**Supplement 1**. Detailed information about each selected OXTR SNP.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SNPs | Alleles | Chromosome Position | Functional Consequence | MAF† | Clinical Significance |
| rs1042778 | G > T | 3:8752859 (GRCh38)3:8794545 (GRCh37) | 3\_prime\_UTR\_variant, intron\_variant | T = 0.093 | Not Reported |
| rs13316193 | T > C | 3:8761057 (GRCh38)3:8802743 (GRCh37) | intron\_variant | C = 0.240 | Not Reported |
| rs2254298 | G > A | 3:8760542 (GRCh38)3:8802228 (GRCh37) | intron\_variant | A = 0.298 | Not Reported |
| rs237885 | T > G | 3:8753857 (GRCh38)3:8795543 (GRCh37) | intron\_variant | G = 0.330 | Not Reported |
| rs237887 | G > A | 3:8755356 (GRCh38)3:8797042 (GRCh37) | intron\_variant | A = 0.417 | Not Reported |
| rs237895 | T > C | 3:8765737 (GRCh38)3:8807423 (GRCh37) | intron\_variant | C = 0.336 | Not Reported |
| rs237899 | G > A | 3:8766829 (GRCh38)3:8808515 (GRCh37) | intron\_variant | A = 0.118 | Not Reported |
| rs53576 | A > G | 3:8762685 (GRCh38)3:8804371 (GRCh37) | intron\_variant | G = 0.419 | Not Reported |
| rs7632287 | G > A | 3:8749760 (GRCh38)3:8791446 (GRCh37) | intron\_variant | A = 0.012 | Not Reported |
| rs9840864 | G > C | 3:8756791 (GRCh38)3:8798477 (GRCh37) | intron\_variant | G = 0.290‡ | Not Reported |
| The data on minor allele frequency was collected from dbSNP, the NCBI database of genetic variation.† The minor allele frequency listed in the table pertains specifically to the East Asian population.‡ For rs9840864, the major allele for the aggregate human population is G allele. However, in the Asian population, the C allele is the major allele. The minor allele frequency for the East Asian population is G with a frequency of 0.290.  |

**Supplement 2**. OXTR risk allele descriptions.

1. Additive Genetic Risk Scores (AGRS) represent a cumulative measure of genetic risk, incorporating information from multiple genetic variants. This method provides an overall risk score by considering the additive effect of each risk allele, under the assumption that each contributes independently and equally to risk. This approach has been widely used in genetic research to aggregate the effects of multiple risk alleles on complex traits and diseases. In our analysis, AGRS were calculated by summing the number of risk alleles across ten OXTR SNPs, resulting in scores ranging from 0 to 20. The AGRS offer a comprehensive perspective on the genetic risk associated with OXTR SNPs in relation to childhood trauma and social functioning in schizophrenia.

|  |  |  |
| --- | --- | --- |
| SNPs | Risk Allele | Genetic risk score |
| 0 | 1 | 2 |
| rs1042778 | T | GG | GT | TT |
| rs13316193 | C | TT | TC | CC |
| rs2254298 | A | GG | GA | AA |
| rs237885 | G | TT | TG | GG |
| rs237887 | A | GG | GA | AA |
| rs237895 | C | TT | TC | CC |
| rs237899 | A | GG | GA | AA |
| rs53576 | G | AA | AG | GG |
| rs7632287 | A | GG | GA | AA |
| rs9840864 | G | CC | CG | GG |

1. Pair-wise linkage disequilibrium plots (LD values: *r*2 x 100) in patients with schizophrenia (left) and healthy controls (right).



**Supplement 3**. Illustration of the moderated mediation model using PROCESS macro v4.1 (Model 7).

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**Supplement 4**. Statistical analyses of studied SNPs within OXTR genes in patients with schizophrenia and healthy controls.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OXTR SNPs |  | *n* (% of group) | χ2 | *p* | OR [95% CI] | Hardy – Weinberg equilibrium |
| Schizophrenia(*n* = 382) | Healthy Control(*n* = 178) | Total(*n* = 560) | χ2 | *p* |
| rs1042778 | GG | 220 (57.6) | 123 (69.1) | 343 (61.2) |  |  | Reference | 5.452 | .065 |
|  | GT | 128 (33.5) | 50 (28.1) | 178 (31.8) |  |  | 1.431 [0.965-2.123] |
|  | TT | 34 (8.9) | 5 (2.8) | 39 (7.0) | 10.217 | **.006** | **3.802 [2.563-5.640]** |
| Allele frequency | G/T | 0.74/0.26 | 0.83/0.17 | 0.77/0.23 | 5.333 | **.021** | **1.702 [1.080-2.682]** |
| rs13316193 | TT | 282 (73.8) | 133 (74.7) | 415 (74.1) |  |  | Reference | 5.590 | .061 |
|  | TC | 86 (22.5) | 40 (22.5) | 126 (22.5) |  |  | 1.014 [0.661-1.556] |
|  | CC | 14 (3.7) | 5 (2.8) | 19 (3.4) | 0.276 | .871 | 1.321 [0.861-2.206] |
| Allele frequency | T/C | 0.85/0.15 | 0.86/0.14 | 0.85/0.15 | 0.075 | .785 | 1.073 [0.646-1.784] |
| rs2254298 | GG | 130 (34.0) | 76 (42.7) | 206 (40.0) |  |  | Reference | 2.578 | .276 |
|  | GA | 168 (44.0) | 84 (47.2) | 252 (39.3) |  |  | 1.169 [0.795-1.719] |
|  | AA | 84 (22.0) | 18 (10.1) | 102 (20.7) | 12.161 | **.002** | **2.728 [1.855-4.012]** |
| Allele frequency | G/A | 0.56/0.44 | 0.66/0.34 | 0.59/0.41 | 5.307 | **.021** | **1.544 [1.066-2.237]** |
| rs237885 | TT | 197 (51.6) | 116 (65.2) | 313 (55.9) |  |  | Reference | 0.003 | .998 |
|  | TG | 155 (40.6) | 56 (31.5) | 211 (37.7) |  |  | **1.630 [1.112-2.388]** |
|  | GG | 30 (7.9) | 6 (3.4) | 36 (6.4) | 10.490 | **.005** | **2.944 [2.009-4.314]** |
| Allele frequency | T/G | 0.72/0.28 | 0.81/0.19 | 0.75/0.25 | 5.255 | **.022** | **1.659 [1.073-2.563]** |
| rs237887 | GG | 127 (33.2) | 89 (50.0) | 216 (38.6) |  |  | Reference | 0.528 | .768 |
|  | GA | 186 (48.7) | 71 (39.9) | 257 (45.9) |  |  | **1.836 [1.249-2.698]** |
|  | AA | 69 (18.1) | 18 (10.1) | 87 (15.5) | 15.827 | **< .001** | **2.686 [1.828-3.948]** |
| Allele frequency | G/A | 0.58/0.42 | 0.70/0.30 | 0.62/0.38 | 7.826 | **.005** | **1.714 [1.173-2.504]** |
| rs237895 | TT | 189 (49.5) | 116 (65.2) | 305 (54.5) |  |  | Reference | 1.426 | .490 |
|  | TC | 160 (41.9) | 49 (27.5) | 209 (37.3) |  |  | **2.004 [1.350-2.974]** |
|  | CC | 33 (8.6) | 13 (7.3) | 46 (8.2) | 12.459 | **.002** | **1.558 [1.050-2.312]** |
| Allele frequency | T/C | 0.70/0.30 | 0.79/0.21 | 0.73/0.27 | 4.478 | **.034** | **1.574 [1.032-2.400]** |
| rs237899 | GG | 187 (49.0) | 111 (62.4) | 298 (53.2) |  |  | Reference | 4.458 | .108 |
|  | GA | 151 (39.5) | 56 (31.5) | 207 (37.0) |  |  | **1.601 [1.088-2.355]** |
|  | AA | 44 (11.5) | 11 (6.2) | 55 (9.8) | 9.763 | **.008** | **2.374 [1.614-3.494]** |
| Allele frequency | G/A | 0.69/0.31 | 0.78/0.22 | 0.72/0.28 | 5.256 | **.022** | **1.623 [1.071-2.459]** |
| rs53576 | AA | 160 (41.9) | 90 (50.6) | 250 (44.6) |  |  | Reference | 5.074 | .079 |
|  | AG | 155 (40.6) | 75 (42.1) | 230 (41.1) |  |  | 1.163 [0.797-1.696] |
|  | GG | 67 (17.5) | 13 (7.3) | 80 (14.3) | 11.025 | **.004** | **2.899 [1.987-4.230]** |
| Allele frequency | A/G | 0.62/0.38 | 0.72/0.29 | 0.65/0.35 | 4.784 | **.029** | **1.536 [1.044-2.260]** |
| rs7632287 | GG | 346 (90.6) | 150 (84.3) | 496 (88.6) |  |  | Reference | 2.057 | .357 |
|  | GA | 33 (8.6) | 27 (15.1) | 60 (10.7) |  |  | 0.530 [0.308-0.912] |
|  | AA | 3 (0.8) | 1 (0.6) | 4 (0.7) | 5.462 | .065 | 1.301 [0.755-2.240] |
| Allele frequency | G/A | 0.95/0.05 | 0.92/0.08 | 0.94/0.06 | 1.969 | .161 | 0.607 [0.300-1.227] |
| rs9840864 | CC | 213 (55.8) | 108 (60.7) | 321 (57.3) |  |  | Reference | 2.303 | .316 |
|  | CG | 141 (36.9) | 56 (31.5) | 197 (35.2) |  |  | 1.277 [0.867-1.879] |
|  | GG | 28 (7.3) | 14 (7.9) | 42 (7.5) | 1.583 | .453 | 1.014 [0.689-1.493] |
| Allele frequency | G/C | 0.74/0.26 | 0.76/0.24 | 0.75/0.25 | 0.310 | .578 | 1.125 [0.743-1.704] |

**Description**

Supplement 4 shows significant differences in genotype frequencies for 7 OXTR SNPs (rs1042778, rs2254298, rs237885, rs237887, rs237895, rs237899, and rs53576) between patients with schizophrenia and healthy controls, with more rare homozygotes (risk alleles) found in patients. Participants with OXTR SNPs rs1042778 (TT), rs2254298 (AA), rs237885 (TG and GG), rs237887 (TC and CC), rs237895 (TC and CC), rs237899 (GA and AA), and rs53576 (GG) were more likely to have schizophrenia. No differences in genotype frequencies were found for 3 other OXTR SNPs (rs13316193, rs7632287, and rs9840864) between the two groups.

**Supplement 5.** The correlations between childhood trauma, social functioning, and plasma oxytocin levels in patients with schizophrenia and healthy controls.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1. CTQ-SF total scores | 1 | .916\*\*\* | .925\*\*\* | .631\*\*\* | .872\*\*\* | .918\*\*\* | -.882\*\*\* | .948\*\*\* | -.886\*\*\* | -.818\*\*\* | -.753\*\*\* | -.815\*\*\* | -.852\*\*\* | -.889\*\*\* | -.756\*\*\* | -.813\*\*\* |
| 2. Physical abuse | .863\*\*\* | 1 | .838\*\*\* | .517\*\*\* | .735\*\*\* | .814\*\*\* | -.863\*\*\* | .897\*\*\* | -.862\*\*\* | -.761\*\*\* | -.713\*\*\* | -.814\*\*\* | -.813\*\*\* | -.862\*\*\* | -.751\*\*\* | -.792\*\*\* |
| 3. Emotional abuse | .746\*\*\* | .587\*\*\* | 1 | .436\*\*\* | .731\*\*\* | .830\*\*\* | -.773\*\*\* | .887\*\*\* | -.813\*\*\* | -.783\*\*\* | -.708\*\*\* | -.735\*\*\* | -.802\*\*\* | -.760\*\*\* | -.723\*\*\* | -.739\*\*\* |
| 4. Sexual abuse | .733\*\*\* | .703\*\*\* | .294\*\*\* | 1 | .576\*\*\* | .451\*\*\* | -.531\*\*\* | .635\*\*\* | -.616\*\*\* | -.637\*\*\* | -.551\*\*\* | -.529\*\*\* | -.593\*\*\* | -.679\*\*\* | -.505\*\*\* | -.485\*\*\* |
| 5. Physical neglect | .710\*\*\* | .519\*\*\* | .270\*\*\* | .607\*\*\* | 1 | .737\*\*\* | -.799\*\*\* | .818\*\*\* | -.787\*\*\* | -.687\*\*\* | -.646\*\*\* | -.729\*\*\* | -.747\*\*\* | -.812\*\*\* | -.669\*\*\* | -.743\*\*\* |
| 6. Emotional neglect | .882\*\*\* | .691\*\*\* | .626\*\*\* | .620\*\*\* | .457\*\*\* | 1 | -.807\*\*\* | .827\*\*\* | -.742\*\*\* | -.671\*\*\* | -.631\*\*\* | -.697\*\*\* | -.709\*\*\* | -.760\*\*\* | -.602\*\*\* | -.715\*\*\* |
| 7. Plasma oxytocin | .064 | .075 | .033 | -.039 | .022 | .092 | 1 | -.909\*\*\* | .912\*\*\* | .804\*\*\* | .732\*\*\* | .895\*\*\* | .845\*\*\* | .920\*\*\* | .763\*\*\* | .868\*\*\* |
| 8. Additive genetic risk scores | .256\*\*\* | .244\*\*\* | .144\* | .320\*\*\* | .231\*\*\* | .172\* | -.131 | 1 | -.958\*\*\* | -.906\*\*\* | -.790\*\*\* | -.906\*\*\* | -.900\*\*\* | -.923\*\*\* | -.859\*\*\* | -.846\*\*\* |
| 9. SFS total scores | -.003 | .047 | -.135 | .141 | .124 | -.069 | -.011 | -.019 | 1 | .906\*\*\* | .807\*\*\* | .959\*\*\* | .956\*\*\* | .933\*\*\* | .929\*\*\* | .870\*\*\* |
| 10. Social withdrawal | .087 | .137 | -.055 | .209\*\* | .138 | .033 | .027 | -.063 | .857\*\*\* | 1 | .791\*\*\* | .837\*\*\* | .841\*\*\* | .827\*\*\* | .836\*\*\* | .735\*\*\* |
| 11. Interpersonal behavior | .069 | .093 | -.096 | .156\* | .218\*\* | -.012 | -.012 | -.039 | .873\*\*\* | .751\*\*\* | 1 | .726\*\*\* | .773\*\*\* | .711\*\*\* | .746\*\*\* | .600\*\*\* |
| 12. Social activities | -.009 | .037 | -.128 | .133 | .097 | -.061 | -.026 | -.011 | .980\*\*\* | .840\*\*\* | .788\*\*\* | 1 | .870\*\*\* | .895\*\*\* | .904\*\*\* | .790\*\*\* |
| 13. Recreational activities | .014 | .045 | -.139 | .135 | .180\* | -.060 | -.013 | -.017 | .959\*\*\* | .766\*\*\* | .912\*\*\* | .917\*\*\* | 1 | .879\*\*\* | .877\*\*\* | .855\*\*\* |
| 14. Independence (performance) | -.117 | -.014 | -.139 | .077 | -.077 | -.163\* | -.033 | -.041 | .743\*\*\* | .649\*\*\* | .469\*\*\* | .744\*\*\* | .589\*\*\* | 1 | .758\*\*\* | .865\*\*\* |
| 15. Independence (competence)  | -.052 | .003 | -.136 | .062 | .060 | -.104 | .068 | .026 | .735\*\*\* | .547\*\*\* | .653\*\*\* | .655\*\*\* | .660\*\*\* | .619\*\*\* | 1 | .723\*\*\* |
| 16. Employment | -.003 | .065 | -.095 | .122 | .090 | -.081 | .040 | -.033 | .793\*\*\* | .754\*\*\* | .804\*\*\* | .684\*\*\* | .733\*\*\* | .638\*\*\* | .784\*\*\* | 1 |
| *Note*. Blank boxes indicate the Pearson’s correlation coefficient of variables in patients with schizophrenia while Grayscale boxes indicate the Pearson’s correlation coefficient of variables in healthy controls. \**p* < .05, \*\**p* < .01, \*\*\**p* < .001 |

**Supplement 6.** Mediation analysis of the effect of plasma oxytocin on the relationship between childhood trauma and social functioning in patients with schizophrenia.

****

Model Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *R* | *R2* | *MSE* | *F* | *p* |
| Model 4 | .887 | .788 | 71.506 | 231.575 | < .001 |

Covariates: sex, age, year of education, psychopathology, antipsychotic dose.

Mediation Estimates

|  |  |  |  |
| --- | --- | --- | --- |
| Effect | Estimate | *SE* | 95% CI |
| Indirect | -0.391 | 0.028 | [-0.329, -0.208] |
| Direct | -0.269 | 0.031 | [-0.329, -0.208] |
| Total | -0.660 | 0.018 | [-0.695, -0.625] |

Path Estimates

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Estimate | *SE* | *t* | *p* |
| CTQ-SF | 🡪 | Oxytocin | -0.130 | 0.004 | -36.923 | < .001 |
| Oxytocin | 🡪 | SFS | 3.020 | 0.211 | 14.334 | < .001 |
| CTQ-SF | 🡪 | SFS | -0.269 | 0.031 | -8.724 | < .001 |

**Supplement 7**. Moderated mediation effect of plasma oxytocin and OXTR SNPs on the relationship between childhood trauma and social functioning in patients with schizophrenia.



Model Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *R* | *R2* | *MSE* | *F* | *p* |
| Model 7 | .929 | .863 | 46.277 | 336.060 | < .001 |

Covariates: sex, age, year of education, psychopathology, antipsychotic dose.

Index of Moderated Mediation

|  |  |  |  |
| --- | --- | --- | --- |
|  | Index | *SE* | 95% CI |
| AGRS | 0.038 | 0.002 | [0.033, 0.044] |

Direct and Conditional Indirect Effect

|  |  |  |  |
| --- | --- | --- | --- |
| Effect | Estimate | *SE* | 95% CI |
| Direct | -0.269 | 0.031 | [-0.329, -0.208] |
| Conditional indirect effect |  |  |  |
|  AGRS (1.64) | -0.029 | 0.019 | [-0.066, 0.008] |
|  AGRS (4.96) | 0.098 | 0.024 | [0.054, 0.147] |
|  AGRS (8.29) | 0.226 | 0.031 | [0.169, 0.290] |

Path Estimates

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Estimate | *SE* | *t* | *p* |
| CTQ-SF | 🡪 | Oxytocin | -0.031 | 0.007 | -4.107 | < .001 |
| AGRS | 🡪 | Oxytocin | -2.158 | 0.102 | -21.085 | < .001 |
| CTQ-SF\*AGRS | 🡪 | Oxytocin | 0.013 | 0.001 | 16.055 | < .001 |
| Oxytocin | 🡪 | SFS | 3.020 | 0.211 | 14.334 | < .001 |
| CTQ-SF | 🡪 | SFS | -0.269 | 0.031 | -8.724 | < .001 |

Conditional indirect effect

|  |  |  |
| --- | --- | --- |
|  | Index of Moderated Mediation | Conditional Indirect Effect |
| OXTR | Index | *SE* | 95% CI | Genotypes | Index | *SE* | 95% CI |
| rs1042778 | **0.041** | **0.014** | **[0.011, 0.065]** | GG | -0.400 | 0.026 | [-0.458, -0.355] |
|  |  |  |  | GG | -0.400 | 0.026 | [-0.458, -0.355] |
|  |  |  |  | GT | -0.360 | 0.031 | [-0.430, -0.360] |
| rs13316193 | 0.026 | 0.205 | [-0.019, 0.062] | TT | -0.384 | 0.025 | [-0.438, -0.339] |
|  |  |  |  | TT | -0.384 | 0.025 | [-0.438, -0.339] |
|  |  |  |  | TC | -0.358 | 0.035 | [-0.436, -0.299] |
| rs2254298 | **0.056** | **0.014** | **[0.028, 0.080]** | GG | -0.416 | 0.022 | [-0.463, -0.377] |
|  |  |  |  | GA | -0.360 | 0.026 | [-0.416, -0.316] |
|  |  |  |  | AA | -0.304 | 0.034 | [-0.381, -0.246] |
| rs237885 | **0.076** | **0.015** | **[0.044, 0.103]** | TT | -0.405 | 0.023 | [-0.456, -0.365] |
|  |  |  |  | TT | -0.405 | 0.023 | [-0.456, -0.365] |
|  |  |  |  | TG | -0.330 | 0.030 | [-0.397, -0.278] |
| rs237887 | **0.087** | **0.015** | **[0.057, 0.115]** | GG | -0.437 | 0.028 | [-0.497, -0.388] |
|  |  |  |  | GA | -0.350 | 0.028 | [-0.413, -0.303] |
|  |  |  |  | AA | -0.263 | 0.035 | [-0.341, -0.202] |
| rs237895 | **0.057** | **0.013** | **[0.030, 0.082]** | TT | -0.397 | 0.027 | [-0.456, -0.349] |
|  |  |  |  | TC | -0.341 | 0.029 | [-0.404, -0.292] |
|  |  |  |  | TC | -0.341 | 0.029 | [-0.404, -0.292] |
| rs237899 | **0.056** | **0.013** | **[0.030, 0.079]** | GG | -0.401 | 0.025 | [-0.455, -0.357] |
|  |  |  |  | GA | -0.345 | 0.028 | [-0.408, -0.297] |
|  |  |  |  | AA | -0.345 | 0.028 | [-0.408, -0.297] |
| rs53576 | **0.019** | **0.013** | **[0.012, 0.041]** | AA | -0.387 | 0.021 | [-0.433, -0.348] |
|  |  |  |  | AG | -0.387 | 0.021 | [-0.433, -0.348] |
|  |  |  |  | GG | -0.349 | 0.038 | [-0.437, -0.287] |
| rs7632287 | 0.027 | 0.146 | [-0.339, 0.149] | GG | -0.391 | 0.028 | [-0.452, -0.342] |
|  |  |  |  | GA | -0.391 | 0.028 | [-0.452, -0.342] |
|  |  |  |  | AA | -0.391 | 0.028 | [-0.452, -0.342] |
| rs9840864 | 0.048 | 0.014 | [-0.019, 0.073] | CC | -0.394 | 0.024 | [-0.445, -0.353] |
|  |  |  |  | CG | -0.394 | 0.024 | [-0.445, -0.353] |
|  |  |  |  | GG | -0.346 | 0.029 | [-0.412, -0.298] |

**Supplement 8**. Types of childhood trauma and association with OXTR SNPs in patients with schizophrenia.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OXTR SNPs | Physical Abuse | Emotional Abuse | Sexual Abuse | Physical Neglect | Emotional Neglect | Number of types of childhood trauma |
| No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | 0 | 1 | 2 | 3 | 4 | 5 |
| rs1042778 | GG | 75 | 145 | 165 | 55 | 186 | 34 | 104 | 116 | 164 | 56 | 54 | 71 | 30 | 9 | 32 | 24 |
|  | GT | 3 | 125 | 12 | 116 | 78 | 50 | 2 | 126 | 10 | 118 | 1 | 3 | 2 | 4 | 74 | 44 |
|  | TT | 1 | 33 | 10 | 24 | 17 | 17 | 8 | 26 | 9 | 25 | 1 | 7 | 1 | 1 | 7 | 17 |
|  |  | χ2 = 56.879, *p* < .001 | χ2 = 145.161, *p* < .001 | χ2 = 33.840, *p* = .007 | χ2 = 81.465, *p* < .001 | χ2 = 151.268, *p* < .001 | χ2 = 169.346, *p* < .001 |
| rs13316193 | TT | 79 | 203 | 179 | 103 | 232 | 50 | 112 | 170 | 177 | 105 | 56 | 79 | 30 | 13 | 67 | 37 |
|  | TC | 0 | 86 | 7 | 79 | 41 | 45 | 2 | 84 | 4 | 82 | 0 | 2 | 2 | 0 | 40 | 42 |
|  | CC | 0 | 14 | 1 | 13 | 8 | 6 | 0 | 14 | 2 | 12 | 0 | 0 | 1 | 1 | 6 | 6 |
|  |  | χ2 = 35.318, *p* < .001 | χ2 = 90.919, *p* < .001 | χ2 = 42.567, *p* < .001 | χ2 = 50.188, *p* < .001 | χ2 = 95.768, *p* < .001 | χ2 = 106.014, *p* < .001 |
| rs2254298 | GG | 50 | 80 | 102 | 28 | 115 | 15 | 73 | 57 | 103 | 27 | 39 | 45 | 15 | 4 | 15 | 12 |
|  | GA | 27 | 141 | 78 | 90 | 119 | 49 | 37 | 131 | 75 | 93 | 15 | 34 | 17 | 10 | 54 | 38 |
|  | AA | 2 | 82 | 7 | 77 | 47 | 37 | 4 | 80 | 5 | 79 | 2 | 2 | 1 | 0 | 44 | 35 |
|  |  | χ2 = 44.380, *p* < .001 | χ2 = 101.190, *p* < .001 | χ2 = 28.875, *p* < .001 | χ2 = 73.128, *p* < .001 | χ2 = 111.075, *p* < .001 | χ2 = 124.680, *p* < .001 |
| rs237885 | TT | 74 | 123 | 146 | 51 | 177 | 20 | 96 | 101 | 150 | 47 | 51 | 68 | 22 | 10 | 30 | 16 |
|  | TG | 3 | 152 | 39 | 116 | 92 | 63 | 16 | 139 | 31 | 124 | 3 | 13 | 11 | 4 | 73 | 51 |
|  | GG | 2 | 28 | 2 | 28 | 12 | 18 | 2 | 28 | 2 | 28 | 2 | 0 | 0 | 0 | 10 | 18 |
|  |  | χ2 = 71.024, *p* < .001 | χ2 = 106.476, *p* < .001 | χ2 = 60.325, *p* < .001 | χ2 = 69.474, *p* < .001 | χ2 = 131.747, *p* < .001 | χ2 = 152.079, *p* < .001 |
| rs237887 | GG | 51 | 76 | 99 | 28 | 109 | 18 | 69 | 58 | 97 | 30 | 40 | 40 | 13 | 4 | 18 | 12 |
|  | GA | 26 | 160 | 74 | 112 | 129 | 57 | 39 | 147 | 76 | 110 | 14 | 37 | 17 | 9 | 57 | 52 |
|  | AA | 2 | 67 | 14 | 55 | 43 | 26 | 6 | 63 | 10 | 59 | 2 | 4 | 3 | 1 | 38 | 21 |
|  |  | χ2 = 47.763, *p* < .001 | χ2 = 71.683, *p* < .001 | χ2 = 16.000, *p* < .001 | χ2 = 58.110, *p* < .001 | χ2 = 75.821, *p* < .001 | χ2 = 94.931, *p* < .001 |
| rs237895 | TT | 77 | 112 | 147 | 42 | 162 | 27 | 95 | 94 | 138 | 51 | 56 | 60 | 21 | 2 | 32 | 18 |
|  | TC | 2 | 158 | 39 | 121 | 106 | 54 | 19 | 141 | 43 | 117 | 0 | 21 | 12 | 10 | 69 | 48 |
|  | CC | 0 | 33 | 1 | 32 | 13 | 20 | 0 | 33 | 2 | 31 | 0 | 0 | 0 | 2 | 12 | 19 |
|  |  | χ2 = 91.794, *p* < .001 | χ2 = 129.369, *p* < .001 | χ2 = 38.558, *p* < .001 | χ2 = 76.356, *p* < .001 | χ2 = 99.261, *p* < .001 | χ2 = 147.621, *p* < .001 |
| rs237899 | GG | 75 | 112 | 144 | 43 | 159 | 28 | 92 | 95 | 135 | 52 | 54 | 59 | 21 | 2 | 32 | 19 |
|  | GA | 3 | 148 | 39 | 112 | 103 | 48 | 20 | 131 | 43 | 108 | 1 | 21 | 11 | 10 | 66 | 42 |
|  | AA | 1 | 43 | 4 | 40 | 19 | 25 | 2 | 42 | 5 | 39 | 1 | 1 | 1 | 2 | 15 | 24 |
|  |  | χ2 = 84.279, *p* < .001 | χ2 = 119.181, *p* < .001 | χ2 = 35.740, *p* < .001 | χ2 = 66.777, *p* < .001 | χ2 = 90.581, *p* < .001 | χ2 = 137.540, *p* < .001 |
| rs53576 | AA | 70 | 90 | 144 | 16 | 150 | 10 | 102 | 58 | 139 | 21 | 49 | 74 | 16 | 1 | 14 | 6 |
|  | AG | 4 | 151 | 28 | 127 | 91 | 64 | 3 | 152 | 30 | 125 | 2 | 3 | 12 | 13 | 72 | 53 |
|  | GG | 5 | 62 | 15 | 52 | 40 | 27 | 9 | 58 | 14 | 53 | 5 | 4 | 5 | 0 | 27 | 26 |
|  |  | χ2 = 90.002, *p* < .001 | χ2 = 185.979, *p* < .001 | χ2 = 57.726, *p* < .001 | χ2 = 154.135, *p* < .001 | χ2 = 167.576, *p* < .001 | χ2 = 231.193, *p* < .001 |
| rs7632287 | GG | 79 | 267 | 181 | 165 | 256 | 90 | 113 | 233 | 177 | 169 | 56 | 80 | 28 | 14 | 94 | 74 |
|  | GA | 0 | 33 | 5 | 28 | 23 | 10 | 0 | 33 | 5 | 28 | 0 | 0 | 5 | 0 | 18 | 10 |
|  | AA | 0 | 3 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 1 |
|  |  | χ2 = 10.363, *p* = .006 | χ2 = 16.943, *p* < .001 | χ2 = 0.359, *p* = .836 | χ2 = 15.365, *p* < .001 | χ2 = 15.906, *p* < .001 | χ2 = 25.979, *p* = .004 |
| rs9840864 | CC | 72 | 141 | 150 | 63 | 180 | 33 | 101 | 112 | 154 | 59 | 52 | 69 | 21 | 13 | 32 | 26 |
|  | CG | 7 | 134 | 34 | 107 | 89 | 52 | 13 | 128 | 26 | 115 | 4 | 12 | 9 | 1 | 72 | 43 |
|  | GG | 0 | 28 | 3 | 25 | 12 | 16 | 0 | 28 | 3 | 25 | 0 | 0 | 3 | 0 | 9 | 16 |
|  |  | χ2 = 50.890, *p* < .001 | χ2 = 90.487, *p* < .001 | χ2 = 34.596, *p* < .001 | χ2 = 71.976, *p* < .001 | χ2 = 115.366, *p* < .001 | χ2 = 136.387, *p* < .001 |
| Note. Participants with scores exceeding the moderate exposure cutoff point on each subscale (physical abuse: ≥10; emotional abuse: ≥13; sexual abuse: ≥8; physical neglect: ≥10; emotional neglect: ≥15) were classified as having a history of exposure to childhood trauma. |

**Supplement 9**. Moderated mediation effect of plasma oxytocin and OXTR SNPs on the relationship between the number of types of childhood trauma and social functioning in patients with schizophrenia.



Model Summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *R* | *R2* | *MSE* | *F* | *p* |
| Model 7 | .914 | .835 | 55.662 | 270.385 | < .001 |

Covariates: sex, age, year of education, psychopathology, antipsychotic dose.

Index of Moderated Mediation

|  |  |  |  |
| --- | --- | --- | --- |
|  | Index | *SE* | 95% CI |
| AGRS | 1.231 | 0.056 | [1.119, 1.339] |

Direct and Conditional Indirect Effect

|  |  |  |  |
| --- | --- | --- | --- |
| Effect | Estimate | *SE* | 95% CI |
| Direct | 0.157 | 0.346 | [-0.523, 0.838] |
| Conditional indirect effect |  |  |  |
|  AGRS (1.64) | -2.103 | 0.190 | [-2.477, -1.740] |
|  AGRS (4.96) | 1.994 | 0.189 | [1.606, 2.357] |
|  AGRS (8.29) | 6.091 | 0.325 | [5.441, 6.704] |

Path Estimates

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Estimate | *SE* | *t* | *p* |
| CTQ-SF | 🡪 | Oxytocin | -0.874 | 0.056 | -15.496 | < .001 |
| AGRS | 🡪 | Oxytocin | -1.946 | 0.064 | -30.480 | < .001 |
| CTQ-SF\*AGRS | 🡪 | Oxytocin | 0.261 | 0.014 | 19.302 | < .001 |
| Oxytocin | 🡪 | SFS | 4.713 | 0.179 | 26.335 | < .001 |
| CTQ-SF | 🡪 | SFS | 0.157 | 0.346 | 0.455 | .650 |