**Supplement****al material**

Table S1. Description of classes of upsetting events

|  |  |
| --- | --- |
| **Category** | **Event** |
| Change in family environment | Separation from mother/ father, acquired new mother/ father, new bother/ sister, changed caretaker |
| Health issues/ adversity | Admitted to hospital, had shock/ fright, abused by someone, taken into care |
| Loss/ bereavement | Loss of family member/ best friend/ pet |
| Change in social environment | Started new school/ kinder garden, moved home |

Table S2a. Fit model statistics for trajectories of emotional problems

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SDQ-E model | Free Parameters | H0a | BIC(Sample Adj)a | Entropyb | Lo-Mendell-Rubin test§ | Bootstrapped likelihood ratio test§ | Smallest class size |
| 1 CLASS – LINEAR | 9 | -91648.759 | 183,350.12 | NA | NA | NA | NA |
| 2 CLASS – LINEAR | 12 | -85221.068 | 170,512.27 | 0.892 | 0 | 0 | 1640 |
| 3 CLASS – LINEAR | 15 | -83857.997 | 167,803.66 | 0.841 | 0 | 1 | 525 |
| 4 CLASS – LINEAR | 18 | -83230.555 | 166,566.31 | 0.837 | 0.0025 | 1 | 400 |
| 5 CLASS – LINEAR | 21 | 82771.933 | 165,666.60 | 0.813 | 0.1546 | 1 | 220 |
| 1 CLASS – QUADRATIC | 10 | -91646.152 | 183,350.75 | NA | NA | NA | NA |
| 2 CLASS – QUADRATIC | 14 | -84982.609 | 170,047.04 | 0.894 | 0 | 0 | 1660 |
| 3 CLASS – QUADRATIC | 18 | -83507.931 | 167,121.06 | 0.844 | 0 | 1 | 560 |
| **4 CLASS – QUADRATIC** | **22** | **-82903.858** | **165,936.30** | **0.835** | **0.0212** | **1** | **461** |
| **5 CLASS - QUADRATIC** | **26** | **-82725.339** | **165,902.64** | **0.812** | **0.0012** | **1** | **242** |
| 1 CLASS – CUBIC | 11 | -91625.967 | 183,316.22 | NA | NA | NA | NA |
| 2 CLASS – CUBIC | 16 | -84923.314 | 169,940.14 | 0.894 | 0 | 0 | 1668 |
| 3 CLASS – CUBIC | 21 | -83439.15 | 167,001.03 | 0.845 | 0 | 1 | 559 |
| **4 CLASS – CUBIC** | **26** | **-82654.545** | **165,461.05** | **0.844** | **0** | **1** | **469** |
| 5 CLASS - CUBIC | 31 | -82147.862 | 164,476.90 | 0.824 | 0 | 1 | 235 |

Notes: a lowest value indicates better fit; §indicates addition of this class significantly improves fit; b value closest to 1 indicates high certainty in classification

Although the bootstrapped likelihood ratio test suggests that the addition of a third or fourth class does not improve the model fit for the linear, quadratic or cubic models for the total subscale score (suggest a 2-class solution), the Lo-Mendell-Rubin test did indicate improvement in fit. We have decided that on the basis of the other model fit indices and what is known from the literature on the development of emotional problems, adding additional classes led to the characterisation of a more theory-informed model that can depict the variations of different symptom trajectories. The cubic model was selected over the linear and quadratic as it performed better in all the model fit indices.

Table S3. Mean SDQ-E item score by age

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Somatic complaints** | **Worry** | **Low mood** | **Nervous/ clingy** | **Fears** |
| Age 4 | 1.21 | 1.14 | 1.15 | 1.6 | 1.33 |
| Age 7 | 1.33 | 1.29 | 1.17 | 1.43 | 1.27 |
| Age 8 | 1.35 | 1.35 | 1.21 | 1.43 | 1.31 |
| Age 9 | 1.42 | 1.29 | 1.17 | 1.35 | 1.24 |
| Age 12 | 1.41 | 1.32 | 1.17 | 1.31 | 1.22 |
| Age 13 | 1.48 | 1.34 | 1.2 | 1.34 | 1.25 |
| Age 17 | 1.48 | 1.52 | 1.24 | 1.33 | 1.3 |

Figure S1a. Mean SDQ-E item score by age. Data show mean item score at each timepoint

A graph of different age groups

Description automatically generated

a Item scores range from 0 to 2

Figure S1b. Mean SDQ-E item score among males. Data show mean item score at each timepoint

A graph of different age groups

Description automatically generated

a Item scores range from 0 to 2

Figure S1c. Mean SDQ-E item score among females. Data show mean item score at each timepoint

A graph of different age groups

Description automatically generated

a Item scores range from 0 to 2

Table S4. Proportion of missing data in key factors in the cohort before the imputation

|  |  |
| --- | --- |
| **Child factors** | **% Missing** |
| Female, % a | 0% |
| Temperament intensity (6m), mean (s.d.)b | 9.9% |
| Behavioural inhibition (3y), mean (s.d.)b | 6.5% |
| Irritability (4y), % a | 6.6% |
| Sleep problems (6y), % a | 10.8% |
| High ADHD or ASD traits (7y), % a | 12.6% |
| Conduct problems (7y), % a | 10.9% |
| Low IQ (8y), % a | 25.3% |
| **Genetic risk** |  |
| PGS (MDD), mean (s.d.)b | 25.2% |
| PGS (anxiety), mean (s.d.)b | 25.2% |
| PGS (ADHD), mean (s.d.)b | 25.2% |
| **Wider family factors** |  |
| Maternal depression, % a | 8.4% |
| Maternal anxiety, % a | 8.7% |
| Adverse experiences (7y), % a | 15.4% |
| Family poverty (11y), % a | 28.7% |
| **Emotional problem score** |  |
| Age 4 | 8.2% |
| Age 7 | 12.9% |
| Age 8 | 15.9% |
| Age 9 | 14.2% |
| Age 12 | 21.9% |
| Age 13 | 21.8% |
| Age 17 | 36.5% |
| **Mental health outcomes** |  |
| MDD (CISR;24y) a | 60.8% |
| GAD (CISR;24y) a | 60.9% |
| Self-harm (24y) a | 51.5% |
| **Functional outcomes** |  |
| Attainment | 64.6% |
| NEET (22y) a | 62.5% |
| Social functioning (25y) a | 59.3% |

a Binary variable b standardised variable

*Multiple imputation*

In our imputation script for childhood correlates, we included the modal class assignment along with auxiliary data to make our missing at random assumption more tenable. These included birthweight, child ethnicity, mother age at birth, mother and partner education status, along with physical illness and financial difficulties in childhood.

Our cohort included those with at least two time-points of SDQ (one in childhood and one in adolescence). As our max missingness was ~ 40% among key early life correlates1-2 we chose to implement 40 imputations, which seems to be approximately correct for the levels of missingness of the data.2

Table S5a. Sociodemographic characteristics and classes of emotional problems in non-imputed sample. Data represent numbers (percentages) and mean (standard deviation).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low emotional problems** | **Decreasing emotional problems** | **Increasing emotional problems** | **Persistent emotional problems** |
| **Child factors** |  |  |  |  |
| Female, % a | 2,586 (46.6) | 800 (52.5) | 462 (62.2) | 260 (55.4) |
| Temperament intensity (6m), mean (s.d.)b | -.01 (1.01) | .04 (.99) | .04 (1.01) | .02 (1.02) |
| Behavioural inhibition (3y), mean (s.d.) b | -.12 (.95) | .34 (1.02) | -.01 (.98) | .45 (1.11) |
| Irritability (4y), % a | 1,834 (35.3) | 741 (52.4) | 337 (48.8) | 296 (67.1) |
| Sleep problems (6y), % a | 137 (2.8) | 103 (7.6) | 44 (6.6) | 76 (18.5) |
| High ADHD or ASD traits (7y), % a | 204 (4.2) | 161 (12.2) | 78 (12.2) | 106 (26.5) |
| Conduct problems (7y), % a | 845 (17.1) | 459 (34.0) | 237 (35.8) | 211 (51.1) |
| Low IQ (8y), % a | 377 (9.1) | 128 (11.2) | 94 (16.8) | 65 (19.6) |
| **Genetic risk** |  |  |  |  |
| PGS (MDD), mean (s.d.)b | -.08 (.99) | .02 (1.01) | .07 (.99) | .05 (1.05) |
| PGS (anxiety), mean (s.d.)b | -.06 (1.00) | .02 (1.03) | .02 (1.00) | .07 (0.99) |
| PGS (ADHD), mean (s.d.)b | -.06 (.99) | -.06 (1.01) | .01 (1.04) | .01 (1.08) |
| **Wider family factors** |  |  |  |  |
| Maternal depression (8m), % a | 968 (18.8) | 397 (28.6) | 201 (29.8) | 177 (40.8) |
| Maternal anxiety (8m), % a | 713 (14.0) | 327 (23.8) | 186 (27.5) | 134 (31.7) |
| Adverse experiences (7y), % a | 418 (10.6) | 159 (14.3) | 80 (14.7) | 63 (19.9) |
| Family poverty (11y), % a | 433 (9.2) | 175 (13.6) | 88 (14.0) | 72 (18.6) |

a Binary variable b standardised variable

Table S5b. Univariable multinomial logistic regressions of the association of early life factors with trajectory classes of emotional problem in non-imputed dataset. Data show Relative Risk Ratios and 95% Confidence Intervals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low emotional problems** | **Decreasing emotional problems** | **Increasing emotional problems** | **Persistent emotional problems** |
| **Child factors** |  |  |  |  |
| Female1 a | 1 (ref) | **1.27 (1.13-1.42)** | **1.88 (1.61-2.21)** | **1.43 (1.18-1.72)** |
| Temperament intensity (6m)2 b | 1 (ref) | 1.05 (0.99-1.12) | 1.05 (0.97-1.14) | 1.04 (0.94-1.15) |
| Behavioural inhibition (3y) 2 b | 1 (ref) | **1.59 (1.50-1.69)** | **1.12 (1.04-1.22)** | **1.75 (1.59-1.93)** |
| Irritability (4y)2 a | 1 (ref) | **2.02 (1.79-2.27)** | **1.75 (1.49-2.06)** | **3.74 (3.05-4.61)** |
| Sleep problems (6y)2 a | 1 (ref) | **2.93 (2.25-3.81)** | **2.56 (1.80-3.64)** | **8.16 (6.03-11.05)** |
| High ADHD or ASD traits (7y)2 a | 1 (ref) | **3.38 (2.72-4.21)** | **3.76 (2.84-4.98)** | **9.30 (7.11-12.17)** |
| Conduct problems (7y)2 a | 1 (ref) | **2.55 (2.23-2.92)** | **2.84 (2.38-3.38)** | **5.27 (4.28-6.48)** |
| Low IQ (8y)2 a | 1 (ref) | **1.29 (1.04-1.60)** | **2.11 (1.65-2.71)** | **2.50 (1.87-3.35)** |
| **Genetic risk** |  |  |  |  |
| PGS (MDD)2 b | 1 (ref) | 1.04 (0.98-1.11) | **1.13 (1.04-1.24)** | **1.18 (1.05-1.32)** |
| PGS (anxiety)2 b | 1 (ref) | **1.08 (1.01-1.16)** | 1.08 (0.99-1.18) | **1.14 (1.02-1.28)** |
| PGS (ADHD) 2 b | 1 (ref) | 1.00 (0.93-2.06) | 1.07 (0.98-1.17) | 1.07 (0.96-1.20) |
| **Wider family factors** |  |  |  |  |
| Maternal depression (8m)2 a | 1 (ref) | **1.75 (1.53-2.01)** | **1.86 (1.56-2.23)** | **3.01 (2.45-3.69)** |
| Maternal anxiety (8m)2 a | 1 (ref) | **1.92 (1.66-2.23)** | **2.36 (1.96-2.85)** | **2.87 (2.31-3.58)** |
| Adverse experiences (7y)2 a | 1 (ref) | **1.54 (1.28-1.86)** | **1.60 (1.25-2.05)** | **2.24 (1.70-2.95)** |
| Family poverty (11y)2 a | 1 (ref) | **1.40 (1.15-1.70)** | **1.45 (1.12-1.87)** | **2.09 (1.56-2.81)** |

1 :Unadjusted, 2 :Adjusted for sex, a Binary variable, b standardised variable

Table S5c. Univariable logistic regressions of differences in the association of early life factors between the decreasing and persistent trajectory classes of emotional problems. Data show Relative Risk Ratios and 95% Confidence Intervals

|  |  |  |
| --- | --- | --- |
|  | **Decreasing emotional problems** | **Persistent emotional problems** |
| **Child factors** |  |  |
| Female1 a | 1 (ref) | 1.13 (0.91-2.39) |
| Temperament intensity (6m)2 b | 1 (ref) | 0.99 (0.88-1.10) |
| Behavioural inhibition (3y) 2 b | 1 (ref) | 1.10 (0.99-1.21) |
| Irritability (4y)2 a | 1 (ref) | **1.86 (1.49-2.32)** |
| Sleep problems (6y)2 a | 1 (ref) | **2.60 (1.90-3.58)** |
| High ADHD or ASD traits (7y)2 a | 1 (ref) | **2.23 (1.64-3.09)** |
| Conduct problems (7y)2 a | 1 (ref) | **2.03 (1.63-2.55)** |
| Low IQ (8y)2 a | 1 (ref) | 1.51 (0.98-2.33) |
| **Genetic risk** |  |  |
| PGS (MDD)2 b | 1 (ref) | 1.00 (0.88-1.12) |
| PGS (anxiety)2 b | 1 (ref) | 1.04 (0.92-1.17) |
| PGS (ADHD) 2 b | 1 (ref) | 1.07 (0.95-1.22) |
| **Wider family factors** |  |  |
| Maternal depression (8m)2 a | 1 (ref) | **1.72 (1.37-2.16)** |
| Maternal anxiety (8m)2 a | 1 (ref) | **1.52 (1.20-1.93)** |
| Adverse experiences (7y)2 a | 1 (ref) | **1.46 (1.09-1.97)** |
| Family poverty (11y)2 a | 1 (ref) | 1.39 (0.96-1.99) |

a Binary variable, b standardised variable

Table S6. Mental health and functional outcomes stratified by emotional problems trajectory class, imputed sample

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low emotional problems** | **Decreasing emotional problems** | **Increasing emotional problems** | **Persistent emotional problems** |
| **Mental health outcomes** |  |  |  |  |
| MDD (CISR;24y) 1 a | 9.2 | 9.9 | 15.0 | 19.4 |
| GAD (CISR;24y) 1 a | 7.8 | 10.6 | 14.4 | 18.2 |
| Self-harm (24y)1 a | 7.4 | 9.7 | 17.8 | 13.9 |
| **Functional outcomes** |  |  |  |  |
| Attainment (no GCSEs) 1 | 2.5 | 4.1 | 8.5 | 7.1 |
| NEET (22y)1 a | 1.2 | 1.7 | 1.9 | 3.2 |
| Social functioning (25)1 a | 7.0 | 7.4 | 10.4 | 11.4 |

1 :Adjusted for sex, a Binary variable

Table S7. Fit model statistics for trajectories of emotional problems for those with data three points with at one timepoint in childhood and one timepoint in adolescence

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| SDQ-E model | Free Parameters | H0a | BIC(Sample Adj)a | Entropyb | Lo-Mendell-Rubin test§ | Bootstrapped likelihood ratio test§ | Smallest class size |
| 1 CLASS – LINEAR | 9 | -91371.749 | 182,796.03 | NA | NA | NA | NA |
| 2 CLASS – LINEAR | 12 | -84957.908 | 169,985.85 | 0.893 | 0 | 0 | 1630 |
| 3 CLASS – LINEAR | 15 | -83600.335 | 167,288.22 | 0.841 | 0 | 1 | 523 |
| **4 CLASS – LINEAR** | 18 | -82975.569 | 166,056.20 | 0.838 | 0.0027 | 1 | 398 |
| 5 CLASS – LINEAR | 21 | -82516.565 | 165,155.70 | 0.815 | 0.1528 | 1 | 213 |
| 1 CLASS – QUADRATIC | 10 | -91369.278 | 182,796.92 | NA | NA | NA | NA |
| 2 CLASS – QUADRATIC | 14 | -84720.495 | 169,522.70 | 0.895 | 0 | 0 | 1,648 |
| **3 CLASS – QUADRATIC** | 18 | -83252.148 | 166,609.35 | 0.845 | 0 | 1 | 556 |
| 4 CLASS – QUADRATIC | 22 | -82650.678 | 165,429.76 | 0.836 | 0.0212 | 1 | 455 |
| 1 CLASS – CUBIC | 11 | -91349.448 | 182,763.10 | NA | NA | NA | NA |
| 2 CLASS – CUBIC | 16 | -84661.931 | 169,417.25 | 0.897 | 0 | 0 | 1,654 |
| **3 CLASS – CUBIC** | 21 | -83184.092 | 166,490.75 | 0.845 | 0 | 1 | 558 |
| **4 CLASS – CUBIC** | 26 | -82401.669 | 164,455.09 | 0.845 | 0 | 1 | 464 |

Notes: a lowest value indicates better fit; §indicates addition of this class significantly improves fit; b value closest to 1 indicates high certainty in classification

As with our chosen model, the 4-class cubic appeared to be the best model fit, so we plotted it below.

Figure S2. Cubic 4-class trajectory of emotional problems (4-17 years) in those with data ≥3 timepoints

a SDQ-E clinical cut-off point ≥5

Table S8. Fit model statistics for trajectories of emotional problems by sex

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Male** | | | | | | | |
| SDQ-E model | Free Parameters | H0a | BIC(Sample Adj)a | Entropyb | Lo-Mendell-Rubin test§ | Bootstrapped likelihood ratio test§ | Smallest class size |
| 1 CLASS – LINEAR | 9 | -45110.094 | 90266.629 | NA | NA | NA | NA |
| 2 CLASS – LINEAR | 12 | -41910.118 | 83882.157 | 0.904 | 0 | 0 | 749 |
| 3 CLASS – LINEAR | 15 | -41229.114 | 82535.627 | 0.85 | 0 | 1 | 272 |
| 4 CLASS – LINEAR | 18 | -40880.743 | 81854.366 | 0.853 | 0.128 | 1 | 194 |
| 1 CLASS - QUADRATIC | 10 | -45100.27 | 90252.139 | NA | NA | NA | NA |
| 2 CLASS - QUADRATIC | 14 | -41709.125 | 83490.489 | 0.908 | 0 | 0 | 776 |
| 3 CLASS - QUADRATIC | 18 | -40971.446 | 82035.772 | 0.864 | 0.005 | 1 | 259 |
| 4 CLASS - QUADRATIC | 22 | -40625.834 | 81365.189 | 0.858 | 0.005 | 1 | 222 |
| 1 CLASS – CUBIC | 11 | -45094.005 | 90244.77 | NA | NA | NA | NA |
| 2 CLASS – CUBIC | 16 | -41685.057 | 83,452.67 | 0.909 | 0 | 0 | 773 |
| 3 CLASS – CUBIC | 21 | -40944.398 | 81,997.16 | 0.864 | 0.218 | 1 | 254 |
| **4 CLASS – CUBIC** | **26** | **-40536.345** | **81,206.85** | **0.861** | **0.022** | **1** | **216** |
| **Female** | | | | | | | |
| SDQ-E model | Free Parameters | H0a | BIC(Sample Adj)a | Entropyb | Lo-Mendell-Rubin test§ | Bootstrapped likelihood ratio test§ | Smallest class size |
| 1 CLASS – LINEAR | 9 | -46204.746 | 92,455.78 | NA | NA | NA | NA |
| 2 CLASS – LINEAR | 12 | -43060.524 | 86,182.77 | 0.877 | 0 | 0 | 883 |
| 3 CLASS – LINEAR | 15 | -42391.227 | 84,859.60 | 0.822 | 0 | 1 | 284 |
| 4 CLASS – LINEAR | 18 | -42092.481 | 84,277.54 | 0.821 | 0.007 | 1 | 217 |
| 1 CLASS - QUADRATIC | 10 | -46204.601 | 92,460.63 | NA | NA | NA | NA |
| 2 CLASS - QUADRATIC | 14 | -42973.609 | 86,019.22 | 0.88 | 0 | 0 | 873 |
| 3 CLASS - QUADRATIC | 18 | -42251.985 | 84,596.55 | 0.822 | 0 | 1 | 306 |
| 4 CLASS - QUADRATIC | 22 | -41955.931 | 84,025.01 | 0.822 | 0.004 | 1 | 244 |
| 1 CLASS – CUBIC | 11 | -46190.819 | 92,438.21 | NA | NA | NA | NA |
| 2 CLASS – CUBIC | 16 | -42939.73 | 85,961.75 | 0.88 | 0 | 0 | 885 |
| 3 CLASS – CUBIC | 21 | -42210.931 | 84,529.87 | 0.823 | 0 | 1 | 308 |
| **4 CLASS – CUBIC** | **26** | **-41837.793** | **83,809.31** | **0.824** | **0.0001** | **1** | **256** |

Notes: a lowest value indicates better fit; §indicates addition of this class significantly improves fit; b value closest to 1 indicates high certainty in classification

Across both sexes, it appears that the 4-class cubic model is the best fit model. So, we plotted the 4-class cubic model for male and female separately.

Among men, there is a class with low emotional problems (69.7%), one with increasing levels of emotional problems (7.5%), one with decreasing levels of emotional problems (17.6%) and one with persistent high levels of emotional problems throughout childhood/adolescence (5.2%).

Figure S3a. Cubic 4-class trajectory of emotional problems from 4-17 years in male

A graph of the age of a person

Description automatically generated

a SDQ-E clinical cut-off point ≥5

Among women, there is a class with low emotional problems (63.9%), one with increasing levels of emotional problems (10.4%), one with decreasing levels of emotional problems (19.5%) and one with persistent high levels of emotional problems throughout childhood/adolescence (6.2%).

Figure S3b. Cubic 4-class trajectory of emotional problems from 4-17 years in female

A graph of the number of years

Description automatically generated

a SDQ-E clinical cut-off point ≥5

Table S9. Fit model statistics for anxiety trajectories

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| BINARY MODEL | Free Parameters | H0a | BIC(Sample Adj)a | Entropyb | Lo-Mendell-Rubin test§ | Bootstrapped likelihood ratio test§ | Smallest class size |
| 1 CLASS – LINEAR | 3 | -31624.777 | 63267.087 | NA | NA | NA | NA |
| 2 CLASS – LINEAR | 6 | -28712.422 | 57459.907 | 0.719 | 0 | 0 | 2,444 |
| 3 CLASS – LINEAR | 9 | -28516.072 | 57084.739 | 0.581 | 0 | 0 | 997 |
| 4 CLASS – LINEAR | 12 | -28460.311 | 56990.749 | 0.611 | 0.226 | 0 | 248 |
| 5 CLASS – LINEAR | 15 | -28412.379 | 56912.416 | 0.633 | 0.046 | 0 | 149 |
| 1 CLASS – QUADRATIC | 4 | -31542.525 | 63108.425 | NA | NA | NA | NA |
| 2 CLASS – QUADRATIC | 8 | -28520.041 | 57086.832 | 0.729 | 0 | 0 | 2,404 |
| **3 CLASS – QUADRATIC** | **12** | **-28303.902** | **56677.931** | **0.682** | **0** | **0** | **643** |
| 4 CLASS – QUADRATIC | 16 | -28121.099 | 56335.701 | 0.589 | 0 | 0 | 894 |
| 1 CLASS – CUBIC | 5 | -31376.009 | 62781.238 | NA | NA | NA | NA |
| 2 CLASS – CUBIC | 10 | -28329.201 | 56716.841 | 0.731 | 0 | 0 | 2,396 |
| **3 CLASS – CUBIC** | **15** | **-28112.220** | **56312.098** | **0.617** | **0** | **0** | **835** |
| **4 CLASS – CUBIC** | **20** | **-27978.877** | **56074.633** | **0.617** | **0** | **0** | **759** |

Notes: a lowest value indicates better fit; §indicates addition of this class significantly improves fit; b value closest to 1 indicates high certainty in classification

Figure S4. Cubic 4-class anxiety trajectory memberships from 4-17 years

A graph of increasing percentages

Description automatically generated

The best solution was the 4-class cubic model which is very similar with the 4-class model for the emotional trajectories suggesting the presence of low worry, high in childhood and stable low in adolescence, adolescence increasing and persistent high worry. It performed better in terms of best model fit criteria including log likelihood, sample size adjusted BIC and had similar entropy indicating a better model fit.

Table S10a. Univariable multinomial logistic regressions of the association of early life factors with anxiety trajectory classes. Data show Relative Risk Ratios and 95% Confidence Intervals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low worry** | **Decreasing worry** | **Increasing worry** | **Persistent worry** |
| **Child factors** |  |  |  |  |
| Female1 a | 1 (ref) | 0.93 (0.83-1.03) | **1.72 (1.47-2.01)** | **1.15 (1.00-1.33)** |
| Temperament intensity (6m)2 b | 1 (ref) | **1.08 (1.02-1.15)** | **1.08 (1.00-1.17)** | **1.14 (1.06-1.23)** |
| Behavioural inhibition (3y) 2 b | 1 (ref) | **1.17 (1.11-1.24)** | 0.98 (0.91-1.06) | **1.32 (1.23-1.42)** |
| Irritability (4y)2 a | 1 (ref) | **1.60 (1.43-1.80)** | **1.67 (1.42-1.96)** | **2.53 (2.17-2.94)** |
| Sleep problems (6y)2 a | 1 (ref) | **2.32 (1.78-3.04)** | **2.13 (1.48-3.08)** | **4.70 (3.55-6.21)** |
| High ADHD or ASD traits (7y)2 a | 1 (ref) | **2.46 (1.97-3.07)** | **2.69 (2.00-3.63)** | **5.48 (4.32-6.93)** |
| Conduct problems (7y)2 a | 1 (ref) | **1.73 (1.52-1.99)** | **1.88 (1.56-2.26)** | **3.22 (2.74-3.79)** |
| Low IQ (8y)2 a | 1 (ref) | 1.04 (0.84-1.28) | **1.54 (1.19-2.00)** | 1.25 (0.96-1.61) |
| **Genetic risk** |  |  |  |  |
| PGS (MDD)2 b | 1 (ref) | 0.96 (0.90-1.02) | 0.97 (0.89-1.06) | **1.23 (1.13-1.34)** |
| PGS (anxiety)2 b | 1 (ref) | **1.09 (1.02-1.16)** | 1.05 (0.96-1.14) | **1.16 (1.07-1.27)** |
| PGS (ADHD) 2 b | 1 (ref) | 1.00 (0.93-1.06) | 1.01 (0.92-1.10) | 1.01 (0.93-1.10) |
| **Wider family factors** |  |  |  |  |
| Maternal depression2 a | 1 (ref) | **1.51 (1.32-1.73)** | **1.53 (1.27-1.84)** | **2.26 (1.92-2.66)** |
| Maternal anxiety2 a | 1 (ref) | **1.41 (1.21-1.64)** | **1.85 (1.52-2.24)** | **2.56 (2.15-3.04)** |
| Adverse experiences (7y)2 a | 1 (ref) | **1.44 (1.20-1.74)** | 1.22 (0.94-1.59) | **2.02 (1.62-2.52)** |
| Family poverty (11y)2 a | 1 (ref) | 1.11 (0.91-1.36) | 1.16 (0.89-1.52) | **1.49 (1.18-1.89)** |

1 :Unadjusted, 2 :Adjusted for sex, a Binary variable, b standardised variable

Table S10b. Univariable multinomial logistic regressions of adult functional and mental health outcomes across anxiety trajectory classes. Data show Relative Risk Ratios and 95% Confidence Intervals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Low worry** | **Decreasing worry** | **Increasing worry** | **Persistent worry** |
| **Mental health outcomes** |  |  |  |  |
| MDD (CISR;24y) 1 a | 1 (ref) | 1.31 (0.98-1.76) | **2.01 (1.45-2.79)** | **1.92 (1.14-2.70)** |
| GAD (CISR;24y) 1 a | 1 (ref) | 1.23 (0.90-1.68) | **1.97 (1.40-2.77)** | **2.09 (1.48-2.96)** |
| Self-harm (24y)1 a | 1 (ref) | 1.19 (0.97-1.59) | **2.41 (1.93-3.01)** | **2.45 (1.97-3.04)** |
| **Functional outcomes** | 1 (ref) |  |  |  |
| Attainment (no GCSEs) 1 | 1 (ref) | 0.93 (0.74-1.15) | 1.23 (0.93-1.63) | 1.01 (0.76-1.33) |
| NEET (22y)1 a | 1 (ref) | 1.07 (0.95-1.21) | 1.07 (0.91-1.27) | 1.02 (0.87-1.19) |
| Social functioning (25)1 a | 1 (ref) | 1.20 (0.86-1.66) | 1.34 (0.89-2.02) | 1**.93 (1.33-2.80)** |

1 :Adjusted for sex, a Binary variable

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