

## Self-, Other-, and Dual-Harm During Adolescence: A Prospective-Longitudinal Study of Childhood Risk Factors and Early Adult Correlates

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### Supplement

#### Variable descriptions

**Table S1.** Variables assessing childhood risk factors and early adult correlates

Measure	Number of items, wording, example items	Scale	Cronbach's $\alpha$	Scoring
<b>Childhood risk factors (age 7–11)</b>				
Sensation-seeking, age 7  Adapted from Alsaker, Naegele, Valkanover, and Hauser (2008)	9 items, assessed using a cardboard game (“travel game”) addressing preference for (choice of) sensational versus less sensational situations  <ul style="list-style-type: none"> <li>• You must decide whether you want to travel by fast motorbike or funny steam locomotive.</li> </ul>	0 = sensational situation not chosen, 1 = sensational situation chosen	0.68	Mean score (possible range: 0–1)
Anxiety/depression, age 11  From the Social Behavior Questionnaire (Murray, Obsuth, Eisner, & Ribeaud, 2019; Tremblay et al., 1991)	8 items  During the past month, how often have you felt the following? <ul style="list-style-type: none"> <li>• I had to cry.</li> <li>• I was scared.</li> </ul>	1 = never to 5 = very often	0.79	Mean score (possible range: 1–5)
Low self-control, age 11  From the self-control scale (Grasmick, Tittle, Bursik, & Arneklev, 1993)	10 items  This is about how you see yourself. Mark how true these statements are <i>for you</i> . <ul style="list-style-type: none"> <li>• I often act on the spur of the moment without stopping to think.</li> <li>• If I don't get something I want immediately, I get angry pretty quickly.</li> <li>• I like to get out and do things more than I like to read or contemplate ideas.</li> </ul>	1 = fully untrue to 4 = fully true	0.75	Mean score (possible range: 1–4)
Relational aggression (perpetration), age 11	3 items  Please indicate which of	1 = never to 5 = very often	0.76	Mean score (possible range: 1–5)

From the Social Behavior Questionnaire (Murray, Obsuth, et al., 2019; Tremblay et al., 1991)	these things you have done in the last 6 months. <ul style="list-style-type: none"> <li>When you were mad at another kid, you said bad things about him/her behind the kid's back.</li> <li>When you were mad at another kid, you got others to dislike that kid as well.</li> </ul>			
Physical aggression (perpetration), age 11  From the Social Behavior Questionnaire (Murray, Obsuth, et al., 2019; Tremblay et al., 1991)	3 items  Please indicate which of these things you have done in the last 6 months. <ul style="list-style-type: none"> <li>You physically attacked other people.</li> <li>You got into fights.</li> </ul>	1 = never to 5 = very often	0.76	Mean score (possible range: 1–5)
Any substance use, age 11	3 items  In the last year, have you... <ul style="list-style-type: none"> <li>smoked cigarettes?</li> <li>smoked a joint (hashish, marijuana, or cannabis)?</li> <li>drunk at least one glass of alcohol (e.g., beer, vodka, mixed drinks, wine)?</li> </ul>	0 = no 1 = yes	--	Binary: 0 = no substance use, 1 = any substance use
Delinquency, age 11  (Eisner, Manzoni, & Ribeaud, 2000; Ribeaud & Eisner, 2009; Wetzels, Enzmann, Mecklenburg, & Pfeiffer, 2001), adapted and expanded	8 items  In the last year, have you... <ul style="list-style-type: none"> <li>Stolen something at home?</li> <li>Stolen something from a shop or kiosk that is worth more than 50 CHF?</li> <li>Used a bus, tram, or train without having a valid ticket?</li> </ul>	0 = no 1 = yes	--	Sum score (possible range: 0–8)
Parental divorce, age 11	1 item  Parent divorced by child age 11.	0 = no 1 = yes	--	Binary: 0 = no, 1 = yes
Lack of parental involvement, age 11  From the Alabama Parenting Questionnaire (Shelton, Frick, & Wootton, 1996)	6 items  Please mark how often the things below occur. <ul style="list-style-type: none"> <li>Your parents talk to you about your friends or about the other students in your class.</li> <li>Your mother or father hugs you to comfort you when you are sad.</li> </ul>	1 = never to 4 = often	0.66	Binary coding indicating belonging to top 25% on the mean scale distribution (possible range: 1–4): 0 = lower 75%, 1 = top 25%

<p>Harsh parenting, age 11</p> <p>From the Alabama Parenting Questionnaire (Shelton et al., 1996)</p>	<p>5 items</p> <p>When you misbehave or are disobedient, do your parents...</p> <ul style="list-style-type: none"> <li>• spank you with their hand?</li> <li>• pull your hair or ears?</li> <li>• yell or scream at you?</li> </ul>	<p>1 = never to 4 = often/always</p>	<p>0.66</p>	<p>Binary coding indicating belonging to top 25% on the mean scale distribution (possible range: 1–4): 0 = lower 75%, 1 = top 25%</p>
<p>Assault victimization, age 11</p> <p>Adapted from (Wetzels et al., 2001)</p>	<p>2 items</p> <p>In the past 12 months, have any of the things below happened to you?</p> <ul style="list-style-type: none"> <li>• Someone purposely injured you with a weapon (e.g., a knife) or object (e.g., a cane) or by repeatedly kicking you with heavy shoes.</li> <li>• Someone hit you so hard that they injured you (e.g. drawing blood or causing a black eye) without using a weapon or objects.</li> </ul>	<p>0 = no, 1 = yes</p>	<p>--</p>	<p>Binary: 0 = none, 1 = any</p>
<p>Bullying victimization, age 11</p> <p>From the Zurich Brief Bullying Scale (Murray, Eisner, et al., 2019)</p>	<p>4 items</p> <p>In the past 12 months, how often have other people purposely...</p> <ul style="list-style-type: none"> <li>• ignored or excluded you?</li> <li>• laughed at, mocked, or insulted you?</li> </ul>	<p>1 = never to 6 = (almost) every day</p>	<p>0.72</p>	<p>Mean score (possible range: 1–6)</p>
<p>Low school bonding, age 11</p> <p>Created by study team</p>	<p>9 items</p> <p>You've been to school for over four years now. How are you doing there? Please tell us how true the statements below are for you.</p> <ul style="list-style-type: none"> <li>• I enjoy going to school.</li> <li>• My teacher treats me fairly.</li> <li>• We have a really good sense of community within the class.</li> </ul>	<p>1 = fully untrue to 4 = fully true</p>	<p>0.80</p>	<p>Mean score (possible range: 1–4)</p>

Adult correlates (age 20)				
Anxiety/depression  From the Social Behavior Questionnaire (Murray, Obsuth, et al., 2019; Tremblay et al., 1991)	13 items  During the past month, how often have you felt the following? (age 20) <ul style="list-style-type: none"> <li>• I didn't feel joy about anything.</li> <li>• I cried.</li> <li>• I was scared for no particular reason.</li> </ul>	1 = never to 5 = very often	0.92	Mean score (possible range: 1–5)
Low self-control  From the self-control scale (Grasmick et al., 1993)	10 items  This is about how you see yourself. Mark how true these statements are <i>for you</i> . <ul style="list-style-type: none"> <li>• I often act on the spur of the moment without stopping to think.</li> <li>• If I don't get something I want immediately, I get angry pretty quickly.</li> <li>• I like to get out and do things more than I like to read or contemplate ideas.</li> </ul>	1 = fully untrue to 4 = fully true	0.74	Mean score (possible range: 1–4)
Relational aggression (perpetration)  From the Social Behavior Questionnaire (Murray, Obsuth, et al., 2019; Tremblay et al., 1991)	4 items  Please indicate which of these things you have done in the last 6 months. <ul style="list-style-type: none"> <li>• When you were mad at someone, you said bad things about him/her behind the kid's back.</li> <li>• When you were mad at someone, you got others to dislike that kid as well.</li> </ul>	1 = never to 5 = very often	0.73	Mean score (possible range: 1–5)
Physical aggression (perpetration)  From the Social Behavior Questionnaire (Murray, Obsuth, et al., 2019; Tremblay et al., 1991)	3 items  Please indicate which of these things you have done in the last 6 months. <ul style="list-style-type: none"> <li>• You physically attacked other people.</li> <li>• You got into fights.</li> </ul>	1 = never to 5 = very often	0.85	Mean score (possible range: 1–5)
Psychopathy  From The Short Dark Triad (Jones & Paulhus, 2013)	6 items  This is about how you see yourself. Mark how true these statements are <i>for you</i> . <ul style="list-style-type: none"> <li>• People always regret messing with me.</li> <li>• It is true that I can be mean to others.</li> </ul>	1 = fully untrue to 4 = fully true	0.73	Mean score (possible range: 1–4)

Suicidal ideation  From the Violent Ideations Scale (Murray, Eisner, & Ribeaud, 2018)	1 item  How often have you thought about killing yourself in the last month?	1 = never to 5 = very often	--	Binary: 0 = never, 1 = at least once
Homicidal ideation  From the Violent Ideations Scale (Murray et al., 2018)	1 item  How often have you thought about killing someone else you know in the past month?	1 = never to 5 = very often	--	Binary: 0 = never, 1 = at least once
Frequent or illicit substance use  (Quednow et al., 2021; Shanahan et al., 2021)	14 items  How often did you take the following substances during the past 12 months?  <ul style="list-style-type: none"> <li>• Beer, wine, alcopops</li> <li>• Liquor</li> <li>• Cannabis</li> <li>• Ecstasy</li> <li>• Cocaine</li> <li>• Amphetamines</li> </ul>	1 = never, 6 = 53–365 times (daily)	--	Binary: 0 = no illicit drug use, no daily alcohol use, and no weekly or daily cannabis use, 1 = any illicit drug use or daily alcohol use or weekly or daily cannabis use
Delinquency  (Eisner et al., 2000; Ribeaud & Eisner, 2009; Wetzels et al., 2001), adapted and expanded	23 items  In the last year, have you... <ul style="list-style-type: none"> <li>• Stolen something at home?</li> <li>• Stolen something from a shop or kiosk that is worth more than 50 CHF?</li> <li>• Used a bus, tram, or train without having a valid ticket?</li> <li>• Driven after consuming alcohol or other drugs?</li> <li>• Urged somebody to engage in sexual acts?</li> </ul>	0 = no, 1 = yes	--	Sum score (possible range: 0–23)
Assault victimization  Adapted from (Wetzels et al., 2001)	2 items  In the past 12 months, have any of the things below happened to you? <ul style="list-style-type: none"> <li>• Someone purposely injured you with a weapon (e.g. a knife) or object (e.g. a cane) or by repeatedly kicking you with heavy shoes.</li> <li>• Someone hit you so hard that they injured you (e.g.</li> </ul>	0 = no, 1 = yes	--	Binary: 0 = none, 1 = any

	drawing blood or causing a black eye) without using a weapon or object.			
Bullying victimization  From the Zurich Brief Bullying Scale (Murray, Eisner, et al., 2019)	4 items  In the past 12 months, how often have other people purposely... <ul style="list-style-type: none"> <li>• ignored or excluded you?</li> <li>• laughed at, mocked, or insulted you?</li> </ul>	1 = never to 6 = (almost) every day	0.63	Mean score (possible range: 1–6)
Perceived social exclusion  from (Bude & Lantermann, 2006)	6 items  This is about how you see yourself opposite other people and society. What do you think about the following statements? <ul style="list-style-type: none"> <li>• I feel like I'm not really part of society.</li> <li>• I don't have a chance in this society anyway.</li> <li>• I feel surplus to society.</li> </ul>	1 = fully untrue to 4 = fully true	0.88	Mean score (possible range: 1–4)

**Socio-demographic characteristics of dual-, single-, and no harm groups***Variable descriptions*

Socio-demographic variables were sex (1 = male, 0 = female), parental education background (1 = at least one parent with a tertiary educational degree, 0 = both parents with a lower or no degree), parental migration background (1 = both parents born abroad, 0 = at least one parent born in Switzerland), and child's educational level at age 13 (1 = high, 0 = low). In Switzerland, children are tracked into different educational levels at ages 12/13 and 15/16. Here we use an indicator of whether the respondents followed an academic track by age 13 (called "high") or a lower track.

*Associations with dual- and single-harm between ages 13 and 17*

Sex differences in dual- and single-harm are described in the main manuscript. Parental educational background was not associated significantly with either dual-harm or other-harm only. However, low parental educational background was associated with a higher risk of self-harm only (17.6% of those with a low parental educational background reported self-harm only, compared to 12.6% of those with a high parental educational background; OR = 1.49, 95% CI = 1.01–2.18,  $p = 0.042$ ). Parental migration background was not associated with dual- or single-harm. Dual-harm was more prevalent among adolescents following a lower educational track at age 13 compared to those in the higher track (8.8% vs. 6.0%; OR = 1.51, 95% CI = 1.01–2.25,  $p = 0.043$ ). Single-harm was not significantly related to child educational level.

**Table S2.** Adjusted associations between childhood risk factors (independent variables) and single-harm between ages 13 and 17 (dependent variable): Results from multinomial regression analyses (OR [95% CI]) controlling for sex, parental educational and migration background, and child's educational level at age 13.

Childhood risk factors: independent variables	Self-harm only vs. other-harm only	Self-harm only vs. no harm	Other-harm only vs. no harm
Sensation-seeking	0.93 (0.73–1.18)	<b>1.21</b> (1.02–1.44)	<b>1.31</b> (1.08–1.59)
Anxiety/depression	1.10 (0.88–1.39)	<b>1.28</b> (1.09–1.50)	1.16 (0.95–1.41)
Lack of self-control	<b>0.80</b> (0.65–0.99)	1.17 (1.00–1.38)	<b>1.46</b> (1.22–1.76)
Relational aggression	1.12 (0.89–1.40)	<b>1.24</b> (1.06–1.46)	1.12 (0.93–1.34)
Physical aggression	<b>0.76</b> (0.59–0.98)	<b>1.27</b> (1.04–1.55)	<b>1.67</b> (1.38–2.01)
Substance use	0.49 (0.20–1.19)	1.00 (0.47–2.11)	<b>2.04</b> (1.17–3.54)
Delinquency	<b>0.80</b> (0.65–0.98)	1.12 (0.95–1.33)	<b>1.40</b> (1.18–1.65)
Parental divorce	0.98 (0.59–1.61)	<b>1.52</b> (1.05–2.21)	<b>1.56</b> (1.04–2.33)
Lack of parental involvement	1.30 (0.76–2.21)	<b>1.89</b> (1.28–2.78)	1.45 (0.94–2.25)
Harsh parenting	0.85 (0.52–1.40)	1.37 (0.91–2.07)	<b>1.62</b> (1.07–2.44)
Assault victimization	1.01 (0.61–1.66)	<b>1.78</b> (1.23–2.57)	<b>1.77</b> (1.17–2.66)
Bullying victimization	1.17 (0.96–1.44)	<b>1.41</b> (1.20–1.65)	<b>1.20</b> (1.01–1.43)
Lack of school bonding	0.87 (0.69–1.08)	<b>1.20</b> (1.01–1.43)	<b>1.39</b> (1.16–1.67)

*Note.* A separate regression model was specified for each correlate. Bold print indicates significant effects ( $p < 0.05$ ).



**Table S3.** Adjusted associations between single-harm (ages 13–17; independent variables) and mental health and social impairments in early adulthood (age 20; dependent variables): Results from linear regression analyses (a:  $\beta$ ,  $p$ ) and binary logistic regression analyses (b: OR, 95% CI) controlling for sex, parental educational and migration background, and child's educational level at age 13.

Early adulthood correlates: dependent variables	Self-harm only vs. other-harm only	Self-harm only vs. no harm	Other-harm only vs. no harm
Anxiety/depression (a)	<b>0.10</b> (0.016)	<b>0.16</b> (< 0.001)	0.05 (0.104)
Lack of self-control (a)	0.02 (0.585)	<b>0.11</b> (< 0.001)	<b>0.08</b> (0.005)
Relational aggression (a)	-0.01 (0.861)	0.06 (0.080)	0.06 (0.053)
Physical aggression (a)	<b>-0.12</b> (0.005)	0.03 (0.268)	<b>0.13</b> (< 0.001)
Psychopathy (a)	-0.07 (0.077)	<b>0.10</b> (0.001)	<b>0.17</b> (< 0.001)
Suicidal ideation (b)	<b>2.47</b> (1.37–4.44)	<b>2.78</b> (1.88–4.11)	1.13 (0.67–1.88)
Homicidal ideation (b)	0.86 (0.39–1.93)	1.31 (0.69–2.47)	1.52 (0.85–2.72)
Frequent/illicit substance use (b)	1.32 (0.85–2.05)	<b>2.15</b> (1.54–3.01)	<b>1.63</b> (1.15–2.31)
Delinquency (a)	-0.02 (0.714)	<b>0.11</b> (< 0.001)	<b>0.12</b> (0.001)
Assault victim (b)	0.85 (0.40–1.81)	1.73 (0.89–3.35)	<b>2.04</b> (1.10–3.79)
Bullying victim (a)	-0.01 (0.806)	<b>0.08</b> (0.011)	<b>0.08</b> (0.015)
Perceived social exclusion (a)	<b>0.11</b> (0.011)	<b>0.16</b> (< 0.001)	0.05 (0.107)

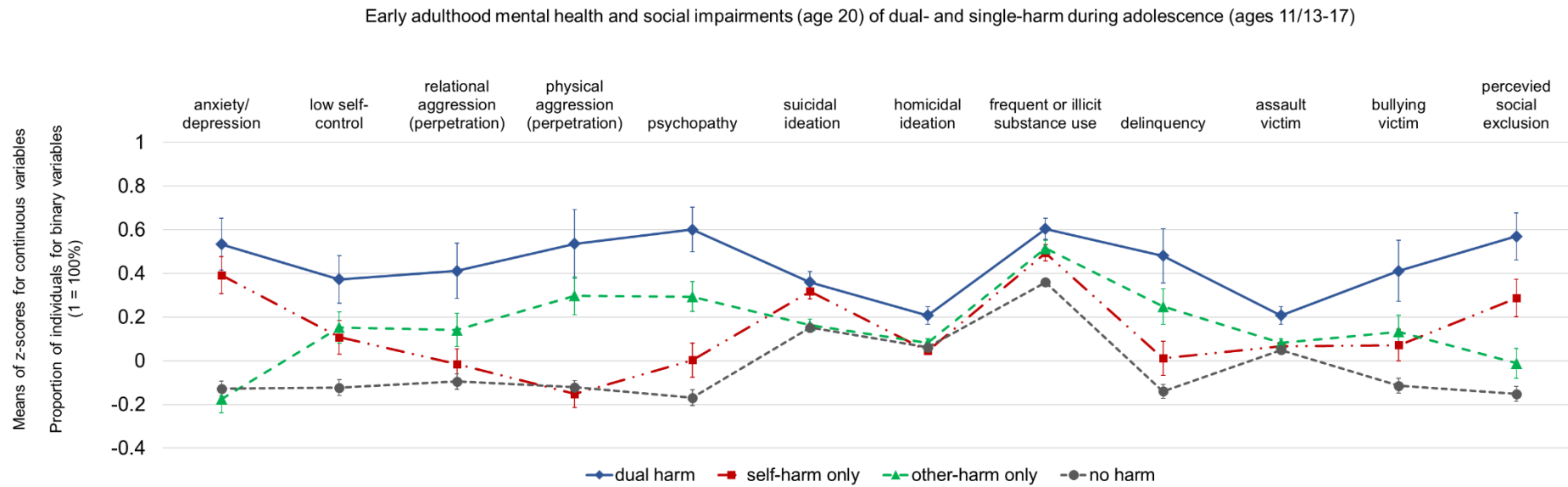
*Note.* A separate regression model was specified for each correlate. Bold print indicates significant effects ( $p < 0.05$ ).

**Dual-and single-harm and change of psychological and social functioning from childhood to early adulthood**

**Table S4.** Adjusted associations between dual-/single-/no harm (ages 13–17; independent variables) and mental health and social impairments between childhood and early adulthood (age 20; dependent variables): Results from linear regression analyses (a:  $\beta$ ,  $p$ ) and binary logistic regression analyses (b: OR, 95% CI) controlling for sex, parental educational and migration background, child’s educational level at age 13, and corresponding childhood indicator of outcome (to indicate change in respective outcome).

Early adulthood correlates: dependent variables	Dual-harm vs. no harm	Dual-harm vs. self- harm only	Dual-harm vs. other-harm only	Self-harm only vs. other-harm only	Self-harm only vs. no harm	Other-harm only vs. no harm
Anxiety/depression (a)	<b>0.17</b> (< 0.001)	0.07 (0.062)	<b>0.14</b> (< 0.001)	<b>0.10</b> (0.021)	<b>0.14</b> (< 0.001)	0.04 (0.150)
Lack of self-control (a)	<b>0.10</b> (0.001)	0.03 (0.350)	0.06 (0.102)	0.04 (0.301)	<b>0.10</b> (0.001)	0.05 (0.072)
Relational aggression (a)	<b>0.10</b> (0.003)	0.07 (0.060)	0.06 (0.128)	-0.01 (0.747)	0.04 (0.171)	0.05 (0.071)
Physical aggression (a)	<b>0.16</b> (< 0.001)	<b>0.14</b> (0.001)	0.07 (0.127)	<b>-0.10</b> (0.016)	0.02 (0.415)	<b>0.11</b> (0.001)
Frequent/illicit substance use (b)	<b>2.52</b> (1.57–4.04)	1.16 (0.71–1.91)	1.63 (0.94–2.83)	1.40 (0.90–2.19)	<b>2.17</b> (1.55–3.02)	<b>1.55</b> (1.09–2.20)
Delinquency (a)	<b>0.14</b> (< 0.001)	0.07 (0.069)	0.07 (0.083)	0.00 (1.00)	<b>0.10</b> (< 0.001)	<b>0.10</b> (0.005)
Assault victim (b)	<b>4.64</b> (2.48– 8.67)	<b>2.79</b> (1.33–5.82)	<b>2.36</b> (1.16–4.82)	0.85 (0.40–1.81)	1.67 (0.85–3.27)	<b>1.96</b> (1.04–3.68)
Bullying victim (a)	<b>0.13</b> (0.001)	<b>0.09</b> (0.038)	0.07 (0.090)	-0.02 (0.649)	<b>0.06</b> (0.064)	<b>0.07</b> (0.032)

*Note.* A separate regression model was specified for each correlate. Bold print indicates significant effects ( $p < 0.05$ ). To avoid multi-collinearity, we did not enter all risk factors simultaneously into the models.



**Figure S1.** Sensitivity analysis of early adulthood correlates of dual- and single-harm, with age-11 other-harm being included in the coding of harm groups.

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