ORIGINAL ARTICLE

The Role of Psychopathic Traits and Supportive Parental Practices in Long-Term Juvenile Recidivism: a 10-Year Follow-Up

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Abstract

Recidivism rates of juvenile delinquents remain high despite numerous intervention efforts. Identifying factors that can predict (long-term) recidivism is therefore an important research issue. Knowledge on why juveniles re-offend is a key to effective interventions as it helps to identify factors most likely to be successful targets in intervention programs. A 10-year follow-up study prospectively examined whether psychopathic traits and supportive parental practices predicted the timing and frequency of recidivism in juvenile delinquents. Participants were 256 adolescents who were referred to treatment for serious antisocial behavior (72.4% male). Participants were between 12 and 18 years old at baseline ($M = 15.9$ years). Parents reported on juveniles' psychopathic traits and supportive parental practices at baseline. At 10-year follow-up, the official recidivism data were collected. A substantial number of juveniles (86.3%) had recidivated at 10-year follow-up. Juvenile psychopathic traits and supportive parental practices did not incrementally predict the timing or frequency of recidivism over time over and beyond the static control variables gender and prior offenses. The present study confirms previous work suggesting that static risk factors gender and prior offenses are strongest predictors of recidivism.

Keywords Juvenile offenders · Psychopathic traits · Supportive parental practices · Long-term recidivism

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The recidivism rate of juvenile delinquents after release from juvenile justice institutions is approximately 55% within 2 years (Verweij et al., 2021). Hence, despite interventions offered to prevent juvenile recidivism (Olsson et al., 2021), reoffending seems the norm rather than the exception. Recidivism has generally been defined as the relapse of an individual into criminal behavior after receiving a correctional intervention (Pechorro et al., 2018; Zara & Farrington, 2016) and relates to unfavorable developmental outcomes for adolescents involved as well as high societal costs (Cacho et al., 2020; Spencer & Jones-Walker, 2004). Consequently, identifying factors most strongly associated with recidivism is an important research line in criminological research as it helps to find successful targets for treatment programs offered during detention (Singh et al., 2014). Previous research indicated that for successful interventions, focus should be on variables that are directly related to (re)offending and are emendable to change (i.e., dynamic factors) (Andrews & Bonta, 2010). Two dynamic factors that have consistently been linked to juvenile delinquency and recidivism are psychopathic traits and supportive parental practices (Polaschek & Daly, 2013; Sawyer & Borduin, 2011). Remarkably, their association with recidivism has hardly been studied prospectively over a longer period. Hence, this study aims to extend the literature by prospectively examining whether psychopathic traits (risk factor) and supportive parental practices (protective factor) are predictive of recidivism over a period of 10 years.

Psychopathic Traits and Recidivism

Psychopathy can be defined as a multidimensional personality construct that consists of interpersonal, behavioral, and affective features that coalesce into an individual who is manipulative and narcissistic, fearless, unemotional, and aggressive (DeLisi et al., 2018; Hare et al., 1991). Given these trait characteristics, it is not surprising that psychopaths are over-represented within the criminal justice system (Docherty et al., 2019) and that their impact on the criminal justice system is noteworthy: a relatively small number of psychopathic offenders is responsible for a disproportionate amount of crime (Hare, 2003). It has been found that juveniles with high(er) levels of psychopathic traits often engage in delinquent behaviors earlier, commit more crimes, and show more versatility in offending than juveniles without psychopathic traits (DeLisi, 2016; Leistico et al., 2008; Olver & Wong 2015; Vincent et al., 2003). Despite these findings, there has been discussion about the predictive ability of psychopathy on *recidivism* over time. Whereas multiple studies have found a positive predictive association between psychopathic traits and recidivism (e.g., Geerlings et al., 2020; Salekin, 2008), others did not find this association (Edens & Cahill., 2007; Pechorro et al., 2019) or reported inconsistent findings within the same study. For instance, Cauffman et al. (2009) found psychopathic traits to be predictive of recidivism at 6- and 12-month follow-up, yet not at 36-month follow up.

Thus, the role of psychopathic traits as a dynamic risk factor for juvenile recidivism is still unclear. This is unfortunate, given that labels such as "psychopathic personality" may have stigmatizing and harmful effects for the child as well as legal decision making (e.g., Edens et al., 2001, 2013; Salekin, 2008). In

other words, if there is no incremental value in including psychopathy as a predictor of recidivism over time, then we should question the necessity to measure it, given the labels' potential detrimental consequences.

The controversy regarding *if* we should assess psychopathic traits in juveniles is not new. Psychopathy was mainly tested in adult populations, and there is limited empirical evidence that psychopathic features and associated behaviors are fixed during childhood and adolescence (see reviews by Salekin & Lynam (2010) and Viding & McCrory (2018)). Seagrave & Grisso (2002) for instance warned that it may be difficult to reliably distinguish psychopathic traits from features of normative adolescent development (e.g., impulsivity). Additionally, there is controversy regarding *how* we should assess psychopathic traits in juveniles which could explain the inconsistent findings as mentioned above. Starting, studies that examined the association between juvenile psychopathic traits and recidivism mostly focused on distinct facets of psychopathy (e.g., callous-unemotional features) (Colins et al., 2012; Frick & Myers, 2017). Yet, studies comparing total scores with single facets stress that it is the overarching construct that captures something essential which is missed when solely focusing on one facet (Andershed et al., 2018; Cauffman et al., 2009). Andershed et al. (2018) for instance found that juveniles with conduct problems scoring high on all three psychopathic trait dimensions showed the most robust and highest risk for future stable conduct problems and aggression compared to youth who merely manifested callous-unemotional traits. Second, most studies assessing recidivism over time used retrospective study designs (Salekin & Andershed, 2022). Consequently, it is yet unknown whether differences in previous findings are the result of differences in strength of the association between psychopathy and recidivism for different developmental periods.

To conclude, given that psychopathic traits and their long-term association with recidivism have hardly been studied prospectively, examining whether the overarching construct of psychopathic traits incrementally (i.e., over and above predictive static factors such as criminal history, gender and age) relates to recidivism may be crucial to improve knowledge on factors explaining persistent delinquency. Hence, the first aim of this study is to examine the incremental predictive role of adolescent psychopathic traits in long-term recidivism.

Supportive Parental Practices and Recidivism

Besides juvenile's individual traits, the role of parental practices in explaining recidivism is also important to examine (Bosk et al., 2021; Hoeve et al., 2009; Loeber & Stouthamer-Loeber, 1986). Poor parental practices, such as inconsistency and harsh discipline, are associated with increased juvenile delinquency (Welsh & Farrington, 2007). As such, many prevention and intervention programs target improving parental practices by helping parents to apply positive discipline techniques (De Vries Robbé, 2014; McMahon & Frick, 2019). According to the social bonding theory (Hirschi, 1969), mechanisms of social control (e.g., parental monitoring) contribute to the desistance of delinquency as juveniles with positive social bonds are more likely to

conform to conventional norms. For instance, juveniles with strong parental bonds might reconsider involvement in delinquency as it may disappoint their parents (Hart & Mueller, 2013). Hence, supportive parental practices are expected to protect from delinquency and recidivism (Ryan et al., 2013). A meta-analysis examining the association between parenting and delinquency showed a moderate negative association between supportive parenting and delinquency (Hoeve et al., 2009). Despite the clear impact of supportive parenting, it is less clear whether supportive parenting also affects longer term recidivism during adulthood, especially given that the influence of family (factors) on juvenile delinquency decreases over time as social ties to labor or marriage become more important (Laub & Sampson, 1993). As such, determining whether supportive parental practices remain protective of recidivism over time provides important information for prevention strategies. Hence, the second aim of this study is to examine whether supportive parental practices incrementally (i.e., over and above criminal history, gender and age) predict recidivism of juvenile delinquents over time.

Besides directly protecting from recidivism, supportive parental practices could potentially also *buffer* the association between psychopathy and recidivism (Fergusson et al., 2007). Namely, psychopathy is theoretically conceptualized as a developmental disorder that originates from a complex interaction between environmental, biological, and social factors. Lykken (1995) theorized that positive parental behaviors promote the child's ability to internalize prosocial values and behaviors such as empathy. This in turn buffers against the expression of psychopathic traits, by inhibiting antisocial behavior.

Only a handful of studies have examined the link between supportive parenting practices and antisocial behavior among youths with psychopathic traits, while this information may be crucial in explaining whether systemic interventions for juvenile delinquents are (not) effective. In a clinically referred sample of boys aged 4 to 12 years, parental warmth was strongly negatively associated with antisocial behavior in those with higher levels of psychopathic traits (Pasalich et al., 2011). Similar results were found in a study by Kimonis et al. (2013), where juvenile offenders aged 12–19 years, high on psychopathic traits who were exposed to low levels of maternal care were at higher risk for antisocial behavior in comparison with those who experienced high levels of maternal care. To our knowledge, empirical studies thus far have not examined whether we can extend these findings to *recidivism* in justice involved youth. Hence, the third aim of this study is to examine whether supportive parental practices incrementally buffer the negative effect of psychopathic traits on recidivism over time.

Timing and Frequency of Recidivism

Thus, psychopathic traits function as a risk factor for juvenile recidivism whereas supportive parental practices could potentially prevent recidivism. However, we expect the patterns of recidivism to differ across developmental periods as one of the most robust findings in the criminology literature is the curvilinear relation between age and crime: offending rises sharply in mid-adolescence and declines slightly less

sharply again in young adulthood (e.g., Farrington et al., 2008). Using a dichotomous measure (i.e., reconvicted yes or no) would not allow for the untangling of offending that occurred in adolescence versus adulthood which could (mis)label an individual as persistent offender even though someone might have been reconvicted in adolescence but not adulthood. In the current study, we will therefore use two measures of recidivism that allow for disaggregating adolescent and adult reconviction: the *timing* and *frequency* of recidivism.

The Present Study

Taken together, prior literature acknowledges the role of psychopathic traits and supportive parental practices as important predictors of juvenile delinquency and recidivism. Yet, due to methodological limitations (e.g., retrospective designs and relatively short follow-up periods), these associations remain insufficiently understood. This study aims to extend findings about the incremental predictive validity of juvenile psychopathic traits and supportive parental practices on (long-term) recidivism: the timing and frequency of recidivism. We expect that juveniles with higher levels of psychopathic traits recidivate faster and more frequently than juveniles with lower levels of psychopathic traits. Moreover, we expect that juveniles experiencing more supportive parental practices recidivate less fast and less frequently compared to juveniles who experience less supportive parental practices. Last, we hypothesized that positive parental practices buffer the link between psychopathic traits and various measures of recidivism. More specifically, we expect that juveniles with psychopathic traits recidivate less fast and less frequent if they have higher levels of supportive parental practices compared to juveniles with lower levels of supportive parental practices. We examined these hypotheses by using a multimethod (questionnaire and official data) longitudinal design covering a period of 10 years.

Method

Participants and Procedure

The sample consisted of 257 adolescents aged 12 to 18 years at T_1 (M_{age} $T_1 = 15.85$, SD_{age} $T_1 = 1.39$, 72.4% boys).[1] Within the sample, 50.6% had a Dutch ethnicity. Of the adolescents belonging to ethnic minority groups, most had a Moroccan (34%) or a Surinamese (32%) background. Thirty-one percent of the fathers and 38.9% of the

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[1] The datafile containing the 10-year follow-up recidivism data as provided by the Research and Documentation Centre (WODC) of the Dutch Ministry of Justice and Security contained limited demographic information due to anonymization procedures. In that data file information of four participants was not traceable, while this information was present in the original study. Consequently, there are small differences in descriptive demographic statistics between the current and the original dataset Asscher et al. (2014).

mothers were unemployed at T_1. Last, 68.5% of the sample had been arrested prior to baseline.

Participants were juveniles and their families in The Netherlands who were referred to treatment for severe and persistent antisocial behavior and who participated in a randomized controlled trail between 2006 and 2010, examining the effectiveness of multisystemic therapy (MST) (see Asscher et al., 2013, 2014). The design was approved by the institutional review board and medical ethic committee of Utrecht University (Dutch Trial Register number 1930), and the current follow-up study was approved by de ethical committee of the social sciences faculty at Utrecht University (register number 21–0474). The questionnaires used for this study (independent variables) were filled in by parents during home visits at T_1 (baseline), which lasted about 1.5 h. Adolescents reported on their own age and gender at T_1. Each family member received €10 for completing the assessment (see Asscher et al., 2013, for a more elaborate description of the procedure).

Official judicial data were collected at four consecutive waves: 6 (T_2), 24 (T_3), 60 (T_4), and 120 (T_5) months after the end of treatment. Despite extensive tracing efforts, 81 participants were lost due to follow-up across 120 months. Little's MCAR test for missing data was not significant (χ^2 (12) = 15.834, p = 0.072), indicating that results were not biased due to missing data patterns. Notwithstanding, missing values on the outcome measures were not imputed. Within the sample, for seventeen participants, no observed scores on any of the predictor variables were reported. Those participants were excluded from further analysis. The number of juveniles included in each wave were 213 (T_2), 213 (T_3), 211 (T_4), and 168 (T_5).

Measures

Psychopathic Traits

Psychopathic traits of adolescents were assessed with parent-reported measures of the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and the Inventory of Callous and Unemotional traits (ICU; Frick, 2004). Impulsiveness (e.g., "Does risky or dangerous things," α = 0.77) and Narcissism (e.g., "Uses or misleads others to get what he/she wants," α = 0.85) were assessed with respectively 5 and 7 items from the APSD. Callous/unemotional traits (e.g., "hides feelings," α = 0.90) were assessed with 24 items from the ICU. Items were answered on a 4-point Likert scale, ranging from 1 = *not at all true*, to 4 = *absolutely true*. Items were reverse coded when necessary, such that higher scores all indicated higher psychopathic trait scores. A mean score for overall psychopathic traits was computed (α = 0.93).

To assess whether juveniles scoring high and low on psychopathic traits differ in their risk to recidivate, dichotomous subgroups were created. This is in line with the literature on psychopathy in adults in which psychopathy is considered taxonomic: people high on psychopathic traits seem to be etiologically distinct from others lower

on the distribution of such traits (see Hare et al., 1991; Newman & Wallace, 1993). Hence, following the strategy as used by Manders et al. (2013), the upper quartile of psychopathy total score was used to indicate the "high psychopathy" group ($n = 53$), whereas the rest was classified as the "low(er) psychopathy" group ($n = 160$).

Supportive Parental Practices

Five theoretically relevant constructs of parenting were assessed by parents at baseline and combined into one *supportive parental practices* dimension: parental monitoring, consistency, responsivity, behavioral control, and inductive discipline. The first indicator, *parental monitoring*, was assessed with 6 items (e.g., "How much do you know about what [adolescents name] does in his/her free time?," $\alpha = 0.89$), rated on a 4-point scale ($1 = I$ *do not know anything about this* to $4 = I$ *know all about this)* (Brown et al., 1993). Second, *parental responsiveness* is an 8-item scale (e.g., "I can discuss anything with my child," $\alpha = 0.88$) of the Nijmegen Parenting Questionnaire, to be answered on a 6-point scale ($1 = I$ *totally disagree* to $6 = I$ *totally agree*). Third, *behavioral control* was measured with six items of the Parenting Practices Questionnaire (PPQ) (e.g., "Does your child need permission to come home late on a schoolnight?," $\alpha = 0.84$), rated on a 5-point scale from ($1 = never$ to $5 = always$). Fourth, *consistency* was assessed with a subscale of the Parenting Dimensions inventory (PDI) (Deković et al., 2003; Slater & Power., 1987), consisting of 8 items (e.g., "I always persevere in disciplining my child, no matter how long it takes," $\alpha = 0.76$), to be rated on a 6-point scale ($1 = totally\ disagree$ to $6 = totally\ agree$). Last, three hypothetical situations from the PDI were presented to parents, in which adolescent misbehavior was described followed by several possible parental reactions. Parents were thereafter asked to indicate how probable ($1 = very\ improbable$ to $6 = very\ probable$) it was that they would use each reaction themselves. Two items (i.e., possible reactions) describe parental use of *inductive discipline* (i.e., explaining the reason for rules and pointing out consequences of misbehaviors for adolescent or for others) (e.g., [hypothetical situation lying] "Point out the consequences of misbehavior," $\alpha = 0.89$). If necessary, items were recoded such that higher scores indicated more supportive parental practices. A mean score across three situations was calculated.

To assess the feasibility of combining different indicators of the same construct in a composite score, we conducted a confirmatory factor analysis (CFA) in Mplus (Muthén & Muthén, 1998—2017). The CFA, based on the covariance matrix and using maximum likelihood estimation, showed an acceptable fit to the data [$\chi^2/df = 2.32$, RMSEA [90% CI] = 0.074 [0.014, 0.131], CFI = 0.940, SRMR = 0.037], with all estimated factor loadings being significant. As such, a composite mean score was calculated in SPSS (IBM version 28). Before computing the composite mean score, we transformed all scales into z scores given that item responses were rated on different scales. After transformation, higher scores all indicated higher levels of supportive parental practices. The Cronbach's alpha for the composite scale was 0.60.

Control Variables

Several demographic variables were included as control variables in the study as they have been associated with delinquency and recidivism and could, as such, be responsible for the variance in recidivism that seems to be accounted for by our predictor variables (Corrado et al., 2015). First, participants gender (0 = *male*, 1 = *female*) was included as males commit crime at higher rates than do females (Steffensmeier et al., 2005). Second, age was included due to findings suggesting that age of first offense negatively relates to persistent crime (Moffitt, 1993). Third, the number of prior convictions was controlled for as it appears to be one of the most stable predictors of recidivism (Andrews & Bonta., 2010). Last, we controlled for the treatment participants received (Asscher et al., 2014) to account for possible differences within our sample (0 = *multisystemic therapy*, 1 = *treatment as usual*).

Official Recidivism Data

Recidivism data (outcome measures) were collected from the Judicial Documentation System (JDS) provided by the Research and Documentation Centre (WODC) of the Dutch Ministry of Justice and Security. This database contains information about all criminal cases in which a person is convicted for a criminal offence in the Netherlands (see Wartna et al., 2011). Recidivism was defined in terms of timing of recidivism (time until first reconviction) and frequency (continuous variable: number of reconvictions).

Analytic Strategy

Data were prepared in IBM SPSS Statistics (Version 28). Baseline differences in psychopathic traits and supportive parental practices were tested for gender and age using independent-samples *T* tests and correlations respectively.

To assess the effect of predictors on the *timing* of recidivism over the four subsequent waves, four Cox regression analysis were conducted (Cox, 1972; Petersson & Strand, 2017). Time to conviction was considered as dependent variable, measured as the number of months between the end of treatment (date of program termination) and the date of the recidivism event, yielding a period of between 0 and 6 (T_2), 0 and 24 (T_3), 0 and 60 (T_4), and 0 and 120 months (T_5). To assess the effect of predictors on the *frequency* of recidivism at each wave, negative binomial regression analyses were used (Hilbe, 2011; Ver hoef & Boveng, 2007).[2]

In order to assess whether predictor variables were independently related to the timing and frequency of recidivism (i.e., whether they had incremental validity), a three-step hierarchical approach was used. Control variables (age, gender, prior convictions, and prior treatment) were added to the model (Step 1) before adding direct effects (psychopathic traits and supportive parental practices) (Step 2). The

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[2] The data were overdispersed (i.e., recidivism counts were more variable than the variance), which violated the assumption for a Poisson model. With a negative binomial regression model, a random term reflecting unexplained between-subject differences is included.

interaction effect (psychopathic traits × supportive parental practices) was calculated by multiplying the variables and was added in the final step (Step 3). To assess whether the predictors add to the prediction the timing of recidivism, we present the block χ^2 and -2 log likelihood ($-2LL$) statistics for each step. To assess the incremental predictability for the frequency of recidivism, Akaike information criterion (AIC), Bayesian information criterion (BIC), and likelihood ratio statistics are presented (Drury et al., 2019). Before running the analyses, assumptions were checked and met.

Results

Preliminary Analyses

No significant differences were found between individuals whose recidivism rates were traced at T_2 and those whose recidivism rates were not traceable at T_5 with regard to baseline scores of psychopathic traits, age, or ethnicity. However, juveniles whose recidivism rates were traceable after 120 months were more likely to be boys ($\chi^2(1)=6.82$, $p=0.014$), and to have lower levels of supportive parental practices ($t(185)=2.24$, $p=0.026$).

Table 1 displays descriptive statistics and Pearson's correlations among the study variables. At the end of the follow-up period (120 months), 86.3% of the juveniles had been reconvicted at least once (on average after 1135 days, $SD=1531.96$).

The correlations among the dynamic predictors and the timing and frequency of recidivism ranged from $r=|-0.17|$ to $r=|.00|$. A negative significant correlation was found between supportive parental practices and psychopathy, and between supportive parental practices and the frequency of recidivism at 6 months. All other correlations were nonsignificant.

T tests showed no significant differences on baseline scores of supportive parental practices and psychopathic traits with regard to gender. A significant negative correlation between age and supportive parental practices was found, indicating that juveniles younger at baseline had higher levels of supportive parental practices.

Timing of Recidivism

Table 2 (Step 1) shows that gender significantly predicted the timing of recidivism at all waves, suggesting that males recidivated faster. Prior convictions at T_1 significantly predicted the timing of recidivism at the latter three waves, suggesting that juveniles with more prior convictions at baseline recidivated faster at 24, 60, and 120 months. Age additionally predicted the timing at T_5, suggesting that juveniles who were younger at baseline were reconvicted faster after 120 months. All effects can be considered small (Azuero, 2016).

As is evident from the nonsignificant block χ^2 and $-2LL$ statistics (Table 3, Step 2), psychopathic traits nor supportive parental practices added incrementally to the first step of analyses at any wave. Albeit not significant, juveniles scoring high on psychopathic traits seem to recidivate faster over 120 months compared to juveniles scoring low on psychopathic traits (Fig. 1). Last, nonsignificant block χ^2 and $-2LL$ statistics

Table 1 Descriptive statistics and intercorrelations for the study variables

Variable	M(SD)	1	2	3	4	5	6	7	8	9	10
1. Psychopathic traits	0.25 (0.44)	-									
2. SPP	−0.05 (0.64)	−.33**	-								
3. Gender (girls)	1.21 (0.41)	−.01	.06	-							
4. Age	15.92 (1.39)	−.08	−.16*	−.07	-						
5. Prior convictions	2.68 (2.32)	−.17*	.12	−.29**	.13	-					
6. Days till first rearrest	1135.64 (1531.96)	−.08	.00	.33**	.09	−.26**	-				
7. Frequency 6 months	0.75 (1.13)	−.02	−.17*	−.21**	−.09	.15**	−.47**	-			
8. Frequency 24 months	1.68 (2.05)	−.01	−.10	−.26**	.01	.22**	−.52**	.70**	-		
9. Frequency 60 months	2.86 (3.05)	−.02	−.07	−.31**	−.04	.25**	−.54**	.58**	.86**	-	
10. Frequency 120 months	4.43 (4.56)	−.03	−.05	−.30**	−.11	.27**	−.45**	.35**	.66**	.87**	-

SPP supportive parental practices

* $p < .05$. **$p < .01$

Table 2 Cox regression models for the prediction of the timing to recidivism

	6 months 43.2% recidivated			24 months 66.2% recidivated			60 months 77.3% recidivated			120 months 86.3% recidivated		
	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]
Step 1												
Gender[1]	−0.82 (0.33)	6.153*	0.44 [0.23, 0.83]	−0.94 (0.27)	12.401***	0.39 [0.23, 0.66]	−0.99 (0.24)	17.124***	0.37 [0.23, 0.60]	−0.78 (0.25)	9.893*	0.46 [0.28, 0.73]
Age	−0.09 (0.08)	1.318	0.92 [0.79, 1.06]	−0.10 (0.06)	2.432	0.91 [0.81, 1.03]	−0.09 (0.06)	2.540	0.91 [0.81, 1.02]	−0.14 (0.06)	5.133*	0.87 [0.77, 0.98]
Prior c	0.06 (0.04)	1.663	1.06 [0.97, 1.16]	0.08 (0.04)	4.903*	1.08 [1.01, 1.16]	0.07 (0.03)	4.209*	1.07 [1.00, 1.15]	0.12 (0.04)	9.158*	1.12 [1.05, 1.22]
Treatment[1]	−0.09 (0.23)	0.155	0.92 [0.59, 1.43]	−0.21 (0.18)	1.359	0.81 [0.56, 1.06]	−0.32 (0.17)	3.368	0.73 [0.52, 1.02]	−0.09 (0.19)	0.208	0.93 [0.64, 1.35]
−2 LL	851.18			1229.00			1378.12			1131.01		
Block χ²	12.39*			28.17**			34.39**			28.57**		
Step 2												
Gender[1]	−0.80 (0.33)	5.738*	0.45 [0.23, 0.87]	−0.93 (0.27)	11.977***	0.40 [0.23, 0.70]	−0.98 (0.24)	16.895***	0.38 [0.24, 0.60]	−0.77 (0.25)	9.685**	0.46 [0.29, 0.75]
Age	−0.10 (0.07)	1.625	0.91 [0.78, 1.05]	−0.09 (0.06)	1.961	0.91 [0.82, 1.04]	−0.09 (0.06)	2.138	0.92 [0.81, 1.03]	−0.15 (0.06)	5.399*	0.86 [0.76, 0.98]
Prior c	0.07 (0.04)	2.086	1.07 [0.98, 1.17]	0.09 (0.04)	5.606*	1.09 [1.02, 1.18]	0.08 (0.04)	4.925*	1.08 [1.01, 1.16]	0.13 (0.04)	10.121**	1.14 [1.05, 1.24]
Treatment[1]	−0.09 (0.23)	0.150	0.92 [0.59, 1.43]	−0.21 (0.19)	1.217	0.82 [0.57, 1.37]	−0.31 (0.17)	3.142	0.74 [0.53, 1.03]	−0.10 (0.19)	0.270	0.91 [0.62, 1.32]
SPP	−0.17 (0.19)	0.754	0.85 [0.58, 1.24]	−0.02 (0.16)	0.000	1.00 [0.73, 1.37]	0.00 (0.15)	0.001	1.00 [0.75, 1.34]	−0.11 (0.15)	0.560	0.89 [0.66, 1.02]
PT[1]	0.06 (0.28)	0.041	1.06 [0.62, 1.82]	0.23 (0.22)	1.098	1.26 [0.82, 1.96]	0.23 (0.21)	1.184	1.26 [0.83, 1.89]	0.08 (0.22)	0.145	1.09 [0.70, 1.67]

Table 2 (continued)

	6 months 43.2% recidivated			24 months 66.2% recidivated			60 months 77.3% recidivated			120 months 86.3% recidivated		
	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]	B(SE)	Wald	HR [95%CI]
−2 LL	850.10			1227.64			1376.75			1129.90		
Block χ^2	1.12			1.36			1.36			1.11		
Step 3												
Gender[1]	−0.84 (0.33)	6.358*	0.43 [0.23, 0.83]	−0.94(0.27)	12.334***	0.39 [0.23, 0.66]	−0.98(0.24)	16.965***	0.37 [0.23, 0.60]	−0.77 (0.25)	9.659**	0.46 [0.29, 0.75]
Age	−0.11 (0.08)	1.943	0.90 [0.77, 1.04]	−0.09(0.07)	2.122	0.91 [0.80, 1.03]	−0.09(0.06)	2.183	0.91 [0.81, 1.03]	−0.15 (0.06)	5.339*	0.86 [0.76, 0.98]
Prior c	0.06 (0.04)	1.894	1.07 [0.97, 1.16]	0.09(0.04)	5.562*	1.09 [1.02, 1.17]	0.08(0.04)	4.935*	1.08 [1.01, 1.16]	0.13 (0.04)	10.095**	1.14 [1.05, 1.24]
Treatment[1]	−0.09 (0.23)	0.144	0.92 [0.59, 1.43]	−0.20(0.19)	1.184	0.82 [0.57, 1.18]	−0.30(0.17)	3.098	0.74 [0.53, 1.04]	−0.10 (0.19)	0.271	0.91 [0.62, 1.32]
SPP	−0.39 (0.23)	2.888	0.68 [0.44, 1.06]	−0.09(0.20)	0.205	0.91 [0.62, 1.35]	−0.02(0.18)	0.013	0.98 [0.69, 1.40]	−0.11 (0.19)	0.347	0.90 [0.62, 1.29]
PT[1]	0.22 (0.27)	0.637	1.24 [0.73, 2.12]	0.29(0.23)	1.568	1.33 [0.85, 2.08]	0.24(0.22)	1.243	1.28 [0.83, 1.96]	0.08 (0.24)	0.116	1.08 [0.68, 1.73]
SPP×PT[1]	0.69 (0.41)	2.791	1.99 [0.88, 4.47]	0.24(0.33)	0.540	1.28 [0.67, 2.45]	0.07(0.31)	0.053	1.07 [0.59, 1.96]	−0.01 (0.31)	0.001	0.99 [0.54, 1.82]
−2 LL	847.21			1227.10			1376.70			1129.90		
Block χ^2	2.85			0.53			0.05			0.00		

$N_{6\ months} = 213$; $N_{24\ months} = 213$; $N_{60\ months} = 211$; $N_{120\ months} = 168$. Gender[1] = girls; Prior c = prior convictions; Treatment[1] = treatment as usual; SPP = supportive parental practices; PT[1] = high psychopathic traits

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 3 Negative binomial models for the prediction of the frequency of recidivism

	6 months			24 months			60 months			120 months		
	B (SE)	Wald χ²	Exp B [95%CI]	B (SE)	Wald χ²	Exp B [95%CI]	B (SE)	Wald χ²	Exp B [95%CI]	B (SE)	Wald χ²	Exp B [95%CI]
Model 1												
Gender[1]	−0.97 (0.34)	8.122*	0.38 [0.20, 0.74]	−1.03 (0.27)	14.583**	0.36 [0.21, 0.60]	−1.16 (0.24)	22.802**	0.31 [0.20, 0.51]	−1.08 (0.26)	18.030***	0.34 [0.21, 0.56]
Age	−0.10 (0.08)	1.551	0.91 [0.78, 1.06]	−0.02 (0.07)	0.057	0.98 [0.86, 1.12]	−0.05 (0.06)	0.533	0.95 [0.84, 1.08]	−0.10 (0.07)	1.995	0.93 [0.63, 1.37]
Prior c	0.05 (0.05)	1.167	1.05 [0.96, 1.16]	0.07 (0.04)	2.809	1.07 [0.99, 1.17]	0.06 (0.04)	2.555	1.06 [0.99, 1.15]	0.08 (0.04)	3.991*	1.09 [1.05, 1.18]
Treatment[1]	−0.04 (0.23)	0.027	0.96 [0.61, 1.52]	0.01 (0.19)	0.003	1.01 [0.69, 1.48]	−0.10 (0.18)	0.324	0.90 [0.63, 1.29]	−0.08 (0.20)	0.148	0.93 [0.63, 1.37]
LR χ²	13.65 (4)**			22.89 (4)**			31.63 (4)**			28.77 (4)**		
AIC/BIC	468.195/484.586			685.489/701.880			843.562/859.901			785.224/800.409		
Model 2												
Gender[1]	−0.84 (0.34)	6.014*	0.43 [0.22, 0.84]	−0.99 (0.27)	13.036***	0.37 [0.22, 0.64]	−1.14 (0.25)	21.289***	0.32 [0.20, 0.52]	−1.05 (0.26)	16.414***	0.35 [0.21, 0.58]
Age	−0.14 (0.08)	2.968	0.87 [0.74, 1.02]	−0.03 (0.07)	0.225	0.97 [0.84, 1.11]	−0.06 (0.07)	0.686	0.95 [0.83, 1.08]	−0.11 (0.07)	2.253	0.90 [0.78, 1.03]
Prior c	0.07 (0.05)	1.944	1.07 [0.97, 1.19]	0.08 (0.04)	3.372	1.08 [0.99, 1.18]	0.07 (0.04)	2.671	1.07 [0.99, 1.15]	0.09 (0.04)	4.250	1.09 [1.00, 1.19]
Treatment[1]	−0.07 (0.24)	0.090	0.93 [0.59, 1.48]	−0.01 (0.19)	0.002	0.99 [0.68, 1.45]	−0.11 (0.18)	0.364	0.90 [0.63, 1.28]	−0.10 (0.20)	0.246	0.90 [0.61, 1.35]
SPP	−0.43 (0.18)	5.709*	0.65 [0.46, 0.93]	−0.15 (0.16)	0.943	0.86 [0.64, 1.67]	−0.07 (0.14)	0.248	0.93 [0.70, 1.24]	−0.09 (0.16)	0.315	0.92 [0.67, 1.25]
PT[1]	−0.13 (0.27)	0.220	0.88 [0.52, 1.50]	0.01 (0.23)	0.014	1.03 [.66, 1.59]	0.00 (0.21)	0.000	1.00 [0.66, 1.54]	0.01 (0.23)	0.003	0.92 [0.64, 1.61]

Table 3 (continued)

	6 months			24 months			60 months			120 months		
	B (SE)	Wald χ^2	Exp B [95%CI]	B (SE)	Wald χ^2	Exp B [95%CI]	B (SE)	Wald χ^2	Exp B [95%CI]	B (SE)	Wald χ^2	Exp B [95%CI]
LR χ^2	19.48 (6)**			23.99 (6)**			31.91 (6)**			29.19 (6)**		
AIC/BIC	466.371/489.318			688.395/711.342			847.279/870.154			788.808/810.067		
Model 3												
Gender[1]	−0.89(0.35)	6.551*	0.41 [0.21, 0.81]	−1.00 (0.27)	13.216***	0.37 [0.22, 0.63]	−1.13 (0.25)	21.122***	0.32 [0.20, 0.52]	−1.04 (0.26)	15.836***	0.34 [0.21, 0.59]
Age	−0.15(0.08)	3.197	0.86 [0.73, 1.01]	−0.04 (0.07)	0.253	0.97 [0.84, 1.11]	−0.05 (0.07)	0.670	0.95 [0.83, 1.08]	−0.11 (0.07)	2.319	0.90 [0.78, 1.03]
Prior c	0.07(0.05)	1.879	1.07 [0.97, 1.19]	0.08 (0.04)	3.322	1.08 [0.99, 1.18]	0.07 (0.04)	2.728	1.07 [0.99, 1.16]	0.09 (0.04)	4.509*	1.10 [1.01, 1.19]
Treatment[1]	−0.09(0.23)	0.154	0.91 [0.57, 1.45]	−0.02 (0.20)	0.009	0.98 [0.67, 1.44]	−0.11 (0.18)	0.332	90 [0.63, 1.29]	−0.10 (0.20)	0.237	0.91 [0.61, 1.35]
SPP	−0.59(0.21)	8.163**	0.55 [0.37, 0.83]	−0.24 (0.18)	1.782	0.79 [0.55, 1.12]	−0.04 (0.17)	0.059	0.96 [0.69, 1.33]	−0.00 (0.17)	0.001	1.00 [0.70, 1.41]
PT[1]	0.07(0.29)	0.055	1.07 [0.61, 1.90]	0.11 (0.24)	0.210	1.12 [0.70, 1.79]	−0.03 (0.23)	0.015	0.97 [0.62, 1.52]	−0.11 (0.26)	0.175	0.90 [0.54, 1.49]
SPP×PT[1]	0.64(0.39)	2.662	1.90 [0.88, 4.10]	0.33 (0.33)	0.989	1.39 [0.72, 2.66]	−0.11 (0.31)	0.124	0.90 [0.48, 1.67]	−0.33 (0.34)	0.940	0.72 [0.37, 1.40]
LR χ^2	22.14(7)**			24.98 (7)**			32.04 (7)**			30.12(7)**		
AIC/BIC	465.707/491.932			689.408/715.633			849.155/875.298			789.861/814.157		

$N_{6\ months} = 213$; $N_{24\ months} = 213$; $N_{60\ months} = 211$; $N_{120\ months} = 168$; CI = confidence interval; Gender[1] = girls; Prior c = prior convictions; Treatment[1] = treatment as usual; SPP = supportive parental practices; PT[1] = high psychopathic traits

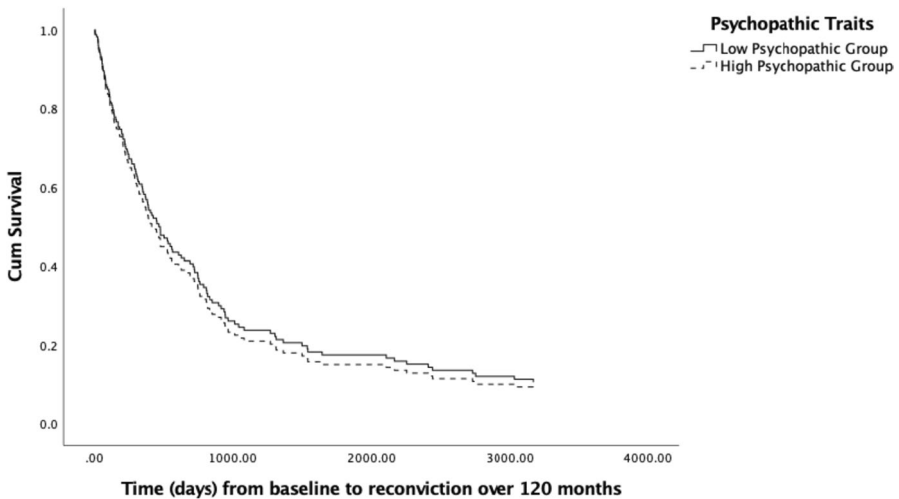*$p < .05$. **$p < .01$. ***$p < .001$

Fig. 1 Psychopathic traits as predictor of the timing of recidivism over 120 months

indicate that the interaction effect of supportive parental practices and psychopathy did not add to the prediction of the timing of recidivism at any wave (Step 3).

Frequency of Recidivism

Results of the negative binomial regression analysis are presented in Table 3. Across all waves, males were reconvicted more often compared to females. Additionally, juveniles with more prior convictions at T_1 were reconvicted more often after 120 months compared to those with fewer prior convictions at T_1 (see Model 1). Effects can be considered small (Chen et al., 2010).

In the second model, supportive parental practices incrementally predicted the frequency of recidivism at 6 months, suggesting that juveniles with higher levels of supportive parental practices at T_1 were less often reconvicted. However, psychopathic traits and supportive parental practices did not incrementally add to the prediction of the number of reconvictions at any of the subsequent waves (Model 2) as can be inferred from the degraded model fit (Drury et al., 2019). Similarly, despite the coefficients of Models 2 and 3 being significant, the interaction effect of supportive parental practices on psychopathic traits did not incrementally add to the prediction of the frequency of recidivism at any wave (Model 3).

Discussion

Given the substantial number of justice-involved youth recidivating, it is crucial to know whether risk and protective factors are related to recidivism, and if, and to what extent, they are incrementally predictive over other (static) risk factors. The present

study prospectively examined whether psychopathic traits and supportive parental practices predicted the *timing* and the *frequency* of reconviction over ten years after controlling for several static factors. Overall, 86.3% in our sample recidivated within 120 months. However, with one exception, psychopathic traits and supportive parental practices did not explain the timing or frequency of recidivism.

Psychopathic Traits

Contrary to our hypotheses and to prior studies (Corrado et al., 2004), juvenile psychopathic traits did not incrementally predict the timing or frequency of recidivism. Possibly, this is a consequence of the selected assessment method to assess psychopathy. In the current study, parent reports were used, whereas most earlier studies used expert-reported rating scales (e.g., Psychopathy Checklist: Youth Version [PCL-YV]) (Geerlings et al., 2020). Geerlings et al. (2020) found that the strength of the association between juvenile psychopathy and recidivism depended on the assessment instrument used, with lower effect sizes for instruments *other* than the PCL-YV. One explanation for this difference may be that the PCL-YV includes antisocial history items, which may significantly enhance its ability to predict recidivism (i.e., construct contamination), whereas most other psychopathy measures such as the APSD and ICU more strictly capture the underlying "trait-like" aspects of psychopathy (Pechorro et al., 2018). However, this explanation is not without discussion. In current paper, psychopathy is operationalized as a three-factor structure (Cooke & Michie, 2001; Cooke & Sellbom, 2019), whereas others have hypothesized that the construct is comprised of four factors including interpersonal, affective, behavioral *and* antisocial areas (Hare & Neumann, 2008; Neumann et al., 2015). Currently, there is empirical evidence supporting both the three- and four-factor models of psychopathy (Salekin et al., 2006; Veal et al., 2021). In addition, several studies have compared how well different methods (e.g., self-report, parent report an interviews) associate with various criminal variables (e.g., Cauffman et al., 2009; West et al., 2023). Little overlap was found between different methods of assessment and self-report measures of psychopathy tended to show less utility because of convergent validity and reliability (Asscher et al., 2011; Geerlings et al., 2020; Salekin et al., 2004; Silva et al., 2012). A recent meta-analysis by Geerlings et al. (2020) for example found that clinical ratings of psychopathy had stronger associations with criminal outcomes compared with self-report measures of psychopathy, which could reflect the impact of social desirability.

However, possibly the association between psychopathic traits and delinquency is not as robust as expected when studies control for important static risk factors such as gender and prior offenses. Our null results converge with other longitudinal studies (Colins et al., 2020; Pechorro et al., 2020) who found no predictive utility of psychopathic traits for recidivism over time. In their study, Colins et al., (2020) examined data from 302 detained girls (*M* age = 16.2) and found that neither the APSD total nor the APSD component scores contributed to the prediction of the recidivism outcomes. In their 2-year prospective longitudinal

study, Pechorro et al. (2020) similarly found that self-reported psychopathy did not predict (violent) recidivism in an incarcerated female sample. Comparing our study to these findings, an alternative explanation for the null results could be that the construct only has predictive utility for some samples of justice involved youth. For instance, we used a mixed-gender sample (30% girls), whereas psychopathy has been found less predictive of (re)offending in girls (Colins et al., 2020; Pechorro et al., 2020).

Supportive Parental Practices

Based on the social bonding theory (Hirshi, 1969), we expected that supportive parental practices would protect against the various forms of recidivism over time given that juveniles with positive bonds are more likely to conform to conventional norms. Contrary to our hypotheses, only one significant effect was found: juveniles with higher levels of supportive parental practices were less frequently reconvicted at 6-month follow up. For the consecutive waves, no significant (incremental) effects were found, suggesting that the protective effect of supportive parental practices on the number of reconvictions only has short-term effects. These results confirm the general belief and prior findings that the (protective) influence of parents on delinquency decreases over time as adolescents turn older and possibly other social ties (e.g., friends and spouses) become more important (e.g., Laub & Sampson, 1993; Van der Put et al., 2011). Yet, the diminishing effects could also be due to a change in engagement from parents. For instance, parents of older children are found to feel less responsible for the actions of their older adolescents than parents of younger adolescents (Collins & Laursen, 2004).

Supportive parental practices additionally failed to incrementally protect against the earlier timing, suggesting that juveniles with higher levels of supportive parental practices at T_1 did not recidivate less quickly compared to juveniles with lower levels of supportive parental practices. One possible explanation for the general lack of findings could be that our measure of supportive parental practices was solely reported by parents. Namely, the extent to which parents can monitor their child (e.g., know about their whereabouts) depends on the adolescents' level of disclosure. Hence, although parents may think they know about their adolescents' whereabouts, leading to higher reported scores on parental support, this might not necessarily be the case. In addition, by using the composite parenting practice scale as operationalized in present article, we might have lost variance which could have explained the correlation.

Buffering Effect of Supportive Parental Practices

Last, we examined whether supportive parental practices would protect against recidivism by *buffering* effects of psychopathic traits. Contrary to our hypotheses, supportive parental practices did not (incrementally) buffer the relation between psychopathic traits and recidivism. These findings could be due to the aforementioned decreasing parental influence as juveniles grow older. For instance,

several studies found that after early childhood, the effects of psychopathic traits persist regardless of the quality of parenting (Farrington, 2005; Salekin & Lochman, 2008). Alternatively, supportive parental practices have mainly been found to modify callous-unemotional traits specifically (Cornell & Frick, 2007; Fontaine et al., 2011). So, despite studies stressing the importance of looking at total psychopathy scores, it could be that parental practices moderate specific facets only. Nevertheless, it could well be that, as assessed in adolescence, there simply is no buffering effect of supportive parenting on recidivism.

Static Factors

Although it was not a direct aim of our study, our findings do suggest that the static factors used as control variables in our study (i.e., gender, age, and prior convictions) were, on average the strongest predictors of recidivism in this group of juvenile offenders, which is generally in line with several meta-analyses (e.g., Assink et al., 2015; Cottle et al., 2001). More specifically, boys consistently recidivated faster and more frequent across all waves, younger juveniles recidivated faster after 120 months and juveniles with more prior convictions recidivated faster across 24, 60, and 120 months and more frequent after 120 months. This in fact raises the question whether dynamic risk factors can even add to the strong and persistent static risk factors and how interventions should respond to this.

Limitations and Strengths

This study must be considered in light of its limitations. First, we do not know whether scores of psychopathic traits and supportive parenting practices remained stable across waves as we solely used measures collected at baseline. Therefore, future studies should collect and analyze these factors simultaneously to see if and how the association(s) change over time (Salekin, 2008). Second, we solely used official reconviction data. This could have led our study to underestimate the actual number of recidivism as we could not account for crimes that were not reported (e.g., that did not make it to a case). Also, we were unable to control for the time juveniles spent in detention after reconviction to earlier convictions (Coleman & Moynihan, 1996). Yet, given that roughly 13.2% did not recidivate the underreporting of recidivism is unlikely.

Notwithstanding the limitations, the current 10-year follow-up study has several important strengths. First, we made use of a prospective design with a substantial time span in which two different operationalizations of recidivism were used. This design allowed us to examine the influence of psychopathic traits and parenting from adolescence into adulthood, which helps to explain why systemic interventions may (not) have long term effects. Second, this study examined whether two dynamic factors incrementally predicted recidivism over and above several static factors, which is crucial to determine focus of intervention programs for young offenders (Edens et al., 2006).

Future Directions and Clinical Implications

The current study suggests several directions for future research. First, the aim of this study was to examine the role of two dynamic risk factors which often have been studied as moderators of intervention effects. Yet, this study gave no indications of their (long-term) effects on recidivism. Nonetheless, it is important to replicate these results before coming to definite conclusions and to further study which dynamic factors are in fact associated with long-term recidivism. When replicating this study, it is important to additionally use another assessment instrument for psychopathy, ask both parents and juveniles about their experiences regarding parenting, but also to possibly assess the dynamic factors at later timepoints.

Second, our findings show that several static factors are more often predictive of the timing and frequency of recidivism over 120 months. Despite the general premise being that static factors are not amendable to change (Andrews & Bonta, 2010), it does not mean that such factors could (or should) not be (better) addressed. In fact, we argue that these factors raise important research questions and demand (clinical) implications. First, our results stress that males are at higher risk to recidivate. Yet, despite research on males' predisposition for crime, the underlying mechanisms of this strong association have barely been addressed (Bijlsma et al., 2021). One male-specific risk factor of (re)offending that requires further examination is that males are more susceptible to deviant peer pressure for risk-taking behaviors compared to females (McCoy et al., 2019). This could be because, compared to females, males are less emotionally and cognitively equipped with regulatory capabilities and coping skills which could assist them to resist deviant peers. Perhaps therefore, cognitive behavioral therapies as offered to justice involved males should focus more on interpersonal problem-solving elements (i.e., training in problem-solving skills for dealing with peer pressure; Landenberger & Lipsey, 2005).

Furthermore, we found prior convictions to be a significant predictor of several recidivism outcomes over time. This could, potentially, be attributed to the (social) collateral consequences that juveniles often experience which increases their likelihood to recidivate (Hamilton & Fairfax-Columbo, 2022). For instance, juveniles often experience difficulties in finding a job or internship due to remarks on their code of conduct (Ramakers, 2020), leaving a gap between income (e.g., work) and spending. Research indicates that this gap is often filled by crime (Shapland et al., 2012). If so, we should improve aftercare to better (and perhaps longer) guide juveniles after conviction to rehabilitate in society (Welsh & Farrington, 2012). Last, given that one small effect was found for supportive parental practices at 6 months follow-up, the potential of family-focused interventions for the prevention or treatment of juvenile reoffending may be relatively low but most promising when offered earlier on.

Conclusion

The findings of this 10-year follow-up study showed a high rate of recidivism for juvenile offenders who received ambulant treatment during adolescence: 86.3% of the present sample recidivated within 120 months. Static factors (i.e., male gender, age and prior convictions) were associated with a higher likelihood to recidivate,

while psychopathic traits and supportive parenting, generally, do not seem to add to the prediction of recidivism. Therefore, we emphasize future studies to continue to further explore underlying mechanisms of both static and dynamic risk and protective factors to increase knowledge on which factors to address in intervention programs for juvenile delinquents and thus increase effectiveness of those programs.

Declarations

Conflict of Interest The authors declare no competing interests.

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