Supplemental Material.

Sibling Bullying in Middle Childhood and Psychotic Disorder in Early Adulthood: A Prospective Cohort Study.

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| **Table S1.**Individual and Family Characteristics of Sibling Bullying Victims and Perpetrators. |
|   | Never *%* or M (SD) | Only Ever Once or Twice % or M (SD) | 2 or 3 Times a Month *%* or M (SD) | About Once a Week *%* or M (SD) | Several Times a Week *%* or M (SD) | *P* |
| **Victimization (N)** | 3636 | 1190 | 645 | 662 | 783 |  |
| Male | 49 | 44.3 | 45.7 | 41.1 | 44.6 | **<.001** |
| IQ | 105.95 (15.9) | 105.30 (16.95) | 105.67 (15.63) | 104.54 (16.38) | 103.75 (16.45) | **.031** |
| Internalizing Problems | 1.44 (1.61) | 1.51 (1.71) | 1.47 (1.68) | 1.69 (1.69) | 1.75 (1.77) | **<.001** |
| Externalizing Problems | 1.41 (1.39) | 1.58 (1.40) | 1.61 (1.45) | 1.71 (1.48) | 1.96 (1.60) | **<.001** |
| Peer Perpetrationa | 6.7 | 5.5 | 8.6 | 8.9 | 9.7 | **<.05** |
| Peer Victimizationa | 35.5 | 39.9 | 37.3 | 43.7 | 45.9 | **<.001** |
| Psychiatric Diagnosis | 4.3 | 4.3 | 4.1 | 5.5 | 9.1 | **<.001** |
| First-born | 50.2 | 36.4 | 34.9 | 37.3 | 34.8 | **<.001** |
| Single-mother | 16.5 | 17 | 15.4 | 14.9 | 16.3 | >.250 |
| Children at Home (%>=3) | 28.9 | 37.4 | 39.5 | 40 | 44.8 | **<.001** |
| Older Brother | 25.9 | 36.1 | 40.2 | 40.2 | 47.2 | **<.001** |
| Older Sister | 30.9 | 35.3 | 32.6 | 32 | 29.4 | >.250 |
| Maternal Education (>CSE) | 60.1 | 59 | 54.9 | 57.1 | 61.4 | .336 |
| Maternal Depression | 6.26 (4.53) | 6.34 (4.40) | 6.55 (4.48) | 7.01 (4.77) | 7.07 (4.74) | **<.001** |
| Maltreatment | 11.8 | 12.6 | 13.3 | 12.4 | 16.2 | **.010** |
| Domestic Violence | 16.7 | 19.5 | 20.7 | 22.1 | 2.5 | **<.001** |
| **Perpetration (N)** | 4072 | 841 | 697 | 673 | 598 |  |
| Male | 47.2 | 39.0 | 43.8 | 49.8 | 52.8 | >.250 |
| IQ | 105.58 (16.17) | 105.66 (15.75) | 107.18 (15.83) | 104.71 (16.29) | 103.21 (17.17 | **.003** |
| Internalizing Problems | 1.41 (1.59) | 1.56 (1.79) | 1.69 (1.70) | 1.69 (1.71) | 1.78 (1.85) | **<.001** |
| Externalizing Problems | 1.37 (1.35) | 1.61 (1.50) | 1.76 (1.43) | 1.84 (1.46) | 2.11 (1.65) | **<.001** |
| Peer Perpetrationa | 6.4 | 5.1 | 8.3 | 9.2 | 12.7 | **<.001** |
| Peer Victimizationa | 36.1 | 38.3 | 38.4 | 41.8 | 49.3 | **<.001** |
| Psychiatric Diagnosis | 4.0 | 5.7 | 3.8 | 6.6 | 9.6 | **<.001** |
| First-born | 39.1 | 47.4 | 51.6 | 50.7 | 51.9 | **<.001** |
| Single-mother | 15.9 | 15.5 | 17.1 | 17.8 | 17.7 | .177 |
| Children at Home (%>=3) | 30.6 | 35.5 | 39 | 39.8 | 44.1 | **<.001** |
| Older Brother | 35.5 | 26.7 | 24.8 | 31 | 31.9 | **<.001** |
| Older Sister | 34.2 | 32.6 | 29.5 | 25.2 | 22.9 | **<.001** |
| Maternal Education (>CSE) | 59.1 | 57.7 | 57.4 | 60.3 | 63.1 | >.250 |
| Maternal Depression | 6.39 (4.52) | 6.24 (4.54) | 6.41 (4.48) | 6.85 (4.77) | 6.87 (4.77) | **.025** |
| Maltreatment | 11.7 | 13.8 | 14.3 | 13.7 | 14.4 | **<.001** |
| Domestic Violence | 17.4 | 19.0 | 20.0 | 24.1 | 24.9 | **<.001** |
| a Peer bullying perpetration and victimization measures were obtained at 8 years.  |

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| **Table S2.**Dropout analysis with regard to availability of PLIKS interviewa |
| **Characteristics** | PLIKS Interview available, N (%) or M (SD) | PLIKS Interview Not Available, N (%) or M (SD) | Unavailable vs. Available  | *p* |
| Gender |  |  |  |  |
|  Female | 2068 (55.4) | 1665 (44.6) | Reference |  |
|  Male | 1527 (47.0) | 1724 (53.0) | **1.40 (1.28-1.54)** | **<.001** |
| Birth Order |  |  |  |  |
|  First Born | 1397 (55.9) | 1102 (44.1) | Reference |  |
|  Later Born | 1709 (52.6) | 1539 (47.4) | **1.14 (1.02-1.27)** | **.013** |
| Marital Status |  |  |  |
| Married | 2684 (56.2) | 2095 (43.8) | Reference |  |
| Single | 435 (46.5) | 501 (53.5) | **1.48 (1.28-1.70)** | **<.001** |
| Children at Home |  |  |
|  <=2 | 2053 (55.3) | 1657 (44.7) | Reference |  |
|  >=3 | 1047 (54.4) | 876 (45.6) | 1.04 (0.93-1.16) | >.250 |
| Older Brother |  |  |  |
|  No | 2125 (54.9) | 1747 (45.1) | Reference |  |
|  Yes | 981 (52.3) | 894 (47.7) | 1.11 (0.99-1.24) | .068 |
| Older Sister |  |  |  |  |
|  No | 2152 (54.9) | 1767 (45.1) | Reference |  |
|  Yes | 954 (52.2) | 874 (47.8) | 1.16 (1.00-1.25) | .054 |
|  |  |  |  |  |
| Maternal Education |  |  |  |
|  O-Levels or more | 1331 (60.9) | 855 (39.1) | Reference |  |
|  CSE or less | 1667 (52.5) | 1506 (47.5) | **1.41 (1.26-1.57)** | **<.001** |
| Bullied by Peersa |  |  |  |
|  No | 2604 (61.4) | 1639 (38.6) | Reference |  |
|  Yes | 486 (59.2) | 335 (40.8) |  1.10 (0.94-1.28) | .242 |
| Maltreatment |  |  |  |
|  No | 2495 (54.9) | 2053 (45.1) | Reference |  |
|  Yes | 419 (56.9) | 317 (43.1) |  0.92 (0.79-1.08) | >.250 |
| Domestic Violence  |  |  |  |
|  No | 2335 (55.4) | 1880 (44.6) | Reference |  |
|  Yes | 566 (50.5) | 554 (49.5) | **1.22 (1.07-1.39)** | **.004** |
| Sibling Bullying Victimization |  |  |
|  Never | 1848 (50.9) | 1786 (49.1) | Reference |  |
|  Only ever once or twice | 626 (52.6) | 564 (47.4) | 0.93 (0.82-1.06) | >.250 |
|  2 or 3 times a month | 333 (51.6) | 312 (48.4) | 0.97 (0.82-1.15) | >.250 |
|  About once a week | 363 (54.9) | 298 (45.1) | 0.85 (0.72-1.00) | .055 |
|  Several times a week | 388 (49.6) | 395 (50.4) | 1.05 (0.90-1.23) | >.250 |
| Sibling Bullying Perpetration |  |  |  |  |
|  Never | 2092 (51.4) | 1976 (48.6) | Reference |  |
|  Only ever once or twice | 440 (52.3) | 401 (47.7) | 0.97 (0.83-1.12) | >.250 |
|  2 or 3 times a month | 384 (55.1) | 313 (44.9) | 0.86 (0.73-1.01) | .074 |
|  About once a week | 349 (51.9) | 323 (48.1) | 0.98 (0.83-1.15) | >.250 |
|  Several times a week | 277 (46.4) | 320 (53.6) | **1.22 1.02-1.45)** | **.022** |
| Sibling Bullying Status |  |  |  |
| None | 2537 (51.6) | 2376 (48.4) | Reference |  |
| Victim | 364 (54.8) | 300 (45.2) | 0.88 (0.75-1.04) | .124 |
| Bully | 236 (48.6) | 250 (51.4) | 1.13 (0.94-1.36) | .195 |
| Bully-Victim | 384 (49.8) | 387 (50.2) | 1.08 (0.92-1.25) | >.250 |
| Maternal Post-Natal Depression | 6.22 (4.43) | 6.74 (4.68) | **1.03 (1.01-1.04)** | **<.001** |
| IQ | 107.83 (16.09) | 101.67 (15.73 | **0.98 (0.97-0.98)** | **<.001** |
| Internalizing Problems | 1.53 (1.67) | 1.49 (1.67) | 0.99 (0.96-1.02) | >.250 |
| Externalizing Problems | 1.51 (1.43) | 1.60 (1.46) | **1.04 (1.01-1.08)** | **.019** |
| a Peer bullying perpetration and victimization measures were obtained at 8 years. |

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| **Table S3.**Association between sibling and peer bullying at 12 years (OR, 95% CI) |
|  | Peer Bullying |
|  | Pure Victim | Pure Bully | Bully-Victim |
| Sibling Bullying |  |  |  |
|  Neutral | 1 | 1 | 1 |
|  Pure Victim | **1.33 (1.04-1.71)\*** | 1.42 (0.79-2.53) | 1.28 (0.84-1.97) |
|  Pure Bully | **1.42 (1.06-1.90)\*** | **2.74 (1.62-4.66)\*\*** | **3.42 (2.40-4.87)\*\*** |
|  Bully-Victim | **1.86 (1.49-2.33)\*\*** | **2.50 (1.56-4.00)\*\*** | **4.17 (3.13-5.56)\*\*** |
| Reference group: Neutral peer bullying status.\*p<0.05 \*\*p<.01 \*\*\*p<.001.  |

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| **Table S4.**Prevalence and ORs of Psychotic Disorder at Age 18 According to Sibling Bullying Victimization and Perpetration at Age 12 |
| Sibling Bullying | Frequency of Sibling Bullying |
|  | Never | Only Ever Once or Twice | 2 or 3 Times a Month | About Once a Week | Several Times a Week | Linear Trend |
| **Victimization (N=3,559)** | 1,849 | 626 | 333 | 363 | 388 |  |
| % yes | 1.1 | 1.4 | 0.9 | 2.8 | 3.1 |  |
| Unadjusted OR (95% CI) | Reference | 1.33 (0.60-2.95) | 0.83 (0.25-2.81) | **2.59 (1.20-5.58)\*** | **2.92 (1.41-6.02)\*\*** | **1.31 (1.11-1.56)\*\*** |
| Imputed Adjusteda OR (95% CI)  | Reference | 1.18 (0.52-2.67) | 0.74 (0.21-2.57) | 2.23 (1.00-5.00) | **2.43 (1.11-5.29)\*** | **1.26 (1.05-1.51)\*** |
| **Perpetration (N=3,546)** | 2,096 | 440 | 384 | 349 | 277 |  |
| % yes | 1.0 | 1.4 | 2.6 | 2.3 | 3.3 |  |
| Unadjusted OR (95% CI) | Reference | 1.44 (0.57-3.59) | **2.78 (1.29-5.98)\*\*** | **2.44 (1.06-5.57)\*** | **3.49 (1.57-7.73)\*\*** | **1.37 (1.15-1.63)\*\*** |
| Imputed Adjusteda OR (95% CI) | Reference | 1.28 (0.50-3.29) | **2.49 (1.12-3.53)\*** | 2.17 (0.90-5.21) | **3.05 (1.29-7.22)\*** | **1.32 (1.10-1.63)\*\*** |

a Includes family characteristics and factors associated with psychosis as confounders.

Significant confounders:

Victimization=male gender, lower maternal education, single marital status, maltreatment present, pliks at 12 years present.

Perpetration=male gender, lower maternal education, single marital status, maltreatment present, pliks at 12 years present.

\**p*<.05 \*\**p*<.01.

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| **Table S5.**Prevalence and ORs of Psychotic Disorder at Age 18 According to Sibling Bullying Status at Age 12 |
|  |  | Sibling Bullying Status |
|  | Non-Involved | Pure Victim | Pure Bully | Bully-Victim |
| Bullying Involvement (N=3,522) | 2,538 | 364 | 236 | 384 |
| %yes | 1.0 | 3.0 | 2.5 | 2.9 |
| Unadjusted OR (95% CI) | Reference | **3.13 (1.53-6.42)\*\*** | **2.62 (1.06-6.46)\*** | **2.96 (1.45-6.07)\*** |
| Imputed Adjusteda OR (95% CI) | Reference | **2.82 (1.33-5.95)\*\*** | 2.51 (0.97-6.52) | **2.60 (1.20-5.64)\*** |
| a Includes family characteristics and factors associated with psychosis as confounders. Significant confounders: =male gender, lower maternal education, single marital status, maltreatment present, pliks at 12 years present. \**p*<.05 \*\**p*<.01. |

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| **Table S6.**Prevalence and ORs of Psychotic Disorder at Age 18 According to Sibling and/or Peer Victimization at Age 12. |

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|  | Non-Involved | Sibling OR Peer | Sibling AND Peer | Linear Trend |
| Psychotic Disorder (N=3,171) | 1,957 | 1,015 | 199 |  |
| % yes | 0.8 | 2.2 | 3.5 |  |
| Unadjusted OR (95% CI) | Reference | **2.87 (1.48-5.55)\*\*** | **4.72 (1.90-11.72)\*\*** | **2.28 (1.51-3.44)\*\*** |
| Imputed Adjusteda OR (95% CI) | Reference | **2.43 (1.22-4.82)\*** | **3.42 (1.30-8.98)\*** | **1.93 (1.24-3.01)\*** |
| a Includes family characteristics and factors associated with psychosis as confounders. Significant confounders: = lower maternal education, single marital status, pliks at 12 years present. \**p*<.05 \*\**p*<.01. |