**Table S1.** The cue words list (with English description)

|  |  |  |
| --- | --- | --- |
| **Positive cues** | **Neutral cues** | **Control cues** |
| 收到 礼物  Receive a gift | 清洗 衣服  Do the laundry | 摩托 轿车  Motorcycle sedan |
| 完成 手工  Complete a DIY | 咨询 客服  Consult a customer service staff | 帽子 眼镜  Hat glasses |
| 得到 帮助  Get help from someone | 外出 问路  Ask for directions | 图钉 卷尺  Pin tape |
| 欣赏 音乐  Enjoy music | 查找 信息  Look up information | 水杯 铁桶  Cup bucket |
| 享用 美食  Enjoy delicious food | 超市 买单  Pay a check at a store | 布鞋 纽扣  Shoes button |
| 享受 运动  Enjoy sports | 打扫 房间  Clean the room | 硬币 钱包  Coin wallet |
| 游戏 获胜  Win a game | 攀爬 楼梯  Climb stairs | 瓶子 书桌  Bottle desk |
| 联系 老友  Contact an old friend | 软件 更新  Update a software | 书包 铅笔  Bag pencil |
| 计划 约会  Plan a dating | 发呆 走神  Mind wandering | 衬衫 手套  Shirt gloves |
| 受到 表扬  Be praised by someone | 参加 会议  Attend a conference | 书本 邮票  Book stamp |
| 演讲 成功  Deliver a success speech | 填写 材料  Fill a form | 篮球 乒乓  Basketball table tennis ball |
| 计划 旅行  Plan travelling | 乘坐 汽车  Be in a car | 椅子 沙发  Chair sofa |
| 阅读 小说  Read a novel |  |  |
| 家人 团聚  Family reunion |  |  |
| 挣到 外快  Earn extra money |  |  |
| 欣赏 雪景  Enjoy the snowing |  |  |
| 午间 休息  Have a lunch break |  |  |
| 通过 考核  Pass a test |  |  |
| 闻到 花香  Smell the flowers |  |  |
| 习得 技能  Master a new skill |  |  |
| 登山 游览  Go hiking |  |  |
| 享受 阳光  Enjoy sunshine |  |  |
| 观看 电影  Watch a movie |  |  |
| 散步 放松  Take a relaxing walk |  |  |

**Table S2.** Brain activation during prospection (vs. control imagination) in all participants

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Brain region (AAL)** | **Peak MNI Coordinates** | | | **Voxels** | **T** | **FWE *p*** |
|  | **X** | **Y** | **Z** |  |  |  |
| Cingulum\_Post\_L | -15 | -42 | 24 | 5643 | 11.33 | <0.001 |
| Frontal\_Sup\_L | -15 | 45 | 21 | 1768 | 8.61 | <0.001 |
| Temporal\_Mid\_L | -51 | -9 | -21 | 568 | 9.97 | <0.001 |
| Temporal\_Mid\_R | 54 | 3 | -24 | 223 | 6.68 | 0.004 |
| Cerebelum\_9\_R | 9 | -54 | -48 | 146 | 5.47 | 0.02 |
| Rolandic\_Oper\_L | -39 | -15 | 15 | 132 | 4.68 | 0.03 |

*Note*: Cingulum\_Post\_L, left posterior cingulate cortex; Frontal\_Sup\_L. left superior frontal gyrus; Temporal\_Mid\_L, left middle temporal gyrus ; Temporal\_Mid\_R, right middle temporal gyrus.

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**Figure S1** Brain activations during prospection (vs. control imagination) in all participants. L, left; R, right; A, anterior; P, posterior. Threshold: initial p < 0.001 with cluster-level FWE 0.05 correction.

**Table S3.** Duration of each stage in each condition

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **SocAhn**  (N=46) | **Control**  (N=32) | ***t*** | ***P*** |
| Pos\_C | 3.80(2.26) | 3.93(2.64) | -1.09 | 0.28 |
| Pos\_E | 14.20(2.26) | 14.07(2.64) | 1.09 | 0.28 |
| Neu\_C | 3.86(2.52) | 4.01(2.59) | -0.87 | 0.39 |
| Neu\_E | 14.14(2.52) | 14.00(2.59) | 0.87 | 0.39 |
| Con\_C | 4.00(2.06) | 4.07(2.70) | -0.38 | 0.70 |
| Con\_E | 14..00(2.06) | 13.93(2.70) | 0.38 | 0.70 |

*Note*: SocAhn, individuals with social anhedonia; Pos, positive; Neu, neutral; Con, control; C, Construction; E, Elaboration

In the control analysis, hemodynamic activity of the entire 18 seconds of the prospection phase (collapsing the construction and elaboration stage) was modeled in the first-level analysis. One-sample t tests were conducted for the prospection contrast (positive + neutral - control) in all participants and for the emotion contrast (positive - neutral) in each group.

Then a two-sample t test was used to investigate group differences for the emotion contrast. A cluster-level FWE 0.05 correction (initial p < 0.001) was applied as previous analysis did. Results showed a similar pattern compared with previous findings:

(1) The typical prospection network was engaged when prospecting future events in all participants (Table S4; Figure S2);

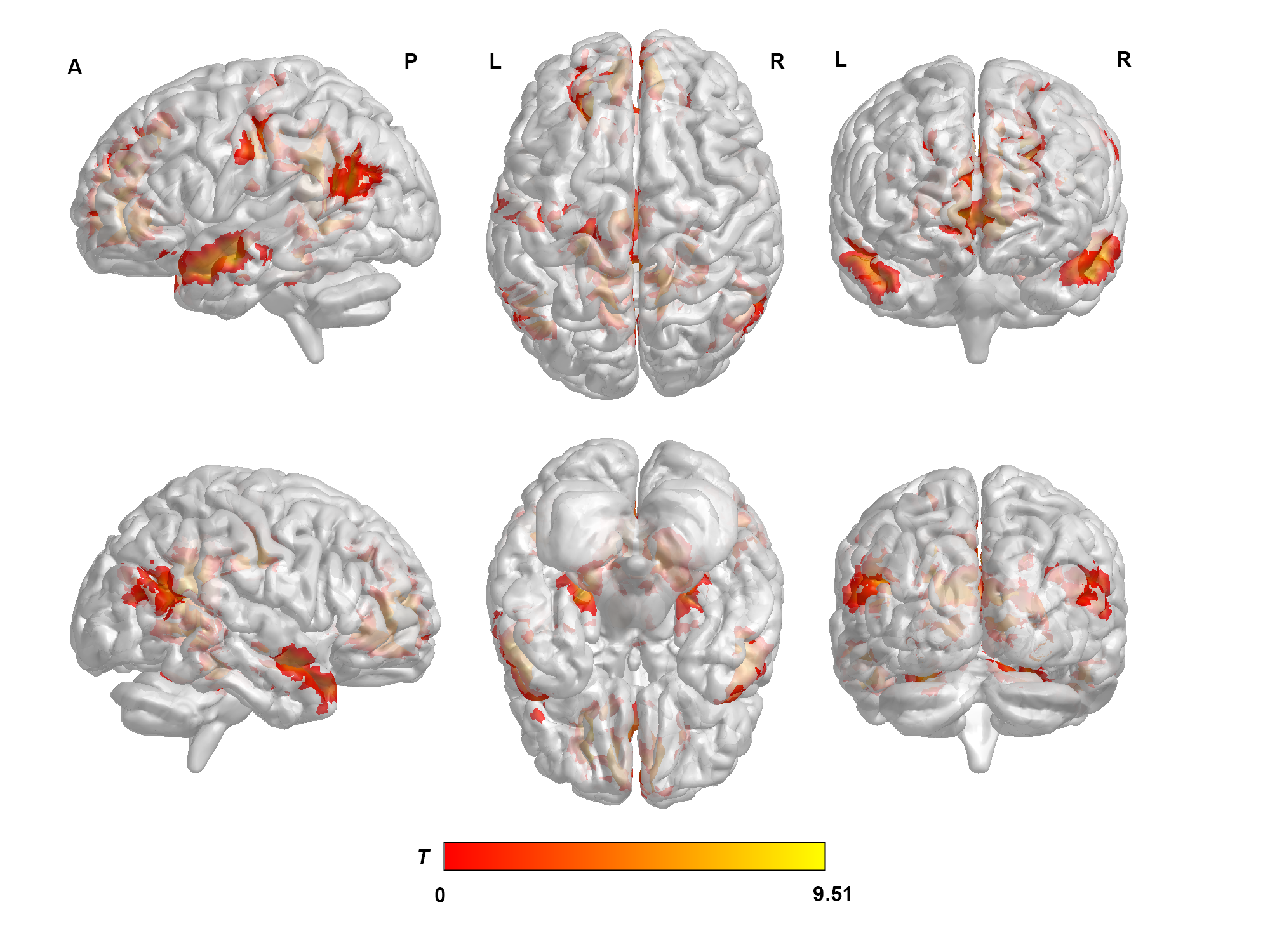
(2) In the control group, the left frontal regions, the right occipital lobe and the left caudate were more activated when envisioning positive future episodes relative to neutral ones, while less engagement of the precuneus cortex in positive prospection (relative to neutral prospection) was detected in individuals with SocAnh (Table S5; Figure S3);

(3) Compared with controls, individuals with SocAnh exhibited reduced activations in the right caudate during positive prospection (vs. neutral ones) (Table S5; Figure S3).

**Table S4.** Brain activation for the prospection contrast in all participants in control analysis

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Brain region (AAL)** | **Peak MNI Coordinates** | | | **Voxels** | **T** | **FWE *p*** |
|  | **X** | **Y** | **Z** |  |  |  |
| Cingulum\_Post\_L | -12 | -45 | 18 | 2968 | 8.87 | <0.001 |
| Frontal\_Sup\_L | -12 | 45 | 27 | 1757 | 9.49 | <0.001 |
| Temporal\_Mid\_L | -39 | -48 | 15 | 280 | 6.54 | 0.002 |
| Temporal\_Mid\_L | -51 | -12 | -21 | 260 | 9.51 | 0.002 |
| Temporal\_Mid\_R | 54 | 3 | -24 | 185 | 6.93 | 0.01 |
| Cerebelum\_4\_5\_L | -21 | -36 | -24 | 120 | 7.29 | 0.004 |

*Note*: Cingulum\_Post\_L, left posterior cingulate cortex; Frontal\_Sup\_L. left superior frontal gyrus; Temporal\_Mid\_L, left middle temporal gyrus; Temporal\_Mid\_R, right middle temporal gyrus.



**Figure S2** Brain activations during prospection (vs. control imagination) in all participants in the control analysis. L, left; R, right; A, anterior; P, posterior. Threshold: initial p < 0.001 with cluster-level FWE 0.05 correction.

**Table S5.** Brain activations for the emotion contrast in the control analysis

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Brain region (AAL) | Peak MNI Coordinates | | | Voxels | T | FWE *p* |
|  | X | Y | Z |  |  |  |
| **SocAnh** |  |  |  |  |  |  |
| Precuneus\_R | 12 | -57 | 45 | 402 | -4.87 | <0.001 |
| Angular\_R | 45 | -51 | 36 | 147 | -4.29 | 0.02 |
| **Controls** |  |  |  |  |  |  |
| Postcentral\_L | -39 | -21 | 45 | 739 | 8.58 | <0.001 |
| Cerebelum\_6\_R | 12 | -54 | -27 | 478 | 6.02 | <0.001 |
| Cingulum\_Ant\_L | 0 | 21 | 12 | 220 | 6.91 | 0.001 |
| Lingual\_R | 18 | -81 | 0 | 117 | 4.40 | 0.02 |
| Caudate\_L\* | -15 | 15 | 6 | 15 | 4.31 | 0.03 |
| **SocAhn < Controls** |  |  |  |  |  |  |
| Caudate\_R\* | 21 | 21 | 0 | 12 | 3.56 | 0.02 |

*Note*: \* small volume correction was applied; SocAhn, individuals with social anhedonia; Postcentral\_L, left postcentral gyrus; Cingulum\_Ant\_L, left anterior cingulate cortex; Lingual\_R, right lingual cortex.

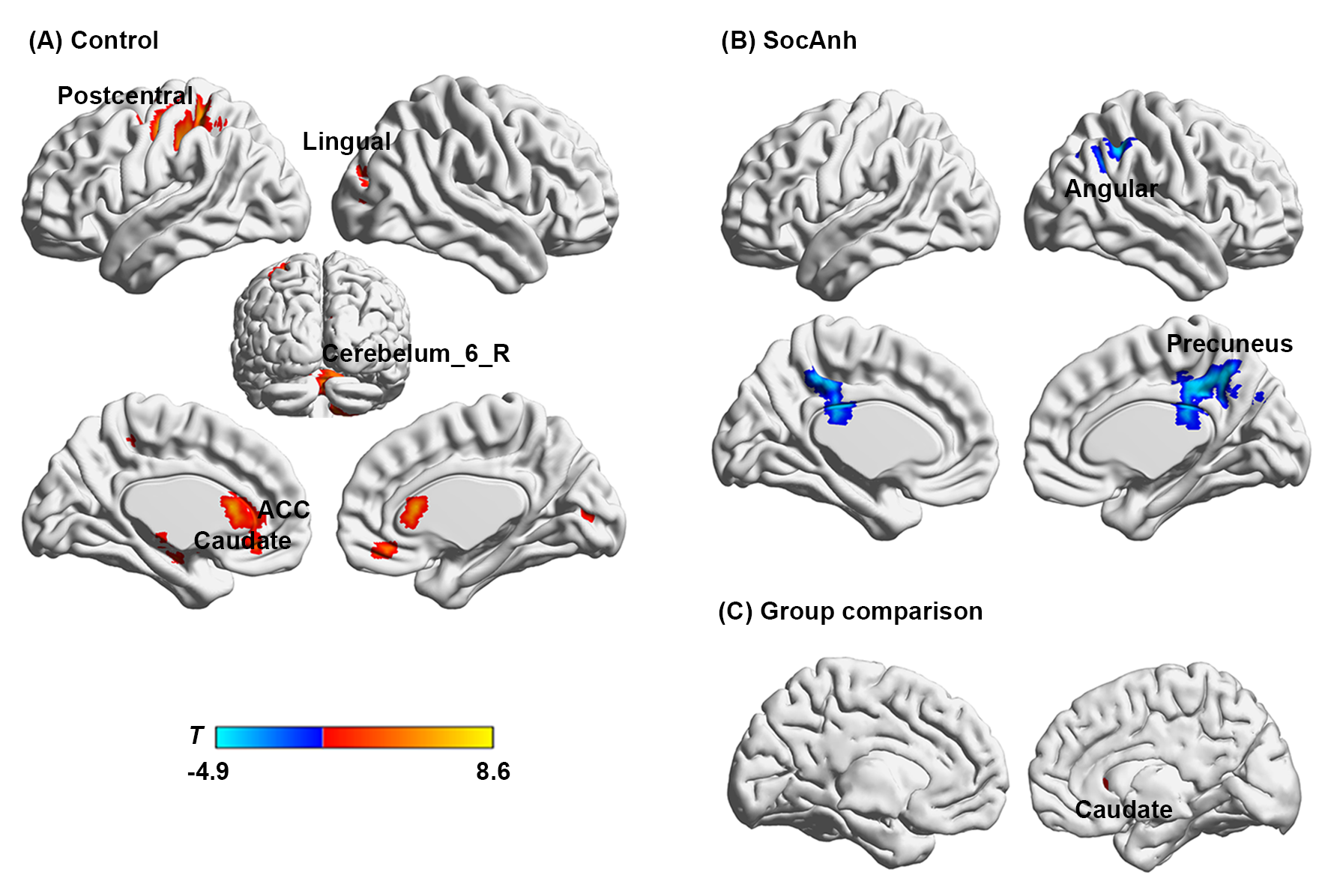


Figure S3. Brain activations for the emotion contrast (positive prospection vs. neutral prospection) in the control analysis. (A) Brain regions engaged in the control group. (B) Brain activations in the SocAnh group. (C) Significant clusters in group comparison (Control - SocAnh). SocAnh, social anhedonia; ACC, anterior cingulate. Threshold: initial p < 0.001 with cluster-level FWE 0.05 correction.