Supplementary material

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| *Table S1*. Descriptive statistics for sample characteristics, victimization rates and IRT scores of mental health variables, separate per survey. | | | | | | | | |
|  | **2000** | | **2002** | | **2004** | | **2009** | |
|  | **Mean  (Min-Max)** | **SD** | **Mean  (Min-Max)** | **SD** | **Mean  (Min-Max)** | **SD** | **Mean  (Min-Max)** | **SD** |
| Loneliness |  |  |  |  | -0.021  (-0.73 -2.54) | 0.8 | -0.036  (-0.61 - 2.67) | 0.78 |
| Anxiety | -0.05  (-2.07 - 3.74) | 0.96 | -0.04  (-2.19 - 3.28) | 0.96 |  |  |  |  |
| Depression | -0.06  (-1.39 - 3.33) | 0.93 | -0.04  (-1.57 - 3.81) | 0.926 |  |  | -0.07  (-1.29 - 3.83) | 0.88 |
| Age | 34.20  (25 - 90) | 9.94 | 40.94  (25 - 85) | 13.06 | 43.47  (25-80) | 13.707 | 46.91  (25 - 97) | 12.57 |
|  | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| Male | 1553 | 38.5 | 3276 | 43.3 | 4130 | 37.2 | 4689 | 37.5 |
| Female | 2485 | 61.5 | 4294 | 56.7 | 6962 | 62.8 | 7829 | 62.5 |
| Sexual Crime | | | | | | | | |
| Not experienced | 3735 | 92.5 | 6879 | 90.9 | 10049 | 90.6 | 11511 | 91.9 |
| < 1 year ago | 11 | 0.3 | 8 | 0.1 | 13 | 0.1 | 23 | 0.2 |
| 1-5 years ago | 31 | 0.8 | 34 | 0.4 | 41 | 0.4 | 61 | 0.5 |
| 5+ years ago | 201 | 5 | 422 | 5.6 | 631 | 5.7 | 768 | 6.1 |
| Violent Crime | | | | | | | | |
| Not experienced | 3728 | 92.3 | 6843 | 90.4 | 10096 | 91 | 11628 | 92.9 |
| < 1 year ago | 39 | 1 | 51 | 0.7 | 57 | 0.5 | 63 | 0.5 |
| 1-5 years ago | 69 | 1.7 | 161 | 2.1 | 155 | 1.4 | 144 | 1.2 |
| 5+ years ago | 121 | 3 | 270 | 3.6 | 409 | 3.7 | 551 | 4.4 |
| Theft | | | | | | | | |
| Not experienced | 2984 | 73.9 | 5107 | 67.5 | 7709 | 69.5 | 8251 | 65.9 |
| < 1 year ago | 265 | 6.6 | 553 | 7.3 | 507 | 4.6 | 525 | 4.2 |
| 1-5 years ago | 395 | 9.8 | 774 | 10.2 | 977 | 8.8 | 1061 | 8.5 |
| 5+ years ago | 366 | 9.1 | 1046 | 13.8 | 1697 | 15.3 | 2639 | 21.1 |

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| *Table S2.*  Population analyses show the association between victimization and loneliness, anxiety and, depression, with victimization split by period of occurrence. | | | | | | | | | |
|  | **Loneliness** | | | **Anxiety** | | | **Depression** | | |
|  | **B** | **95% CI (LL - UL)** | **q** | **B** | **95% CI (LL - UL)** | **q** | **B** | **95% CI (LL - UL)** | **q** | |
| Sexual Crime | | | | | | | | | |
| < 1 year ago | 0.181 | (-0.158 - 0.52) | 0.438 | 0.148 | (-0.267 - 0.564) | 0.589 | 0.294 | (-0.068 - 0.656) | 0.176 | |
| 1-5 years ago | 0.140 | (-0.056- 0.335) | 0.278 | 0.422 | (0.073 - 0.772) | 0.039 | 0.320 | (0.078 - 0.562) | 0.023 | |
| 5+ year ago | 0.322 | (0.260 - 0.384) | <0.001 | 0.386 | (0.292 - 0.480) | <0.001 | 0.388 | (0.315 - 0.461) | <0.001 | |
| Violent Crime | | | | | | | | | |
| < 1 year ago | 0.214 | (0.005 - 0.423) | 0.176 | 0.058 | (-0.195 - 0.312) | 0.692 | 0.209 | (0.001 - 0.417) | 0.037 | |
| 1-5 years ago | 0.220 | (0.106 - 0.333) | 0.001 | 0.254 | (0.104 - 0.404) | 0.003 | 0.247 | (0.105 - 0.389) | 0.008 | |
| 5+ year ago | 0.201 | (0.131 - 0.272) | <0.001 | 0.197 | (0.09 - 0.305) | 0.001 | 0.247 | (0.168 - 0.326) | <0.001 | |
| Theft | | | | | | | | | |
| < 1 year ago | 0.082 | (0.018 - 0.145) | 0.031 | 0.066 | (-0.013 - 0.146) | 0.149 | 0.029 | (-0.041 - 0.099) | 0.528 | |
| 1-5 years ago | 0.060 | (0.015 - 0.105) | 0.025 | -0.032 | (-0.103 - 0.038) | 0.466 | 0.065 | (0.013 - 0.118) | 0.038 | |
| 5+ year ago | 0.024 | (-0.007 - 0.056) | 0.172 | 0.024 | (-0.036 - 0.083) | 0.511 | 0.040 | (0.002 - 0.079) | 0.096 | |
| Age (years) | 0.001 | (0 - 0.002) | 0.171 | -0.002 | (-0.003 - -0.006) | 0.097 | -0.002 | (-0.003 - -0.001) | 0.001 | |
| Sex (ref = male) | 0.181 | (-0.158 - 0.52) | <0.001 | 0.261 | (0.220 - 0.302) | 0 | 0.370 | (0.341 - 0.399) | <0.001 | |
| B = unstandardized regression coefficient, 95% CI = 95% confidence interval, LL = lower limit, UL = upper limit, q = FDR q-value. | | | | | | | | | |

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| *Table S3.* Population analyses showing the association between victimization and loneliness, anxiety and depression, per survey. | | | | | | | | | |
|  |  | **Anxiety** | | | | **Depression** | | | |
|  |  | **B** | **95% CI** |  | **q** | **B** | **95% CI** | | **q** |
| **Survey** |  |  | LL | UL |  |  | LL | UL |  |
| 2000 | Violent crime (ref = not experienced) | 0.335 | (0.195 - 0.475) | | <0.001 | 0.339 | (0.170 - 0.508) | | <0.001 |
| Sexual crime (ref = not experienced) | 0.264 | (0.129 - 0.398) | | <0.001 | 0.29 | (0.119 - 0.462) | | 0.003 |
| theft crime (ref = not experienced) | 0.019 | (-0.049 - 0.088) | | 0.661 | 0.098 | (0.021 - 0.175) | | 0.029 |
| Sex (ref = male) | 0.286 | (0.224 - 0.348) | | <0.001 | 0.443 | (0.372 - 0.515) | | <0.001 |
| Age | -0.003 | (-0.007 - 0.001) | | 0.163 | -0.001 | (-0.004 - 0.003) | | 0.698 |
|  |  | **Anxiety** | | | | **Depression** | | | |
|  |  | **B** | **95% CI** |  | **q** | **B** | **95% CI** | | **q** |
|  |  |  | LL | UL |  |  | LL | UL |  |
| 2002 | Violent crime (ref = not experienced) | 0.329 | (0.227 - 0.430) | | <0.001 | 0.324 | (0.228 -0.420) | | <0.001 |
| Sexual crime (ref = not experienced) | 0.192 | (0.096 - 0.288) | | <0.001 | 0.163 | (0.072 - 0.254) | | 0,002 |
| theft crime (ref = not experienced) | 0.017 | (-0.031 - 0.065) | | 0.592 | 0.049 | (0.003 - 0.094) | | 0.078 |
| Sex (ref = male) | 0.257 | (0.213 - 0.301) | | <0.001 | 0.479 | (0.438 - 0.520) | | <0.001 |
| Age | -0.001 | (-0.003 - 0.001) | | 0.316 | 0 | (-0.001 - 0.002) | | 0.836 |
|  |  | **Loneliness** | | | |  | | | |
|  |  | **B** | **95% CI** | | **q** |  |  | |  |
|  |  |  | LL | UL |  |  |  |  |  |
| 2004 | Violent crime (ref = not experienced) | 0.231 | (0.151 - 0.310) | | <0.001 |  |  |  |  |
| Sexual crime (ref = not experienced) | 0.207 | (0.128 - 0.285) | | <0.001 |  |  |  |  |
| theft crime (ref = not experienced) | 0.021 | (-0.015 - 0.057) | | 0.338 |  |  |  |  |
| Sex (ref = male) | 0.149 | (0.118 - 0.180) | | <0.001 |  |  |  |  |
| Age | 0.001 | (0 - 0.002) | | 0.172 |  |  |  |  |
|  |  | **Loneliness** | | | | **Depression** | | | |
|  |  | **B** | **95% CI** | | **q** | **B** | **95% CI** | | **q** |
|  |  |  | LL | UL |  |  | LL | UL |  |
| 2009 | Violent crime (ref = not experienced) | 0.317 | (0.249 - 0.385) | | <0.001 | 0.364 | (0.290 - 0.437) | | <0.001 |
| Sexual crime (ref = not experienced) | 0.211 | (0.141 - 0.281) | | <0.001 | 0.235 | (0.159 - 0.310) | | <0.001 |
| theft crime (ref = not experienced) | 0.047 | (0.017 - 0.077) | | 0.338 | 0.055 | (0.020 - 0.089) | | 0.006 |
| Sex (ref = male) | 0.146 | (0.119 - 0.174) | | <0.001 | 0.342 | (0.310 - 0.375) | | <0.001 |
| Age | 0.001 | (0 - 0.002) | | 0.172 | -0.003 | (-0.004 - -0.001) | | <0.001 |
| B = unstandardized regression coefficient, 95% CI = 95% confidence interval, LL = lower limit, UL = upper limit, q = FDR q-value. | | | | | | | | | |

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| *Table S4.* Results population analyses and analyses in the same-sex (SS) discordant twin pairs for loneliness, anxiety and depression, separately for violent crime, sexual crime and theft. | | | | | | | | | | | | | | | |
|  |  | **Violent Crimes** | | | | |  | **Sexual Crime** | | |  | **Theft** | | | |
|  | **N** | **B** | | **95% CI** | | **q** | **N** | **B** | **95% CI** | **q** | **N** | **B** | **95% CI** | **q** |
|  |  |  | | **(LL - UL)** | |  |  |  | **(LL - UL)** |  |  |  | **(LL - UL)** |  |
|  |  |  |  | | **Loneliness** | | | | | | | | | | |
| Population analysis | 16,378 | 0.294 | | (0.233 -0.355) | | <0.001 | 16,378 | 0.203 | (0.142 -0.263) | <0.001 | 16,378 | 0.04 | (0.013 - 0.067) | 0.01 |
| SS DZ | 79 | 0.0649 | | (-0.190 - 0.320) | | 0.664 | 82 | 0.082 | (-0.160 - 0.325) | 0.584 | 267 | 0.084 | (-0.044 - 0.212) | 0.32 |
| MZ and SS DZ | 164 | 0.078 | | (-0.052 -0.208) | | 0.336 | 236 | 0.056 | (-0.079 - 0.191) | 0.509 | 863 | 0.041 | (-0.026 - 0.108) | 0.33 |
| MZ | 18578 | 0.086 | | (-0.064 - 0.237) | | 0.36 | 154 | 0.041 | (-0.121 - 0.204) | 0.66 | 596 | 0.022 | (-0.056 - 0.101) | 0.64 |
|  |  |  |  | | **Anxiety** | | | | | | | | | | |
| Population analysis | 8,640 | 0.345 | | (0.250 - 0.440) | | <0.001 | 8,640 | 0.204 | (0.117 - 0.292) | <0.001 | 8,640 | 0.008 | (-0.038 - 0.054) | 0.75 |
| SS DZ | 39 | 0.226 | | (-0.218 - 0.670) | | 0.42 | 43 | 0.202 | (-0.202 - 0.606) | 0.422 | 459 | -0.069 | (-0.266 - 0.126) | 0.57 |
| MZ and SS DZ | 127 | 0 | | (-0.211 - 0.211) | | 0.959 | 133 | 0.155 | (-0.051 - 0.360) | 0.235 | 489 | -0.022 | (-0.125 - 0.079) | 0.69 |
| MZ | 88 | -0.088 | | (-0.3246 - 0.148) | | 0.56 | 90 | 0.125 | (-0.112 - 0.360 | 0.403 | 330 | 0 | (-0.119 - 0.119) | 0.96 |
|  |  |  |  | | **Depression** | | | | | | | | | | |
| Population analysis | 14,220 | 0.372 | | (0.302 - 0.441) | | <0.001 | 14,220 | 0.238 | (0.170 - 0.306) | <0.001 | 14,220 | 0.035 | (0.003 - 0.067) | 0.75 |
| SS DZ | 57 | -0.018 | | (-0.373 - 0.336) | | 0.904 | 67 | 0.096 | (-0.225 - 0.417) | 0.621 | 250 | 0.156 | (0.001 - 0.312) | 0.109 |
| MZ and SS DZ | 225 | 0.115 | | (-0.382 - 0.268) | | 0.234 | 217 | 0.098 | (-0.055 - 0.253) | 0.321 | 778 | 0.053 | (-0.024 - 0.129) | 0.281 |
| MZ | 169 | 0.166 | | (0.002 - 0.332) | | 0.106 | 150 | 0.095 | (-0.077 - 0.270) | 0.333 | 538 | 0 | (-0.083 - 0.090) | 0.913 |
| Note: N refers to the total sample in the population analyses and the total twin pairs in the discordant twin pairs analyses. | | | | | | | | | | | | | | |

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| *Table S5.* Association between loneliness, anxiety and depression, and victimization, measured both pre- and post-victimization, comparison between victims and familial and non-familial non-victims. | | | | | | | | | |
|  | **Prior victimization** |  | | | | **Post victimization** | | | |
|  | **Loneliness** | | | | | | | | |
|  |  | **N** | **B** | **95% (LL=UL)** | **q** | **N** | **B** | **95% (LL - UL)** | **Q** |
|  | Constant |  | 0.581 | (0.224 -0.939) | 0.003 |  | 0.395 | (0.042 - 0.749) | 0.068 |
| Sexual crime | Non-victim family member | 23 | -0.170 | (-0.536 - 0.196) | 0.481 | 23 | -0.119 | (-0.492 - 0.254) | 0.638 |
| (ref = victim) | Non-victim non-related | 4110 | -0.409 | (-0.724 - -0.094) | 0.032 | 4110 | -0.294 | (-0.601 - 0.014) | 0.130 |
| Violent crime | Non-victim family member | 74 | -0.216 | (-0.488 - -0.056) | 0.221 | 74 | -0.08 | (-0.34 - 0.179) | 0.648 |
| (ref = victim) | Non-victim non-related | 4022 | -0.296 | (-0.5 - -0.092) | 0.015 | 4022 | -0.203 | (-0.413 - 0.007) | 0.128 |
| Theft | Non-victim family member | 461 | -0.094 | (-0.191 - 0.003) | 0.128 | 461 | -0.09 | (-0.180 - -0.001) | 0.112 |
| (ref = victim) | Non-victim non-related | 3008 | -0.059 | (-0.127 - 0.01) | 0.179 | 3008 | -0.087 | (-0.150 - -0.023) | 0.023 |
| Sex (ref = male) | |  | 0.127 | (0.080 - 0.174) | <0.001 |  | 0.145 | (0.100 - 0.190) | <0.001 |
| Age |  |  | 0.001 | (-0.001 - 0.002) | 0.717 |  | -3,46x10-10 | (-0.002 - 0.001) | 0.740 |
|  | **Anxiety** | | | | | | | | |
|  |  | **N** | **B** | **95% (LL=UL)** | **q** | **N** | **B** | **95% (LL=UL)** | **q** |
|  | Constant |  | 0.485 | (-0.054 - 1.025) | 0.154 |  | 0.463 | (-0.115 - 1,041) | 0.205 |
| Sexual crime | Non-victim family member | 16 | -0.28 | (-0.843 - 0.283) | 0.452 | 16 | -0.485 | (-1,268 - 0.298) | 0.357 |
| (ref = victim) | Non-victim non-related | 2104 | -0.523 | (-0.965 - -0.08) | 0.056 | 2104 | -0.558 | (-1,053 - -0.062) | 0.068 |
| Violent crime | Non-victim family member | 37 | -0.023 | (-0.404 - 0.359) | 0.946 | 37 | -0.078 | (-0.524 - 0.368) | 0.788 |
| (ref = victim) | Non-victim non-related | 2038 | -0.133 | (-0.413 - 0.146) | 0.469 | 2038 | -0.072 | (-0.333 - 0.189) | 0.674 |
| Theft | Non-victim family member | 210 | -0.094 | (-0.244 - 0.055) | 0.351 | 210 | -0.103 | (-0.264 - 0.057) | 0.348 |
| (ref = victim) | Non-victim non-related | 1471 | -0.09 | (-0.193 - 0.013) | 0.178 | 1471 | -0.060 | (-0.164 -0.043) | 0.377 |
| Sex (ref = male) | |  | 0.309 | (0.226 - 0.392) | <0.001 |  | 0.315 | (0.231 - 0.398) | <0.001 |
| Age |  |  | -0.002 | (-0.007 - 0.003) | 0.490 |  | -0.002 | (-0.007 - 0.003) | 0.604 |
|  | **Depression** | | | | | | | | |
|  |  | **N** | **B** | **95% (LL=UL)** | **q** | **N** | **B** | **95% (LL=UL)** | **q** |
|  | Constant |  | 0.350 | (-0.087 - 0.787) | 0.202 |  | 0.409 | (0.019 - 0.800) | 0.092 |
| Sexual crime | Non-victim family member | 18 | -0.310 | (-0.671 - 0.052) | 0.186 | 18 | -0.194 | (-0.578 - 0.189) | 0.448 |
| (ref = victim) | Non-victim non-related | 3706 | -0.344 | (-0.738 - 0.051) | 0.179 | 3706 | -0.295 | (-0.638 - 0.049) | 0.183 |
| Violent crime | Non-victim family member | 65 | 0.049 | (-0.24 - 0.338) | 0.781 | 65 | -0.113 | (-0.424 - 0.199) | 0.602 |
| (ref = victim) | Non-victim non-related | 3610 | -0.291 | (-0.534 - -0.047) | 0.052 | 3610 | -0.317 | (-0.587 - -0.048) | 0.055 |
| Theft | Non-victim family member | 445 | -0.105 | (-0.209 - -0.001) | 0.128 | 445 | -0.078 | (-0.183 - 0.027) | 0.257 |
| (ref = victim) | Non-victim non-related | 2662 | -0.038 | (-0.116 - 0.04) | 0.457 | 2662 | -0.046 | (-0.126 - 0.035) | 0.384 |
| Sex (ref = male) | |  | 0.456 | (0.399 - 0.514) | <0.001 |  | 0.357 | (0.301 - 0.413) | <0.001 |
| Age |  |  | -0.001 | (-0.003 - 0.001) | 0.592 |  | -0.002 | (-0.005 - 0) | 0.062 |
| Constant = mean score for victims, corrected for sex and age, B = unstandardized regression coefficient, 95% CI = 95% confidence interval, LL = lower limit, UL = upper limit, q = FDR q-value. | | | | | | | | | |