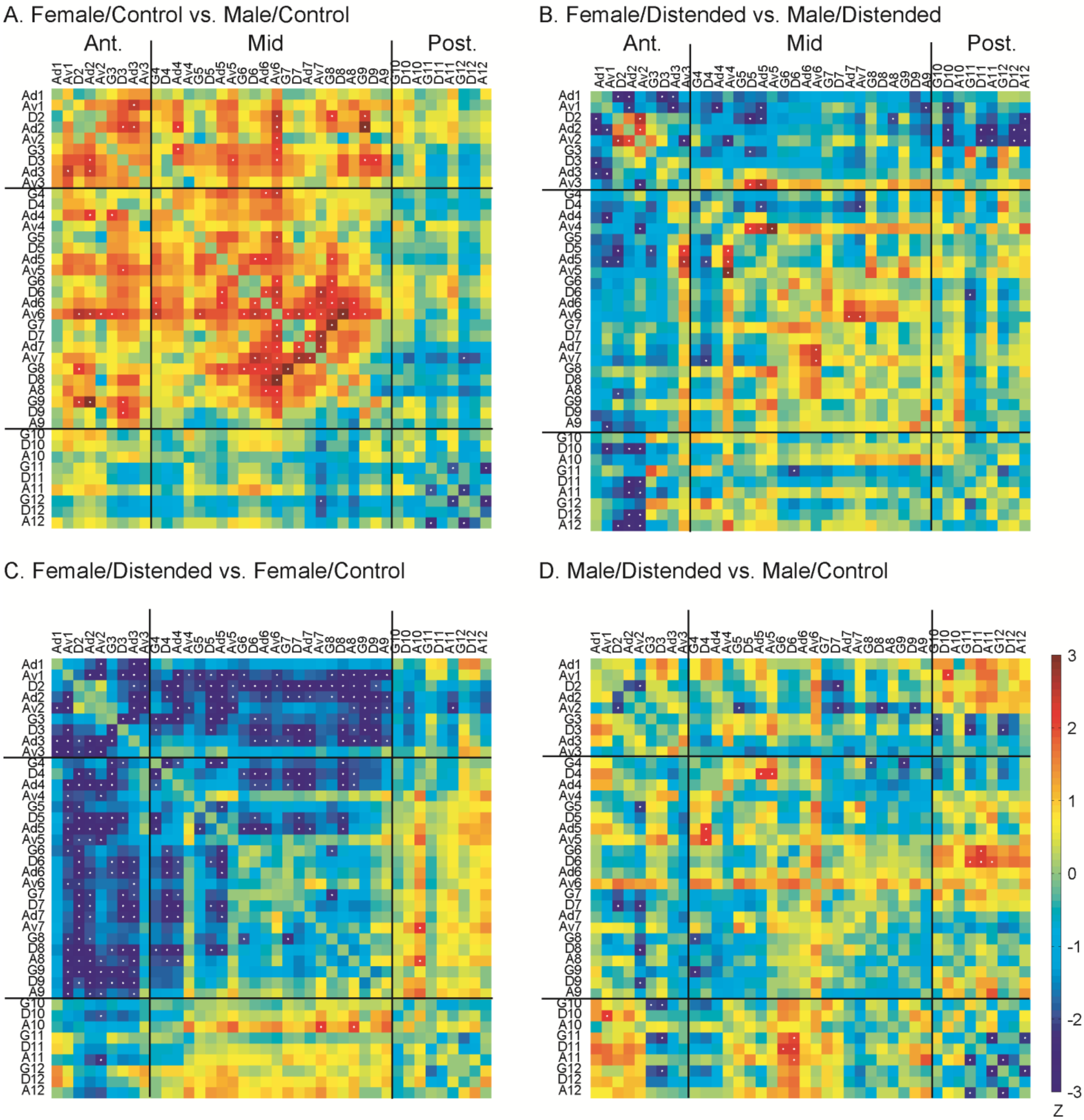

Figure S4. **Comparison of intra-insular functional connectivity.** Statistically significant between-group differences in inter-regional correlation coefficients were tested using Fisher's Z transform and marked with white dots in the correlation matrices. Z value comparing correlation coefficient from the 1st group and 2nd group is color-coded. Greater (smaller) coefficient in the 1st compared to the 2nd group is represented by red (blue) color.

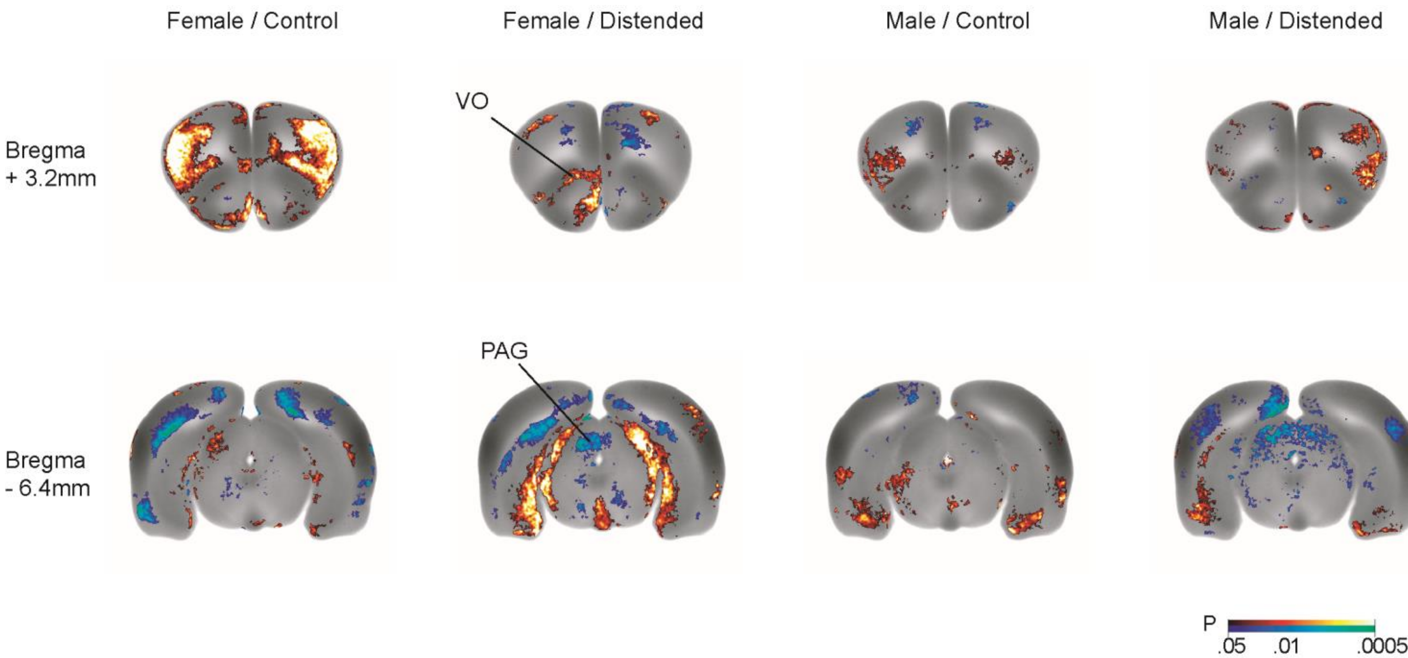

Figure S5. Specific insular functional connectivity with the ventral orbital cortex in the female/distended group. Functional connectivity analysis of the INS with pain-related regions revealed strong, positive correlation between the mid INS and VO (ventral orbital cortex) in the female/distended group, but not other groups (**Fig. 6**). We used left Ad7 (dorsal agranular INS at bregma +0.3 mm) as seed, whole-brain functional connectivity was examined for all groups. Representative seed correlation results showed striking sex difference. Color-coded overlays over the template brain at bregma +3.2 mm (top row) and bregma -6.4 mm (lower row) show brain areas that are significantly correlated with the insular seed ($P < 0.05$ for clusters of > 100 contiguous, significant voxels). Note significant positive correlation in the left VO and negative correlation in the left side of periaqueductal gray (PAG) only in the female/distended group.