**Supplement A**

 Overview of the conceptual model applied in this paper.

1. ***The controlled direct effect*:** The risk of drug use disorders in young adulthood among those who were exposed to poverty in adolescence, relative to those who were not, if everyone had no indication of psychiatric disorders in adolescence (this represents the proportion of the total effect that is due to ***neither mediation nor interaction***).
2. ***The reference interaction*:** The combined risk of drug use disorders in young adults who experienced poverty in adolescence, and had a psychiatric diagnosis, if poverty in adolescence **was not a precondition** for having a psychiatric disorder in adolescence (this represents the proportion of the total effect that is due to ***interaction only***).
3. ***A mediated interaction*:** The combined risk of drug use disorders in young adults who experienced poverty in adolescence, and had a psychiatric diagnosis, if poverty in adolescence **was a precondition** for having a psychiatric disorder in adolescence (this represents the proportion of the total effect that is due to ***both mediation and interaction***).
4. ***Pure indirect effect:*** The risk of drug use disorder in young adults who experienced poverty in adolescence, and had a psychiatric diagnosis, if poverty in adolescence **was a precondition** for having a psychiatric disorder in adolescence (this represents the proportion of the total effect that is due to ***mediation only***, without interaction).

**Supplement tables**

**Table 1**. **Distribution of years spent in poverty and DUD in males and females**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Years in poverty  | Frequencies  | Percent  | Females with DUD | Males with DUD  |
| 0 | 465,260  | 73.4 | 3 343 | 5 973 |
| 1 | 66,365  | 10.5  | 772 | 1 425 |
| 2 | 33,762  | 5.3  | 392 | 724 |
| 3 | 21,831  | 3.4  | 214 | 461 |
| 4 | 13,955  | 2.2  | 158 | 261 |
| 5 | 8,270  | 1.3  | 94 | 145 |
| 6 | 24,780  | 3.9  | 214 | 406 |

**Table 2. Hazard Ratios of DUD by years spent in poverty, in males and females.**

|  |  |  |
| --- | --- | --- |
| Years in poverty  | Females | Males |
|  | HR 95% CI | HR 95% CI |
| 0  | Ref.  | Ref.  |
| 1  | 1.63 (1.51–1.77) | 1.70 (1.59–1.79) |
| 2  | 1.64 (1.48–1.82) | 1.68 (1.56–1.81) |
| 3  | 1.37 (1.20–1.57) | 1.67 (1.52–1.83) |
| 4  | 1.58 (1.34–1.84) | 1.49 (1.31–1.68) |
| 5  | 1.57 (1.29–1.93) | 1.40 (1.19–1.65) |
| 6  | 1.21 (1.06–1.39) | 1.29 (1.17–1.42) |

CI: Confidence interval; HR: Hazard ratio. Ref: reference category.

**Table 3. Internalizing disorders between the ages of 13 and 18 years in males and females**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Internalizing disorders**  | **Male** | **Female**  | **Frequencies**  | **Percent** |
| F32 | 1,575 | 3,884 | 5,459 | 40.62 |
| F33 | 81 | 234 | 315 | 2.34 |
| F34 | 101 | 204 | 305 | 2.27 |
| F38 | 16 | 36 | 52 | 0.39 |
| F39 | 37 | 103 | 140 | 1.04 |
| F40 | 192 | 308 | 500 | 3.72 |
| F41 | 916 | 2,240 | 3,156 | 23.48 |
| F42 | 327 | 374 | 701 | 5.22 |
| F43 | 618 | 1,542 | 2,160 | 16.07 |
| F48 | 37 | 57 | 94 | 0.70 |
| F92 | 107 | 182 | 289 | 2.15 |
| F93 | 98 | 171 | 269 | 2.00 |
| **Total** | **4,105** | **9,335** | **13,440** | 100.00 |

**Table 4. Externalized disorders between the ages of 13 and 18 years in males and females**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Externalizing disorders**  | **Male**  | **Female**  | **Frequencies** | **Percent** |
| F55 | 22 | 12 | 34 | 0.52 |
| F60.2 F60.3 | 309 | 751 | 1060 | 16.35 |
| F90-F91 | 3,966 | 1,425 | 5,391 | 83,13 |
| **Total** | **4,297** | **2,188** | **6,485** | **100.00** |

**Table 5. Association Between Poverty in Adolescence and Drug Use Disorder in Young Adulthood. Results from Cox Regression Analysis with Four-Way Decomposition by Presence of Adolescent internalizing disorders.**

|  |  |
| --- | --- |
|  | Drug Use Disorder in Young Adulthood (19–31 years of age ) |
| Four-Way Decomposition by Presence of Psychiatric Diagnosis in Adolescence  | Female | Male |
|  | **Estimate 95% CI** | **Estimate 95% CI** |
|  | Model 1 | Model 2 | Model 1 | Model 2 |
|  *Total effects* |  |  |  |  |
|  Total excess relative risk (*tereri\**) | 0.54 (0.45–0.63) | 0.39 (0.31–0.47) | 0.60 (0.53–0.66) | 0.42 (0.37–0.49) |
|  Excess relative risk due to neither mediation nor interaction (ereri\_cde\*) | 0.44 (0.37–0.52) | 0.36 (0.28–0.44) | 0.57 (0.50–0.63) | 0.42 (0.36–0.48) |
|  Excess relative risk due to interaction only (ereri\_intref\*) | 0.04 (0.01–0.07) | 0.01 (-0.01–0.03) | 0.01 (-0.00–0.03) | 0.00 (-0.00–0.01) |
|  Excess relative risk due to mediated interaction (ereri\_intmed\*) | 0.01 (0.00–0.02) | 0.00 (-0.00–0.01) | 0.00 (-0.00–0.01) | 0.00 (-0.00–0.00) |
|  Excess relative risk due to mediation only (ereri\_pie\*) | 0.04 (0.03–0.05) | 0.02 (0.02–0.03) | 0.00 (0.00–0.02) | 0.00 (0.00–0.01) |
|  Total effect relative risk ratio (tereria\*) | 1.53 (1.45–1.62) | 1.39 (1.31–1.47) | 1.60 (1.53–1.66) | 1.43 (1.37–1.50) |
|  |  |  |  |  |
|  *Effects of proportion* |  |  |  |  |
|  Proportion due to neither mediation nor interaction (p\_cde\*) | 0.83 (0.76–0.89) | 0.91 (0.85–0.97) | 0.95 (0.93–0.98) | 0.97 (0.95–0.99) |
|  Proportion due to interaction only (p\_intref\*) | 0.08 (0.03–0.13) | 0.03 (-0.02–0.08) | 0.02 (-0.00–0.04) | 0.01 (-0.01–0.03) |
|  Proportion due to mediated interaction (p\_intmed\*) | 0.02 (0.01–0.04) | 0.01 (-0.00–0.02) | 0.00 (-0.00–0.01) | 0.00 (-0.00–0.01) |
|  Proportion due to mediation only (p\_pie\*) | 0.07 (0.07–0.09) | 0.06 (0.04–0.08) | 0.02 (0.01–0.03) | 0.01 (0.00–0.02) |
|  Overall proportion due to mediation (op\_m\*) | 0.10 (0.07–0.12) | 0.06 (0.04–0.08) | 0.03 (0.02–0.03) | 0.02 (0.01–0.02) |
|  Overall proportion due to interaction (op\_ati\*) | 0.10 (0.03–0.16) | 0.03 (-0.02–0.09) | 0.03(-0.00–0.05) | 0.01 (-0.01–0.04) |
|  Overall proportion eliminated (op\_e\*) | 0.17 (0.11-0.23) | 0.09 (0.03-0.15) | 0.05 (0.02–0.72) | 0.03 (0.00–0.05) |

CI. Confidence intervals; Model 1. Unadjusted model; Model 2. Adjusted for domicile, origin and parental psychiatric disorder.

Note: The upper part of the table (Total effects) describes the relative risks. The lower part of the table (Effects of proportion) describes the proportion of the association due to psychiatric disorders diagnosis. \* terms assigned by the Stata command

**Table 6. Association Between Poverty in Adolescence and Drug Use Disorder in Young Adulthood. Results from Cox Regression Analysis with Four-Way Decomposition by Presence of Adolescent externalized disorders.**

|  |  |
| --- | --- |
|  | Drug Use Disorder in Young Adulthood (19–31 years of age ) |
| Four-Way Decomposition by Presence of Psychiatric Diagnosis in Adolescence  | Female | Male |
|  | **Estimate 95% CI** | **Estimate 95% CI** |
|  | Model 1 | Model 2 | Model 1 | Model 2 |
|  *Total effects* |  |  |  |  |
|  Total excess relative risk (*tereri\**) | 0.53 (0.44–0.62) | 0.40 (0.32–0.48) | 0.60 (0.53–0.67) | 0.43 (0.37–0.49) |
|  Excess relative risk due to neither mediation nor interaction (ereri\_cde\*) | 0.51 (0.42–0.59) | 0.39 (0.31–0.47) | 0.54 (0.48–0.60) | 0.39 (0.33–0.45) |
|  Excess relative risk due to interaction only (ereri\_intref\*) | -0.01 (-0.02–0.01) | -0.01 (-0.02–0.00) | 0.02 (0.01–0.04) | 0.01 (0.00–0.03) |
|  Excess relative risk due to mediated interaction (ereri\_intmed\*) | -0.00 (-0.01–0.00) | -0.00 (-0.01–0.00) | 0.01 (0.00–0.02) | 0.00 (0.00–0.01) |
|  Excess relative risk due to mediation only (ereri\_pie\*) | 0.03 (0.02–0.04) | 0.02 (0.01–0.03) | 0.03 (0.02–0.03) | 0.02 (0.01–0.03) |
|  Total effect relative risk ratio (tereria\*) | 1.53 (1.44–1.62) | 1.39 (1.32–1.48) | 1.60 (1.53–1.67) | 1.43 (1.37–1.49) |
|  |  |  |  |  |
|  *Effects of proportion* |  |  |  |  |
|  Proportion due to neither mediation nor interaction (p\_cde\*) | 0.96 (0.91–0.99) | 0.98 (0.94–1.02) | 0.89 (0.86–0.93) | 0.91 (0.87–0.94) |
|  Proportion due to interaction only (p\_intref\*) | -0.01 (-0.04–0.02) | -0.02 (-0.05–0.01) | 0.04 (0.02–0.06) | 0.03 (0.01–0.06) |
|  Proportion due to mediated interaction (p\_intmed\*) | -0.01 (-0.02–0.01) | -0.01 (-0.02–0.00) | 0.02 (0.01–0.03) | 0.01 (0.00–0.02) |
|  Proportion due to mediation only (p\_pie\*) | 0.06 (0.04–0.08) | 0.05 (0.03–0.07) | 0.05 (0.04–0.06) | 0.05 (0.03–0.06) |
|  Overall proportion due to mediation (op\_m\*) | 0.06 (0.04–0.08) | 0.04 (0.03–0.06) | 0.06 (0.05–0.08) | 0.06 (0.04–0.08) |
|  Overall proportion due to interaction (op\_ati\*) | -0.02 (-0.06–0.03) | -0.03 (-0.07–0.01) | 0.06 (0.02–0.09) | 0.04 (0.01–0.08) |
|  Overall proportion eliminated (op\_e\*) | 0.04 (0.00-0.09) | 0.02 (-0.17-0.06) | 0.10 (0.07–0.14) | 0.09 (0.05–0.12) |

CI. Confidence intervals; Model 1. Unadjusted model; Model 2. Adjusted for domicile, origin and parental psychiatric disorder.

Note: The upper part of the table (Total effects) describes the relative risks. The lower part of the table (Effects of proportion) describes the proportion of the association due to psychiatric disorders diagnosis. \* terms assigned by the Stata command

**Supplement B**

 likelihood ratio test for the main analyses presented in table 2

• Females lrtest m1 m2 Likelihood-ratio test LR chi2(4) = 1004.94 (Assumption: A nested in B) Prob > chi2=0.0000

• Males lrtest m1 m2 Likelihood-ratio test LR chi2(4) = 1736.89

(Assumption: A nested in B) Prob > chi2=0.0000