**Supplementary material**

**Comparison with proband data**

Data was available for 68 affected probands of the unaffected relatives included in this paper.

Of these patients, 39 (57%) were ‘emotionally preserved’, 14 (21%) ‘emotionally blunted’, and 15 (22%) ‘emotionally volatile’. These proportions are in line with our previous findings of 57% of patients with mood disorders being ‘emotionally preserved’, 26% ‘emotionally blunted’, and 17% ‘emotionally volatile’ (Varo et al., 2021).

Moreover, of the unaffected relatives categorised as ‘emotionally preserved’, 66% (n=25) of their affected probands were also categorised as ‘emotionally preserved’, whereas the remaining 34% presented with impaired emotional cognition (n=13; emotionally blunted n=5 and emotionally volatile n=8). Of the unaffected relatives categorised as ‘emotionally blunted’, 53% of their affected probands also presented with aberrant emotional cognition (n=16; emotionally blunted n=9 and emotionally volatile n=7), whereas the remaining 47% (n=14) were ‘emotionally preserved’.

**Table S1.** Measures of emotional cognition

|  |  |  |
| --- | --- | --- |
| *Name* | *Abbreviation* | *Description* |
| The Social Scenarios Task (Kjærstad et al., 2016) | SST | Emotion reactivity and regulation to positive and negative social scenarios  |
| Facial Expression Recognition Task (Harmer, Shelley, Cowen, & Goodwin, 2004) | FERT | Recognition of six basic facial expressions: anger, disgust, fear, happiness, sadness, and surprise |
| Faces Dot-Probe Task (Murphy, Downham, Cowen, & Harmer, 2008) | Faces Dot-Probe | Attention allocation toward emotional stimuli |

**Table S2.** Established neurocognitive tests (BIO-study) and matched SCIP subtests (NEAD-study) that make up calculated composite neurocognitive domains

|  |  |  |
| --- | --- | --- |
| Composite domain | BIO-study | NEAD-study |
| Attention and psychomotor speed | TMT-A, RBANS digit-symbol coding, RBANS digit-span-forward, RVP accuracy and mean latency | TMT-A, SCIP PST |
| Verbal learning | RAVLT trial I-V correct, trial VI correct, delayed recall, recognition | SCIP VLT-I, SCIP VLT-D |
| Working memory and executive function | TMT-B, WAIS letter-number sequencing, SWM between errors and strategy | TMT-B, SCIP WMT |
| Verbal fluency | Verbal fluency S and D | SCIP VLF |

Abbreviations: TMT-A = Trail Making Test part A; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; RVP = Rapid Visual Processing (CANTAB); RAVLT = Rey Auditory Verbal Learning Test; TMT-B = Trail Making Test part B; WAIS = Weschler’s Adult Intelligence Scale; SWM = Spatial Working Memory (CANTAB), SCIP = Screen for Cognitive Impairment in Psychiatry, PST = Processing Speed Test; VLT-I = Verbal Learning Test - Immediate; VLT-D = Verbal Learning Test - Delayed, WMT = Working Memory Test; VLF = Verbal Fluency Test.

**Table S3.** Measure of functioning

|  |  |  |
| --- | --- | --- |
| *Name* | *Abbreviation* | *Description* |
| *Functioning Assessment Short Test*(Rosa et al., 2007) | *FAST* | *Domains* |
| *Autonomy* |
| Capacity of the patient of doing things alone and take his/her own decisions |
| *Occupational functioning* |
| Capacity to maintain a paid job, efficiency of performing tasks at work, working in the field in which the patient was educated and earning according to the level of the employment position |
| *Cognitive functioning* |
| Ability to concentrate, perform simple mental calculations, solve problems, learn new information and remember learned information |
| *Financial issues* |
| Capacity of managing the finances and spending in a balanced way |
| Interpersonal relationships |
| Relations with friends, family, involvement in social activities, sexual relations and the ability to defend ideas and opinions |
| *Leisure Time* |
| Capacity of performing physical activities (sport, exercise) and the enjoyment of hobbies |
| *Total Fast* |
| Rates of psychosocial functional impairment |

|  |
| --- |
| **Table S4.** Emotional cognition variables for unaffected first-degree relatives in the BIO-study (n=51) and the NEAD-study (n=43) |
|  | BIO-study | NEAD-study | *t* | *p*-value |
| M (SD) | M (SD) |
| *Social Scenarios Task* |   |   |   |  |
|  Negative reactivity | 0.06 (0.92) | 0.31 (0.90) | -1.29 | 0.20 |
|  Positive reactivity | -0.07 (1.16) | 0.14 (0.91) | -0.97 | 0.33 |
|  Dampen negative | 0.12 (1.07) | 0.61 (1.18) | -2.09 | **0.04** |
|  Dampen positive | -0.10 (1.15) | 0.39 (0.88) | -2.28 | **0.03** |
| *Facial Expression Recognition* Task, *Discrimination accuracy* |  |  |  |
|  Negative emotions | -0.24 (0.94) | -0.32 (1.10) | 0.36 | 0.72 |
|  Positive emotions | -0.08 (0.86) | -0.25 (1.12) | 0.79 | 0.43 |
| *Facial Expression Recognition Task, ms* |   |   |   |
|  Negative emotions | 0.08 (0.84) | -0.38 (1.01) | 2.40 | **0.02** |
|  Positive emotions | 0.10 (0.77) | -0.21 (0.80) | 1.90 | 0.06 |
| *Facial Dot-Probe, Median vigilance scores* |  |  |
|  Masked fear | 0.22 (1.08) | -0.24 (1.12) | 2.02 | **0.047** |
|  Masked happy | -0.15 (0.88) | -0.06 (1.07) | -0.48 | 0.63 |
|  Unmasked fear | 0.13 (0.89) | -0.03 (1.10) | 0.80 | 0.43 |
|  Unmasked happy | -0.17 (0.72) | -0.00 (0.74) | -1.12 | 0.26 |

**Figure S1.** Dendrogram



**Figure S2.** (a) Agglomeration schedule and (b) scree plot of coefficients by stage

