**Supplemental Material:**

**For Online Publication Only**

Traumatic brain injury during key developmental stages and its effect on co-occurring psychological symptoms.

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**Appendix A: Missing Data Analysis After Variance Recode**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A1: Missing case analysis adverse psychological effects (Wave 3) on TBI (Wave 2). | | | |  |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .26 | .30 | -1.30 | .08 |
| Fighting in School | .54 | .57 | -.75 | .05 |
| Exposure to Violence | .46 | .36 | 4.39\* | .26 |
| Psychopathy | 1.69 | 1.54 | 3.42\* | .20 |
| Impulsivity | 3.18 | 2.97 | 3.78\* | .22 |
| Moral Disengagement | 1.67 | 1.59 | 3.81\* | .22 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .18 | .12 | 1.72 | .11 |
| *Adverse Psychological Effects* (Wave 3) |  |  |  |  |
| Anxiety | .40 | .34 | 1.68 | .13 |
| Depression | .45 | .42 | .65 | .05 |
| Hostility | .64 | .56 | 1.76 | .14 |
| Impulsivity | 3.04 | 2.76 | 5.41\* | .33 |
| Interpersonal Sensitivity | .36 | .35 | .16 | .01 |
| Moral Disengagement | 1.59 | 1.44 | 7.85\* | .48 |
| Obsessive Compulsive Disorder | .65 | .61 | .76 | .06 |
| Paranoia | .70 | .65 | 1.08 | .08 |
| Phobia | .24 | .17 | 2.70\* | .20 |
| Psychoticism | .41 | .35 | 1.53 | .12 |
| Somatization | .31 | .27 | 1.01 | .08 |
| *N* | 438 | 916 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A2: Missing case analysis adverse psychological effects (Wave 4) on TBI (Wave 2). | | | |  |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .26 | .30 | -1.39 | .08 |
| Fighting in School | .53 | .58 | 1.70 | .11 |
| Exposure to Violence | .45 | .37 | 3.86\* | .23 |
| Psychopathy | 1.68 | 1.55 | 2.85\* | .17 |
| Impulsivity | 3.20 | 2.97 | 4.26\* | .25 |
| Moral Disengagement | 1.66 | 1.60 | 3.18\* | .19 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .20 | .11 | 2.37\* | .15 |
| *Adverse Psychological Effects* (Wave 4) |  |  |  |  |
| Anxiety | .38 | .31 | 1.94 | .15 |
| Depression | .47 | .42 | 1.09 | .09 |
| Hostility | .61 | .52 | 1.79 | .14 |
| Impulsivity | 2.97 | 2.68 | 5.57\* | .33 |
| Interpersonal Sensitivity | .38 | .34 | .87 | .07 |
| Moral Disengagement | 1.55 | 1.42 | 6.66\* | .41 |
| Obsessive Compulsive Disorder | .66 | .59 | 1.35 | .11 |
| Paranoia | .71 | .67 | .99 | .08 |
| Phobia | .21 | .18 | 1.38 | .11 |
| Psychoticism | .40 | .34 | 1.71 | .14 |
| Somatization | .30 | .24 | 2.16\* | .17 |
| *N* | 425 | 929 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A3: Missing case analysis adverse psychological effects (Wave 5) on TBI (Wave 2). | | | |  |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.54 | .03 |
| Fighting in School | .52 | .59 | -2.63\* | .16 |
| Exposure to Violence | .46 | .35 | 5.57\* | .32 |
| Psychopathy | 1.67 | 1.54 | 3.06\* | .17 |
| Impulsivity | 3.16 | 2.97 | 3.56\* | .20 |
| Moral Disengagement | 1.65 | 1.60 | 2.24\* | .13 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .15 | .13 | .60 | .04 |
| *Adverse Psychological Effects* (Wave 5) |  |  |  |  |
| Anxiety | .33 | .31 | .39 | .03 |
| Depression | .41 | .39 | .29 | .02 |
| Hostility | .49 | .44 | 1.18 | .08 |
| Impulsivity | 2.85 | 2.62 | 4.23\* | .24 |
| Interpersonal Sensitivity | .29 | .30 | -.09 | .01 |
| Moral Disengagement | 1.49 | 1.39 | 4.65\* | .27 |
| Obsessive Compulsive Disorder | .58 | .55 | .56 | .04 |
| Paranoia | .64 | .58 | 1.16 | .08 |
| Phobia | .16 | .18 | -.80 | .06 |
| Psychoticism | .34 | .30 | 1.13 | .08 |
| Somatization | .24 | .25 | -.42 | .03 |
| *N* | 512 | 842 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| Table A4: Missing case analysis adverse psychological effects (Wave 6) on TBI (Wave 2). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.78 | .05 |
| Fighting in School | .53 | .58 | -1.77 | .11 |
| Exposure to Violence | .45 | .36 | 4.77\* | .27 |
| Psychopathy | 1.65 | 1.55 | 2.28\* | .13 |
| Impulsivity | 3.14 | 2.97 | 3.08\* | .17 |
| Moral Disengagement | 1.64 | 1.60 | 2.13\* | .12 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .17 | .11 | 1.64 | .10 |
| *Adverse Psychological Effects* (Wave 6) |  |  |  |  |
| Anxiety | .31 | .32 | -.20 | .01 |
| Depression | .38 | .36 | .60 | .04 |
| Hostility | .49 | .45 | 1.07 | .07 |
| Impulsivity | 2.85 | 2.61 | 4.32\* | .25 |
| Interpersonal Sensitivity | .31 | .26 | 1.58 | .11 |
| Moral Disengagement | 1.46 | 1.37 | 4.48\* | .26 |
| Obsessive Compulsive Disorder | .58 | .55 | .60 | .04 |
| Paranoia | .64 | .57 | 1.40 | .10 |
| Phobia | .19 | .16 | .85 | .06 |
| Psychoticism | .34 | .30 | 1.08 | .07 |
| Somatization | .26 | .22 | 1.17 | .08 |
| *N* | 531 | 823 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A5: Missing case analysis adverse psychological effects (Wave 7) on TBI (Wave 2). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .26 | .29 | -1.05 | .06 |
| Fighting in School | .53 | .58 | -1.52 | .09 |
| Exposure to Violence | .44 | .37 | 3.79\* | .22 |
| Psychopathy | 1.65 | 1.55 | 2.22\* | .13 |
| Impulsivity | 3.17 | 2.96 | 3.84\* | .22 |
| Moral Disengagement | 1.64 | 1.61 | 1.49 | .08 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .18 | .11 | 1.78 | .11 |
| *Adverse Psychological Effects* (Wave 7) |  |  |  |  |
| Anxiety | .34 | .33 | .29 | .02 |
| Depression | .44 | .38 | 1.53 | .11 |
| Hostility | .50 | .47 | .67 | .05 |
| Impulsivity | 2.82 | 2.56 | 4.54\* | .27 |
| Interpersonal Sensitivity | .28 | .26 | .47 | .03 |
| Moral Disengagement | 1.42 | 1.35 | 3.36\* | .20 |
| Obsessive Compulsive Disorder | .60 | .55 | .90 | .06 |
| Paranoia | .65 | .59 | 1.16 | .08 |
| Phobia | .16 | .20 | -1.09 | .08 |
| Psychoticism | .34 | .31 | .83 | .06 |
| Somatization | .26 | .26 | .30 | .02 |
| *N* | 493 | 861 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A6: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 2). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .26 | .29 | -.94 | .06 |
| Fighting in School | .54 | .57 | -1.06 | .07 |
| Exposure to Violence | .47 | .36 | 5.07 | .30 |
| Psychopathy | 1.66 | 1.56 | 2.19 | .13 |
| Impulsivity | 3.11 | 3.00 | 1.92 | .11 |
| Moral Disengagement | 1.64 | 1.61 | 1.86 | .11 |
| *Lagged Endogenous Variables* (Wave 2) |  |  |  |  |
| TBI | .17 | .12 | 1.35 | .08 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .31 | .33 | -.53 | .04 |
| Depression | .34 | .38 | -.80 | .06 |
| Hostility | .41 | .42 | -.23 | .02 |
| Impulsivity | 2.74 | 2.56 | 3.03\* | .19 |
| Interpersonal Sensitivity | .25 | .28 | -.84 | .07 |
| Moral Disengagement | 1.42 | 1.34 | 3.91\* | .24 |
| Obsessive Compulsive Disorder | .50 | .59 | -1.60 | .12 |
| Paranoia | .61 | .62 | -.27 | .02 |
| Phobia | .15 | .15 | .03 | .01 |
| Psychoticism | .29 | .31 | -.45 | .04 |
| Somatization | .21 | .21 | -.22 | .02 |
| *N* | 439 | 915 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A7: Missing case analysis adverse psychological effects (Wave 4) on TBI (Wave 3). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .26 | .30 | -1.28 | .08 |
| Fighting in School | .53 | .58 | -1.62 | .10 |
| Exposure to Violence | .45 | .37 | 3.96\* | .24 |
| Psychopathy | 1.66 | 1.56 | 2.44\* | .14 |
| Impulsivity | 3.19 | 2.97 | 4.05\* | .24 |
| Moral Disengagement | 1.65 | 1.60 | 2.60\* | .15 |
| *Lagged Endogenous Variables* (Wave 3) |  |  |  |  |
| TBI | .22 | .07 | 3.80\* | .25 |
| *Adverse Psychological Effects* (Wave 4) |  |  |  |  |
| Anxiety | .38 | .31 | 1.98\* | .16 |
| Depression | .46 | .43 | .57 | .05 |
| Hostility | .59 | .55 | .76 | .06 |
| Impulsivity | 2.96 | 2.69 | 5.32\* | .32 |
| Interpersonal Sensitivity | .38 | .33 | 1.26 | .10 |
| Moral Disengagement | 1.55 | 1.42 | 6.47\* | .40 |
| Obsessive Compulsive Disorder | .65 | .60 | 1.08 | .09 |
| Paranoia | .70 | .68 | .38 | .03 |
| Phobia | .21 | .18 | 1.26 | .10 |
| Psychoticism | .39 | .36 | .75 | .06 |
| Somatization | .31 | .23 | 2.30\* | .18 |
| *N* | 419 | 935 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A8: Missing case analysis adverse psychological effects (Wave 5) on TBI (Wave 3). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .28 | -.09 | .01 |
| Fighting in School | .54 | .58 | -1.50 | .09 |
| Exposure to Violence | .47 | .35 | 5.94\* | .34 |
| Psychopathy | 1.67 | 1.54 | 2.96\* | .17 |
| Impulsivity | 3.15 | 2.97 | 3.40\* | .19 |
| Moral Disengagement | 1.64 | 1.60 | 1.81 | .10 |
| *Lagged Endogenous Variables* (Wave 3) |  |  |  |  |
| TBI | .18 | .09 | 2.61\* | .16 |
| *Adverse Psychological Effects* (Wave 5) |  |  |  |  |
| Anxiety | .34 | .30 | 1.11 | .08 |
| Depression | .41 | .39 | .67 | .05 |
| Hostility | .49 | .43 | 1.48 | .10 |
| Impulsivity | 2.88 | 2.61 | 4.86\* | .28 |
| Interpersonal Sensitivity | .31 | .28 | .62 | .04 |
| Moral Disengagement | 1.49 | 1.39 | 4.89\* | .29 |
| Obsessive Compulsive Disorder | .59 | .54 | 1.18 | .08 |
| Paranoia | .64 | .57 | 1.34 | .09 |
| Phobia | .17 | .16 | .45 | .03 |
| Psychoticism | .35 | .29 | 1.50 | .10 |
| Somatization | .25 | .24 | .36 | .03 |
| *N* | 500 | 854 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A9: Missing case analysis adverse psychological effects (Wave 6) on TBI (Wave 3). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.65 | .04 |
| Fighting in School | .55 | .57 | -.68 | .04 |
| Exposure to Violence | .46 | .35 | 5.06\* | .28 |
| Psychopathy | 1.66 | 1.55 | 2.60\* | .15 |
| Impulsivity | 3.12 | 2.99 | 2.52\* | .14 |
| Moral Disengagement | 1.64 | 1.61 | 1.58 | .09 |
| *Lagged Endogenous Variables* (Wave 3) |  |  |  |  |
| TBI | .17 | .09 | 2.28\* | .14 |
| *Adverse Psychological Effects* (Wave 6) |  |  |  |  |
| Anxiety | .32 | .32 | .06 | .01 |
| Depression | .38 | .36 | .52 | .04 |
| Hostility | .50 | .44 | 1.37 | .09 |
| Impulsivity | 2.85 | 2.61 | 4.24\* | .25 |
| Interpersonal Sensitivity | .31 | .26 | 1.59 | .11 |
| Moral Disengagement | 1.46 | 1.37 | 4.44\* | .26 |
| Obsessive Compulsive Disorder | .58 | .56 | .40 | .03 |
| Paranoia | .65 | .57 | 1.66 | .11 |
| Phobia | .20 | .14 | 1.89 | .13 |
| Psychoticism | .34 | .31 | .86 | .06 |
| Somatization | .26 | .22 | 1.25 | .08 |
| *N* | 527 | 827 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A10: Missing case analysis adverse psychological effects (Wave 7) on TBI (Wave 3). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.66 | .04 |
| Fighting in School | .54 | .57 | -.92 | .06 |
| Exposure to Violence | .45 | .36 | 4.31\* | .25 |
| Psychopathy | 1.65 | 1.56 | 2.16\* | .12 |
| Impulsivity | 3.14 | 2.98 | 3.06\* | .17 |
| Moral Disengagement | 1.63 | 1.61 | 1.08 | .06 |
| *Lagged Endogenous Variables* (Wave 3) |  |  |  |  |
| TBI | .17 | .10 | 1.96 | .12 |
| *Adverse Psychological Effects* (Wave 7) |  |  |  |  |
| Anxiety | .35 | .33 | .55 | .04 |
| Depression | .44 | .38 | 1.24 | .09 |
| Hostility | .49 | .47 | .54 | .04 |
| Impulsivity | 2.83 | 2.56 | 4.67\* | .28 |
| Interpersonal Sensitivity | .28 | .27 | .20 | .01 |
| Moral Disengagement | 1.43 | 1.35 | 3.87\* | .23 |
| Obsessive Compulsive Disorder | .60 | .54 | 1.24 | .09 |
| Paranoia | .66 | .61 | .78 | .06 |
| Phobia | .17 | .19 | -.77 | .06 |
| Psychoticism | .34 | .30 | 1.20 | .09 |
| Somatization | .27 | .25 | .39 | .03 |
| *N* | 488 | 866 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A11: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 3). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.54 | .03 |
| Fighting in School | .56 | .56 | .13 | .01 |
| Exposure to Violence | .47 | .36 | 5.26\* | .31 |
| Psychopathy | 1.66 | 1.56 | 2.23\* | .13 |
| Impulsivity | 3.10 | 3.01 | 1.59 | .09 |
| Moral Disengagement | 1.64 | 1.61 | 1.85 | .11 |
| *Lagged Endogenous Variables* (Wave 3) |  |  |  |  |
| TBI | .18 | .10 | 2.09\* | .13 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .32 | .32 | -.06 | .01 |
| Depression | .35 | .38 | -.67 | .05 |
| Hostility | .43 | .41 | .48 | .04 |
| Impulsivity | 2.75 | 2.56 | 3.28\* | .20 |
| Interpersonal Sensitivity | .26 | .26 | -.05 | .01 |
| Moral Disengagement | 1.43 | 1.34 | 4.20\* | .26 |
| Obsessive Compulsive Disorder | .52 | .55 | -.66 | .05 |
| Paranoia | .61 | .61 | -.03 | .01 |
| Phobia | .16 | .13 | .84 | .06 |
| Psychoticism | .30 | .30 | .09 | .01 |
| Somatization | .21 | .20 | .30 | .02 |
| *N* | 428 | 926 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A12: Missing case analysis adverse psychological effects (Wave 5) on TBI (Wave 4). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .28 | .10 | .01 |
| Fighting in School | .54 | .58 | -1.44 | .09 |
| Exposure to Violence | .47 | .35 | 5.99\* | .34 |
| Psychopathy | 1.67 | 1.54 | 3.12\* | .18 |
| Impulsivity | 3.16 | 2.96 | 3.70\* | .21 |
| Moral Disengagement | 1.64 | 1.60 | 2.09\* | .12 |
| *Lagged Endogenous Variables* (Wave 4) |  |  |  |  |
| TBI | .15 | .13 | .62 | .04 |
| *Adverse Psychological Effects* (Wave 5) |  |  |  |  |
| Anxiety | .35 | .29 | 1.65 | .12 |
| Depression | .43 | .37 | 1.42 | .10 |
| Hostility | .49 | .43 | 1.59 | .11 |
| Impulsivity | 2.87 | 2.61 | 4.85\* | .28 |
| Interpersonal Sensitivity | .31 | .28 | .74 | .05 |
| Moral Disengagement | 1.49 | 1.39 | 5.05\* | .29 |
| Obsessive Compulsive Disorder | .60 | .53 | 1.41 | .10 |
| Paranoia | .63 | .58 | .94 | .07 |
| Phobia | .17 | .16 | .47 | .03 |
| Psychoticism | .35 | .28 | 2.04\* | .14 |
| Somatization | .26 | .22 | .94 | .07 |
| *N* | 524 | 830 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A13: Missing case analysis adverse psychological effects (Wave 6) on TBI (Wave 4). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .29 | -.40 | .02 |
| Fighting in School | .55 | .57 | -.86 | .05 |
| Exposure to Violence | .46 | .35 | 5.06\* | .28 |
| Psychopathy | 1.66 | 1.54 | 2.68\* | .15 |
| Impulsivity | 3.13 | 2.98 | 2.81\* | .16 |
| Moral Disengagement | 1.64 | 1.60 | 1.65 | .09 |
| *Lagged Endogenous Variables* (Wave 4) |  |  |  |  |
| TBI | .17 | .11 | 1.71 | .10 |
| *Adverse Psychological Effects* (Wave 6) |  |  |  |  |
| Anxiety | .32 | .31 | .15 | .01 |
| Depression | .37 | .37 | .12 | .01 |
| Hostility | .50 | .44 | 1.34 | .09 |
| Impulsivity | 2.85 | 2.61 | 4.42\* | .26 |
| Interpersonal Sensitivity | .31 | .26 | 1.39 | .10 |
| Moral Disengagement | 1.46 | 1.37 | 4.99\* | .29 |
| Obsessive Compulsive Disorder | .58 | .56 | .37 | .03 |
| Paranoia | .64 | .57 | 1.45 | .10 |
| Phobia | .20 | .14 | 1.88 | .13 |
| Psychoticism | .34 | .32 | .56 | .04 |
| Somatization | .26 | .21 | 1.51 | .10 |
| *N* | 546 | 808 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

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| --- | --- | --- | --- | --- |
| Table A14: Missing case analysis adverse psychological effects (Wave 7) on TBI (Wave 4). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .80 | -.23 | .01 |
| Fighting in School | .55 | .57 | -.75 | .05 |
| Exposure to Violence | .45 | .36 | 4.40\* | .25 |
| Psychopathy | 1.66 | 1.55 | 2.60\* | .15 |
| Impulsivity | 3.15 | 2.97 | 3.39\* | .19 |
| Moral Disengagement | 1.64 | 1.61 | 1.55 | .09 |
| *Lagged Endogenous Variables* (Wave 4) |  |  |  |  |
| TBI | .19 | .10 | 2.36\* | .14 |
| *Adverse Psychological Effects* (Wave 7) |  |  |  |  |
| Anxiety | .35 | .33 | .57 | .04 |
| Depression | .45 | .37 | 1.67 | .12 |
| Hostility | .51 | .45 | 1.31 | .09 |
| Impulsivity | 2.83 | 2.55 | 4.84\* | .29 |
| Interpersonal Sensitivity | .29 | .25 | .96 | .07 |
| Moral Disengagement | 1.43 | 1.35 | 3.93\* | .23 |
| Obsessive Compulsive Disorder | .61 | .53 | 1.73 | .12 |
| Paranoia | .64 | .61 | .74 | .05 |
| Phobia | .18 | .18 | -.01 | .01 |
| Psychoticism | .34 | .30 | .90 | .07 |
| Somatization | .27 | .24 | .97 | .07 |
| *N* | 497 | 857 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A15: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 4). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .29 | -.31 | .02 |
| Fighting in School | .55 | .56 | -.14 | .01 |
| Exposure to Violence | .47 | .36 | 5.29\* | .31 |
| Psychopathy | 1.68 | 1.55 | 2.99\* | .17 |
| Impulsivity | 3.08 | 3.01 | 1.24 | .07 |
| Moral Disengagement | 1.65 | 1.60 | 2.11\* | .12 |
| *Lagged Endogenous Variables* (Wave 4) |  |  |  |  |
| TBI | .17 | .12 | 1.45 | .09 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .32 | .32 | .04 | .01 |
| Depression | .35 | .37 | -.44 | .04 |
| Hostility | .43 | .40 | .71 | .06 |
| Impulsivity | 2.75 | 2.55 | 3.41\* | .21 |
| Interpersonal Sensitivity | .27 | .25 | .36 | .03 |
| Moral Disengagement | 1.42 | 1.34 | 4.32\* | .26 |
| Obsessive Compulsive Disorder | .53 | .54 | -.12 | .01 |
| Paranoia | .62 | .60 | .40 | .03 |
| Phobia | .16 | .12 | 1.34 | .10 |
| Psychoticism | .30 | .30 | .16 | .01 |
| Somatization | .22 | .20 | .60 | .05 |
| *N* | 449 | 905 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A16: Missing case analysis adverse psychological effects (Wave 6) on TBI (Wave 5). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .28 | -.18 | .01 |
| Fighting in School | .54 | .58 | -1.50 | .09 |
| Exposure to Violence | .45 | .35 | 5.09\* | .28 |
| Psychopathy | 1.64 | 1.55 | 2.17\* | .12 |
| Impulsivity | 3.12 | 2.98 | 2.63\* | .15 |
| Moral Disengagement | 1.63 | 1.61 | 1.42 | .08 |
| *Lagged Endogenous Variables* (Wave 5) |  |  |  |  |
| TBI | .09 | .03 | 2.88\* | .17 |
| *Adverse Psychological Effects* (Wave 6) |  |  |  |  |
| Anxiety | .32 | .32 | -.08 | .01 |
| Depression | .37 | .37 | .09 | .01 |
| Hostility | .50 | .44 | 1.42 | .10 |
| Impulsivity | 2.84 | 2.61 | 4.25\* | .25 |
| Interpersonal Sensitivity | .30 | .27 | 1.02 | .07 |
| Moral Disengagement | 1.46 | 1.37 | 4.99\* | .29 |
| Obsessive Compulsive Disorder | .57 | .56 | .15 | .01 |
| Paranoia | .64 | .58 | 1.18 | .08 |
| Phobia | .20 | .14 | 1.93 | .13 |
| Psychoticism | .34 | .10 | .93 | .07 |
| Somatization | .26 | .22 | 1.29 | .09 |
| *N* | 562 | 792 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A17: Missing case analysis adverse psychological effects (Wave 7) on TBI (Wave 5). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.44 | .03 |
| Fighting in School | .53 | .58 | -1.67 | .10 |
| Exposure to Violence | .45 | .36 | 4.50\* | .25 |
| Psychopathy | 1.66 | 1.55 | 2.55\* | .14 |
| Impulsivity | 3.15 | 2.97 | 3.28\* | .18 |
| Moral Disengagement | 1.63 | 1.61 | 1.29 | .07 |
| *Lagged Endogenous Variables* (Wave 5) |  |  |  |  |
| TBI | .09 | .04 | 2.31\* | .14 |
| *Adverse Psychological Effects* (Wave 7) |  |  |  |  |
| Anxiety | .36 | .31 | 1.24 | .09 |
| Depression | .45 | .36 | 2.25\* | .16 |
| Hostility | .52 | .43 | 2.07\* | .15 |
| Impulsivity | 2.83 | 2.55 | 4.95\* | .29 |
| Interpersonal Sensitivity | .30 | .24 | 1.64 | .12 |
| Moral Disengagement | 1.43 | 1.35 | 4.11\* | .24 |
| Obsessive Compulsive Disorder | .61 | .52 | 1.99\* | .14 |
| Paranoia | .67 | .57 | 2.00\* | .14 |
| Phobia | .18 | .10 | .52 | .04 |
| Psychoticism | .35 | .29 | 1.57 | .11 |
| Somatization | .27 | .24 | .88 | .06 |
| *N* | 518 | 836 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A18: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 5). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .29 | -.32 | .02 |
| Fighting in School | .54 | .57 | 1.26 | .08 |
| Exposure to Violence | .47 | .35 | 5.63\* | .33 |
| Psychopathy | 1.65 | 1.56 | 2.23\* | .13 |
| Impulsivity | 3.09 | 3.01 | 1.39 | .08 |
| Moral Disengagement | 1.64 | 1.61 | 1.73 | .10 |
| *Lagged Endogenous Variables* (Wave 5) |  |  |  |  |
| TBI | .10 | .04 | 2.50\* | .16 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .33 | .30 | .61 | .05 |
| Depression | .36 | .36 | .11 | .01 |
| Hostility | .44 | .38 | 1.53 | .12 |
| Impulsivity | 2.72 | 2.57 | 2.57\* | .16 |
| Interpersonal Sensitivity | .26 | .25 | .35 | .03 |
| Moral Disengagement | 1.42 | 1.34 | 4.01\* | .24 |
| Obsessive Compulsive Disorder | .54 | .52 | .32 | .03 |
| Paranoia | .62 | .59 | .50 | .04 |
| Phobia | .16 | .13 | .96 | .08 |
| Psychoticism | .31 | .28 | .77 | .06 |
| Somatization | .22 | .19 | .88 | .07 |
| *N* | 460 | 894 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A19: Missing case analysis adverse psychological effects (Wave 7) on TBI (Wave 6). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.54 | .03 |
| Fighting in School | .54 | .57 | -1.11 | .07 |
| Exposure to Violence | .45 | .36 | 4.20\* | .24 |
| Psychopathy | 1.65 | 1.55 | 2.13\* | .12 |
| Impulsivity | 3.15 | 2.97 | 3.39\* | .19 |
| Moral Disengagement | 1.63 | 1.61 | 1.36 | .08 |
| *Lagged Endogenous Variables* (Wave 6) |  |  |  |  |
| TBI | .08 | .07 | .27 | .02 |
| *Adverse Psychological Effects* (Wave 7) |  |  |  |  |
| Anxiety | .35 | .32 | .78 | .06 |
| Depression | .44 | .37 | 1.62 | .12 |
| Hostility | .51 | .44 | 1.54 | .11 |
| Impulsivity | 2.84 | 2.54 | 5.18\* | .30 |
| Interpersonal Sensitivity | .29 | .25 | 1.12 | .08 |
| Moral Disengagement | 1.43 | 1.35 | 4.18\* | .25 |
| Obsessive Compulsive Disorder | .61 | .53 | 1.59 | .11 |
| Paranoia | .66 | .58 | 1.55 | .11 |
| Phobia | .18 | .17 | .27 | .02 |
| Psychoticism | .34 | .30 | 1.18 | .09 |
| Somatization | .27 | .25 | .62 | .05 |
| *N* | 521 | 833 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A20: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 6). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .27 | .29 | -.50 | .03 |
| Fighting in School | .54 | .57 | -.92 | .06 |
| Exposure to Violence | .47 | .36 | 5.22\* | .30 |
| Psychopathy | 1.65 | 1.56 | 1.92 | .11 |
| Impulsivity | 3.08 | 3.01 | 1.31 | .08 |
| Moral Disengagement | 1.64 | 1.61 | 1.70 | .10 |
| *Lagged Endogenous Variables* (Wave 6) |  |  |  |  |
| TBI | .08 | .07 | .62 | .04 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .33 | .30 | .64 | .05 |
| Depression | .36 | .36 | -.11 | .01 |
| Hostility | .43 | .39 | .93 | .07 |
| Impulsivity | 2.73 | 2.57 | 2.67\* | .16 |
| Interpersonal Sensitivity | .26 | .25 | .24 | .02 |
| Moral Disengagement | 1.41 | 1.34 | 3.59\* | .22 |
| Obsessive Compulsive Disorder | .53 | .53 | .01 | .01 |
| Paranoia | .63 | .58 | .77 | .06 |
| Phobia | .16 | .13 | .88 | .07 |
| Psychoticism | .31 | .28 | .72 | .06 |
| Somatization | .22 | .19 | .63 | .05 |
| *N* | 461 | 893 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table A21: Missing case analysis adverse psychological effects (Wave 8) on TBI (Wave 7). | | | | |
|  | Analytical Sample | Full Sample | *t-value* | *Cohen’s d* |
|  |  |  |
| *Exogenous Variables* (Wave 1) |  |  |  |  |
| Sports Involvement | .28 | .28 | -.09 | .01 |
| Fighting in School | .53 | .58 | -1.45 | .09 |
| Exposure to Violence | .47 | .35 | 5.58\* | .32 |
| Psychopathy | 1.65 | 1.56 | 2.15\* | .12 |
| Impulsivity | 3.09 | 3.01 | 1.35 | .08 |
| Moral Disengagement | 1.64 | 1.61 | 1.78 | .10 |
| *Lagged Endogenous Variables* (Wave 7) |  |  |  |  |
| TBI | .06 | .04 | .69 | .04 |
| *Adverse Psychological Effects* (Wave 8) |  |  |  |  |
| Anxiety | .32 | .31 | .21 | .03 |
| Depression | .36 | .37 | -.17 | .01 |
| Hostility | .43 | .40 | .67 | .05 |
| Impulsivity | 2.73 | 2.57 | 2.75\* | .17 |
| Interpersonal Sensitivity | .25 | .27 | -.32 | .03 |
| Moral Disengagement | 1.42 | 1.33 | 4.44\* | .27 |
| Obsessive Compulsive Disorder | .53 | .54 | -.18 | .01 |
| Paranoia | .63 | .59 | .72 | .06 |
| Phobia | .16 | .13 | 1.08 | .09 |
| Psychoticism | .31 | .28 | .72 | .06 |
| Somatization | .22 | .19 | .67 | .05 |
| *N* | 467 | 887 |  |  |
| *Notes: N*-size varies between *t*-tests. All variances were recoded for the exogenous and lagged endogenous variables prior to the estimation of the missing case analysis. | | | | |
| *\*p < .05* | | | | |

**Appendix B: Head Injury Questionnaire from the Pathways to Desistance Data**

1. In the past N months, have you had a head injury where you lost consciousness (were knocked out or passed out) or where you needed medical treatment (e.g. stitches)?
2. Did you require medical treatment (the first time you had a head injury in the past N months)?
3. What kind of medical treatment did you receive the first time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
4. Did you have seizures as a result of this injury (the first time in the past N months)?
5. Have you has any other head injuries in the past N months?
6. Did you require medical treatment (the second time you had a head injury in the past N months)?
7. What kind of medical treatment did you receive the second time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
8. Did you have seizures as a result of this injury (the second time in the past N months)?
9. Have you had any other head injuries in the past N months?
10. Did you require medical treatment (the third time you had a head injury in the past N months)?
11. What kind of medical treatment did you receive the third time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
12. Did you have seizures as a result of this injury (the third time in the past N months)?
13. Have you had any other head injuries in the past N months?
14. Did you require medical treatment (the fourth time you had a head injury in the past N months)?
15. What kind of medical treatment did you receive the fourth time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
16. Did you have seizures as a result of this injury (the fourth time in the past N months)?
17. Have you had any other head injuries in the past N months?
18. Did you require medical treatment (the fifth time you had a head injury in the past N months)?
19. What kind of medical treatment did you receive the fifth time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
20. Did you have seizures as a result of this injury (the fifth time in the past N months)?
21. Have you had any other head injuries in the past N months?
22. Did you require medical treatment (the sixth time you had a head injury in the past N months)?
23. What kind of medical treatment did you receive the fifth time you had a head injury in the past N months? Open-ended interview item. Answer does not appear in SPSS.
24. Did you have seizures as a result of this injury (the sixth time in the past N months)?
25. Total number of head injuries (max of 6)\_\_\_\_\_.
26. Did any of the head injuries you mentioned occur during Month 1?
27. Did any of the head injuries you mentioned occur during Month 2?
28. Did any of the head injuries you mentioned occur during Month 3?
29. Did any of the head injuries you mentioned occur during Month 4?
30. Did any of the head injuries you mentioned occur during Month 5?
31. Did any of the head injuries you mentioned occur during Month 6?
32. Did any of the head injuries you mentioned occur during Month 7?
33. Did any of the head injuries you mentioned occur during Month 8?
34. Did any of the head injuries you mentioned occur during Month 9?
35. Did any of the head injuries you mentioned occur during Month 10?
36. Did any of the head injuries you mentioned occur during Month 11?
37. Did any of the head injuries you mentioned occur during Month 12?
38. Did any of the head injuries you mentioned occur during Month 13?
39. Did any of the head injuries you mentioned occur during Month 14?

**Appendix C: Moral Disengagement Questionnaire**

Circle the number that shows how much you agree with each statement.

(1) Disagree

(2) Neither Agree nor Disagree

(3) Agree

1. It is alright to protect your friends.
2. Slapping and shoving someone is just a way of joking.
3. Damaging some property is no big deal when you consider that others are beating people up.
4. A kid in a gang should not be blamed for the trouble the gang causes.
5. Kids are living under bad conditions they cannot be blamed for behaving aggressively.
6. It is okay to tell small lies because they don't really do any harm.
7. Some people deserve to be treated like animals.
8. If kids fight and misbehave in school it is their teacher's fault.
9. It is alright to beat someone who bad mouths your family.
10. To hit obnoxious classmates is just giving them 'a lesson.'
11. Stealing some money is not too serious compared to those who steal a lot of money.
12. A kid who suggests breaking rules should not be blamed if other kids go ahead and do it.
13. If kids are not disciplined they should not be blamed for misbehaving.
14. Children do not mind being teased because it shows interest in them.
15. It is okay to treat badly somebody who behaved like a 'worm' or a 'low life.'
16. If people are careless where they leave their things it is their own fault it they get stolen.
17. It is alright to fight when your group's honor is threatened.
18. Taking someone's bicycle without their permission is just 'borrowing it.'
19. It is okay to insult a classmate because beating him/her is worse.
20. If a group decides together to do something harmful it is unfair to blame any kids in the group for it.
21. Kids cannot be blamed for using bad words when all their friends do it.
22. Teasing someone does not really hurt them.
23. Someone who is obnoxious does not deserve to be treated like a human being.
24. Kids who get mistreated usually do things that deserve it.
25. It is alright to lie to keep your friends out of trouble.
26. It is not a bad thing to 'get high' once in a while.
27. Compared to the illegal things people do, taking some things from a store without paying for them is not very serious.
28. It is unfair to blame a child who had a small part in the harm caused by a gang.
29. Kids cannot be blamed for misbehaving if their friends pressured them to do it.
30. Insults among children do not hurt anyone.
31. Some people have to be treated roughly because they lack feelings that can be hurt.
32. Children are not at fault for misbehaving if their parents force them too much.

**Appendix D: Exposure to Violence-Victim Questionnaire**

Indicate if you have experienced the following events.

**Victim:**

1. In the past N months, have you been chased where you thought you might be seriously hurt? Earlier you said you had been chased where you thought you could seriously get hurt. How many times has this happened?
2. In the past N months, have you been beaten up, mugged, or seriously threatened by another person? Earlier you said you had been beaten up, mugged, or seriously threatened by another person. How many times has this happened?
3. In the past N months, have you been raped, had someone attempt to rape you or been sexually attacked in some other way? Earlier you said you had been raped, had someone attempt to rape you or been sexually attacked in some other way. Present but no data. Has this happened more than one time? =(1) Yes =(5) No
4. How is the person that did this related to the subject? =(1) Family member =(2) Friend/acquaintance =(3) Stranger
5. Where did this happen? =(1) At home =(2) At school =(3) In his/her neighborhood =(4) Other (specify) Specify "other" location.
6. In the past N months, have you been attacked with a weapon, like a knife, box cutter, or bat? Earlier you said you had been attacked with a weapon, like a knife, box cutter, or bat. How many times has this happened?
7. In the past N months, have you been shot at? Earlier you said you had been shot at. How many times has this happened?
8. In the past N months, have you been shot? Earlier you said you had been shot. How many times has this happened?

**Appendix E: Full Model Results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table E1: Full SEM of adverse psychological effects (Wave 3) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 3)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.457 | .150 | .818 | 1.162,1.752 | < .001 |
| Depression | 1.594 | .170 | .801 | 1.260,1.927 | < .001 |
| Hostility | 1.920 | .192 | .830 | 1.544,2.296 | < .001 |
| Interpersonal Sensitivity | 1.348 | .144 | .752 | 1.067,1.630 | < .001 |
| Obsessive Compulsive Disorder | 1.967 | .197 | .828 | 1.581,2.353 | < .001 |
| Paranoia | 1.735 | .177 | .769 | 1.389,2.082 | < .001 |
| Phobia | 1.031 | .126 | .651 | .785,1.278 | < .001 |
| Psychoticism | 1.593 | .165 | .861 | 1.269,1.917 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 5.532 | .627 | .700 | 4.304,6.761 | < .001 |
| Moral Disengagement | 1.704 | .201 | .552 | 1.311,2.097 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.089 | .037 | -.155 | -.272,-.038 | .016 |
| Fighting in School (Wave 1) | .158 | .048 | .255 | .121,.389 | .001 |
| Exposure to Violence (Wave 1) | .327 | .084 | .442 | .253,.630 | < .001 |
| Psychopathy (Wave 1) | .066 | .030 | .173 | .016,.329 | .029 |
| *Adverse Psychological Effects* (DV: Wave 3) |  |  |  |  |  |
| TBI (Wave 2) | .227 | .057 | .589 | .395,.784 | < .001 |
| Impulsivity (Wave 1) | .040 | .007 | .363 | .257,.469 | < .001 |
| Moral Disengagement (Wave 1) | .058 | .019 | .186 | .074,.299 | .002 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Psychopathy (Wave 1) | .084 | .012 | .309 | .060,.108 | < .001 |
| Exposure to Violence, Impulsivity (Wave 1) | .107 | .017 | .297 | .074,.139 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .036 | .006 | .278 | .024,.047 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .114 | .016 | .345 | .083,.145 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .167 | .033 | .238 | .103,.231 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .088 | .013 | .352 | .063,.113 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .015 | .011 | .071 | -.006,.036 | .157 |
| Anxiety, Phobia (Wave 3) | .043 | .035 | .504 | -.026,.112 | .217 |
| Anxiety, Somatization (Wave 3) | .043 | .032 | .466 | -.020,.105 | .185 |
| Depression, Phobia (Wave 3) | .003 | .033 | .028 | -.061,.067 | .931 |
| Depression, Psychoticism (Wave 3) | .028 | .036 | .358 | -.043,.098 | .437 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .058 | .010 | .838 | .039,.078 | < .001 |
| Adverse Psychological Effects | .004 | .002 | .326 | .001,.007 | .021 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2453.342 (*p* < .001) | | | | |
| Model *X2* | 219.445 (*p* < .001) | | | | |
| CFI | .958 | | | | |
| RMSEA (90%CI) | .042 (.033, .051) | | | | |
| SRMR | .091 | | | | |
| N | 438 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table E2: Full SEM of adverse psychological effects (Wave 4) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 4)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.351 | .125 | .812 | 1.107,1.596 | < .001 |
| Depression | 1.582 | .151 | .786 | 1.285,1.879 | < .001 |
| Hostility | 1.787 | .161 | .822 | 1.472,2.103 | < .001 |
| Interpersonal Sensitivity | 1.478 | .138 | .812 | 1.208,1.747 | < .001 |
| Obsessive Compulsive Disorder | 1.921 | .173 | .848 | 1.582,2.260 | < .001 |
| Paranoia | 1.698 | .146 | .733 | 1.412,1.985 | < .001 |
| Phobia | .944 | .094 | .714 | .759,1.128 | < .001 |
| Psychoticism | 1.485 | .140 | .827 | 1.211,1.758 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 6.883 | .748 | .761 | 5.416,8.350 | < .001 |
| Moral Disengagement | 1.877 | .215 | .525 | 1.457,2.298 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.067 | .067 | -.048 | -.142,.046 | .315 |
| Fighting in School (Wave 1) | .216 | .079 | .144 | .038,.250 | .006 |
| Exposure to Violence (Wave 1) | .075 | .132 | .043 | -.105,.191 | .567 |
| Psychopathy (Wave 1) | .150 | .050 | .163 | .049,.276 | .003 |
| *Adverse Psychological Effects* (DV: Wave 4) |  |  |  |  |  |
| TBI (Wave 2) | .028 | .011 | .204 | .083,.325 | .010 |
| Exposure to Violence (Wave 1) | .090 | .013 | .372 | .286,.459 | < .001 |
| Impulsivity (Wave 1) | .054 | .007 | .541 | .431,.651 | < .001 |
| Moral Disengagement (Wave 1) | .057 | .017 | .207 | .092,.323 | .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Psychopathy (Wave 1) | .088 | .013 | .316 | .063,.113 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .118 | .015 | .376 | .089,.147 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .208 | .029 | .309 | .151,.265 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .087 | .012 | .354 | .062,.111 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.004 | .009 | -.020 | -.023,.014 | .650 |
| Anxiety, Phobia (Wave 4) | .026 | .027 | .372 | -.027,.079 | .330 |
| Anxiety, Somatization (Wave 4) | .044 | .029 | .476 | -.014,.101 | .139 |
| Depression, Psychoticism (Wave 4) | .049 | .033 | .496 | -.015,.113 | .134 |
| Paranoia, Somatization (Wave 4) | -.004 | .025 | -.025 | -.052,.045 | .878 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .070 | .011 | .891 | .049,.091 | < .001 |
| Adverse Psychological Effects | .003 | .001 | .369 | .001,.005 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 3076.088 (*p* < .001) | | | | |
| Model *X2* | 259.040 (*p* < .001) | | | | |
| CFI | .954 | | | | |
| RMSEA (90%CI) | .051 (.042, .059) | | | | |
| SRMR | .065 | | | | |
| N | 425 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E3: Full SEM of adverse psychological effects (Wave 5) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 5)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.220 | .119 | .796 | .998,1.453 | < .001 |
| Depression | 1.551 | .149 | .796 | .988,1.453 | < .001 |
| Hostility | 1.572 | .158 | .780 | 1.263,1.882 | < .001 |
| Interpersonal Sensitivity | 1.163 | .117 | .654 | .933,1.393 | < .001 |
| Obsessive Compulsive Disorder | 1.889 | .178 | .849 | 1.541,2.238 | < .001 |
| Paranoia | 1.740 | .155 | .610 | 1.437,2.043 | < .001 |
| Phobia | .741 | .082 | .656 | .580,.902 | < .001 |
| Psychoticism | 1.407 | .139 | .782 | 1.134,1.679 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 9.037 | 1.213 | .752 | 6.659,11.414 | < .001 |
| Moral Disengagement | 2.675 | .353 | .577 | 1.985,3.366 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.001 | .057 | .001 | -.088,.087 | .994 |
| Fighting in School (Wave 1) | .124 | .066 | .086 | -.004,.176 | .058 |
| Exposure to Violence (Wave 1) | .294 | .103 | .173 | .048,.299 | .005 |
| Psychopathy (Wave 1) | .007 | .037 | .008 | -.078.094 | .858 |
| *Adverse Psychological Effects* (DV: Wave 5) |  |  |  |  |  |
| TBI (Wave 2) | .005 | .005 | .040 | -.046,.126 | .367 |
| Exposure to Violence (Wave 1) | .028 | .011 | .139 | .038,.240 | .009 |
| Impulsivity (Wave 1) | .029 | .005 | .363 | .251,.475 | < .001 |
| Moral Disengagement (Wave 1) | .034 | .013 | .156 | .047,.265 | .007 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .103 | .015 | .288 | .074,.132 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .259 | .023,.044 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .092 | .012 | .328 | .069,.116 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .124 | .015 | .371 | .095,.152 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .181 | .303 | .251 | .122,.239 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .083 | .012 | .318 | .060,.107 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .002 | .009 | .011 | -.016,.021 | .800 |
| Anxiety, Phobia (Wave 5) | .017 | .021 | .229 | -.025,.059 | .424 |
| Depression, Psychoticism (Wave 5) | .057 | .039 | .389 | -.020,.134 | .145 |
| Depression, Somatization (Wave 5) | -.007 | .030 | -.047 | -.065,.052 | .825 |
| Hostility, Phobia (Wave 5) | -.016 | .023 | -.158 | -.060,.028 | .481 |
| Paranoia, Somatization (Wave 5) | -.020 | .026 | -.135 | -.072,.032 | .448 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .088 | .014 | .939 | .062,.115 | < .001 |
| Adverse Psychological Effects | .004 | .001 | .737 | .002,.006 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2482.913 (*p* < .001) | | | | |
| Model *X2* | 196.779 (*p* < .001) | | | | |
| CFI | .967 | | | | |
| RMSEA (90%CI) | .035 (.026, .044) | | | | |
| SRMR | .052 | | | | |
| N | 512 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E4: Full SEM of adverse psychological effects (Wave 6) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 6)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.095 | .107 | .812 | .885,1.305 | < .001 |
| Depression | 1.307 | .127 | .799 | 1.058,1.555 | < .001 |
| Hostility | 1.364 | .132 | .781 | 1.106,1.622 | < .001 |
| Interpersonal Sensitivity | 1.170 | .113 | .788 | .950,1.391 | < .001 |
| Obsessive Compulsive Disorder | 1.642 | .150 | .859 | 1.349,1.935 | < .001 |
| Paranoia | 1.526 | .137 | .783 | 1.258,1.795 | < .001 |
| Phobia | .879 | .094 | .701 | .695,1.062 | < .001 |
| Psychoticism | 1.204 | .117 | .822 | .976,1.433 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 6.900 | .794 | .781 | 5.344,8.457 | < .001 |
| Moral Disengagement | 1.533 | .182 | .497 | 1.176,1.891 | < .001 |
| BSI | 1.000 | -- |  | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .002 | .058 | .001 | -.081,.083 | .978 |
| Fighting in School (Wave 1) | .081 | .067 | .052 | -.033,.137 | .226 |
| Exposure to Violence (Wave 1) | .163 | .109 | .090 | -.030,.209 | .136 |
| Psychopathy (Wave 1) | .066 | .047 | .071 | -.030,.171 | .163 |
| *Adverse Psychological Effects* (DV: Wave 6) |  |  |  |  |  |
| TBI (Wave 2) | .006 | .007 | .041 | -.044,.126 | .355 |
| Exposure to Violence (Wave 1) | .029 | .015 | .104 | .003,.206 | .048 |
| Fighting in School (Wave 1) | .045 | .010 | .188 | .113,.263 | < .001 |
| Impulsivity (Wave 1) | .053 | .008 | .483 | .374,.592 | < .001 |
| Moral Disengagement (Wave 1) | .035 | .017 | .115 | .008,.222 | .039 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .111 | .015 | .304 | .081,.141 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .035 | .005 | .268 | .025,.045 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .089 | .012 | .323 | .066,.112 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .128 | .014 | .381 | .100,.156 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .218 | .027 | .305 | .165,.272 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .085 | .011 | .335 | .064,.106 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .013 | .009 | .060 | -.005,.031 | < .001 |
| Anxiety, Phobia (Wave 6) | .043 | .043 | .415 | -.042,.128 | .324 |
| Depression, Psychoticism (Wave 6) | .046 | .044 | .385 | -.041,.133 | .296 |
| Hostility, Paranoia (Wave 6) | .022 | .052 | .112 | -.081,.124 | .677 |
| Paranoia, Somatization (Wave 6) | -.013 | .042 | -.082 | -.096,.069 | .752 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .136 | .020 | .923 | .097,.174 | < .001 |
| Adverse Psychological Effects | .007 | .001 | .622 | .004,.010 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2520.819 (*p* < .001) | | | | |
| Model *X2* | 169.287 (*p* < .001) | | | | |
| CFI | .980 | | | | |
| RMSEA (90%CI) S | .027 (.017, .033) | | | | |
| SRMR | .049 | | | | |
| N | 531 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E5: Full SEM of adverse psychological effects (Wave 7) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 7)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.404 | .131 | .796 | 1.147,1.661 | < .001 |
| Depression | 1.622 | .148 | .783 | 1.331,1.913 | < .001 |
| Hostility | 1.611 | .149 | .773 | 1.319,1.903 | < .001 |
| Interpersonal Sensitivity | 1.388 | .130 | .813 | 1.133,1.643 | < .001 |
| Obsessive Compulsive Disorder | 1.947 | .178 | .811 | 1.599,2.296 | < .001 |
| Paranoia | 1.810 | .156 | .739 | 1.504,2.117 | < .001 |
| Phobia | .842 | .093 | .644 | .660,1.024 | < .001 |
| Psychoticism | 1.382 | .130 | .831 | 1.126,1.637 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 5.197 | .561 | .717 | 4.097,6.296 | < .001 |
| Moral Disengagement | 1.234 | .142 | .514 | .955,1.512 | < .001 |
| BSI | 1.000 | -- |  | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .031 | .060 | .024 | -.067,.115 | .606 |
| Fighting in School (Wave 1) | .113 | .068 | .078 | -.014,.170 | .096 |
| Exposure to Violence (Wave 1) | .219 | .118 | .127 | -.009,.263 | .064 |
| Psychopathy (Wave 1) | .036 | .049 | .041 | -.070,.153 | .467 |
| *Adverse Psychological Effects* (DV: Wave 7) |  |  |  |  |  |
| TBI (Wave 2) | .012 | .009 | .058 | -.019,.135 | .154 |
| Impulsivity (Wave 1) | .057 | .008 | .403 | .313,.493 | < .001 |
| Moral Disengagement (Wave 1) | .162 | .024 | .407 | .313,.500 | < .001 |
| Sports Involvement (Wave 1) | -.040 | .010 | -.147 | -.210,-.084 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .132 | .015 | .370 | .104,.161 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .041 | .005 | .324 | .031,.051 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .090 | .013 | .323 | .066,.115 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .093 | .015 | .286 | .063,.123 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .250 | .030 | .351 | .192,.309 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .094 | .011 | .370 | .072,.115 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.011 | .009 | -.048 | -.028,.007 | .248 |
| Anxiety, Phobia (Wave 7) | .035 | .035 | .343 | -.033,.104 | .312 |
| Depression, Phobia (Wave 7) | -.014 | .028 | -.116 | -.070,.041 | .612 |
| Depression, Psychoticism (Wave 7) | .030 | .036 | .258 | -.041,.101 | .415 |
| Depression, Somatization (Wave 7) | -.015 | .030 | -.109 | -.073,.043 | .612 |
| Paranoia, Somatization (Wave 7) | -.025 | .031 | -.144 | -.086,.035 | .411 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .078 | .012 | .811 | .055,.101 | < .001 |
| Adverse Psychological Effects | .010 | .002 | .549 | .006,.014 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2765.393 (*p* < .001) | | | | |
| Model *X2* | 225.515 (*p* < .001) | | | | |
| CFI | .960 | | | | |
| RMSEA (90%CI) S | .042 (.033, .050) | | | | |
| SRMR | .058 | | | | |
| N | 493 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E6: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 2). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.599 | .183 | .849 | 1.240,1.958 | < .001 |
| Depression | 1.843 | .207 | .860 | 1.437,2.249 | < .001 |
| Hostility | 1.235 | .139 | .664 | .961,1.508 | < .001 |
| Interpersonal Sensitivity | 1.442 | .174 | .753 | .102,1.782 | < .001 |
| Obsessive Compulsive Disorder | 2.028 | .221 | .824 | 1.596,2.460 | < .001 |
| Paranoia | 1.824 | .205 | .705 | .1423,2.226 | < .001 |
| Phobia | .898 | .115 | .670 | .673,1.124 | < .001 |
| Psychoticism | 1.490 | .171 | .805 | 1.155,1.825 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 9.413 | 1.354 | .707 | 6.759,12.067 | < .001 |
| Moral Disengagement | 2.121 | .340 | .449 | 1.455,2.786 | < .001 |
| BSI | 1.000 | -- |  | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 2) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .016 | .065 | .011 | -.079,.101 | .808 |
| Fighting in School (Wave 1) | .106 | .071 | .070 | -.023,.163 | .136 |
| Exposure to Violence (Wave 1) | .304 | .119 | .167 | .033,.300 | .011 |
| Psychopathy (Wave 1) | -.018 | .043 | -.020 | -.111,.071 | .671 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 2) | .003 | .005 | .027 | -.061,.114 | .551 |
| Impulsivity (Wave 1) | .022 | .005 | .298 | .181,.415 | < .001 |
| Moral Disengagement (Wave 1) | .092 | .017 | .434 | .308,.561 | < .001 |
| Fighting in School (Wave 1) | .043 | .010 | .269 | .165,.373 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .123 | .016 | .332 | .091,.155 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .031 | .005 | .240 | .021,.042 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .097 | .013 | .341 | .071,.123 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .110 | .016 | .328 | .078,.142 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .199 | .035 | .273 | .130,.268 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .090 | .012 | .349 | .066,.114 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.001 | .010 | -.002 | -.020,.019 | .966 |
| Hostility, Moral Disengagement (Wave 8) | .022 | .010 | .185 | .002,.042 | .032 |
| Moral Disengagement, Paranoia (Wave 8) | .017 | .011 | .104 | -.005,.038 | .136 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .074 | .013 | .933 | .048,.099 | < .001 |
| Adverse Psychological Effects | .003 | .001 | .562 | .001,.005 | .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1681.233 (*p* < .001) | | | | |
| Model *X2* | 163.075 (*p* < .001) | | | | |
| CFI | .974 | | | | |
| RMSEA (90%CI) S | .027 (.014, .037) | | | | |
| SRMR | .053 | | | | |
| N | 439 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E7: Full SEM of adverse psychological effects (Wave 4) on TBI (Wave 3). | | | | | |
| **Measurement Model (Wave 4)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.343 | .127 | .826 | 1.095,1.591 | < .001 |
| Depression | 1.514 | .149 | .783 | 1.222,1.806 | < .001 |
| Hostility | 1.655 | .145 | .734 | 1.370,1.939 | < .001 |
| Interpersonal Sensitivity | 1.453 | .138 | .818 | 1.182,1.724 | < .001 |
| Obsessive Compulsive Disorder | 1.898 | .175 | .857 | 1.555,2.242 | < .001 |
| Paranoia | 1.655 | .145 | .734 | 1.370,1.939 | < .001 |
| Phobia | .931 | .095 | .722 | .744,1.118 | < .001 |
| Psychoticism | 1.411 | .136 | .822 | 1.143,1.678 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 7.772 | .890 | .771 | 6.028,9.517 | < .001 |
| Moral Disengagement | 2.178 | .258 | .542 | 1.673,2.684 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 3) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.016 | .073 | -.011 | -.103,.082 | .822 |
| Fighting in School (Wave 1) | .026 | .074 | .016 | -.072,.103 | .725 |
| Exposure to Violence (Wave 1) | .420 | .137 | .219 | .073,.365 | .002 |
| Psychopathy (Wave 1) | -.004 | .058 | -.004 | -.115,.108 | .950 |
| *Adverse Psychological Effects* (DV: Wave 4) |  |  |  |  |  |
| TBI (Wave 3) | .017 | .007 | .148 | .044,.253 | .016 |
| Impulsivity (Wave 1) | .040 | .007 | .445 | .324,.567 | < .001 |
| Moral Disengagement (Wave 1) | .041 | .017 | .167 | .037,.298 | .015 |
| Exposure to Violence (Wave 1) | .020 | .014 | .091 | -.036,.219 | .165 |
| Psychopathy (Wave 1) | .021 | .007 | .180 | .062,.299 | .004 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .114 | .016 | .323 | .082,.146 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .036 | .006 | .278 | .025,.048 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .089 | .013 | .318 | .063,.115 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .116 | .015 | .375 | .087,.146 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .190 | .032 | .286 | .127,.252 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .084 | .013 | .346 | .059,.110 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.007 | .009 | -.035 | -.026,.011 | .437 |
| Anxiety, Phobia (Wave 4) | .023 | .028 | .337 | -.031,.077 | .404 |
| Anxiety, Somatization (Wave 4) | .040 | .030 | .461 | -.019,.100 | .184 |
| Depression, Psychoticism (Wave 4) | .050 | .033 | .509 | -.016,.115 | .136 |
| Paranoia, Somatization (Wave 4) | -.006 | .025 | -.044 | -.056,.044 | .800 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .077 | .012 | .918 | .053,.100 | < .001 |
| Adverse Psychological Effects | .004 | .001 | .521 | .002,.005 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2907.327 (*p* < .001) | | | | |
| Model *X2* | 169.773 (*p* < .001) | | | | |
| CFI | .982 | | | | |
| RMSEA (90%CI) | .031 (.019, .042) | | | | |
| SRMR | .054 | | | | |
| N | 419 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E8: Full SEM of adverse psychological effects (Wave 5) on TBI (Wave 3). | | | | | |
| **Measurement Model (Wave 5)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.233 | .119 | .814 | 1.000,1.465 | < .001 |
| Depression | 1.523 | .145 | .744 | 1.238,1.808 | < .001 |
| Hostility | 1.513 | .152 | .766 | 1.215,1.811 | < .001 |
| Interpersonal Sensitivity | 1.142 | .115 | .652 | .917,1.367 | < .001 |
| Obsessive Compulsive Disorder | 1.889 | .177 | .855 | 1.543,2.235 | < .001 |
| Paranoia | 1.697 | .150 | .764 | 1.403,1.991 | < .001 |
| Phobia | .768 | .085 | .651 | .602,.934 | < .001 |
| Psychoticism | 1.377 | .136 | .781 | 1.111,1.644 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 9.492 | 1.326 | .756 | 6.894,12.090 | < .001 |
| Moral Disengagement | 2.827 | .384 | .582 | 2.074,3.581 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 3) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .020 | .060 | .016 | -.079,.111 | .740 |
| Fighting in School (Wave 1) | .096 | .064 | .069 | -.022,.159 | .134 |
| Exposure to Violence (Wave 1) | .455 | .115 | .275 | .132,.417 | < .001 |
| Psychopathy (Wave 1) | -.021 | .042 | -.025 | -.123,.074 | .626 |
| *Adverse Psychological Effects* (DV: Wave 5) |  |  |  |  |  |
| TBI (Wave 3) | .022 | .008 | .188 | .082,.295 | .004 |
| Impulsivity (Wave 1) | .028 | .005 | .370 | .260,.480 | < .001 |
| Moral Disengagement (Wave 1) | .038 | .013 | .184 | .066,.301 | .004 |
| Psychopathy (Wave 1) | .003 | .005 | .029 | -.076,.134 | .589 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .111 | .014 | .318 | .084,.139 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .264 | .024,.045 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .098 | .012 | .354 | .075,.121 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .113 | .014 | .352 | .085,.141 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .159 | .031 | .231 | .098,.220 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .080 | .012 | .314 | .056,.104 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.001 | .010 | -.001 | -.019,.19 | .994 |
| Anxiety, Phobia (Wave 5) | .015 | .022 | .191 | -.028,.058 | .500 |
| Depression, Psychoticism (Wave 5) | .062 | .040 | .413 | -.017,.140 | .125 |
| Depression, Somatization (Wave 5) | -.003 | .030 | -.021 | -.063,.056 | .920 |
| Hostility, Phobia (Wave 5) | -.017 | .024 | -.148 | -.062,.030 | .481 |
| Paranoia, Somatization (Wave 5) | -.018 | .027 | -.118 | -.071,.035 | .507 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .094 | .014 | .948 | .066,.122 |  |
| Adverse Psychological Effects | .004 | .001 | .720 | .002,.005 |  |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2481.561 (*p* < .001) | | | | |
| Model *X2* | 207.261 (*p* < .001) | | | | |
| CFI | .963 | | | | |
| RMSEA (90%CI) | .038 (.029, .046) | | | | |
| SRMR | .053 | | | | |
| N | 500 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E9: Full SEM of adverse psychological effects (Wave 6) on TBI (Wave 3). | | | | | |
| **Measurement Model (Wave 6)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.135 | .113 | .820 | .913,1.358 | < .001 |
| Depression | 1.312 | .131 | .794 | 1.056,1.568 | < .001 |
| Hostility | 1.364 | .135 | .769 | 1.100,1.628 | < .001 |
| Interpersonal Sensitivity | 1.200 | .118 | .801 | .969,1.430 | < .001 |
| Obsessive Compulsive Disorder | 1.651 | .154 | .856 | 1.350,1.953 | < .001 |
| Paranoia | 1.482 | .137 | .755 | 1.214,1.751 | < .001 |
| Phobia | .921 | .100 | .693 | .726,1.116 | < .001 |
| Psychoticism | 1.221 | .121 | .829 | .984,1.457 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 7.494 | .907 | .791 | 5.716,9.273 | < .001 |
| Moral Disengagement | 1.605 | .199 | .486 | 1.215,1.995 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 3) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .013 | .058 | .010 | -.077,.097 | .829 |
| Fighting in School (Wave 1) | -.031 | .057 | -.022 | -.100,.056 | .584 |
| Exposure to Violence (Wave 1) | .364 | .112 | .211 | .077,.345 | .001 |
| Psychopathy (Wave 1) | -.002 | .048 | -.002 | -.108,.103 | .964 |
| *Adverse Psychological Effects* (DV: Wave 6) |  |  |  |  |  |
| TBI (Wave 3) | .014 | .008 | .092 | .001,.185 | .072 |
| Impulsivity (Wave 1) | .048 | .008 | .463 | .350,.575 | < .001 |
| Moral Disengagement (Wave 1) | .036 | .016 | .125 | .018,.232 | .026 |
| Exposure to Violence (Wave 1) | .020 | .015 | .075 | -.032,.183 | .172 |
| Fighting in School (Wave 1) | .041 | .010 | .188 | .111,.264 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .118 | .015 | .327 | .089,.147 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .266 | .025,.044 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .093 | .011 | .345 | .071,.116 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .122 | .014 | .370 | .095,.150 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .182 | .027 | .262 | .129,.234 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .078 | .011 | .314 | .057,.098 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .008 | .009 | .034 | -.010,.027 | .902 |
| Anxiety, Phobia (Wave 6) | .048 | .045 | .441 | -.040,.136 | .286 |
| Depression, Psychoticism (Wave 6) | .046 | .045 | .385 | -.042,.133 | .308 |
| Hostility, Paranoia (Wave 6) | .031 | .052 | .147 | -.071,.133 | .555 |
| Paranoia, Somatization (Wave 6) | -.012 | .042 | -.068 | -.094,.070 | .777 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .134 | .020 | .932 | .095,.173 | < .001 |
| Adverse Psychological Effects | .006 | .001 | .641 | .004,.009 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2414.895 (*p* < .001) | | | | |
| Model *X2* | 154.725 (*p* < .001) | | | | |
| CFI | .985 | | | | |
| RMSEA (90%CI) | .023 (.010, .033) | | | | |
| SRMR | .046 | | | | |
| N | 527 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E10: Full SEM of adverse psychological effects (Wave 7) on TBI (Wave 3). | | | | | |
| **Measurement Model (Wave 7)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.409 | .131 | .805 | 1.151,1.666 | < .001 |
| Depression | 1.568 | .144 | .778 | 1.285,1.852 | < .001 |
| Hostility | 1.614 | .149 | .773 | 1.322,1.907 | < .001 |
| Interpersonal Sensitivity | 1.344 | .127 | .802 | 1.096,1.593 | < .001 |
| Obsessive Compulsive Disorder | 1.917 | .175 | .816 | 1.573,2.260 | < .001 |
| Paranoia | 1.783 | .154 | .744 | 1.481,2.085 | < .001 |
| Phobia | .869 | .095 | .658 | .684,1.055 | < .001 |
| Psychoticism | 1.374 | .130 | .822 | 1.120,1.628 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 4.968 | .536 | .695 | 3.918,6.019 | < .001 |
| Moral Disengagement | 1.230 | .140 | .509 | .956,1.505 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 3) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.045 | .052 | -.035 | -.113,.044 | .385 |
| Fighting in School (Wave 1) | -.024 | .046 | -.017 | -.080,.046 | .597 |
| Exposure to Violence (Wave 1) | .348 | .120 | .202 | .059,.345 | .004 |
| Psychopathy (Wave 1) | .027 | .048 | .031 | -.075,.137 | .563 |
| *Adverse Psychological Effects* (DV: Wave 7) |  |  |  |  |  |
| TBI (Wave 3) | .022 | .011 | .106 | .010,.203 | .051 |
| Impulsivity (Wave 1) | .034 | .008 | .239 | .139,.340 | < .001 |
| Moral Disengagement (Wave 1) | .105 | .023 | .270 | .166,.375 | < .001 |
| Psychopathy (Wave 1) | .018 | .010 | .095 | -.005,.196 | .066 |
| Exposure to Violence (Wave 1) | .090 | .020 | .249 | .150,.349 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .104 | .016 | .287 | .074,.135 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .255 | .023,.044 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .094 | .012 | .337 | .069,.118 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .120 | .016 | .355 | .090,.151 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .211 | .032 | .297 | .148,.274 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .081 | .012 | .313 | .057,.105 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.004 | .010 | -.020 | -.024,.015 | .645 |
| Anxiety, Phobia (Wave 7) | .032 | .035 | .318 | -.037,.102 | .360 |
| Depression, Phobia (Wave 7) | -.016 | .029 | -.125 | -.072,.041 | .588 |
| Depression, Psychoticism (Wave 7) | .035 | .037 | .291 | -.038,.107 | .347 |
| Depression, Somatization (Wave 7) | -.010 | .030 | -.074 | -.069,.049 | .736 |
| Paranoia, Somatization (Wave 7) | -.027 | .031 | -.154 | -.088,.035 | .394 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .080 | .012 | .811 | .057,.103 | < .001 |
| Adverse Psychological Effects | .011 | .002 | .606 | .007,.016 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2741.855 (*p* < .001) | | | | |
| Model *X2* | 190.424 (*p* < .001) | | | | |
| CFI | .973 | | | | |
| RMSEA (90%CI) | .035 (.025, .044) | | | | |
| SRMR | .054 | | | | |
| N | 488 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E11: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 3). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.499 | .172 | .846 | 1.161,1.837 | < .001 |
| Depression | 1.698 | .190 | .857 | 1.326,2.070 | < .001 |
| Hostility | 1.187 | .133 | .655 | .927,1.448 | < .001 |
| Interpersonal Sensitivity | 1.384 | .167 | .743 | 1.056,1.712 | < .001 |
| Obsessive Compulsive Disorder | 1.947 | .212 | .820 | 1.532,2.361 | < .001 |
| Paranoia | 1.681 | .188 | .687 | 1.313,2.050 | < .001 |
| Phobia | .848 | .108 | .645 | .636,1.060 | < .001 |
| Psychoticism | 1.380 | .158 | .778 | 1.070,1.690 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 9.161 | 1.358 | .657 | 6.499,11.822 | < .001 |
| Moral Disengagement | 2.261 | .368 | .458 | 1.539,2.982 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 3) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .009 | .067 | .007 | -.093,.106 | .896 |
| Fighting in School (Wave 1) | -.049 | .060 | -.035 | -.119,.049 | .410 |
| Exposure to Violence (Wave 1) | .334 | .130 | .201 | .045,.357 | .008 |
| Psychopathy (Wave 1) | .019 | .051 | .021 | -.093,.135 | .715 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 3) | .013 | .007 | .120 | .012,.228 | .054 |
| Impulsivity (Wave 1) | .023 | .005 | .312 | .183,.441 | < .001 |
| Moral Disengagement (Wave 1) | .089 | .018 | .447 | .308,.587 | < .001 |
| Fighting in School (Wave 1) | .047 | .010 | .322 | .207,.437 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .115 | .016 | .318 | .083,.147 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .031 | .006 | .235 | .020,.042 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .102 | .014 | .359 | .075,.128 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .107 | .016 | .329 | .075,.139 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .190 | .034 | .272 | .123,.258 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .086 | .013 | .337 | .061,.110 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.004 | .010 | -.016 | -.024,.017 | .727 |
| Hostility, Moral Disengagement (Wave 8) | .021 | .010 | .174 | .001,.042 | .041 |
| Moral Disengagement, Paranoia (Wave 8) | .016 | .011 | .101 | -.006,.038 | .150 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .119 | .015 | .946 | .054,.112 | < .001 |
| Adverse Psychological Effects | .002 | .001 | .485 | .001,.004 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1663.714 (*p* < .001) | | | | |
| Model *X2* | 169.403 (*p* < .001) | | | | |
| CFI | .970 | | | | |
| RMSEA (90%CI) | .029 (.017, .040) | | | | |
| SRMR | .054 | | | | |
| N | 428 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E12: Full SEM of adverse psychological effects (Wave 5) on TBI (Wave 4). | | | | | |
| **Measurement Model (Wave 5)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.275 | .119 | .803 | 1.041,1.509 | < .001 |
| Depression | 1.550 | .141 | .751 | 1.275,1.826 | < .001 |
| Hostility | 1.533 | .144 | .776 | 1.250,1.816 | < .001 |
| Interpersonal Sensitivity | 1.207 | .117 | .673 | .978,1.436 | < .001 |
| Obsessive Compulsive Disorder | 1.861 | .165 | .846 | 1.537,2.184 | < .001 |
| Paranoia | 1.675 | .141 | .756 | 1.398,1.951 | < .001 |
| Phobia | .816 | .088 | .688 | .644,.988 | < .001 |
| Psychoticism | 1.448 | .137 | .798 | 1.179,1.717 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 7.660 | .997 | .710 | 5.707,9.614 | < .001 |
| Moral Disengagement | 2.404 | .306 | .582 | 1.804,3.004 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 4) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.002 | .048 | -.002 | -.088,.084 | .972 |
| Fighting in School (Wave 1) | .027 | .050 | .022 | -.058,.101 | .593 |
| Exposure to Violence (Wave 1) | .118 | .077 | .081 | -.023,.186 | .124 |
| Psychopathy (Wave 1) | .023 | .038 | .030 | -.069,.130 | .548 |
| *Adverse Psychological Effects* (DV: Wave 5) |  |  |  |  |  |
| TBI (Wave 4) | .038 | .011 | .251 | .145,.358 | < .001 |
| Impulsivity (Wave 1) | .025 | .006 | .278 | .168,.388 | < .001 |
| Moral Disengagement (Wave 1) | .046 | .014 | .190 | .085,.295 | .001 |
| Exposure to Violence (Wave 1) | .028 | .011 | .126 | .028,.224 | .014 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .105 | .015 | .296 | .076,.134 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .033 | .005 | .250 | .022,.043 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .095 | .012 | .338 | .071,.118 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .118 | .014 | .365 | .091,.145 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .162 | .029 | .235 | .106,.218 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .080 | .012 | .315 | .058,.103 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .004 | .010 | .017 | -.015,.023 | .684 |
| Anxiety, Phobia (Wave 5) | .021 | .029 | .250 | -.035,.077 | .456 |
| Depression, Psychoticism (Wave 5) | .054 | .040 | .364 | -.025,.133 | .184 |
| Depression, Somatization (Wave 5) | -.006 | .029 | -.040 | -.063,.051 | .837 |
| Hostility, Phobia (Wave 5) | -.021 | .024 | -.184 | -.068,.027 | .391 |
| Paranoia, Somatization (Wave 5) | -.015 | .026 | -.097 | -.066,.035 | .554 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .092 | .013 | .928 | .066,.118 | < .001 |
| Adverse Psychological Effects | .005 | .001 | .723 | .003,.007 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2573.775 (*p* < .001) | | | | |
| Model *X2* | 214.787 (*p* < .001) | | | | |
| CFI | .961 | | | | |
| RMSEA (90%CI) | .038 (.030, .047) | | | | |
| SRMR | .054 | | | | |
| N | 524 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E13: Full SEM of adverse psychological effects (Wave 6) on TBI (Wave 4). | | | | | |
| **Measurement Model (Wave 6)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.107 | .107 | .813 | .898,1.316 | < .001 |
| Depression | 1.309 | .126 | .798 | 1.063,1.555 | < .001 |
| Hostility | 1.343 | .128 | .772 | 1.092,1.594 | < .001 |
| Interpersonal Sensitivity | 1.183 | .112 | .796 | .964,1.403 | < .001 |
| Obsessive Compulsive Disorder | 1.634 | .147 | .855 | 1.347,1.921 | < .001 |
| Paranoia | 1.499 | .133 | .765 | 1.239,1.760 | < .001 |
| Phobia | .892 | .094 | .684 | .708,1.075 | < .001 |
| Psychoticism | 1.225 | .117 | .843 | .997,1.454 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 7.028 | .811 | .770 | 5.438,8.618 | < .001 |
| Moral Disengagement | 1.582 | .188 | .494 | 1.213,1.951 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 4) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .014 | .050 | .013 | -.073,.098 | .773 |
| Fighting in School (Wave 1) | .077 | .052 | .061 | -.020,.141 | .140 |
| Exposure to Violence (Wave 1) | .121 | .084 | .081 | -.031,.192 | .150 |
| Psychopathy (Wave 1) | .014 | .043 | .018 | -.091,.126 | .751 |
| *Adverse Psychological Effects* (DV: Wave 6) |  |  |  |  |  |
| TBI (Wave 4) | .053 | .016 | .296 | .182,.410 | .001 |
| Impulsivity (Wave 1) | .050 | .008 | .469 | .358,.580 | < .001 |
| Moral Disengagement (Wave 1) | .045 | .017 | .149 | .043,.256 | .008 |
| Exposure to Violence (Wave 1) | .014 | .015 | .052 | -.054,.157 | .341 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .117 | .015 | .324 | .088,.146 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .262 | .024,.043 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .091 | .012 | .329 | .068,.114 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .121 | .013 | .373 | .094,.147 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .188 | .026 | .271 | .137,.239 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .079 | .010 | .318 | .058,.099 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .006 | .010 | .027 | -.013,.025 | .524 |
| Anxiety, Phobia (Wave 6) | .050 | .043 | .457 | -.035,.136 | .245 |
| Depression, Psychoticism (Wave 6) | .036 | .044 | .315 | -.050,.121 | .415 |
| Hostility, Paranoia (Wave 6) | .029 | .051 | .141 | -.071,.128 | .572 |
| Paranoia, Somatization (Wave 6) | -.016 | .041 | -.092 | -.096,.064 | .703 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .136 | .190 | .929 | .098,.174 | < .001 |
| Adverse Psychological Effects | .006 | .001 | .582 | .003,.009 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2568.594 (*p* < .001) | | | | |
| Model *X2* | 188.709 (*p* < .001) | | | | |
| CFI | .972 | | | | |
| RMSEA (90%CI) | .032 (.022, .040) | | | | |
| SRMR | .050 | | | | |
| N | 546 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E14: Full SEM of adverse psychological effects (Wave 7) on TBI (Wave 4). | | | | | |
| **Measurement Model (Wave 7)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.381 | .124 | .804 | 1.138,1.624 | < .001 |
| Depression | 1.558 | .138 | .785 | 1.289,1.826 | < .001 |
| Hostility | 1.589 | .141 | .784 | 1.313,1.865 | < .001 |
| Interpersonal Sensitivity | 1.352 | .122 | .815 | 1.113,1.591 | < .001 |
| Obsessive Compulsive Disorder | 1.852 | .162 | .801 | 1.534,2.170 | < .001 |
| Paranoia | 1.751 | .145 | .751 | 1.467,2.035 | < .001 |
| Phobia | .865 | .091 | .658 | .668,1.043 | < .001 |
| Psychoticism | 1.323 | .120 | .826 | 1.088,1.559 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 5.019 | .524 | .717 | 3.993,6.046 | < .001 |
| Moral Disengagement | 1.131 | .129 | .475 | .878,1.383 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 4) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.060 | .025 | -.181 | -.286,-.076 | .018 |
| Fighting in School (Wave 1) | -.041 | .058 | -.107 | -.399,.185 | .482 |
| Exposure to Violence (Wave 1) | .131 | .053 | .293 | .136,.450 | .012 |
| Psychopathy (Wave 1) | .029 | .016 | .123 | .001,.245 | .080 |
| *Adverse Psychological Effects* (DV: Wave 7) |  |  |  |  |  |
| TBI (Wave 4) | .677 | .265 | .830 | .455,1.205 | .011 |
| Impulsivity (Wave 1) | .035 | .008 | .240 | .141,.339 | < .001 |
| Moral Disengagement (Wave 1) | .107 | .023 | .267 | .166,.368 | < .001 |
| Fighting in School (Wave 1) | .093 | .042 | .229 | .033,.565 | .031 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .105 | .016 | .289 | .074,.135 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .030 | .005 | .225 | .019,.040 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .093 | .013 | .333 | .069,.118 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .115 | .015 | .347 | .085,.144 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .206 | .031 | .294 | .146,.266 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .080 | .012 | .315 | .057,.103 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.005 | .010 | -.021 | -.024,.014 | .619 |
| Anxiety, Phobia (Wave 7) | .035 | .036 | .326 | -.035,.105 | .332 |
| Depression, Phobia (Wave 7) | -.020 | .028 | -.157 | -.076,.036 | .479 |
| Depression, Psychoticism (Wave 7) | .032 | .036 | .274 | -.039,.103 | .380 |
| Depression, Somatization (Wave 7) | -.014 | .030 | -.099 | -.072,.045 | .479 |
| Paranoia, Somatization (Wave 7) | -.030 | .031 | -.179 | -.091,.030 | .326 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .086 | .012 | .816 | .062,.109 | < .001 |
| Adverse Psychological Effects | .000 | .020 | .005 | -.012,.012 | .987 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2811.834 (*p* < .001) | | | | |
| Model *X2* | 179.382 (*p* < .001) | | | | |
| CFI | .978 | | | | |
| RMSEA (90%CI) | .031 (.021, .040) | | | | |
| SRMR | .086 | | | | |
| N | 497 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E15: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 4). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.562 | .171 | .852 | 1.228,1.896 | < .001 |
| Depression | 1.781 | .191 | .867 | 1.408,2.155 | < .001 |
| Hostility | 1.223 | .130 | .679 | .968,1.479 | < .001 |
| Interpersonal Sensitivity | 1.426 | .162 | .746 | 1.109,1.743 | < .001 |
| Obsessive Compulsive Disorder | 2.022 | .208 | .823 | 1.614,2.431 | < .001 |
| Paranoia | 1.739 | .185 | .691 | 1.376,2.102 | < .001 |
| Phobia | .892 | .108 | .663 | .681,1.103 | < .001 |
| Psychoticism | 1.494 | .163 | .824 | 1.175,1.812 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 11.215 | 1.657 | .742 | 7.969,14.462 | < .001 |
| Moral Disengagement | 2.293 | .379 | .426 | 1.550,3.035 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 4) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.013 | .057 | -.011 | -.105,.084 | .827 |
| Fighting in School (Wave 1) | -.026 | .057 | -.020 | -.107,.066 | .643 |
| Exposure to Violence (Wave 1) | .147 | .098 | .094 | -.030,.219 | .133 |
| Psychopathy (Wave 1) | .030 | .048 | .037 | -.079,.153 | .531 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 4) | .022 | .008 | .209 | .093,.325 | .007 |
| Impulsivity (Wave 1) | .021 | .005 | .321 | .200,.442 | < .001 |
| Moral Disengagement (Wave 1) | .069 | .015 | .370 | .241,.500 | < .001 |
| Fighting in School (Wave 1) | .037 | .009 | .270 | .163,.377 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .116 | .016 | .317 | .084,.148 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .030 | .005 | .229 | .019,.041 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .103 | .014 | .358 | .076,.130 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .111 | .016 | .341 | .080,.141 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .179 | .034 | .252 | .112,.245 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .086 | .012 | .336 | .062,.109 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.005 | .010 | -.022 | -.025,.015 | .624 |
| Hostility, Moral Disengagement (Wave 8) | .018 | .009 | .151 | -.001,.036 | .053 |
| Moral Disengagement, Paranoia (Wave 8) | .018 | .011 | .112 | -.003,.040 | .086 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .082 | .014 | .953 | .055,.109 | < .001 |
| Adverse Psychological Effects | .002 | .001 | .554 | .001,.004 | .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1780.662 (*p* < .001) | | | | |
| Model *X2* | 173.172 (*p* < .001) | | | | |
| CFI | .970 | | | | |
| RMSEA (90%CI) | .030 (.018, .040) | | | | |
| SRMR | .053 | | | | |
| N | 449 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E16: Full SEM of adverse psychological effects (Wave 6) on TBI (Wave 5). | | | | | |
| **Measurement Model (Wave 6)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.110 | .106 | .813 | .902,1.317 | < .001 |
| Depression | 1.287 | .122 | .798 | 1.048,1.527 | < .001 |
| Hostility | 1.357 | .128 | .779 | 1.106,1.608 | < .001 |
| Interpersonal Sensitivity | 1.149 | .108 | .783 | .937,1.361 | < .001 |
| Obsessive Compulsive Disorder | 1.621 | .144 | .856 | 1.339,1.902 | < .001 |
| Paranoia | 1.490 | .130 | .774 | 1.235,1.745 | < .001 |
| Phobia | .891 | .092 | .689 | .710,1.072 | < .001 |
| Psychoticism | 1.205 | .114 | .829 | .982,1.427 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 7.203 | .844 | .776 | 5.548,8.858 | < .001 |
| Moral Disengagement | 1.617 | .194 | .499 | 1.238,1.997 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 5) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.012 | .036 | -.015 | -.100,.070 | .734 |
| Fighting in School (Wave 1) | .010 | .043 | .010 | -.078,.099 | .817 |
| Exposure to Violence (Wave 1) | .128 | .064 | .114 | .001,.229 | .047 |
| Psychopathy (Wave 1) | .006 | .033 | .010 | -.101,.121 | .859 |
| *Adverse Psychological Effects* (DV: Wave 6) |  |  |  |  |  |
| TBI (Wave 5) | .018 | .011 | .073 | -.015,.161 | .120 |
| Impulsivity (Wave 1) | .046 | .007 | .435 | .329,.541 | < .001 |
| Moral Disengagement (Wave 1) | .044 | .016 | .149 | .047,.251 | .006 |
| Exposure to Violence (Wave 1) | .023 | .014 | .086 | -.013,.185 | .092 |
| Fighting in School (Wave 1) | .037 | .009 | .165 | .092,.238 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .114 | .015 | .314 | .085,.143 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .034 | .005 | .262 | .024,.043 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .091 | .011 | .334 | .069,.113 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .121 | .014 | .369 | .095,.148 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .191 | .026 | .274 | .140,.242 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .082 | .010 | .331 | .062,.102 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .007 | .009 | .030 | -.011,.025 | .458 |
| Anxiety, Phobia (Wave 6) | .051 | .043 | .461 | -.034,.136 | .239 |
| Depression, Psychoticism (Wave 6) | .043 | .043 | .367 | -.041,.127 | .312 |
| Hostility, Paranoia (Wave 6) | .019 | .051 | .096 | -.080,.118 | .706 |
| Paranoia, Somatization (Wave 6) | -.018 | .040 | -.109 | -.097,.061 | .662 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .139 | .020 | .931 | .100,.177 | < .001 |
| Adverse Psychological Effects | .007 | .001 | .666 | .004,.010 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2588.243 (*p* < .001) | | | | |
| Model *X2* | 190.644 (*p* < .001) | | | | |
| CFI | .971 | | | | |
| RMSEA (90%CI) | .032 (.023, .040) | | | | |
| SRMR | .051 | | | | |
| N | 562 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E17: Full SEM of adverse psychological effects (Wave 7) on TBI (Wave 5). | | | | | |
| **Measurement Model (Wave 7)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.423 | .126 | .810 | 1.175,1.671 | < .001 |
| Depression | 1.570 | .136 | .782 | 1.303,1.836 | < .001 |
| Hostility | 1.631 | .143 | .784 | 1.351,1.912 | < .001 |
| Interpersonal Sensitivity | 1.360 | .121 | .816 | 1.123,1.596 | < .001 |
| Obsessive Compulsive Disorder | 1.910 | .165 | .810 | 1.586,2.234 | < .001 |
| Paranoia | 1.810 | .148 | .761 | 1.520,2.100 | < .001 |
| Phobia | .924 | .094 | .682 | .739,1.109 | < .001 |
| Psychoticism | 1.350 | .121 | .827 | 1.113,1.587 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 5.301 | .560 | .726 | 4.204,6.399 | < .001 |
| Moral Disengagement | 1.218 | .138 | .488 | .947,1.489 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 5) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.038 | .032 | -.048 | -.127,.030 | .227 |
| Fighting in School (Wave 1) | .049 | .046 | .053 | -.046,.153 | .293 |
| Exposure to Violence (Wave 1) | .109 | .067 | .101 | -.022,.223 | .103 |
| Psychopathy (Wave 1) | .020 | .031 | .037 | -.074,.148 | .509 |
| *Adverse Psychological Effects* (DV: Wave 7) |  |  |  |  |  |
| TBI (Wave 5) | .021 | .014 | .065 | -.015,.145 | .130 |
| Impulsivity (Wave 1) | .037 | .007 | .267 | .171,.363 | < .001 |
| Moral Disengagement (Wave 1) | .112 | .021 | .290 | .196,.385 | < .001 |
| Exposure to Violence (Wave 1) | .106 | .018 | .297 | .211,.383 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .097 | .015 | .270 | .068,.127 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .029 | .005 | .221 | .019,.039 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .098 | .012 | .353 | .075,.121 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .111 | .015 | .332 | .081,.141 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .218 | .030 | .308 | .160,.276 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .087 | .011 | .338 | .065,.109 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.006 | .009 | -.028 | -.024,.011 | .486 |
| Anxiety, Phobia (Wave 7) | .034 | .036 | .323 | -.036,.105 | .342 |
| Depression, Phobia (Wave 7) | -.024 | .028 | -.186 | -.079,.031 | .394 |
| Depression, Psychoticism (Wave 7) | .032 | .035 | .265 | -.037,.101 | .369 |
| Depression, Somatization (Wave 7) | -.013 | .029 | -.096 | -.070,.043 | .649 |
| Paranoia, Somatization (Wave 7) | -.029 | .032 | -.173 | -.091,.033 | .353 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .086 | .012 | .828 | .062,.110 | < .001 |
| Adverse Psychological Effects | .011 | .002 | .613 | .007,.015 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2956.096 (*p* < .001) | | | | |
| Model *X2* | 207.107 (*p* < .001) | | | | |
| CFI | .969 | | | | |
| RMSEA (90%CI) | .037 (.028, .046) | | | | |
| SRMR | .053 | | | | |
| N | 518 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E18: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 5). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.551 | .164 | .857 | 1.230,1.872 | < .001 |
| Depression | 1.777 | .184 | .860 | 1.416,2.138 | < .001 |
| Hostility | 1.272 | .130 | .686 | 1.016,1.527 | < .001 |
| Interpersonal Sensitivity | 1.411 | .156 | .748 | 1.106,1.716 | < .001 |
| Obsessive Compulsive Disorder | 2.029 | .202 | .830 | 1.633,2.426 | < .001 |
| Paranoia | 1.716 | .177 | .692 | 1.368,2.063 | < .001 |
| Phobia | .867 | .102 | .660 | .667,1.068 | < .001 |
| Psychoticism | 1.472 | .156 | .800 | 1.167,1.777 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 11.001 | 1.573 | .770 | 7.918,14.085 | < .001 |
| Moral Disengagement | 2.255 | .355 | .449 | 1.560,2.951 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 5) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .027 | .045 | .032 | -.073,.137 | .553 |
| Fighting in School (Wave 1) | .037 | .049 | .040 | -.063,.143 | .446 |
| Exposure to Violence (Wave 1) | .191 | .075 | .171 | .036,.306 | .011 |
| Psychopathy (Wave 1) | .004 | .034 | .007 | -.110,.123 | .910 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 5) | -.013 | .008 | -.084 | -.180,.011 | .102 |
| Impulsivity (Wave 1) | .018 | .005 | .252 | .129,.376 | < .001 |
| Moral Disengagement (Wave 1) | .054 | .014 | .278 | .150,.406 | < .001 |
| Psychopathy (Wave 1) | .019 | .006 | .212 | .080,.345 | .003 |
| Exposure to Violence (Wave 1) | .006 | .012 | .037 | -.093,.166 | .578 |
| Fighting in School (Wave 1) | .038 | .009 | .257 | .156,.358 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .119 | .016 | .324 | .086,.151 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .029 | .006 | .220 | .018,.040 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .107 | .013 | .375 | .081,.133 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .116 | .016 | .349 | .085,.147 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .185 | .034 | .259 | .118,.252 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .077 | .013 | .299 | .052,.102 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.008 | .010 | -.035 | -.027,.011 | .409 |
| Hostility, Moral Disengagement (Wave 8) | .021 | .010 | .173 | .001,.040 | .035 |
| Moral Disengagement, Paranoia (Wave 8) | .018 | .011 | .111 | -.004,.039 | .105 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .084 | .014 | .949 | .057,.110 | < .001 |
| Adverse Psychological Effects | .003 | .001 | .620 | .001,.004 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1927.243 (*p* < .001) | | | | |
| Model *X2* | 169.961 (*p* < .001) | | | | |
| CFI | .973 | | | | |
| RMSEA (90%CI) | .029 (.018, .039) | | | | |
| SRMR | .051 | | | | |
| N | 460 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E19: Full SEM of adverse psychological effects (Wave 7) on TBI (Wave 6). | | | | | |
| **Measurement Model (Wave 7)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.424 | .125 | .817 | 1.180,1.669 | < .001 |
| Depression | 1.553 | .133 | .783 | 1.292,1.814 | < .001 |
| Hostility | 1.650 | .143 | .792 | 1.371,1.929 | < .001 |
| Interpersonal Sensitivity | 1.344 | .118 | .811 | 1.113,1.575 | < .001 |
| Obsessive Compulsive Disorder | 1.902 | .162 | .814 | 1.583,2.220 | < .001 |
| Paranoia | 1.762 | .143 | .743 | 1.481,2.043 | < .001 |
| Phobia | .909 | .092 | .686 | .730,1.089 | < .001 |
| Psychoticism | 1.343 | .119 | .825 | 1.110,1.576 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 4.811 | .498 | .694 | 3.835,5.787 | < .001 |
| Moral Disengagement | 1.107 | .125 | .471 | .863,1.351 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 6) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.016 | .010 | -.126 | -.230,-.022 | .098 |
| Fighting in School (Wave 1) | .030 | .017 | .209 | .059,.358 | .077 |
| Exposure to Violence (Wave 1) | .055 | .030 | .316 | .100,.532 | .071 |
| Psychopathy (Wave 1) | .011 | .007 | .126 | .003,.250 | .116 |
| *Adverse Psychological Effects* (DV: Wave 7) |  |  |  |  |  |
| TBI (Wave 6) | 1.927 | 1.044 | .885 | .333,1.438 | .065 |
| Impulsivity (Wave 1) | .034 | .008 | .230 | .132,.327 | < .001 |
| Moral Disengagement (Wave 1) | .098 | .023 | .243 | .143,.342 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .104 | .015 | .285 | .074,.134 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .030 | .005 | .228 | .020,.040 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .091 | .012 | .327 | .067,.116 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .123 | .015 | .362 | .093,.152 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .210 | .031 | .293 | .150,.270 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .082 | .012 | .317 | .060,.105 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.002 | .009 | -.007 | -.020,.017 | .866 |
| Anxiety, Phobia (Wave 7) | .033 | .036 | .319 | -.038,.103 | .364 |
| Depression, Phobia (Wave 7) | -.021 | .028 | -.171 | -.076,.033 | .445 |
| Depression, Psychoticism (Wave 7) | .035 | .035 | .292 | -.035,.104 | .326 |
| Depression, Somatization (Wave 7) | -.012 | .029 | -.087 | -.069,.045 | .680 |
| Paranoia, Somatization (Wave 7) | -.026 | .031 | -.148 | -.087,.035 | .408 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .085 | .012 | .808 | .062,.108 | < .001 |
| Adverse Psychological Effects | -.001 | .010 | -.036 | -.020,.019 | .943 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 2989.534 (*p* < .001) | | | | |
| Model *X2* | 196.467 (*p* < .001) | | | | |
| CFI | .974 | | | | |
| RMSEA (90%CI) | .034 (.025, .043) | | | | |
| SRMR | .092 | | | | |
| N | 521 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E20: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 6). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.553 | .165 | .854 | 1.230,1.876 | < .001 |
| Depression | 1.771 | .185 | .865 | 1.409,2.133 | < .001 |
| Hostility | 1.272 | .132 | .682 | 1.014,1.530 | < .001 |
| Interpersonal Sensitivity | 1.434 | .158 | .756 | 1.124,1.744 | < .001 |
| Obsessive Compulsive Disorder | 2.024 | .203 | .832 | 1.626,2.422 | < .001 |
| Paranoia | 1.698 | .177 | .676 | 1.351,2.045 | < .001 |
| Phobia | .875 | .103 | .665 | .673,1.078 | < .001 |
| Psychoticism | 1.470 | .156 | .803 | 1.164,1.776 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 10.522 | 1.546 | .729 | 7.493,13.551 | < .001 |
| Moral Disengagement | 2.403 | .381 | .484 | 1.656,3.151 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 6) |  |  |  |  |  |
| Sports Involvement (Wave 1) | .062 | .047 | .074 | -.038,.186 | .189 |
| Fighting in School (Wave 1) | .031 | .040 | .034 | -.052,.120 | .440 |
| Exposure to Violence (Wave 1) | .141 | .076 | .128 | -.011,.267 | .063 |
| Psychopathy (Wave 1) | -.002 | .026 | -.003 | -.092,.085 | .943 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 6) | -.002 | .007 | -.015 | -.103,.073 | .740 |
| Impulsivity (Wave 1) | .021 | .005 | .305 | .187,.423 | < .001 |
| Moral Disengagement (Wave 1) | .082 | .016 | .418 | .291,.545 | < .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .122 | .016 | .332 | .090,.153 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .031 | .005 | .239 | .021,.041 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .104 | .013 | .365 | .078,.130 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .113 | .016 | .344 | .082,.143 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .203 | .033 | .284 | .138,.268 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .092 | .012 | .363 | .068,.115 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | .004 | .010 | .019 | -.016,.025 | .668 |
| Hostility, Moral Disengagement (Wave 8) | .020 | .010 | .172 | .001,.040 | .042 |
| Moral Disengagement, Paranoia (Wave 8) | .021 | .011 | .130 | -.001,.042 | .057 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .083 | .013 | .949 | .057,.109 | < .001 |
| Adverse Psychological Effects | .003 | .001 | .645 | .001,.004 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1905.930 (*p* < .001) | | | | |
| Model *X2* | 209.657 (*p* < .001) | | | | |
| CFI | .952 | | | | |
| RMSEA (90%CI) | .038 (.029, .047) | | | | |
| SRMR | .058 | | | | |
| N | 461 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

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| Table E21: Full SEM of adverse psychological effects (Wave 8) on TBI (Wave 7). | | | | | |
| **Measurement Model (Wave 8)** | FL | SE | Std. FL | 95%CI | *p-value* |
| *BSI* | -- | -- | -- | -- | -- |
| Anxiety | 1.548 | .164 | .885 | 1.227,1.868 | < .001 |
| Depression | 1.779 | .184 | .863 | 1.417,2.140 | < .001 |
| Hostility | 1.265 | .130 | .683 | 1.010,1.520 | < .001 |
| Interpersonal Sensitivity | 1.395 | .155 | .745 | 1.093,1.698 | < .001 |
| Obsessive Compulsive Disorder | 2.021 | .202 | .834 | 1.626,2.417 | < .001 |
| Paranoia | 1.699 | .176 | .678 | 1.353,2.044 | < .001 |
| Phobia | .862 | .102 | .656 | .663,1.061 | < .001 |
| Psychoticism | 1.480 | 1.560 | .802 | 1.174,1.786 | < .001 |
| Somatization | 1.000 | -- | -- | -- | -- |
| *Adverse Psychological Effects* | -- | -- | -- | -- | -- |
| Impulsivity | 10.070 | 1.447 | .714 | 7.234,12.905 | < .001 |
| Moral Disengagement | 2.244 | .356 | .449 | 1.546,2.943 | < .001 |
| BSI | 1.000 | -- | -- | -- | -- |
| **Path Model** | *b* | SE | β | β95%CI | *p-value* |
| *TBI* (DV: Wave 7) |  |  |  |  |  |
| Sports Involvement (Wave 1) | -.026 | .029 | -.038 | -.121,.045 | .368 |
| Fighting in School (Wave 1) | .005 | .035 | .007 | -.081,.094 | .879 |
| Exposure to Violence (Wave 1) | -.030 | .064 | -.032 | -.168,.103 | .638 |
| Psychopathy (Wave 1) | -.009 | .028 | -.019 | -.136,.099 | .756 |
| *Adverse Psychological Effects* (DV: Wave 8) |  |  |  |  |  |
| TBI (Wave 7) | .012 | .011 | .064 | -.035,.164 | .238 |
| Fighting in School (Wave 1) | .038 | .009 | .253 | .150,.356 | < .001 |
| Impulsivity (Wave 1) | .018 | .005 | .255 | .137,.372 | < .001 |
| Moral Disengagement (Wave 1) | .057 | .015 | .292 | .160,.425 | < .001 |
| Psychopathy (Wave 1) | .021 | .006 | .230 | .111,.348 | .001 |
| **Covariances** | Cov | SE | Std. Cov | 95%CI | *p-value* |
| Exposure to Violence, Impulsivity (Wave 1) | .115 | .016 | .312 | .084,.147 | < .001 |
| Exposure to Violence, Moral Disengagement (Wave 1) | .030 | .005 | .227 | .019,.041 | < .001 |
| Exposure to Violence, Psychopathy (Wave 1) | .109 | .013 | .381 | .083,.135 | < .001 |
| Impulsivity, Moral Disengagement (Wave 1) | .113 | .016 | .337 | .082,.144 | < .001 |
| Impulsivity, Psychopathy (Wave 1) | .170 | .035 | .233 | .101,.239 | < .001 |
| Moral Disengagement, Psychopathy (Wave 1) | .080 | .013 | .306 | .055,.105 | < .001 |
| Sports Involvement, Fighting in School (Wave 1) | -.004 | .010 | -.015 | -.023,.016 | .724 |
| Hostility, Moral Disengagement (Wave 8) | .018 | .010 | .146 | -.002,.037 | .071 |
| Moral Disengagement, Paranoia (Wave 8) | .017 | .011 | .101 | -.004,.038 | .122 |
| **Disturbance Estimate** | RV | SE | Std. RV | 95%CI | *p-value* |
| BSI | .083 | .013 | .947 | .057,.109 | < .001 |
| Adverse Psychological Effects | .003 | .001 | .612 | .001,.004 | < .001 |
| **Fit Statistics** | | | | | |
| Baseline *X2* | 1865.796 (*p* < .001) | | | | |
| Model *X2* | 163.888 (*p* < .001) | | | | |
| CFI | .976 | | | | |
| RMSEA (90%CI) | .027 (.014, .037) | | | | |
| SRMR | .051 | | | | |
| N | 467 | | | | |
| *Notes*:"Cov" = Covariance;"FL" = Factor Loading; "RV" = Residual Variance; "SE" = Standard Error; "Std." = Standardized; *p-values* for path model are associated with *b.* | | | | | |

**Appendix F: Covariance Matrices after Variance Recode**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F1: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 3) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .26 | .229 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | .015 | .197 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .46 | .023 | .023 | .139 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.69 | -.001 | .066 | .084 | .529 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.18 | .229 | .034 | .103 | .160 | .931 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.67 | .022 | .009 | .036 | .087 | .115 | .118 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .18 | -.001 | .032 | .044 | .047 | .090 | .016 | .497 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .40 | -.013 | .010 | .030 | .036 | .097 | .014 | .048 | .221 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .45 | -.013 | -.001 | .041 | .022 | .073 | .016 | .045 | .176 | .276 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .64 | -.025 | .023 | .052 | .079 | .120 | .045 | .078 | .171 | .188 | .373 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 3.04 | -.044 | .029 | .056 | .159 | .434 | .067 | .091 | .097 | .108 | .192 | .706 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .36 | -.015 | .006 | .023 | .013 | .065 | .014 | .044 | .155 | .165 | .156 | .080 | .224 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.59 | .002 | .014 | .028 | .056 | .072 | .061 | .005 | .022 | .029 | .064 | .086 | .021 | .108 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .65 | -.030 | .013 | .039 | .040 | .075 | .016 | .039 | .221 | .231 | .247 | .145 | .190 | .028 | .393 | -- |  |  |  |
| Paranoia (15) | .70 | .017 | .012 | .047 | .063 | .058 | .021 | .027 | .180 | .194 | .223 | .076 | .174 | .043 | .232 | .355 | -- |  |  |
| Phobia (16) | .24 | .003 | .016 | .019 | .013 | .032 | .002 | .013 | .148 | .117 | .123 | .068 | .125 | .014 | .178 | .138 | .175 | -- |  |
| Psychoticism (17) | .41 | .001 | .018 | .042 | .045 | .082 | .023 | .057 | .170 | .205 | .172 | .108 | .156 | .033 | .201 | .190 | .128 | .238 | -- |
| Somatization (18) | .31 | -.002 | .001 | .023 | .019 | .022 | .003 | .028 | .144 | .124 | .128 | .048 | .113 | .013 | .176 | .126 | .112 | .117 | .183 |
| N | 438 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F2: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 4) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .26 | .230 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | -.004 | .198 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | .007 | .016 | .147 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.68 | -.026 | .065 | .084 | .532 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.20 | .027 | .052 | .108 | .183 | .862 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.66 | -.001 | .018 | .038 | .083 | .120 | .114 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .20 | -.009 | .031 | .039 | .057 | .109 | .022 | .553 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .38 | -.011 | .004 | .023 | .031 | .074 | .007 | .037 | .217 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .47 | .011 | .012 | .024 | .052 | .074 | .011 | .038 | .182 | .318 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .61 | -.018 | .022 | .038 | .086 | .117 | .033 | .062 | .179 | .201 | .371 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.97 | -.003 | .024 | .066 | .162 | .434 | .084 | .080 | .079 | .088 | .171 | .698 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .38 | -.003 | -.001 | .018 | .033 | .071 | .010 | .034 | .177 | .196 | .189 | .079 | .260 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.55 | -.003 | .018 | .029 | .052 | .078 | .055 | .016 | .012 | .014 | .054 | .107 | .011 | .109 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .66 | -.027 | .010 | .031 | .066 | .097 | .017 | .048 | .218 | .249 | .258 | .130 | .229 | .027 | .402 | -- |  |  |  |
| Paranoia (15) | .71 | .013 | .019 | .043 | .067 | .084 | .019 | .022 | .174 | .211 | .239 | .079 | .203 | .037 | .232 | .421 | -- |  |  |
| Phobia (16) | .21 | .001 | .013 | .006 | .021 | .045 | .005 | .023 | .126 | .119 | .119 | .066 | .128 | .013 | .146 | .126 | .137 | -- |  |
| Psychoticism (17) | .40 | -.004 | .018 | .034 | .065 | .070 | .014 | .017 | .163 | .233 | .189 | .080 | .178 | .016 | .215 | .214 | .113 | .253 | -- |
| Somatization (18) | .30 | -.010 | .004 | .015 | .021 | .036 | -.002 | .022 | .150 | .138 | .144 | .044 | .141 | .004 | .170 | .129 | .096 | .122 | .192 |
| N | 425 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F3: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 5) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .242 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .52 | .002 | .191 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .46 | .014 | .023 | .141 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.67 | -.012 | .081 | .093 | .565 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.16 | .018 | .078 | .101 | .179 | .917 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.65 | .001 | .021 | .033 | .083 | .124 | .121 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .15 | .001 | .022 | .036 | .026 | .064 | .020 | .407 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .33 | -.005 | -.003 | -.017 | .002 | .018 | .006 | .005 | .221 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .41 | -.006 | .005 | .027 | .012 | .026 | .004 | .010 | .173 | .409 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .49 | -.010 | .015 | .035 | .036 | .076 | .021 | .009 | .173 | .218 | .382 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.85 | -.008 | .029 | .059 | .111 | .413 | .075 | .047 | .073 | .054 | .146 | .828 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .29 | -.008 | -.003 | .006 | -.004 | .002 | .001 | -.002 | .125 | .193 | .160 | .055 | .298 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.49 | .004 | .021 | .017 | .047 | .076 | .040 | .003 | .024 | .024 | .052 | .108 | .013 | .123 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .58 | -.013 | -.004 | .018 | .006 | .044 | .007 | .017 | .225 | .281 | .264 | .124 | .206 | .036 | .466 | -- |  |  |  |
| Paranoia (15) | .64 | .012 | .015 | .017 | .015 | .001 | .009 | -.006 | .195 | .268 | .259 | .076 | .218 | .060 | .291 | .491 | -- |  |  |
| Phobia (16) | .16 | .003 | .002 | .007 | .004 | -.001 | .003 | .003 | .102 | .110 | .094 | .043 | .085 | .019 | .141 | .103 | .120 | -- |  |
| Psychoticism (17) | .34 | .002 | -.004 | .026 | .004 | .034 | .015 | .023 | .162 | .263 | .186 | .065 | .157 | .025 | .242 | .253 | .097 | .304 | -- |
| Somatization (18) | .24 | .005 | -.012 | .009 | -.016 | .006 | -.002 | -.002 | .136 | .139 | .134 | .041 | .116 | .017 | .195 | .144 | .092 | .130 | .200 |
| N | 512 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F4: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 6) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .240 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | .010 | .197 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | .012 | .018 | .142 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.007 | .079 | .089 | .540 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.14 | .027 | .072 | .111 | .199 | .953 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.008 | .024 | .035 | .083 | .130 | .120 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | .001 | .016 | .020 | .037 | .088 | .018 | .468 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .31 | .012 | .007 | .015 | .008 | .056 | -.002 | .001 | .267 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .38 | .004 | .020 | .020 | .029 | .084 | .012 | .005 | .214 | .393 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .49 | .002 | .024 | .027 | .059 | .116 | .023 | .003 | .206 | .241 | .448 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.85 | .020 | .059 | .062 | .131 | .444 | .082 | .079 | .085 | .095 | .139 | .879 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .31 | .005 | .007 | .013 | .007 | .049 | .002 | .007 | .211 | .242 | .222 | .070 | .324 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.46 | .011 | .011 | .015 | .035 | .069 | .037 | .009 | .015 | .027 | .046 | .107 | .017 | .107 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .58 | -.010 | .009 | .033 | .021 | .104 | .018 | .006 | .277 | .303 | .309 | .170 | .279 | .039 | .537 | -- |  |  |  |
| Paranoia (15) | .64 | .024 | .034 | .036 | .079 | .060 | .024 | -.009 | .245 | .278 | .328 | .097 | .270 | .042 | .342 | .558 | -- |  |  |
| Phobia (16) | .19 | .011 | .002 | .009 | .015 | .044 | .001 | .021 | .184 | .182 | .158 | .048 | .179 | .010 | .214 | .209 | .230 | -- |  |
| Psychoticism (17) | .34 | .002 | .023 | .019 | .038 | .075 | .004 | -.005 | .194 | .277 | .215 | .103 | .221 | .029 | .273 | .271 | .165 | .315 | -- |
| Somatization (18) | .26 | .006 | .003 | .008 | -.002 | .030 | .004 | -.007 | .197 | .199 | .197 | .076 | .189 | .010 | .258 | .211 | .163 | .172 | .269 |
| N | 531 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F5: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 7) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .26 | .246 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | -.003 | .197 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .44 | .004 | .018 | .140 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.030 | .084 | .090 | .557 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.17 | .008 | .061 | .099 | .220 | .962 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.007 | .027 | .031 | .082 | .121 | .124 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .18 | .004 | .017 | .028 | .039 | .075 | .010 | .440 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .34 | -.019 | .026 | .043 | .046 | .076 | .027 | -.001 | .300 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .44 | -.015 | .029 | .043 | .058 | .083 | .029 | .008 | .237 | .413 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .50 | -.038 | .016 | .049 | .073 | .100 | .038 | .015 | .204 | .239 | .418 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.82 | -.019 | .044 | .078 | .177 | .467 | .089 | .047 | .133 | .145 | .194 | .958 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .28 | -.009 | .023 | .032 | .038 | .081 | .023 | .004 | .202 | .228 | .199 | .129 | .281 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.42 | -.005 | .002 | .018 | .039 | .057 | .043 | .009 | .028 | .032 | .055 | .057 | .027 | .105 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .60 | -.035 | .017 | .035 | .067 | .074 | .035 | .013 | .266 | .324 | .290 | .206 | .273 | .036 | .556 | -- |  |  |  |
| Paranoia (15) | .65 | -.004 | .058 | .066 | .101 | .067 | .052 | -.001 | .221 | .281 | .274 | .148 | .243 | .069 | .331 | .578 | -- |  |  |
| Phobia (16) | .16 | .001 | .016 | .021 | .030 | .030 | .022 | .002 | .149 | .117 | .121 | .058 | .137 | .017 | .166 | .151 | .165 | -- |  |
| Psychoticism (17) | .34 | -.026 | .025 | .041 | .052 | .069 | .031 | .014 | .194 | .245 | .198 | .149 | .181 | .036 | .243 | .239 | .122 | .266 | -- |
| Somatization (18) | .26 | -.010 | .018 | .024 | .036 | .042 | .023 | .033 | .157 | .141 | .149 | .076 | .136 | .011 | .224 | .149 | .102 | .118 | .215 |
| N | 493 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F6: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 2). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .26 | .239 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | .004 | .208 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .018 | .021 | .144 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.019 | .090 | .097 | .560 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.11 | .017 | .069 | .115 | .171 | .961 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.008 | .024 | .028 | .074 | .120 | .124 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 2) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | .004 | .023 | .036 | .016 | .067 | .011 | .481 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .31 | -.012 | .021 | .012 | .020 | .039 | .017 | .001 | .280 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .34 | -.002 | .019 | .018 | .031 | .040 | .032 | .020 | .218 | .363 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .41 | -.004 | .016 | .024 | .055 | .037 | .025 | .003 | .153 | .172 | .273 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.74 | -.033 | .070 | .052 | .211 | .364 | .077 | .035 | .111 | .103 | .108 | .941 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .25 | -.009 | .018 | .006 | .002 | .045 | .021 | .003 | .190 | .215 | .135 | .044 | .290 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.42 | .010 | .012 | .013 | .042 | .055 | .046 | .003 | .013 | .019 | .036 | .100 | .006 | .119 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .50 | -.032 | .016 | .021 | .038 | .024 | .022 | .031 | .262 | .278 | .209 | .170 | .226 | .028 | .478 | -- |  |  |  |
| Paranoia (15) | .61 | .013 | .042 | .037 | .060 | .030 | .040 | .009 | .206 | .266 | .170 | .069 | .224 | .037 | .276 | .528 | -- |  |  |
| Phobia (16) | .15 | -.003 | .016 | .004 | -.001 | .001 | .009 | -.004 | .135 | .134 | .083 | .031 | .123 | .011 | .142 | .138 | .142 | -- |  |
| Psychoticism (17) | .29 | -.004 | .017 | .015 | .009 | .034 | .025 | .009 | .180 | .241 | .123 | .080 | .187 | .014 | .220 | .232 | .121 | .271 | -- |
| Somatization (18) | .21 | -.002 | .013 | .008 | .001 | .002 | .006 | .011 | .156 | .139 | .100 | .053 | .123 | .005 | .188 | .131 | .081 | .115 | .176 |
| N | 439 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F7: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 4) on TBI (Wave 3). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .26 | .230 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | -.007 | .199 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | -.001 | .015 | .149 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.032 | .063 | .089 | .523 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.19 | .012 | .047 | .110 | .190 | .845 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.65 | -.005 | .019 | .036 | .084 | .116 | .114 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .22 | .002 | -.003 | .055 | .039 | .088 | .013 | .552 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .38 | -.011 | .004 | .023 | .027 | .067 | .006 | .032 | .220 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .46 | -.008 | .005 | .024 | .042 | .048 | .003 | .037 | .184 | .311 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .59 | -.010 | .017 | .037 | .071 | .102 | .028 | .054 | .180 | .195 | .351 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.96 | -.025 | .026 | .062 | .158 | .420 | .090 | .076 | .073 | .063 | .157 | .695 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .38 | -.005 | -.002 | .019 | .031 | .052 | .007 | .005 | .177 | .202 | .191 | .067 | .263 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.55 | -.005 | .020 | .027 | .055 | .076 | .056 | .023 | .010 | .009 | .049 | .111 | .008 | .110 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .65 | -.030 | .005 | .032 | .061 | .087 | .015 | .042 | .223 | .255 | .256 | .126 | .236 | .024 | .409 | -- |  |  |  |
| Paranoia (15) | .70 | .013 | .019 | .041 | .058 | .071 | .016 | .022 | .176 | .212 | .236 | .078 | .206 | .037 | .234 | .424 | -- |  |  |
| Phobia (16) | .21 | -.001 | .011 | .006 | .018 | .038 | .003 | .014 | .127 | .120 | .117 | .063 | .130 | .011 | .147 | .128 | .139 | -- |  |
| Psychoticism (17) | .39 | -.004 | .015 | .030 | .049 | .046 | .008 | .039 | .162 | .228 | .178 | .067 | .178 | .013 | .213 | .213 | .113 | .245 | -- |
| Somatization (18) | .31 | -.003 | .005 | .012 | .015 | .036 | -.002 | .021 | .152 | .143 | .142 | .036 | .141 | .004 | .178 | .131 | .097 | .128 | .192 |
| N | 419 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F8: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 5) on TBI (Wave 3). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .249 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | -.001 | .198 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .009 | .025 | .141 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.67 | -.015 | .070 | .098 | .545 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.15 | .003 | .071 | .098 | .166 | .876 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.002 | .018 | .032 | .081 | .115 | .119 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .18 | .009 | .016 | .050 | .033 | .069 | .019 | .424 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .34 | -.004 | -.006 | .016 | -.003 | .011 | .005 | .029 | .227 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .41 | -.006 | -.003 | .025 | -.004 | .008 | -.001 | -.002 | .184 | .415 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .49 | -.010 | .010 | .036 | .024 | .071 | .020 | .033 | .179 | .214 | .386 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.88 | -.020 | .028 | .064 | .098 | .397 | .075 | .072 | .067 | .050 | .135 | .808 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .31 | -.007 | -.006 | .005 | -.009 | -.008 | -.002 | .010 | .131 | .199 | .157 | .046 | .304 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.49 | .002 | .018 | .018 | .043 | .064 | .039 | .023 | .025 | .022 | .053 | .105 | .013 | .121 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .59 | -.015 | -.012 | .020 | .004 | .040 | .005 | .041 | .235 | .294 | .269 | .120 | .209 | .038 | .483 | -- |  |  |  |
| Paranoia (15) | .64 | .017 | .010 | .020 | .010 | -.005 | .011 | .011 | .201 | .272 | .259 | .072 | .217 | .060 | .300 | .488 | -- |  |  |
| Phobia (16) | .17 | .001 | -.001 | .009 | .001 | -.008 | .001 | .012 | .109 | .121 | .098 | .044 | .094 | .018 | .148 | .106 | .138 | -- |  |
| Psychoticism (17) | .35 | -.002 | -.008 | .027 | -.001 | .017 | .013 | .007 | .169 | .269 | .186 | .063 | .159 | .026 | .249 | .253 | .106 | .308 | -- |
| Somatization (18) | .25 | .009 | -.014 | .005 | -.024 | -.003 | -.004 | .024 | .141 | .148 | .137 | .035 | .124 | .018 | .201 | .150 | .095 | .133 | .212 |
| N | 500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F9: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 6) on TBI (Wave 3). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .242 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .55 | .006 | .205 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .46 | .003 | .019 | .142 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.008 | .075 | .094 | .519 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.12 | .016 | .063 | .113 | .188 | .922 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.012 | .022 | .034 | .078 | .122 | .118 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | .001 | -.006 | .044 | .028 | .074 | .015 | .419 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | .005 | .007 | .014 | -.007 | .052 | -.002 | .013 | .275 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .38 | -.001 | .010 | .022 | .012 | .079 | .010 | .036 | .219 | .391 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .50 | .003 | .019 | .029 | .045 | .104 | .019 | -.008 | .212 | .238 | .450 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.85 | .008 | .059 | .062 | .104 | .414 | .085 | .060 | .090 | .089 | .128 | .875 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .31 | .003 | .006 | .014 | -.004 | .053 | -.001 | .025 | .213 | .249 | .224 | .076 | .322 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.46 | .013 | .013 | .017 | .026 | .067 | .037 | .020 | .014 | .021 | .039 | .067 | .016 | .106 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .58 | -.015 | .007 | .033 | -.001 | .099 | .017 | .012 | .278 | .300 | .314 | .162 | .277 | .034 | .533 | -- |  |  |  |
| Paranoia (15) | .65 | .024 | .035 | .035 | .063 | .065 | .023 | -.001 | .235 | .262 | .321 | .096 | .255 | .039 | .329 | .552 | -- |  |  |
| Phobia (16) | .20 | .010 | .005 | .009 | .004 | .035 | -.003 | .006 | .198 | .186 | .164 | .059 | .178 | .006 | .218 | .209 | .253 | -- |  |
| Psychoticism (17) | .34 | -.004 | .022 | .014 | .020 | .071 | .001 | .025 | .198 | .275 | .219 | .071 | .217 | .026 | .266 | .260 | .174 | .311 | -- |
| Somatization (18) | .26 | .011 | .002 | .006 | -.001 | .025 | .003 | .007 | .198 | .194 | .196 | .066 | .185 | .007 | .258 | .201 | .165 | .171 | .271 |
| N | 527 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F10: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 7) on TBI (Wave 3). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .250 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | -.004 | .202 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | -.001 | .022 | .143 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.029 | .085 | .095 | .543 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.14 | -.002 | .056 | .101 | .210 | .929 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.63 | -.007 | .026 | .033 | .081 | .120 | .123 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | -.006 | -.009 | .046 | .041 | .065 | .019 | .423 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .35 | -.018 | .027 | .045 | .043 | .069 | .028 | .040 | .302 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .44 | -.014 | .029 | .042 | .056 | .078 | .029 | .019 | .231 | .401 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .49 | -.033 | .017 | .050 | .066 | .098 | .037 | .037 | .211 | .242 | .431 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.83 | -.009 | .048 | .085 | .169 | .954 | .087 | .098 | .132 | .134 | .191 | .954 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .28 | -.007 | .023 | .034 | .039 | .071 | .022 | .004 | .201 | .226 | .199 | .115 | .277 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.43 | -.001 | .002 | .021 | .040 | .057 | .041 | .021 | .029 | .030 | .058 | .115 | .025 | .109 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .60 | -.031 | .019 | .038 | .058 | .079 | .040 | .033 | .269 | .316 | .292 | .198 | .272 | .040 | .544 | -- |  |  |  |
| Paranoia (15) | .66 | -.004 | .053 | .066 | .107 | .064 | .049 | .010 | .218 | .271 | .274 | .140 | .241 | .069 | .324 | .567 | -- |  |  |
| Phobia (16) | .17 | .002 | .019 | .020 | .125 | .030 | .024 | .028 | .153 | .119 | .129 | .062 | .138 | .019 | .166 | .152 | .172 | -- |  |
| Psychoticism (17) | .34 | -.022 | .022 | .039 | .049 | .060 | .032 | .034 | .196 | .247 | .207 | .143 | .179 | .034 | .248 | .243 | .125 | .276 | -- |
| Somatization (18) | .27 | -.008 | .021 | .023 | .034 | .038 | .025 | .015 | .160 | .145 | .156 | .071 | .136 | .012 | .223 | .150 | .105 | .124 | .215 |
| N | 488 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F11: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 3). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .244 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .56 | -.001 | .219 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .011 | .022 | .146 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.026 | .092 | .102 | .549 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.10 | -.001 | .068 | .106 | .165 | .909 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.011 | .026 | .028 | .072 | .117 | .124 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 3) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .18 | .004 | -.009 | .046 | .040 | .063 | .012 | .456 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | -.017 | .025 | .017 | .016 | .036 | .021 | .007 | .275 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .35 | -.002 | .024 | .022 | .023 | .038 | .030 | .021 | .206 | .344 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .43 | -.002 | .022 | .025 | .054 | .022 | .025 | .001 | .149 | .173 | .288 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.75 | -.023 | .080 | .054 | .206 | .353 | .073 | .056 | .095 | .073 | .089 | .918 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .26 | -.011 | .015 | .009 | -.001 | .038 | .018 | -.007 | .187 | .216 | .137 | .018 | .304 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.43 | .017 | .012 | .013 | .041 | .052 | .045 | .016 | .015 | .018 | .034 | .101 | .002 | .115 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .52 | -.036 | .024 | .029 | .028 | .019 | .018 | .020 | .259 | .267 | .224 | .142 | .237 | .026 | .495 | -- |  |  |  |
| Paranoia (15) | .61 | .002 | .044 | .043 | .051 | .025 | .037 | .023 | .194 | .254 | .166 | .041 | .234 | .034 | .274 | .526 | -- |  |  |
| Phobia (16) | .16 | -.008 | .017 | .005 | -.004 | -.001 | .007 | .006 | .132 | .128 | .078 | .025 | .125 | .009 | .143 | .140 | .151 | -- |  |
| Psychoticism (17) | .30 | -.002 | .019 | .016 | -.005 | .025 | .025 | .021 | .168 | .229 | .127 | .050 | .190 | .013 | .219 | .219 | .112 | .276 | -- |
| Somatization (18) | .21 | -.001 | .015 | .008 | .001 | -.001 | .008 | .012 | .157 | .139 | .110 | .051 | .129 | .007 | .194 | .126 | .083 | .120 | .181 |
| N | 428 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F12: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 5) on TBI (Wave 4). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .256 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | .004 | .197 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .012 | .025 | .144 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.67 | -.018 | .072 | .096 | .545 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.16 | .010 | .074 | .104 | .162 | .872 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.001 | .017 | .032 | .081 | .118 | .117 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .15 | .005 | .002 | .015 | .017 | .045 | .013 | .307 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .35 | -.009 | -.008 | .016 | .011 | .006 | .008 | .033 | .250 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .43 | -.010 | -.005 | .027 | .016 | .014 | .004 | .051 | .190 | .422 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .49 | -.014 | .013 | .033 | .031 | .063 | .021 | .020 | .182 | .223 | .387 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.87 | -.018 | .030 | .058 | .091 | .381 | .074 | .064 | .076 | .057 | .147 | .828 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .31 | -.012 | -.009 | .005 | -.001 | -.006 | .001 | .042 | .147 | .209 | .166 | .059 | .319 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.49 | .004 | .020 | .016 | .038 | .067 | .040 | .019 | .026 | .023 | .055 | .104 | .014 | .122 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .60 | -.015 | -.012 | .018 | .009 | .032 | .008 | .053 | .242 | .290 | .271 | .129 | .217 | .038 | .479 | -- |  |  |  |
| Paranoia (15) | .63 | .006 | -.010 | .013 | .009 | -.021 | .007 | .037 | .206 | .272 | .263 | .076 | .223 | .058 | .297 | .486 | -- |  |  |
| Phobia (16) | .17 | -.003 | -.002 | .011 | .012 | -.006 | .002 | .032 | .124 | .129 | .103 | .048 | .107 | .018 | .154 | .112 | .147 | -- |  |
| Psychoticism (17) | .35 | -.003 | -.007 | .028 | .011 | .022 | .017 | .035 | .185 | .276 | .196 | .022 | .178 | .028 | .254 | .261 | .121 | .326 | -- |
| Somatization (18) | .26 | .006 | -.018 | .005 | -.021 | -.003 | -.001 | .027 | .146 | .147 | .142 | .043 | .130 | .018 | .201 | .150 | .098 | -.021 | .220 |
| N | 524 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F13: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 6) on TBI (Wave 4). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .250 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .55 | .006 | .203 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .46 | .004 | .018 | .144 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.008 | .073 | .091 | .530 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.13 | .016 | .063 | .115 | .186 | .910 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.014 | .021 | .033 | .078 | .121 | .115 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | .001 | -.002 | .010 | .002 | .061 | .015 | .368 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | .004 | .005 | .013 | -.004 | .048 | -.001 | .021 | .271 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .37 | -.006 | .015 | .019 | .020 | .083 | .012 | .035 | .218 | .393 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .50 | -.005 | .021 | .023 | .047 | .090 | .018 | .020 | .210 | .243 | .442 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.85 | .001 | .065 | .060 | .107 | .426 | .085 | .101 | .089 | .087 | .127 | .869 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .31 | -.002 | .002 | .015 | .005 | .045 | .001 | .039 | .212 | .248 | .224 | .067 | .323 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.46 | .013 | .014 | .015 | .029 | .070 | .039 | .025 | .013 | .025 | .041 | .105 | .016 | .107 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .58 | -.012 | .005 | .034 | .009 | .094 | .020 | .033 | .277 | .299 | .311 | .154 | .280 | .035 | .534 | -- |  |  |  |
| Paranoia (15) | .64 | .022 | .028 | .034 | .079 | .058 | .027 | .027 | .236 | .268 | .323 | .105 | .260 | .044 | .336 | .561 | -- |  |  |
| Phobia (16) | .20 | .008 | .004 | .008 | .006 | .031 | -.002 | .014 | .195 | .182 | .163 | .056 | .179 | .005 | .214 | .211 | .248 | -- |  |
| Psychoticism (17) | .34 | .001 | .023 | .018 | .035 | .074 | .008 | .049 | .195 | .270 | .219 | .098 | .220 | .028 | .273 | .270 | .171 | .309 | -- |
| Somatization (18) | .26 | .009 | -.001 | .005 | -.012 | .026 | .003 | .028 | .195 | .087 | .197 | .072 | .184 | .009 | .255 | .204 | .162 | .170 | .270 |
| N | 546 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F14: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 7) on TBI (Wave 4). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .262 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .55 | -.004 | .200 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | -.002 | .022 | .145 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.030 | .083 | .094 | .542 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.15 | -.005 | .056 | .103 | .204 | .908 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.012 | .024 | .029 | .080 | .115 | .120 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .19 | -.008 | -.006 | .015 | .005 | .047 | .012 | .401 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .35 | -.023 | .027 | .040 | .043 | .059 | .024 | .036 | .310 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .45 | -.021 | .029 | .040 | .055 | .072 | .026 | .029 | .240 | .414 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .51 | -.042 | .019 | .047 | .072 | .086 | .035 | .024 | .219 | .249 | .431 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.83 | -.016 | .050 | .082 | .165 | .460 | .091 | .096 | .135 | .138 | .191 | .948 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .29 | -.014 | .022 | .032 | .038 | .066 | .021 | .020 | .213 | .238 | .210 | .122 | .289 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.43 | -.004 | .005 | .019 | .034 | .059 | .041 | .022 | .027 | .028 | .052 | .111 | .026 | .110 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .61 | -.037 | .018 | .034 | .055 | .061 | .032 | .028 | .270 | .326 | .300 | .199 | .278 | .032 | .561 | -- |  |  |  |
| Paranoia (15) | .64 | .161 | .057 | .062 | .111 | .051 | .046 | .051 | .223 | .276 | .288 | .141 | .249 | .065 | .330 | .571 | -- |  |  |
| Phobia (16) | .18 | -.003 | .018 | .018 | .031 | .016 | .023 | .015 | .160 | .121 | .140 | .070 | .146 | .019 | .167 | .161 | .182 | -- |  |
| Psychoticism (17) | .34 | -.029 | .023 | .036 | .050 | .051 | .030 | .033 | .197 | .248 | .206 | .144 | .185 | .031 | .249 | .241 | .125 | .270 | -- |
| Somatization (18) | .27 | .012 | .019 | .021 | .033 | .036 | .023 | .015 | .164 | .150 | .150 | .081 | .142 | .012 | .232 | .153 | .108 | .127 | .221 |
| N | 497 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F15: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 4). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .255 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .55 | .001 | .215 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .010 | .023 | .149 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.68 | -.031 | .081 | .104 | .557 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.08 | .008 | .074 | .110 | .148 | .913 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.65 | -.012 | .023 | .029 | .073 | .118 | .120 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 4) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .17 | .004 | -.005 | .016 | .010 | .065 | .015 | .382 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | -.018 | .023 | .013 | .018 | .032 | .013 | .020 | .289 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .35 | -.010 | .018 | .015 | .028 | .040 | .024 | .031 | .225 | .364 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .43 | -.014 | .018 | .018 | .041 | .013 | .018 | .019 | .160 | .185 | .279 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.75 | -.025 | .072 | .051 | .190 | .371 | .077 | .088 | .106 | .093 | .104 | .921 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .27 | -.021 | .010 | .003 | -.002 | .032 | .013 | .001 | .197 | .231 | .142 | .031 | .315 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.42 | .009 | .013 | .014 | .042 | .053 | .044 | .007 | .011 | .015 | .029 | .098 | .001 | .116 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .53 | -.042 | .018 | .022 | .030 | .007 | .014 | .027 | .277 | .291 | .238 | .144 | .247 | .020 | .520 | -- |  |  |  |
| Paranoia (15) | .62 | -.010 | .037 | .040 | .070 | .027 | .034 | .036 | .207 | .264 | .170 | .062 | .243 | .035 | .294 | .546 | -- |  |  |
| Phobia (16) | .16 | -.008 | .015 | .004 | .002 | -.001 | .005 | .004 | .140 | .141 | .084 | .031 | .130 | .008 | .150 | .149 | .156 | -- |  |
| Psychoticism (17) | .30 | -.014 | .013 | .012 | .012 | .030 | .022 | .026 | .185 | .247 | .142 | .071 | .203 | .012 | .241 | .239 | .124 | .283 | -- |
| Somatization (18) | .22 | -.004 | .012 | .004 | -.001 | -.006 | .005 | .011 | .161 | .145 | .113 | .049 | .133 | .005 | .198 | .130 | .082 | .123 | .181 |
| N | 449 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F16: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 6) on TBI (Wave 5). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .255 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | .004 | .201 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | .009 | .020 | .142 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.64 | -.004 | .074 | .091 | .523 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.12 | .021 | .072 | .113 | .191 | .929 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.63 | -.013 | .022 | .033 | .082 | .121 | .117 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .09 | -.005 | .002 | .017 | .010 | .023 | .012 | .177 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | .005 | .002 | .015 | -.007 | .046 | -.001 | .032 | .277 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .37 | .001 | .012 | .022 | .017 | .075 | .011 | .028 | .220 | .388 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .50 | .001 | .019 | .025 | .044 | .095 | .019 | .025 | .213 | .243 | .452 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.84 | .011 | .058 | .058 | .112 | .412 | .085 | .014 | .080 | .088 | .125 | .881 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .30 | .005 | .001 | .017 | -.004 | .044 | .001 | .035 | .214 | .214 | .223 | .060 | .321 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.46 | .017 | .012 | .013 | .032 | .065 | .038 | .001 | .015 | .024 | .042 | .107 | .017 | .107 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .57 | -.080 | .002 | .034 | .008 | .090 | .017 | .026 | .281 | .301 | .315 | .157 | .273 | .037 | .534 | -- |  |  |  |
| Paranoia (15) | .64 | .022 | .033 | .035 | .077 | .062 | .024 | .029 | .235 | .265 | .320 | .105 | .256 | .045 | .335 | .552 | -- |  |  |
| Phobia (16) | .20 | .008 | .001 | .009 | .004 | .029 | -.003 | .018 | .198 | .183 | .168 | .055 | .177 | .006 | .218 | .210 | .249 | -- |  |
| Psychoticism (17) | .34 | .003 | .022 | .021 | .026 | .121 | .117 | .028 | .199 | .274 | .222 | .098 | .217 | .026 | .273 | .268 | .172 | .315 | -- |
| Somatization (18) | .26 | .010 | -.004 | .007 | -.011 | .025 | .002 | .009 | .198 | .198 | .202 | .070 | .186 | .011 | .257 | .204 | .164 | .174 | .267 |
| N | 562 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F17: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 7) on TBI (Wave 5). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .261 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | -.006 | .196 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | .001 | .020 | .141 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.66 | -.025 | .080 | .094 | .548 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.15 | .004 | .064 | .099 | .207 | .924 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.63 | -.009 | .027 | .029 | .082 | .113 | .122 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .09 | -.008 | .006 | .018 | .016 | .025 | .014 | .170 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .36 | -.021 | .024 | .043 | .037 | .062 | .024 | .015 | .321 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .45 | -.016 | .024 | .044 | .047 | .076 | .026 | .026 | .246 | .419 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .52 | -.037 | .013 | .049 | .063 | .085 | .037 | .006 | .232 | .253 | .450 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.83 | -.003 | .049 | .080 | .170 | .455 | .091 | .019 | .137 | .137 | .192 | .955 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .30 | -.011 | .022 | .033 | .034 | .078 | .021 | .015 | .213 | .234 | .211 | .126 | .289 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.43 | .004 | .002 | .019 | .040 | .056 | .041 | .003 | .026 | .028 | .055 | .117 | .024 | .112 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .61 | -.031 | .013 | .040 | .049 | .061 | .031 | .009 | .287 | .335 | .315 | .202 | .279 | .034 | .579 | -- |  |  |  |
| Paranoia (15) | .67 | -.006 | .055 | .068 | .104 | .068 | .049 | .018 | .236 | .287 | .305 | .147 | .255 | .065 | .348 | .589 | -- |  |  |
| Phobia (16) | .18 | -.002 | .018 | .022 | .031 | .026 | .023 | .001 | .171 | .127 | .156 | .073 | .152 | .018 | .180 | .169 | .191 | -- |  |
| Psychoticism (17) | .35 | -.025 | .016 | .039 | .041 | .057 | .030 | .021 | .207 | .252 | .217 | .142 | .186 | .032 | .261 | .251 | .137 | .277 | -- |
| Somatization (18) | .27 | -.010 | .015 | .023 | .024 | .034 | .021 | .014 | .168 | .150 | .166 | .077 | .141 | .009 | .237 | .159 | .116 | .129 | .219 |
| N | 518 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F18: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 5). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .257 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | -.005 | .207 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .011 | .023 | .146 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.018 | .089 | .107 | .553 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.09 | .009 | .069 | .117 | .185 | .919 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.012 | .024 | .029 | .077 | .116 | .121 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 5) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .10 | .005 | .007 | .025 | .183 | .038 | .013 | .183 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .33 | -.015 | .023 | .012 | .018 | .033 | .017 | -.006 | .289 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .36 | -.010 | .014 | .014 | .028 | .026 | .027 | .013 | .231 | .377 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .44 | -.007 | .019 | .020 | .055 | .016 | .022 | .006 | .166 | .196 | .303 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.72 | -.022 | .072 | .059 | .214 | .371 | .079 | .021 | .113 | .097 | .104 | .913 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .26 | -.018 | .013 | .003 | .004 | .036 | .017 | -.009 | .196 | .228 | .152 | .035 | .314 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.42 | .016 | .012 | .013 | .044 | .055 | .043 | -.006 | .014 | .016 | .034 | .102 | .003 | .113 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .54 | -.033 | .018 | .022 | .027 | .007 | .017 | -.011 | .279 | .303 | .245 | .161 | .249 | .025 | .528 | -- |  |  |  |
| Paranoia (15) | .62 | .001 | .038 | .040 | .064 | .021 | .038 | .002 | .206 | .269 | .185 | .073 | .237 | .035 | .293 | .543 | -- |  |  |
| Phobia (16) | .16 | -.005 | .015 | .003 | .004 | .001 | .005 | -.008 | .138 | .138 | .086 | .034 | .128 | .009 | .149 | .146 | .152 | -- |  |
| Psychoticism (17) | .31 | -.010 | .009 | .013 | .005 | .021 | .021 | .008 | .189 | .256 | .149 | .074 | .201 | .013 | .252 | .238 | .121 | .299 | -- |
| Somatization (18) | .22 | -.004 | .012 | .004 | -.003 | -.011 | .005 | -.002 | .163 | .153 | .121 | .051 | .133 | .005 | .206 | .129 | .081 | .130 | .188 |
| N | 460 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| Table F19: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 7) on TBI (Wave 6). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .258 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | -.002 | .200 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .45 | .004 | .019 | .142 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.026 | .083 | .091 | .551 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.15 | .005 | .065 | .104 | .210 | .937 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.63 | -.007 | .025 | .030 | .082 | .122 | .122 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .08 | .012 | .004 | .017 | .011 | .002 | -.001 | .163 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .35 | -.020 | .026 | .045 | .046 | .063 | .024 | .041 | .319 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .44 | -.015 | .024 | .044 | .058 | .080 | .025 | .037 | .245 | .413 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .51 | -.038 | .016 | .052 | .076 | .091 | .037 | .021 | .233 | .255 | .455 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.84 | -.011 | .044 | .081 | .178 | .463 | .089 | .012 | .139 | .137 | .199 | .970 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .29 | -.013 | .023 | .032 | .036 | .077 | .021 | .036 | .213 | .232 | .215 | .125 | .288 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.43 | .001 | .001 | .020 | .040 | .057 | .041 | .001 | .027 | .029 | .055 | .117 | .024 | .111 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .61 | -.031 | .016 | .041 | .063 | .066 | .032 | .038 | .285 | .331 | .315 | .205 | .277 | .035 | .573 | -- |  |  |  |
| Paranoia (15) | .66 | -.003 | .057 | .063 | .102 | .057 | .048 | .050 | .235 | .280 | .299 | .134 | .250 | .064 | .341 | .590 | -- |  |  |
| Phobia (16) | .18 | -.001 | .018 | .023 | .034 | .020 | .023 | .033 | .168 | .127 | .151 | .073 | .150 | .018 | .177 | .171 | .185 | -- |  |
| Psychoticism (17) | .34 | -.023 | .019 | .038 | .047 | .060 | .029 | .019 | .208 | .254 | .220 | .143 | .187 | .032 | .262 | .246 | .134 | .278 | -- |
| Somatization (18) | .27 | -.009 | .017 | .022 | .030 | .035 | .020 | .172 | .172 | .151 | .169 | .078 | .143 | .010 | .239 | .159 | .115 | .130 | .221 |
| N | 521 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F20: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 6). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .27 | .255 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .54 | .004 | .210 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .014 | .023 | .146 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.022 | .085 | .104 | .553 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.08 | .012 | .070 | .117 | .173 | .935 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.011 | .025 | .028 | .076 | .123 | .121 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 6) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .08 | .016 | .007 | .020 | .013 | .015 | .012 | .176 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .33 | -.014 | .021 | .012 | .022 | .031 | .016 | .022 | .290 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .36 | -.007 | .017 | .016 | .036 | .031 | .028 | .008 | .229 | .367 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .43 | -.006 | .016 | .020 | .051 | .019 | .022 | .020 | .168 | .197 | .305 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.73 | -.024 | .072 | .054 | .207 | .368 | .078 | -.022 | .111 | .093 | .103 | .925 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .26 | -.017 | .010 | .005 | .004 | .033 | .017 | .018 | .198 | .230 | .153 | .037 | .315 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.41 | .011 | .009 | .012 | .041 | .058 | .043 | -.005 | .015 | .019 | .034 | .099 | .005 | .110 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .53 | -.035 | .018 | .024 | .033 | .012 | .020 | .023 | .280 | .293 | .245 | .155 | .249 | .029 | .519 | -- |  |  |  |
| Paranoia (15) | .63 | .003 | .040 | .038 | .079 | .025 | .041 | .044 | .204 | .262 | .181 | .064 | .236 | .039 | .288 | .553 | -- |  |  |
| Phobia (16) | .16 | -.006 | .015 | .003 | .007 | .002 | .006 | .010 | .138 | .139 | .086 | .037 | .128 | .009 | .149 | .146 | .152 | -- |  |
| Psychoticism (17) | .31 | -.005 | .014 | .013 | .012 | .026 | .023 | .004 | .186 | .249 | .144 | .070 | .200 | .017 | .244 | .235 | .122 | .294 | -- |
| Somatization (18) | .22 | -.005 | .012 | .006 | .003 | -.009 | .006 | .020 | .162 | .148 | .121 | .046 | .136 | .007 | .201 | .129 | .083 | .127 | .185 |
| N | 461 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table F21: Mean and Variance/Covariance matrix for adverse psychological effects (Wave 8) on TBI (Wave 7). | | | | | | | | | | | | | | | | | | | |
|  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| *Exogenous Variables* (Wave 1) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sports Involvement (1) | .28 | .264 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fighting in School (2) | .53 | .002 | .204 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure to Violence (3) | .47 | .013 | .024 | .145 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Psychopathy (4) | 1.65 | -.023 | .083 | .109 | .566 | -- |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impulsivity (5) | 3.09 | .012 | .065 | .114 | .170 | .938 | -- |  |  |  |  |  |  |  |  |  |  |  |  |
| Moral Disengagement (6) | 1.64 | -.013 | .023 | .030 | .080 | .114 | .121 | -- |  |  |  |  |  |  |  |  |  |  |  |
| *Lagged Endogenous Variable* (Wave 7) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TBI (7) | .06 | -.006 | .001 | -.002 | -.002 | -.033 | -.009 | .126 | -- |  |  |  |  |  |  |  |  |  |  |
| *Adverse Psychological Effects* (Wave 8) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Anxiety (8) | .32 | -.013 | .021 | .010 | .017 | .036 | .015 | .009 | .287 | -- |  |  |  |  |  |  |  |  |  |
| Depression (9) | .36 | -.009 | .017 | .015 | .028 | .029 | .027 | .014 | .231 | .372 | -- |  |  |  |  |  |  |  |  |
| Hostility (10) | .43 | -.007 | .017 | .020 | .051 | .026 | .020 | .009 | .167 | .196 | .301 | -- |  |  |  |  |  |  |  |
| Impulsivity (11) | 2.73 | -.029 | .067 | .049 | .205 | .352 | .072 | .004 | .109 | .095 | .104 | .922 | -- |  |  |  |  |  |  |
| Interpersonal Sensitivity (12) | .25 | -.017 | .010 | .005 | .001 | .040 | .017 | .014 | .194 | .226 | .150 | .035 | .307 | -- |  |  |  |  |  |
| Moral Disengagement (13) | 1.42 | .009 | .012 | .014 | .050 | .050 | .044 | -.001 | .012 | .014 | .031 | .098 | .003 | .116 | -- |  |  |  |  |
| Obsessive Compulsive Disorder (14) | .53 | -.036 | .014 | .023 | .026 | .021 | .018 | .026 | .278 | .299 | .238 | .165 | .240 | .026 | .514 | -- |  |  |  |
| Paranoia (15) | .63 | -.001 | .037 | .039 | .075 | .028 | .040 | -.001 | .203 | .264 | .177 | .058 | .229 | .034 | .287 | .551 | -- |  |  |
| Phobia (16) | .16 | -.007 | .015 | .004 | .005 | .002 | .006 | .005 | .136 | .135 | .085 | .034 | .126 | .010 | .145 | .142 | .151 | -- |  |
| Psychoticism (17) | .31 | -.008 | .012 | .015 | .009 | .025 | .022 | .004 | .188 | .253 | .145 | .071 | .197 | .014 | .249 | .239 | .119 | .298 | -- |
| Somatization (18) | .22 | -.003 | .012 | .005 | -.003 | -.006 | .005 | .013 | .163 | .151 | .121 | .047 | .132 | .004 | .203 | .129 | .080 | .130 | .186 |
| N | 467 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Notes:* Variance/covariance matrix was computed after the variances were recoded. | | | | | | | | | | | | | | | | | | |  |