**Supplemental Material**

|  |  |  |  |
| --- | --- | --- | --- |
| **Table S1.** Baseline characteristics among participants and non-participants | | | |
|  | **Participants** | **Non-participants** | **p-value** |
| n | 1216 | 904 |  |
| Boy, No. (%) | 517 ( 42.5) | 563 (62.3) | <0.001 |
| Maternal age | 29.17 (5.04) | 28.49 (5.44) | 0.003 |
| Paternal age | 31.91 (5.52) | 31.74 (5.81) | 0.502 |
| Maternal low education | 181 ( 14.9) | 204 (22.6) | <0.001 |
| Paternal low education | 236 ( 19.9) | 227 (26.3) | 0.001 |
| Non-Canadian origins | 429 ( 35.5) | 336 (37.5) | 0.365 |
| First born | 556 ( 45.7) | 380 (42.0) | 0.1 |
| Maternal history of antisocial behavior | 216 ( 18.3) | 162 (18.9) | 0.743 |
| Paternal history of antisocial behavior | 187 ( 17.2) | 129 (17.9) | 0.727 |
| Maternal smoking during entire pregnancy | 230 ( 19.0) | 195 (21.7) | 0.143 |
| Paternal smoking during entire pregnancy | 190 ( 15.7) | 96 (10.7) | 0.001 |
| Maternal depressive symptoms | 1.33 (1.13) | 1.51 (1.22) | <0.001 |
| Paternal depressive symptoms | 1.04 (0.99) | 1.12 (1.07) | 0.078 |
| Non-intact family | 244 ( 20.1) | 245 (27.2) | <0.001 |
| Birth weight | 3.403 (0.495) | 3.404 (0.503) | 0.951 |
| Difficult temperament | 2.54 (1.28) | 2.61 (1.36) | 0.241 |
| Socioeconomic disadvantage | 3.86 (0.98) | 4.22 (0.97) | <0.001 |
| Coercive mothering | 2.21 (1.65) | 2.08 (1.69) | 0.063 |
| Coercive fathering | 2.31 (1.74) | 2.24 (1.78) | 0.381 |
| Maternal overprotection | 4.94 (2.19) | 5.30 (2.16) | <0.001 |
| Paternal overprotection | 4.00 (2.12) | 4.34 (2.18) | 0.001 |
| Note: Among the non-participants, 544 were excluded as they did not have measures of mental health at age 20 years old despite having at least one measure of peer victimization between ages 6 and 17 years. These 544 excluded participants were distributed across peer victimization trajectories as follows: low (n= 164, 28.3%), childhood-limited (n=151, 32.7%), moderate-emerging (n=165, 31.42%), high-chronic (n=64, 32.82%). | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table S2.** Indices Used to Determine the Best Fitting Model Between Estimated Models with 2 to 8 Latent Clusters and Quadratic Age Term (N=1760) | | | | |
| **Number of latent clusters** | **Bayesian Information Criterion (BIC)\*** | **Size of the smallest cluster** | **Average posterior probability (APP)** | **Odds of correct classification (OCC)** |
|  |  | **n (%)** | **Median (range)** | **Median (range)** |
| 2 | -21348.4 | 869 (49.4) | 0.88 (0.88, 0.89) | 7.6 (7.2, 8) |
| 3 | -21255.5 | 227 (12.9) | 0.81 (0.79, 0.84) | 11.9 (2.9,29.4) |
| 4 | -21171.8 | 203 (11.5) | 0.75 (0.67, 0.80) | 7.8 (4.3, 30.8) |
| 5 | -21138.1 | 118 (6.7) | 0.74 (0.67, 0.79) | 14.6 (2.9; 44.3) |
| 6 | -21120.5 | 91 (5.2) | 0.70 (0.64, 0.77) | 13.1 (3.6; 62.7) |
| 7 | -21103.3 | 49 (2.8) | 0.67 (0.59, 0.77) | 18.6 (4.0, 117.9) |
| 8 | -21103.2 | 57 (3.2) | 0.69 (0.60, 0.76) | 31.7 (2.6; 93.3) |
| \*In group-based trajectory modeling, the BIC is always negative and the model with the value of BIC closer to 0 fits better the data (i.e., being on the negative scale, this means the higher BIC, the better the model fit).  **Note 1:** All models are based on the maximum available sample n=1760.The BIC increased sharply from the 3- to the 4-group solution and then slightly from the 5- through the 7-group solution. The 4-group solution was selected as it was conceptually meaningful (revealed distinct features of the data that were substantively relevant from a conceptual point of view) and provided the best balance between the fit indices evaluated (increased BIC, size of the smaller cluster >5% of the sample, quality of the classification, APP >.70 and odds of correct classification, classifying participants better than classification by chance, OCC>5).  **Note 2:** We also derived the trajectories of peer victimization among all participants with at least 3 measures of peer victimization between ages 6 and 17 years (n=1551). We obtain the same trajectories in terms of number, shape, with the following proportions of the participants assigned to each trajectory: low (n=473, 30.5%), childhood-limited (n=393, 25.3%), moderate adolescence-emerging (n=495, 31.9%), high-chronic (n=190, 12.3%). The associations of these trajectories (based on at least 3 repeated measure of peer victimization) with early childhood factors and mental health comorbidities at age 20 years gave similar results to those of the trajectories with at least one measure of peer victimization between 6 and 17 years of age. Therefore, we decided to go further with the model estimated among participants with at least 1 measure of peer victimization from 6 to 17 years of age (n=1760) which maximizes the sample size. | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table S3.** Description of the Measurement Instruments for Early Childhood Behavior and Family Characteristics (5 months – 5 years)\* | | | | |
| **Characteristics** | **Child age at measurementa** | **Rangeb** | **Example of items** | **Instrument and references** |
| **Familial and parental factors** | | |  |  |
| Socioeconomic disadvantage | 5 m, 1½, 2½, 4½, 5 y | 0-8 | Standardized aggregate index of 5 items relating to annual gross income, parental education level, and occupational prestige | Index computed by Statistics Canada37 |
| Separated family | 5 m, 1½, 2½, 3½, 4½, 5 y |  | 1= the child was living in a single-parent family or blended family, i.e., living with step siblings at minimum one time point; 0 = otherwise. |  |
| History of antisocial behavior | 5 m |  | 5 items (mother), 4 items (father), e.g., *trouble with the police or arrested; get into fights that you had started*. Derived measure:1= engaged in 2 or more behaviors during adolescence, 0= otherwise. | Modified from NIMH-DIS 38 |
| Depressive symptoms | Mother:5 m, 1½y; father: 5 m | 0-10 | 12 items, e.g., *did not feel like eating; felt lonely; had crying spells* (0=less 1 day/week to 3= 5-7days/week). | Short version of CES-D scale39 |
| Anxiety | Mother & Father: 4½ |  | 10 items, e.g., *be afraid and avoid certain places; feel tension in the body; be disturbed by thoughts; daily life affected by memories* (0=never to 4= always). |  |
| Smoking during pregnancy | 5 m |  | 1 item referring to the use of cigarettes during the entire pregnancy. |  |
| Alcohol use during pregnanacy | 5 m |  | 1 item referring to the use of alcohol during the entire pregnancy. |  |
| Positive parenting | Mother: 2½, 3½, 4½, 5 y; father: 3½, 4½, 5 y | 0-10 | 5-9 items, e.g., *calmly discuss the problem; play sports activities or games together; praise the child* (0=never to 5= several times/day). | Parenting Practices Scale40 |
| Coercive parenting | Mother: 2½, 3½, 4½, 5 y; father: 3½, 4½, 5 y | 0-10 | 5-8 items, e.g., *use physical punishment, tell the child is not as good as others* (0=never to 5= several times/day). |
| **Table S3 (continued).** Description of the Measurement Instruments for Early Childhood Behavior and Family Characteristics (5 months – 5 years)\* | | | | |
| **Characteristics** | **Child age at measurementa** | **Rangeb** | **Example of items** | **Instrument and references** |
| **Child behavior, peer victimization reported by the mother and the father and child care services attendance** | | | | |
| Pre-school peer victimization | Mother & Father: 3½, 4½, 5 y |  | 10-12 items, e.g., *made fun of*; *hit or pushed; called*  *names by other children* (0=never to 2=often). |  |
| Aggression | Mother: 1½, 2½, 3½, 4½, 5 y  Father: 3½, 4½, 5 y | 0-10 | 10-12 items, e.g., *hits, bites, kicks; encourages children to pick on a particular child; reacts in an aggressive manner when something is taken away from him/her* (0=never to 2=often). | Preschool Behavior Questionnaire41,42 |
| Hyperactivity | Mother: 1½, 2½, 3½, 4½, 5 y  Father: 3½, 4½, 5 y | 0-10 | 5-7 items, e.g., *cannot sit still, is restless or hyperactive; has difficulty waiting for his/her turn in games; is fidgety* (0=never to 2=often). | Preschool Behavior Questionnaire41,42 |
| Internalizing behavior | Mother: 1½, 2½, 3½, 4½, 5 y  Father: 3½, 4½, 5 y | 0-10 | 5 items, e.g*., is nervous, is high-strung or tense; is too fearful or anxious* (0=never to 2=often). | Preschool Behavior Questionnaire41,42 |
| Social withdrawal | Mother & Father: 3½, 4½, 5 y | 0-10 | 3-4 items, e.g., *tends to play alone; not much interest for activities with other children* (0=never to 2=often). | Preschool Behavior Questionnaire41,42 |
| Participation in child care services | Mother: 0½, 1½, 2½, 3½, 4½, 5 y |  | 3 items about the use of childcare services (yes/no), the type and the number of attendance hours/week.  Using the repeated measurements of the number of hours per week in child care services, Laurin et al., derived 3 trajectories which capture the age of entry into and intensity of use of child care services (Laurin et al., 2015) |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S4.** Association of peer victimization trajectories for 6 to 17 years of age with mental health comorbidities at 20 years of age | | | | | | | | | | | | |
|  | **Adjusted estimates (reference group: high-chronic group)** | | | | | | | | | | | |
|  | **Childhood-limited** | | |  | **Moderate-emerging** | | |  | **Low** | | |  |
|  | **RR** | **95% CI** | | **p-value** | **RR** | **95% CI** | | **p-value** | **RR** | **95% CI** | | **p-value** |
| Severe mental health problems count | | | |  |  |  |  |  |  |  |  |  |
|  | 0.63 | 0.56 | 0.72 | <0.001 | 0.73 | 0.64 | 0.83 | <0.001 | 0.43 | 0.37 | 0.49 | <0.001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** |
| Type of mental health problems | |  |  |  |  |  |  |  |  |  |  |  |
| No problem | ref |  |  |  |  |  |  |  | ref |  |  |  |
| Internalizing only | 0.63 | 0.46 | 0.85 | 0.003 | 0.9 | 0.67 | 1.2 | 0.473 | 0.45 | 0.33 | 0.61 | <0.001 |
| Externalizing only | 1.09 | 0.85 | 1.4 | 0.484 | 0.88 | 0.68 | 1.14 | 0.328 | 0.75 | 0.58 | 0.98 | 0.034 |
| Comorbid | 0.47 | 0.36 | 0.63 | <.001 | 0.69 | 0.53 | 0.91 | 0.008 | 0.23 | 0.17 | 0.32 | <0.001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Adjusted estimates (reference group: childhood-limited group)** | | | | | | | | | | | |
|  | **Moderate-emerging** | | |  | **High-chronic** | | |  | **Low** | | |  |
|  | **RR** | **95% CI** | | **p-value** | **RR** | **95% CI** | | **p-value** | **RR** | **95% CI** | | **p-value** |
| Severe mental health problems count | | | |  |  |  |  |  |  |  |  |  |
|  | 1.15 | 1.02 | 1.29 | 0.022 | 1.58 | 1.38 | 1.8 | <0.001 | 0.67 | 0.59 | 0.77 | <0.001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** |
| Type of mental health problems | | |  |  |  |  |  |  |  |  |  |  |
| No problem | ref |  |  |  |  |  |  |  | ref |  |  |  |
| Internalizing only | 1.44 | 1.13 | 1.83 | 0.003 | 1.6 | 1.18 | 2.17 | 0.003 | 0.72 | 0.55 | 0.93 | 0.013 |
| Externalizing only | 0.81 | 0.65 | 1 | 0.053 | 0.92 | 0.72 | 1.17 | 0.484 | 0.69 | 0.56 | 0.86 | <0.001 |
| Comorbid | 1.46 | 1.14 | 1.88 | 0.003 | 2.11 | 1.59 | 2.79 | <0.001 | 0.49 | 0.36 | 0.66 | <0.001 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S5.** Association of peer victimization trajectories for 6 to 17 years of age with mental health comorbidities at 20 years of age | | | | | | | | | | | | |
|  | **Adjusted estimates** | | | | | | | | | | | |
|  | **Childhood-limited** | | |  | **Moderate adolescence-emerging** | | | | **High-chronic** | | |  |
|  | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** |
| Type of mental health problems | |  |  |  |  |  |  |  |  |  |  |  |
| **Externalizing-only** | **ref** |  |  |  | **ref** |  |  |  | **ref** |  |  |  |
| Internalizing only | 0.96 | 0.71 | 1.3 | 0.799 | 1.72 | 1.27 | 2.32 | <0.001 | 1.68 | 1.18 | 2.39 | 0.004 |
| Comorbid | 1.42 | 1.02 | 1.99 | 0.041 | 2.58 | 1.85 | 3.62 | <0.001 | 3.27 | 2.26 | 4.74 | <0.001 |
| No problem | 0.69 | 0.56 | 0.86 | <0.001 | 0.86 | 0.68 | 1.08 | 0.184 | 0.75 | 0.58 | 0.98 | 0.034 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **Adjusted estimates** | | | | | | | | | | | |
|  | **Childhood-limited** | | |  | **Moderate adolescence-emerging** | | | | **High-chronic** | | |  |
|  | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** | **OR** | **95% CI** | | **p-value** |
| Type of mental health problems | |  |  |  |  |  |  |  |  |  |  |  |
| **Internalizing-only** | **ref** |  |  |  | **ref** |  |  |  | **ref** |  |  |  |
| Externalizing-only | 1.04 | 0.77 | 1.41 | 0.799 | 0.58 | 0.43 | 0.79 | <0.001 | 0.6 | 0.42 | 0.85 | 0.004 |
| Comorbid | 1.48 | 1.02 | 2.15 | 0.039 | 1.51 | 1.06 | 2.14 | 0.023 | 1.95 | 1.31 | 2.9 | 0.001 |
| No problem | 0.72 | 0.55 | 0.93 | 0.013 | 0.5 | 0.39 | 0.64 | <0.001 | 0.45 | 0.33 | 0.61 | <0.001 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table S6.** Association of peer victimization trajectories from age 6 to 17 years with mental health problems at 20 years of age | | | | | | | | | | | | | | | | | | |
|  | **Crude Estimates** | | | | | | | | | **IPW Adjusted Estimates** | | | | | | | | |
|  | **Childhood-limited** | | | **Moderate adolescence-emerging** | | | **High-chronic** | | | **Childhood-limited** | | | **Moderate adolescence-emerging** | | | **High-chronic** | | |
|  | **OR** | **95% CI** | | **OR** | **95% CI** | | **OR** | **95% CI** | | **OR** | **95% CI** | | **OR** | **95% CI** | | **OR** | **95% CI** | |
| **Internalizing** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Severe depression (CESD-12) | 1.35 | 0.63 | 2.91 | 2.7 | 1.44 | 5.31 | 4.56 | 2.21 | 9.61 | 1.09 | 0.49 | 2.45 | 2.43 | 1.21 | 4.84 | 3.73 | 1.58 | 8.83 |
| Severe anxiety (GAD-7) | 0.86 | 0.39 | 1.85 | 1.45 | 0.75 | 2.83 | 3.03 | 1.45 | 6.26 | 0.80 | 0.34 | 1.86 | 1.44 | 0.7 | 2.96 | 3.37 | 1.40 | 8.09 |
| Eating disorder (SCOFF3) | 1.35 | 0.85 | 2.15 | 1.97 | 1.30 | 3.02 | 2.15 | 1.24 | 3.68 | 1.36 | 0.83 | 2.22 | 2.27 | 1.45 | 3.54 | 2.53 | 1.30 | 4.92 |
| Suicidal ideation/attempt | 2.17 | 1.26 | 3.8 | 2.31 | 1.38 | 3.98 | 3.63 | 1.95 | 6.75 | 2.17 | 1.21 | 3.90 | 2.36 | 1.34 | 4.15 | 3.17 | 1.53 | 6.58 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Externalizing** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ADHD | 1.37 | 0.76 | 2.46 | 1.27 | 0.71 | 2.26 | 2.11 | 1.05 | 4.11 | 1.37 | 0.73 | 2.57 | 1.27 | 0.69 | 2.35 | 1.55 | 0.72 | 3.35 |
| Conduct problems | 2.46 | 1.09 | 5.87 | 3.08 | 1.45 | 7.11 | 3.33 | 1.27 | 8.7 | 1.80 | 0.73 | 4.40 | 2.50 | 1.07 | 5.87 | 2.15 | 0.75 | 6.15 |
| Risky use of alcohol (AUDIT) | 1.87 | 0.85 | 4.23 | 1.38 | 0.61 | 3.17 | 2.07 | 0.75 | 5.38 | 1.47 | 0.61 | 3.54 | 0.94 | 0.39 | 2.32 | 1.09 | 0.38 | 3.14 |
| Cigarette | 3.94 | 2.00 | 8.33 | 3.83 | 1.97 | 8.03 | 5.11 | 2.33 | 11.62 | 2.88 | 1.33 | 6.22 | 2.77 | 1.29 | 5.93 | 2.20 | 0.86 | 5.64 |
| Cannabis | 1.75 | 1.00 | 3.07 | 2.33 | 1.4 | 3.96 | 3.29 | 1.77 | 6.10 | 1.34 | 0.74 | 2.43 | 1.76 | 1.01 | 3.06 | 3.00 | 1.43 | 6.27 |
| Hard drugs | 1.69 | 1.11 | 2.58 | 1.38 | 0.91 | 2.11 | 2.13 | 1.26 | 3.55 | 1.55 | 0.99 | 2.44 | 1.25 | 0.80 | 1.96 | 2.45 | 1.31 | 4.60 |

**Figure S1.** Covariance balance by peer victimization groups before and after the application of the propensity score via inverse probability weights

