

# Stability of self-reported psychopathic traits in high-risk adolescents in youth welfare and juvenile justice institutions

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## Research Article

**Keywords:** Psychopathic traits , YPI, adolescents , stability , Reliable Change Index, residential care , child welfare , juvenile justice, internalizing mental health problems , externalizing mental health problems

**Posted Date:** March 10th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1427259/v1>

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# Abstract

**Background:** The purpose of this study was to evaluate the self-reported stability of psychopathic traits in adolescents in residential care (both child welfare and juvenile justice placed juveniles) and potential influencing factors.

**Method:** We applied the Youth Psychopathic traits Inventory (YPI) in a sample of 162 adolescents (M=15.0 years, SD=1.3) over a mean time interval of 11 months (min. 6, max. 21 months, SD=3.14).

**Results:** There was no significant difference in YPI total score nor in the three underlying dimensions Grandiose-Manipulative (GM), Callous-Unemotional (CU), and Impulsive-Irresponsible (II) between t1 and t2. Furthermore, 70% of the adolescents showed no clinically significant reliable change on the YPI total score (as measured with the reliable change index), 15% improved, 15% deteriorated. The strongest predictor for psychopathic traits at t2 were psychopathic traits at t1. Additional predictors for higher levels of general psychopathic traits was male gender, for CU-traits male gender and lower levels of internalizing mental health problems, and for II-traits higher levels of externalizing mental health problems. Generally, the three reliable change groups (increase, no change, decrease) did not seem to differ on relevant factors.

**Conclusions:** Our results add to the findings that psychopathic traits are relatively stable in this high-risk group over approximately a one-year time interval. Research with a longer follow-up time and more time points is warranted to better interpret these results.

## Background

Psychopathic traits in children and adolescents are increasingly getting attention in both the scientific literature as well as clinical practice. Psychopathic traits tend to be associated with an earlier onset of delinquent behavior, higher levels of delinquent behavior, and higher rates of recidivism (Leenarts et al., 2017). This interest in psychopathic traits is also reflected in the newly added limited prosocial emotion (LPE) specifier to the Conduct Disorder (CD) diagnosis in the Diagnostic and Statistical Manual (DSM)-5 (American Psychiatric Association, 2013), in order to better capture the small group of youth who are more likely to persist in antisocial behavior and might, therefore, be diagnosed with an antisocial personality disorder in adulthood. Nevertheless, there is little research regarding the stability of psychopathic traits in adolescents and young adults.

The stability of psychopathic traits is a long-standing discussion in the adults literature with opposing opinions on the efficacy of therapeutic interventions (Salekin, 2002). This is not surprising given the common belief that treatment might have even a negative effect on psychopathic traits (D'Silva, Duggan, & McCarthy, 2004). A systematic review on the empirical evidence regarding untreatability of psychopathic characteristics in adults, however, reported that only one study suggested high psychopathic traits being associated with less favourable treatment outcomes and that individuals with higher levels of psychopathic traits could demonstrate similar therapeutic progress compared to others

(Larsen, Jalava, & Griffiths, 2020). Other research suggested possible modest changes of psychopathic traits in the life course of adults even without therapeutic interventions (Polaschek, 2014).

These findings in adults may not inevitably be translated to juveniles, as adolescence is an important neuro-developmental phase, with the brain still maturing and developing (Sisk & Romeo, 2019). Literature suggests that increases in psychosocial maturity (among others responsibility, social perspective and temperance) are more pronounced in adolescents than in adults (Cauffman, Skeem, Dmitrieva, & Cavanagh, 2016). Hence, there is evidence that the transition from adolescence to young adulthood is marked by continuity of lower and higher order levels of personality trait hierarchy and growth toward greater maturity (Roberts, Caspi, & Moffitt, 2001). The dimensions of psychopathy might be considered variants of normal personality traits, i.e. with some having more, and others having less psychopathic traits. Given the developmental nature of adolescence, one might argue that psychopathic traits in adolescents are less stable over time as suggested and possibly more changeable than in adulthood.

Research in juveniles published mixed results regarding the stability of psychopathic traits. On the one hand, studies support the idea that psychopathy is relatively stable across adolescence (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Lynam & Gudonis, 2005). One study regarding more than 1,500 boys in the public school system showed no age-related fluctuations in reliability, stability and predictive utility of psychopathy across childhood and adolescence suggesting that concern about large changes in personality pathology across childhood and adolescence may be overstated (Lynam et al., 2009). Psychopathic features in adolescents (Loney, Taylor, Butler, & Iacono, 2007) and aggressive children (Barry, Barry, Deming, & Lochman, 2008) were found to be moderately to stable in transition from adolescence to adulthood.

Other findings, on the other hand, support change and variability of psychopathic traits in adolescence and in transition to adulthood with results from mean- and individual-level analyses revealing a decline of Impulsive Antisociality (e.g. social deviance) from late adolescence to early adulthood (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006). A longitudinal study over a 2 to 4-year time frame demonstrated a regression to the mean (Frick, Kimonis, Dandreaux, & Farrell, 2003). Identification of psychopathy using the Psychopathic Checklist (PCL) in adolescents was found less reliable over a 2-year period than in adults and increases in psychosocial maturity over time predicted decreases in PCL scores for adolescents (Cauffman et al., 2016).

Repeated assessments of changes in Callous/Unemotional, Narcissism, and Impulsivity scores indicate that personality features associated with psychopathy in youth can be reduced through institutional treatment, even in severely behaviorally disordered adolescents (M. F. Caldwell, McCormick, Wolfe, & Umstead, 2012). Nevertheless, it has to be noted that literature on the different dimensions of psychopathy and its course over time in adolescents is still scarce.

One possibility to delineate psychopathy in adolescents is the three-dimensional conceptualization of Cooke and Michie (2001) with the underlying dimensions Grandiose-Manipulative (GM), Callous-Unemotional (CU), and Impulsive-Irresponsible (II) with CU seen as the core trait (also in line with the main

focus of LPE specifier). This affective facet of psychopathy and the dysfunction thereof involves reduced guilt and empathy, as well as reduced attachment to significant others. CU traits showed a moderate level of stability over three years in a large North-American sample of N = 1,216 adolescents who had been arrested for the first time, similar to what has been reported in community samples, as well as an overall decline at older age (Ray et al., 2019). A longitudinal study on a twin sample confirmed previous research that genetic factors substantially underlie CU traits during childhood, while non-shared environmental factors have considerable, generally age-specific contributions, over and above genetic factors (Henry et al., 2018).

The GM dimension comprises four subscales: Dishonest Charm, Grandiosity, Lying, and Manipulation. A Swedish study investigating the stability of GM traits over four years in 1,068 adolescents from a community sample and reported in summary three profiles with declining levels over time and one profile of adolescents who start with high levels and maintain elevated levels (Salihovic, Özdemir, & Kerr, 2014).

The II dimension includes items regarding Impulsiveness, Thrill-Seeking, and Irresponsibility. The time course of the traits in above mentioned study suggested three profiles of decreasing levels and a moderate-stable profile (Salihovic et al., 2014). Longitudinal analyses seem to suggest a linkage of attachment to parents with the impulsive-irresponsible psychopathic trait and therefore the influence of environmental factors in the time course of this dimension (Vagos, Ribeiro da Silva, & Macedo, 2021).

The differences of stability of psychopathic traits might partly be explained by the use of different instruments and the large variety of samples as stated by Lynam and colleagues (2007). As alternative measures of psychopathy manifest low rates of agreement in classifying youth as psychopathic even at a single time point (Cauffman, Kimonis, Dmitrieva, & Monahan, 2009) there persists the uncertainty if changes of psychopathic scores assessed with different measures reflect instability of psychopathy or measurement errors. The variation of scores on measures of psychopathy might also reflect the method how the components of psychopathy are examined as well as the different developmental stages of the participants (Cauffman et al., 2016). These possible confounding factors were omitted in multiple longitudinal studies on the stability of psychopathic characteristics. One examination of the Psychopathy Checklist: Youth Version (PCL:YV) over a 6-month follow-up period found moderate-to-high stability while the affective factor of the PCL:YV was less stable than the other factors (Z. Lee, Klaver, Hart, Moretti, & Douglas, 2009). In a North-American study over a period of approximately 2 years using parent and self-reports (starting sample age approximately 13 years) the rank-order stability of psychopathic traits was high to very high based on parent reports and lower based on self-reports (Munoz & Frick, 2007). These findings suggest the stability of psychopathic traits in early adolescence (Gacono, 2015). A longitudinal study in Sweden investigated the stability of psychopathic traits from the approximate age of 13 and onwards for a total of 4 years. The most stable subscales in the yearly assessments using the Youth Psychopathic traits Inventory (YPI) were the impulsive-irresponsible subscale and the grandiose-manipulative subscale indicating that possibly the more behavior-focused dimensions of psychopathic traits are highly-stable across adolescence (Salihovic et al., 2014). A Swedish study on twins examined the importance of genetic and environmental influence for the stability of psychopathic personality

between mid- and late adolescence over the course of 3 years measured also using the YPI. Results showed that the three psychopathic personality dimensions were stable at different levels of analysis and linked to a stable higher order general factor (i.e., psychopathic personality factor). Genetic factors contributed substantially to the stability of this general higher order factor, whereas environmental factors were of little importance (Forsman, Lichtenstein, Andershed, & Larsson, 2008).

In short, current research findings indicate that results regarding the stability of psychopathic traits in adolescents are mixed (e.g. due to differences in assessment, different conceptualization, in treatment or not). The aim of the present study was to add empirical knowledge regarding stability of self-reported psychopathic traits, including the underlying dimensions of GM, CU and II. The following results would be informative for treatment approaches and better adherence to therapeutic settings and consecutive improved outcomes and prevention of delinquent recidivism.

## Methods

### Participants

The data used in this study was collected within the MAZ.-project (Swiss Model Project for Clarification and Goal-attainment in Child Welfare and Juvenile-Justice Institutions) (for details see Schmid, Kölch, Fegert, & Schmeck, 2013). From 2007 to 2011, an extensive set of computer-based screening questionnaires were administered to 592 children, adolescents and young adults living in 64 different child welfare and juvenile justice institutions in the German-, French-, and Italian-speaking parts of Switzerland at two time points (t1, t2). In parallel, participants were evaluated by their socio-pedagogical caseworkers. Participants were admitted to the institutions by penal law, civil law, or by voluntary placement. Placement by civil law and voluntary placement were due to severe problems in the adolescents' well-being, behavior or environment. Adolescents were eligible for study participation if they had sufficient linguistic competence in German, French, or Italian and IQ scores above 70. For the current paper, participants aged 12 to 18 years who had completed the YPI (Andershed, Kerr, Stattin, & Levander, 2002) at both time points (t1 and t2) with a time interval of at least 6 months were selected. This yielded a subsample of 162 participants (110 males, 52 females) with an average age of 15.0 (SD = 1.3). Overall, the sample is representative of adolescents in Swiss youth welfare and juvenile justice institutions (Dölitzsch et al., 2014; Schmid et al., 2013). Table 1 shows the sample characteristics with respect to age, gender, Swiss nationality and type of placement. Male and female participants differed with respect to type of placement ( $\chi^2(2, N = 162) = 7.189, p < .027$ ), with male participants being underrepresented in civil law placements (59.1% vs. 78.8%), and overrepresented in penal law placements (15.5% vs. 3.8%). There were no differences with respect to age or Swiss nationality.

Table 1  
Sample characteristics

	n	%	M	SD
Gender				
Male	110	67.9		
Female	52	32.1		
Age				
Male			14.9	1.2
Female			15.2	1.4
Nationality				
Swiss	137	84.6		
Non-Swiss	25	15.4		
Placement type				
Civil law	106	65.4		
Penal law	19	11.7		
Voluntary	37	22.8		

Table 1 approximately here

## Procedure

Adolescents provided informed consent to participate in the study. Their socio-pedagogical caseworkers had to confirm that they knew the participant well enough to validly answer the study questions. The computerized data collection took place in the institutions and included socio-demographics and information of personal history. In addition, participants and their socio-pedagogical caseworkers completed psychometric screening instruments at t1 and t2, normally at intervals of one year. In cases of shorter residence times t2 was collected earlier. Ethical approval for the MAZ.-study was obtained by the Ethics Committee of Basel (Basel-Stadt/City and Basel- Landschaft/Country).

## Measures

### Psychopathic personality traits

Psychopathic personality traits were assessed using a computerized version of the YPI, which is a 50-item self-report questionnaire to assess core personality traits of psychopathy in youth. Each item is scored on a 4-point Likert scale (1 = does not apply at all, to 4 = applies very well). The YPI was designed in line with a three-dimensional conceptualization of psychopathy (Cooke & Michie, 2001). The GM

dimension or Interpersonal factor includes dishonest charm, manipulation/lying, and grandiosity. The CU dimension or Affective factor includes callousness, unemotionality, and remorselessness. The II dimension or Behavioral factor includes impulsivity, irresponsible behavior, and thrill-seeking. Higher scores reflect higher levels of traits. Assessment was conducted twice (t1, t2) with an interval of at least 6 months. The interval between t1 and t2 varied between 6 and 21 months and was on average 11.1 months (SD = 3.14). Internal consistency based on Cronbach's alpha at t1 were 0.90 for the YPI total score, 0.89 for GM, 0.70 for CU, 0.77 for II.

## Mental health problems

A computerized version of the Youth Self Report (YSR) (Achenbach, 2001) was used to measure internalizing and externalizing mental health problems. This questionnaire lists around 120 behavioral and emotional difficulties commonly found in adolescents. Items are scored on a 3-point Likert scale (0 = not true to, 1 = somewhat or sometimes true, 2 = very true or often true). The YSR provides three broadband scales: total problems (TOT), internalizing problems (INT), externalizing problems (EXT). Scores were transformed into t-scores. Internal consistencies within the present sample at t1 were good to excellent ( $\alpha = 0.93$  TOT,  $\alpha = 0.87$  INT,  $\alpha = 0.86$  EXT).

## Measuring reliable change

In order to report essential statements on individual change in psychopathic personality traits analyses were based on the concept of Reliable Change (Jacobson, Follette, & Revenstorf, 1984; Jacobson & Truax, 1992). The Reliable Change Index (RCI) examines whether an individual change is larger than expected due to measurement error of the instruments used. In other words, the difference between the obtained scores is related to the reliability of the measurement. The calculation requires estimates of a scale's internal consistency or test-retest reliability and the standard deviation at first measurement ( $SD_{Pre}$ ). The threshold for reliable change at a significance level of 0.05 is defined as 1.96 times the standard error of the difference between t1 and t1. Values greater than 1.96 indicate a significant change in the individual. The standard error of the difference ( $SE_{Diff}$ ) is calculated using the formula:  $\sqrt{2(SD_{Pre}\sqrt{1 - \alpha})^2}$ .

In the present sample, standard deviations ( $SD_{Pre}$ ) and internal consistency (Cronbach's  $\alpha$ ) of scales at t1 provide reasonable estimates of these statistics. Because for the YPI, no satisfying data on the test-retest reliability in large or comparable samples were found in literature, information on the internal consistency obtained in the present sample was preferred. For the YPI total score,  $\alpha$  was 0.90 and  $SD_{Pre}$  of the total mean score was 2.11. A  $SE_{Diff}$  of 0.88 and a cut-off for reliable change of 1.73 ( $0.88 \times 1.96$ ) was computed. Thus, any change of  $> 1.73$  in YPI total mean score was considered a reliable change in psychopathic personality traits. On the level of each factor, cut-offs for reliable change were 2.48 for the GM dimension ( $SD_{Pre} = 2.70$ ,  $\alpha = 0.89$ ,  $SE_{Diff} = 1.27$ ), 3.16 for the CU dimension ( $SD_{Pre} = 2.08$ ,  $\alpha = 0.70$ ,  $SE_{Diff} = 1.61$ ), and 3.22 for the II dimension ( $SD_{Pre} = 2.42$ ,  $\alpha = 0.77$ ,  $SE_{Diff} = 1.64$ ).

## Statistical analyses

Statistical analyses were performed using SPSS for Windows, version 27. Differences in YPI mean scores between between t1 and t2 were calculated in paired sample t-tests. To define the groups with reliably increased or decreased YPI scores at t2 cut-offs were set according the aforementioned described RCI. Differences between reliable change groups were calculated using chi-square for categorical variables and ANOVA for continuous variables. Because of multiple testing, Bonferroni correction was applied. Finally, separate exploratory multiple linear regression models were conducted to detect potential influencing factors for YPI total mean scores in total score and each dimension at t2. Participant's YPI mean scores at t1, age, gender, time span between t1 and t2 and behavior measures at t1 were included as independent variables. Significance levels for all analyses were set at  $\alpha = 0.05$ .

## Results

First, psychopathic trait scores of the YPI between t1 and t2 were compared at group level. Results showed no significant differences on the total score as well as on the underlying dimensions.

Table 2 approximately here

Table 2  
Mean differences in YPI mean scores and YSR t-scores between t1 and t2.

	t1 (SD)	t2 (SD)	p-value
<i>Total sample (N = 162)</i>			
Total mean score	11.05 (1.97)	11.10 (2.28)	.748
Grandiose-Manipulative	10.15 (2.70)	10.46 (3.02)	.112
Callous-Unemotional	10.59 (2.08)	10.77 (2.37)	.313
Impulsive-Irresponsible	12.40 (2.41)	12.06 (2.64)	.072

In Figs. 1–4, the RCI are presented visually. The majority of adolescents do not change significantly (YPI total score and GM dimension: approximately 70; CU and II dimension: approximately 85%). The percentage that improves or deteriorates is overall relatively evenly distributed for both the YPI total score and the underlying dimensions.

Figure 1–4 approximately here

In Table 3 various predictive linear regressions models for the YPI total score and the three underlying dimensions at t2 are presented. At step 1, only the equivalent at t1 of the outcome of the model is included (e.g., the YPI total score at t1 as a predictor of the YPI total score at t2). At step 2, age, gender and time between t1 and t2 are added. Finally, emotional problems and behavioral problems are added to the model (Step 3). In all models, the equivalent at t1 of the outcome is the strongest predictor. The  $R^2$  does not increase noticeably, except for CU-traits (Step 1: 25.2%, Step 3: 31.6%). In addition to the YPI

total score at t1, gender is of predictive value for the YPI total score at t2 in the final model (step 3). Boys have significantly higher YPI total scores at t2 than girls. We also see this gender distinction in the final CU-traits model. A third significant predictor in the final CU-traits model, next to CU-traits at t1 and gender, is emotional problems (YSR INT): the more emotional problems at t1, the fewer CU-traits at t2. Finally, behavioral problems (YSR EXT) were found to be predictive of II-traits at t2 (over and above II-traits at t1), with higher behavioral problems scores predicting higher II scores.

Table 3  
Linear regressions predicting YPI Total mean score and YPI dimensions at t2

Step	Predictor	Unstandardized coefficients		Standardized coefficients		$R^2$	F
		B	SE	$\beta$	p		
<b>YPI Total mean score at t2</b>							
1						.360	91.377
	YPI Total mean score at t1	.697	.073	.603	< .001		
2						.374	25.043
	YPI Total mean score at t1	.644	.076	.557	< .001		
	Age	.173	.116	.096	.138		
	Gender (1 = male; 2 = female)	-.703	.317	-.144	.028		
	Time span in months (t1-t2)	-.021	.047	-.028	.663		
3						.383	17.625
	YPI Total mean score at t1	.576	.088	.498	< .001		
	Age	.169	.115	.094	.146		
	Gender (1 = male; 2 = female)	-.718	.321	-.147	.027		
	Time span in months (t1-t2)	-.009	.047	-.012	.853		
	YSR INT at t1	-.026	.017	-.105	.129		
	YSR EXT at t1	.037	.020	.146	.069		
<b>YPI Total Grandiose-Manipulative mean score at t2</b>							
1						.414	114.873
	YPI Grandiose-Manipulative mean score at t1	.725	.068	.646	< .001		
2						.424	30.579
	YPI Grandiose-Manipulative mean score at t1	.681	.070	.608	< .001		
	Age	.182	.146	.077	.216		
	Gender (1 = male; 2 = female)	-.711	.403	-.110	.080		

*Note.* SE = standard error of B. Gender: 1 = male, 2 = female. Time span (t1-t2) = time interval between t1 and t2 in months. YSR INT = Internalizing problems (T-score). YSR EXT = Externalizing problems (T-score).

		Unstandardized coefficients		Standardized coefficients			
	Time span in months (t1-t2)	-.065	.060	-.068	.281		
3						.424	20.754
	YPI Grandiose-Manipulative mean score at t1	.650	.077	.580	< .001		
	Age	.170	.147	.072	.249		
	Gender (1 = male; 2 = female)	-.714	.410	-.111	.084		
	Time span in months (t1-t2)	-.053	.061	-.055	.384		
	YSR INT at t1	-.021	0.22	-.065	.329		
	YSR EXT at t1	.033	.024	.098	.176		
<b>YPI Total Callous-Unemotional mean score at t2</b>							
1						.252	55.178
	YPI Callous Unemotional mean score at t1	.578	.078	.506	< .001		
2						.300	18.225
	YPI Callous Unemotional mean score at t1	.515	.080	.451	< .001		
	Age	.166	.127	.089	.192		
	Gender (1 = male; 2 = female)	-1.187	.352	-.234	< .001		
	Time span in months (t1-t2)	.053	.052	.070	.314		
3						.316	13.384
	YPI Callous Unemotional mean score at t1	.475	.083	.416	< .001		
	Age	.168	.126	.090	.185		
	Gender (1 = male; 2 = female)	-1.144	.351	-.226	.001		
	Time span in months (t1-t2)	.069	.052	.091	.188		
	YSR INT at t1	-.042	.019	-.164	.026		
	YSR EXT at t1	.034	.020	.128	.098		

*Note.* SE = standard error of B. Gender: 1 = male, 2 = female. Time span (t1-t2) = time interval between t1 and t2 in months. YSR INT = Internalizing problems (T-score). YSR EXT = Externalizing problems (T-score).

		Unstandardized coefficients		Standardized coefficients	
<b>YPI Total Impulsive-Irresponsible mean score at t2</b>					
1				.320	76.778
	YPI Impulsive-Irresponsible mean score at t1	.624	.071	.569	< .001
2				.326	20.429
	YPI Impulsive-Irresponsible mean score at t1	.595	.072	.543	< .001
	Age	.192	.140	.093	.172
	Gender (1 = male; 2 = female)	-.335	.370	-.059	.366
	Time span in months (t1-t2)	-.063	.056	-.075	.266
3				.339	14.740
	YPI Impulsive-Irresponsible mean score at t1	.499	.085	.456	< .001
	Age	.188	.139	.091	.178
	Gender (1 = male; 2 = female)	-.337	.370	-.060	.364
	Time span in months (t1-t2)	-.044	.057	-.053	.435
	YSR INT at t1	-.018	.020	-.064	.368
	YSR EXT at t1	.056	.025	.188	.025
<i>Note.</i> SE = standard error of B. Gender: 1 = male, 2 = female. Time span (t1-t2) = time interval between t1 and t2 in months. YSR INT = Internalizing problems (T-score). YSR EXT = Externalizing problems (T-score).					

Table 3 approximately here

Finally, the three reliable change groups (increasers, no reliable change, decreasers) were compared on several relevant variables (Table 4). Only the reason for placement significantly differed between the three groups when taken the YPI Total score as the outcome into account. Adolescents placed voluntarily were more often found to show no reliable change, adolescents placed under penal law were more often in the group that clinically significantly improved.

Table 4  
Differences between reliable change groups

	Increase (% / M, SD)	No reliable change (% / M, SD)	Decrease (% / M, SD)	$Chi^2 / F$	$p$
<b>YPI Total mean score</b>					
Gender (m, f)	18.2, 9.6	67.3, 75.0	14.5, 15.4	1.998	.368
Age	14.5, 1.2	14.6, 1.3	14.3, 1.4	.586	.558
Time span in months (t1-t2)	11.6, 3.6	11.0, 3.0	11.2, 3.6	.402	.670
Nationality (Swiss, Non-Swiss)	16.0, 15.3	72.0, 69.3	12.0, 15.3	.186 <sup>a</sup>	.991
Placement type (civil law, penal law, voluntary)	18.9, 10.5, 8.1	66.0, 57.9, 86.5	15.1, 31.6, 5.4	10.292 <sup>a</sup>	.036
YSR INT at t1	57.2, 9.4	59.0, 9.3	61.8, 8.4	1.597	.206
YSR EXT at t1	61.2, 8.9	60.5, 8.6	62.8, 8.9	.683	.507
<b>YPI Grandiose-Manipulative mean score</b>					
Gender (m, f)	17.3, 13.5	68.2, 71.2	14.5, 15.4	.381	.826
Age	14.6, 1.2	14.6, 1.3	14.3, 1.4	.378	.686
Time span in months (t1-t2)	11.5, 3.1	11.0, 3.1	10.9, 3.6	.311	.733
Nationality (Swiss, Non-Swiss)	20.0, 15.3	68.0, 69.3	12.0, 15.3	.451 <sup>a</sup>	.798
Placement type (civil law, penal law, voluntary)	17.9, 10.5, 13.5	68.9, 57.9, 75.7	13.2, 31.6, 10.8	5.508 <sup>a</sup>	.239
YSR INT at t1	58.0, 9.5	58.8, 9.5	61.5, 7.2	.999	.370
YSR EXT at t1	61.7, 11.0	59.9, 8.2	64.7, 9.0	2.982	.054
<b>YPI Callous-Unemotional mean score</b>					
Gender (m, f)	10.2, 5.8	84.5, 86.5	5.5, 7.7	1.034 <sup>a</sup>	.596
Age	14.4, 1.6	14.6, 1.3	14.7, 1.3	.224	.799
Time span in months (t1-t2)	10.7, 3.2	11.0, 3.1	12.2, 3.9	1.040	.356

Note. YSR INT = Internalizing problems (T-score). YSR EXT = Externalizing problems (T-score).

<sup>a</sup> 2 cells have an expected frequency less than 5.

<sup>b</sup> 4 cells have an expected frequency less than 5.

	Increase (% / M, SD)	No reliable change (% / M, SD)	Decrease (% / M, SD)	<i>Chi</i> <sup>2</sup> / F	<i>p</i>
Nationality (Swiss, Non-Swiss)	12.0, 8.0	88.0, 84.7	0.0, 7.3	2.238 <sup>a</sup>	.327
Placement type (civil law, penal law, voluntary)	10.4, 5.3, 5.4	83.0, 89.5, 89.2	6.6, 5.3, 5.4	1.331 <sup>b</sup>	.856
YSR INT at t1	59.1, 9.6	58.7, 9.3	64.1, 7.3	1.587	.208
YSR EXT at t1	60.8, 11.3	60.9, 8.7	61.6, 8.9	.032	.969
<b>YPI Impulsive-Irresponsible mean score</b>					
Gender (m, f)	10.0, 1.9	80.0, 90.4	10.0, 7.7	3.770 <sup>a</sup>	.152
Age	14.8, 1.2	14.5, 1.3	14.7, 1.2	.268	.765
Time span in months (t1-t2)	12.9, 3.1	10.9, 3.0	11.2, 3.9	3.001	.053
Nationality (Swiss, Non-Swiss)	12.0, 6.6	76.0, 84.7	12.0, 8.8	1.272 <sup>a</sup>	.529
Placement type (civil law, penal law, voluntary)	7.5, 10.5, 5.4	84.9, 63.2, 89.2	7.5, 26.3, 5.4	8.463 <sup>b</sup>	.076
YSR INT at t1	55.5, 10.2	59.4, 9.3	59.5, 7.4	.985	.376
YSR EXT at t1	59.7, 9.3	61.2, 9.1	59.6, 7.1	.338	.714
<i>Note.</i> YSR INT = Internalizing problems (T-score). YSR EXT = Externalizing problems (T-score).					
<sup>a</sup> 2 cells have an expected frequency less than 5.					
<sup>b</sup> 4 cells have an expected frequency less than 5.					

Table 4 approximately here

## Discussion

The aim of the present study was to add empirical knowledge regarding the stability of self-reported psychopathic traits, including the underlying dimensions of GM, CU and II, in high-risk youths. Based on our results psychopathic traits seem to be stable at group level over an average follow-up time of 11 months. In addition, we found similar results on an individual level (as based on the RCI); the majority of adolescents did not show a clinically significant change. This is in line with previous findings using external assessments (Hemphälä, Kosson, Westerman, & Hodgins, 2015; Z. Lee et al., 2009).

Regarding predictor factors for psychopathic traits, we found that psychopathic traits at t1 were the strongest predictor for psychopathic traits at t2. This did not only account for the YPI total score, but also

for all underlying dimension. Over and above the psychopathic trait scores at t1, gender was also found to be a significant predictor for the YPI total score as well as CU scores; adolescent males had higher psychopathic trait/CU trait scores at t2 compared to adolescent females. Furthermore, internalizing mental health problems - which often manifest as symptoms of anxiety and depression - were negatively associated with higher levels of CU traits at t2. This is in line with the concept of the primary variant subgroup of youth with CU traits which is associated with low levels of anxiety, trauma, and Posttraumatic Stress Disorder (PTSD) (Lee-Rowland, Lui, Bortfeld, Barry, & Reiter, 2020). Finally, externalizing mental health problems were positively related to II traits at t2 over and above II traits at t1. This is in line with other studies (Fanti & Lordos, 2021). This connection might warrant further attention as other studies linked elevated externalizing problems like (especially psychological) child-to-parent violence to high levels of II traits (Hoyo-Bilbao, Orue, & Calvete, 2021).

With regard to the RCI outcomes, we generally did not find any differences between the three groups (i.e. increasers, no reliable change, decreasers) except for reason of placement for the YPI total score. This seemed to concern in particular the overrepresentation of the group of voluntarily placed adolescents in the no reliable change group and to a lesser extent the overrepresentation of penal placed adolescents in the decreasers group. The latter group is particularly interesting because it may provide more information about the treatment options of young offenders in order to reduce psychopathological traits. Unfortunately, based on our data it was not possible to investigate this in more detail. However, data of a 2-year follow-up on juvenile offenders with high scores on the PCL:YV suggested that intensive treatment was associated with relatively slower and lower rates of serious recidivism, even after controlling for the effects of non-random assignment to treatment groups and release status (M. Caldwell, Skeem, Salekin, & Van Rybroek, 2006). In addition, a recent study on male detained youth aged 14 to 18 years old from Portugal showed promising results in an intervention group treated with a specialized program with moderate to large decreases in psychopathic traits on global and factor level at post-treatment and 6-months follow-up (Ribeiro da Silva et al., 2021). This notion is supported by our data as all adolescents were placed in institutions with pedagogical concepts with considerable effort to better socialize these youths. Nevertheless, just as many adolescents increased as decreased in their psychopathic traits, while the majority remained stable. This strongly suggests that there is indeed a need for specialized programs and treatment as usual seems to contribute hardly when it comes to attenuating psychopathic traits. This points to possible beneficial effects of an intensive and structured therapeutic setting as described for adults with high levels of psychopathic traits (Mokros & Habermeyer, 2012).

## Limitations

The results of the current study have to be seen in the light of various limitations: First, as reported in the literature, short time spans between assessments tend to have higher stability than longer time spans (Salihovic et al., 2014). With a mean time period of 11 months this observation has to be kept in mind before qualifying the stability of longer term psychopathic traits in adolescents. Second, is the modality of the assessment, i.e. self-reports on psychopathic traits. While being a more ecological method, external assessments through parent and teacher ratings are more objective. Third, the heterogeneity of our

sample calls for subgroup analyses. However, the size of our sample often does not allow for this. Nevertheless, it should be said that our sample is of relatively large size for such a study (medium-term longitudinal study, a very extensive test battery to better understand the strengths and difficulties within this very complex group) in the field of residential youth care with high-risk (for an overview of the study design, see Schmid et al. (2013)). Finally, the youth care system in Switzerland is unique, as youth with civil and criminal law decision can be placed in the same institutions (for more details, see Jäggi et al. (2021)). Consequently, our results not easily generalizable to other countries and legal systems. Hence, more research in other countries is needed.

## Implications

The considerable stability of psychopathic traits in adolescents is linked to the clinical worry of subsequent criminal and self-harming (e.g. substance use) behaviour (Y. Lee & Kim, 2020). Consequently, it is important to intervene in adolescent psychopathic traits and not assume that these traits will disappear on over time. In addition, in order to better understand our results, more research is warranted. This research should focus on the use of third party assessment and expert opinions/clinical judgements in addition to the use of self-report. A longer follow-up time is also recommended. Finally, given the aforementioned unique situation in Switzerland, it is important that our results be replicated in other countries, other legal systems, and other modalities (such as juvenile justice institutions, forensic psychiatry, outpatient care).

## Conclusions

Our results showed that self-reported psychopathic traits in adolescents in residential care over a mean time interval of 11 months were relatively stable. The question arises if this stability can also be found over longer time periods as well as with other assessment modalities, such as expert opinions/clinical judgements (using e.g. the PCL:YV). Hence, additional research is needed to better understand our results.

## Abbreviations

YPI - Youth Psychopathic traits Inventory

GM - Grandiose-Manipulative dimension of psychopathy

CU - Callous-Unemotional dimension of psychopathy

II - Impulsive-Irresponsible dimension of psychopathy

YSR - Youth Self Report

TOT - total problems

INT - internalizing problems

EXT - externalizing problems

PCL:YV - Psychopathic Checklist (PCL): Youth Version

MAZ. Modellversuchs Abklärung und Zielerreichung in stationären Massnahmen (English translation: Swiss Model Project for Clarification and Goal-attainment in Child Welfare and Juvenile-Justice Institutions)

RCI - Reliable Change Index

## Declarations

### • **Ethics approval and consent to participate**

As noted in the Methods section adolescents provided informed consent to participate in the study. Their socio-pedagogical caseworkers had to confirm that they knew the participant well enough to validly answer the study questions. Ethical approval for the MAZ.-study was obtained by the Ethics Committee of Basel (Basel-Stadt/City and Basel- Landschaft/Country).

### • **Consent for publication**

Not applicable.

### • **Availability of data and materials**

The datasets generated and/or analysed during the current study are not publicly available due [property of the federal ministry of justice] but are available from the corresponding author on reasonable request.

### • **Competing interests**

The authors declare that they have no competing interests.

### • **Funding**

The MAZ. study was funded by the Swiss federal ministry of justice.

### • **Authors' contributions**

HH and MS initially planned the manuscript and data analysis. NJ, CB and HH analyzed and interpreted the data. HH and CB were major contributor in writing the manuscript with NJ covering the Methods section. All authors read and approved the final manuscript.

## • Acknowledgements

Not applicable.

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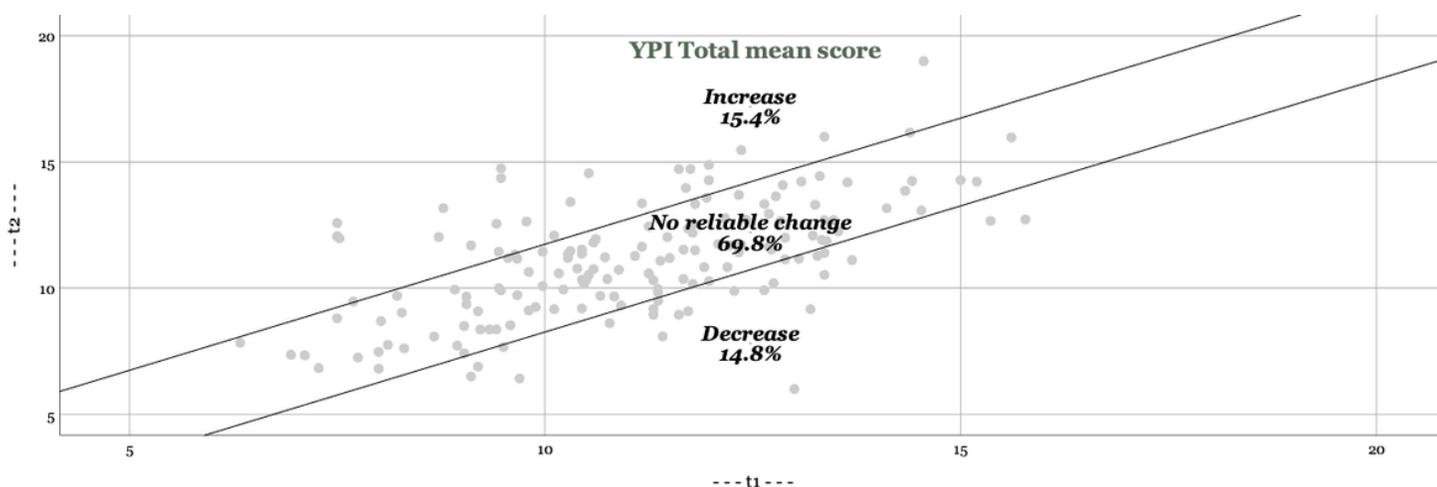
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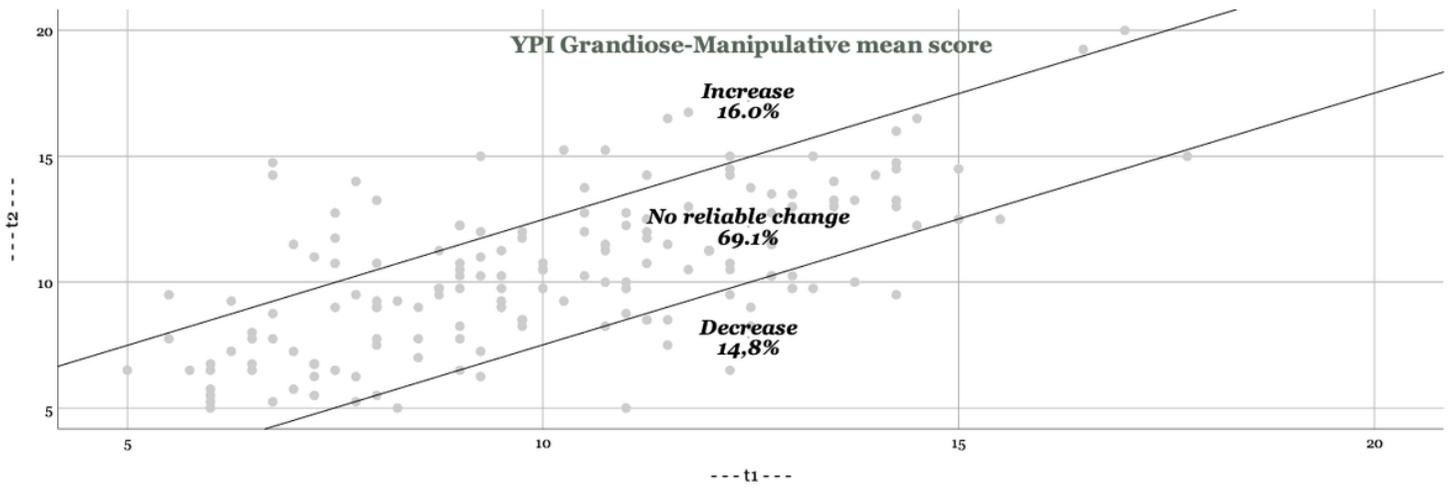
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## Figures



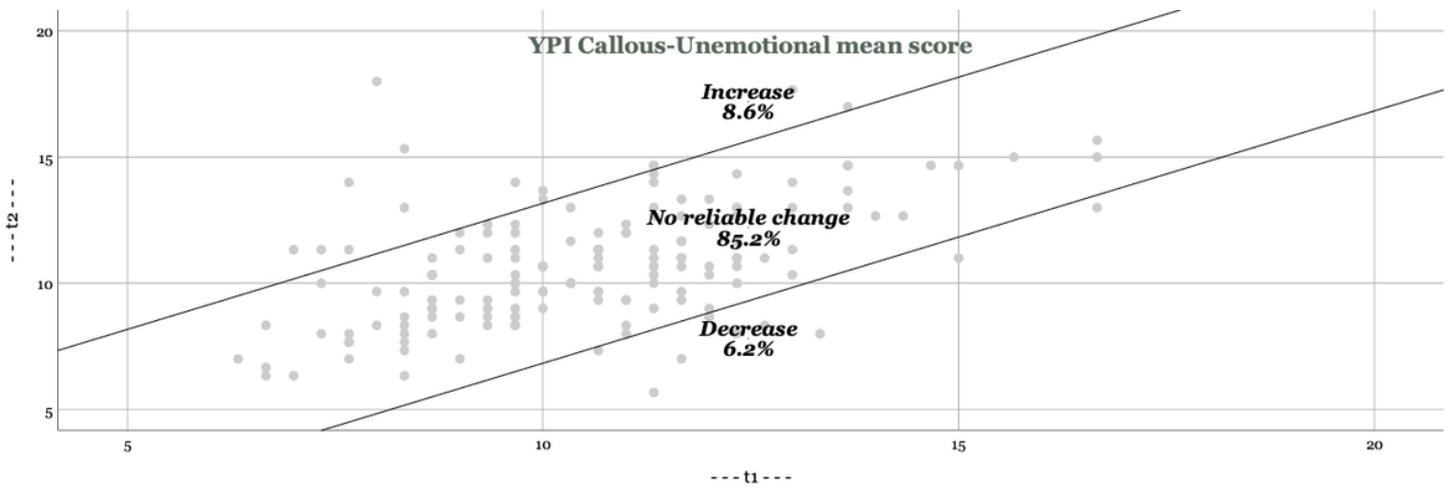
**Figure 1**

Reliable changes YPI Total score



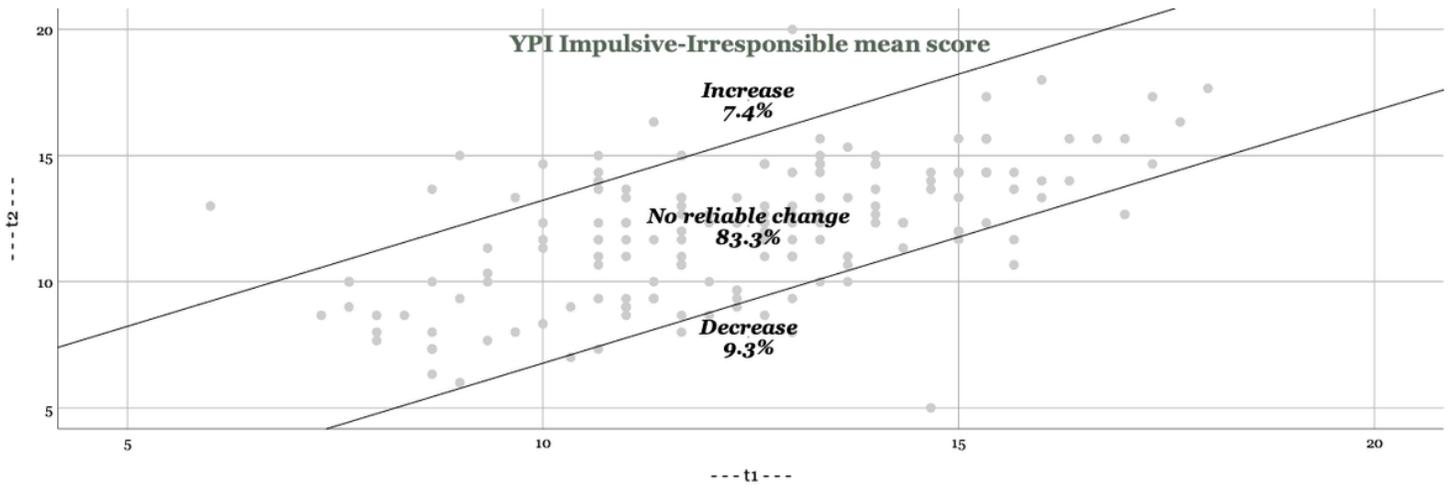
**Figure 2**

Reliable changes GM traits



**Figure 3**

Reliable changes CU traits



**Figure 4**

Reliable changes II traits