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## **aInfluence of psychopathic traits on desistance factors from criminal behavior during transition to adulthood**

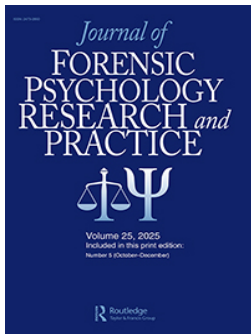
Habersaat, S.; Boonmann, C.; d'Huart, D.; Buergin, D.; Schmeck, K.; Fegert, J.; ... ; Urben, S.

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## Influence of Psychopathic Traits on Desistance Factors From Criminal Behavior During Transition to Adulthood

Stéphanie Habersaat<sup>a</sup>, Cyril Boonmann<sup>a,b,c</sup>, Delfine d’Huart<sup>a,b</sup>, David Bürgin<sup>a,d</sup>, Klaus Schmeck<sup>a</sup>, Jörg Fegert<sup>e</sup>, Marc Schmid<sup>a\*</sup>, and Sébastien Urben<sup>f\*</sup>

<sup>a</sup>Child and Adolescent Psychiatric Research Department, Psychiatric University Hospitals Basel (UPK), University of Basel, Basel, Switzerland; <sup>b</sup>Department of Forensic Child and Adolescent Psychiatry, Psychiatric University Hospitals Basel (UPK), Basel, Switzerland; <sup>c</sup>LUMC Curium – Department of Child and Adolescent Psychiatry, Leiden University Medical Center, Leiden, the Netherlands; <sup>d</sup>Jacobs Center for Productive Youth Development, University of Zurich, Zurich, Switzerland; <sup>e</sup>Department of Child and Adolescent Psychiatry and Psychotherapy, University Hospital of Ulm, Ulm, Germany; <sup>f</sup>Division of Child and Adolescent Psychiatry, University Hospital of Lausanne (CHUV) and University of Lausanne, Lausanne, Switzerland

### ABSTRACT

This study examined the evolution of psychopathic traits from adolescence to adulthood over a 10-year period, focusing on their impact on delinquency. It also assessed whether psychosocial maturation (e.g., temperance, perspective taking) and life turning points (e.g., employment, parenthood) mediated or moderated this relationship. The sample included 165 adolescent offenders. Psychopathic traits decreased over time but remained strongly linked to delinquent behavior at both time points. Neither psychosocial maturation nor turning points mediated or moderated this link. These findings highlight the persistent influence of psychopathic traits on delinquency and suggest the need for multifaceted intervention strategies.

### KEYWORDS

Desistance; psychopathic traits; turning points; psychosocial factors; longitudinal design

Since the work of Hirschi and Gottfredson (1983) on the age-crime curve, the concept of desistance from delinquent behavior has become increasingly important. These authors showed that delinquent behavior typically begins around the age of 12, peaks in late adolescence, and finally declines in young adulthood, regardless of ethnic group or social background. This observation has given rise to various theories that attempt to explain why most individuals, both women and men, naturally cease their delinquent behaviors (i.e., desist from committing crimes) when they reach adulthood. One of the most widely accepted desistance theories is certainly Sampson and Laub’s (1995) age-graded informal social control theory, which suggests that typical adult life events such as military service, marriage, employment, or parenthood serve as turning points after which criminal behaviors cease. Indeed, these events

**CONTACT** Sébastien Urben  [Sebastien.Urben@chuv.ch](mailto:Sebastien.Urben@chuv.ch)  Service Universitaire de Psychiatrie de l’Enfant Et de l’Adolescent (SUPEA) Centre Hospitalier Universitaire Vaudois (CHUV) Av. Echallens 9, Lausanne 1004

\*Both authors contributed equally.

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represent a form of commitment to conventional adult responsibilities and allow for the formation of new positive social ties. Since most of these life events occur in young adulthood, they may explain the decline in delinquent behavior at this age (Sampson & Laub, 1995). While many studies support this theory (see for example Abeling-Judge, 2021; Craig & Foster, 2013; Craig et al., 2020; Kang, 2019; Kreager et al., 2010; McGloin et al., 2011; Uggen & Staff, 2001), some authors (Hill et al., 2017; Kang, 2019) have noted that, nowadays, some of these life events occur much later in life (e.g., due to longer time spent in schooling, marriage and parenthood are generally more likely around the age of 30 in general). In this line, some studies found a delayed peak of delinquent behavior (Neil & Sampson, 2021; Steffensmeier et al., 2024, 2025; Tuttle, 2024); however, some others did not and suggested that the impact of these turning points on desistance should be reconsidered and specified (Hill et al., 2017; Kang, 2019). For instance, Hill et al. (2017) showed that it was not the employment status that triggered desistance but rather financial independence from parents. Furthermore, Zedaker (2017) showed that it was not marriage *per se* that influenced desistance from criminal behaviors but rather the quality of an affective relationship.

While studies derived from Sampson and Laub's work focused almost exclusively on concrete external factors (i.e., turning points), other researchers suggested that psychological characteristics such as self-labeling, self-control, agency, or identity were more appropriate to explain desistance from criminal activity (see for example Crank & Brezina, 2019; Lee et al., 2020; Paternoster & Bushway, 2009; Rocque, 2015; Rocque et al., 2019; Walters, 2019). In this vein, the theory of psychosocial maturation suggests that the decline in delinquent behaviors in young adulthood is related to increased psychosocial maturity related to brain development in young adulthood. This consists primarily of three factors: increases in temperance (e.g., self-control and risk avoidance), perspective taking (e.g., planning capacity, future orientation), and responsibility (e.g., autonomy, identity, agency) (e.g., Cauffman & Steinberg, 2000; Steinberg & Cauffman, 1996). For instance, these factors have been tested by Rocque et al. (2019), who found that increased psychosocial maturation (using variables such as self-control, future orientation, consideration for others, and responsibility) was a strong predictor of desistance from delinquent behavior across different ethnic groups. In addition, McCuish et al. (2020) found that responsibility, work orientation, and self-identity were the most important predictors of psychosocial maturation. Furthermore, concern for others and moral disengagement were the psychosocial maturation variables most strongly associated with desistance from delinquent behavior. Aside from turning points and factors related to psychosocial maturation, Bekbolatkyzy et al. (2019) considered a number of social variables and suggested that attachment to parents, parenting style, peer relationships, or social support

may also play a role in desistance from delinquent behavior. Using a cohort sample across four measurements' waves, Bekbolatkyzy et al. found that only social support, and only to some extent (i.e., increased the odds of aging out of delinquency at Wave 2 but decreased them at Wave 4), was related to a decline in delinquent behaviors.

More recently, studies have suggested that desistance from delinquent behaviors is best explained by a combination of psychological (maturational), social, and external (turning point) factors. For example, Bares (2021) notes that while marriage may be an important turning point, it is the result of a long process of psychosocial changes (such as adult role identification, responsibility, life planning, and stable emotional commitment). In short, desistance from delinquent behavior should, therefore, be viewed as a long and dynamic process, taking place in young adulthood, that integrates psychosocial maturation variables. These variables provide access to turning points and social acceptance of a new nondelinquent identity (Crank & Brezina, 2019; Giordano et al., 2002; Johnston et al., 2019; Nugent & Schinkel, 2016; Walters, 2019; Weaver, 2019). It is not yet clear what mechanisms trigger or impede the psychosocial maturation processes that provide access to turning points, prosocial environments, and ultimately desistance from criminal behavior.

A central feature of more-violent, chronic, and serious offending behaviors is the presence of psychopathic traits (Fox et al., 2015; Kahn et al., 2013; McCuish, 2016). Psychopathic traits are usually described using at least three dimensions—namely, affective (i.e., callous, unemotional), interpersonal (i.e., grandiose, manipulative), and lifestyle (i.e., sensation seeking, impulsivity) (e.g., Patrick et al., 2012). Some models also included antisocial traits as a core feature of psychopathy (e.g., De Brito et al., 2021; Hare & Neumann, 2009), while other researchers argued that the antisocial dimension reflects maladaptive outcomes of the affective, interpersonal, and lifestyle dimensions (Cooke et al., 2006; Skeem & Cooke, 2010; Steinert et al., 2017). While some studies have shown that psychopathic traits were relatively stable from childhood to adolescence (Lynam, Charnigo, et al., 2009) and from adolescence to adulthood (Hemphälä et al., 2015), others have shown that they were less stable at adolescence than at adulthood (Cauffman et al., 2016) and were sensitive to some early interventions (Hawes et al., 2014). Moreover, it was observed that adolescents with the most psychopathic traits were the most likely to experience a decrease over the years (McCuish & Lussier, 2018). Other studies suggested that the psychopathic traits were deeply rooted in the biological and neural functioning of the individual (Blair, 2003; Debowska et al., 2014; Deming & Koenigs, 2020; Johanson et al., 2020; Seara-Cardoso et al., 2022). Therefore, given their early onset, their nature, and the fact that they are associated with chronic delinquent behaviors, psychopathic traits seem to be a good candidate to investigate in relation to desistance factors.

Previous studies mentioned that callous unemotional trait, included in the affective facet of psychopathic traits, was related with difficulties in relationships with others (Baroncelli et al., 2023; Blair, 2022; Facci et al., 2023; Golmaryami et al., 2021; Vaughan et al., 2023). Relationships difficulties may impede access to prosocial environments that help form a prosocial identity, but also to turning points such as marriage and romantic relationship satisfaction, which are known as desistance variables (see for example: Laub et al., 2017). In addition, callous unemotional traits have also been associated with low school engagement (Hwang et al., 2021), poor academic performance (Ciucci et al., 2014; Levine et al., 2023), reducing chances of having access to a satisfying job, and financial independence, the last two of which are also known as desistance factors (Hill et al., 2017; Johnson & Giordano, 2021; Skardhamar & Savolainen, 2014). Furthermore, a study by McCuish and Gushue (2022), using the large cohort of the Pathways to Desistance Study, showed that within-individual changes in psychosocial, adult role, and identity maturation predicted changes in features of psychopathy.

### ***The current study***

Although existing literature suggests that some psychopathic traits are linked to variables theoretically associated with desistance mechanisms and to serious and chronic offending, their impact on psychosocial maturation variables and significant life events remains unclear. Therefore, in the current study, we aimed, first, to assess the evolution of psychopathic traits over a 10-year follow-up period (during emerging adulthood) to assess the intrinsic stability of this feature. Second, we examine longitudinally the mediating effect of psychosocial maturation and key turning points on the relationship between psychopathic traits and desistance from delinquent behaviors—in other words, how associations between psychopathic traits and delinquency at follow-up are sustained by psychosocial factors and key turning points. Third, we analyze cross-sectionally the moderating effects of psychosocial maturation factors and key turning points on the relationship between psychopathic traits, and desistance from delinquency. The moderation analyses have been computed to examine how psychosocial factors and turning points may modify the associations between psychopathic traits and delinquency at follow-up.

## **Method**

### ***Procedure***

The current study is embedded in the Youth Welfare Trajectories: Learning From Experience (“Jugendhilfverläufe: Aus Erfahrung lernen”

[JAEL]) study, the 10-year follow-up study of the Clarification and Goal-Attainment in Child Welfare and Juvenile-Justice Institutions study (“Modellversuch zur Abklärung und Zielerreichung in stationären Massnahmen” [MAZ] (see Jäggi et al., 2021; M. Schmid, Kölch, Fegert, et al., 2013), conducted in Switzerland from 2007 to 2011. The MAZ study is a large-scale investigation of psychological and behavioral characteristics of children and adolescents who have been placed in a Swiss institution as a result of the criminal law (e.g., completion of a sentence after a serious offense), civil law (e.g., runaway, victimization, minor offenses, harmful family environment), or by voluntary placement (e.g., repeated relational and behavioral problems within the family). The JAEL study (follow-up study) started in 2016, about 10 years after the MAZ study. One of the main objectives of the JAEL study was to reevaluate these now young adults, focusing on how they coped with the transition from institutional to independent living conditions.

For this specific study, only adolescents who had committed any type of offense prior to the MAZ study according to the Crime Questionnaire (see Measures) were included ( $n = 427$ ). Of these, 165 were included in the 10-year follow-up study (of the 262 who dropped out between the two studies, the majority never responded to our invitation to participate in the follow-up study, some were no longer in Switzerland, and a small number had died). For the MAZ study, participants were contacted and assessed by a team investigator during their institutional stay (for more information, see M. Schmid, Kölch, Fegert, et al., 2013). For the JAEL study, participants who agreed during MAZ to be recontacted for a follow-up were recontacted by mail with a description of the study and a request to contact the study team by e-mail or phone if they were interested in participating in the follow-up. If they agreed, participants received an e-mail with a personal link to online questionnaires regarding psychological symptoms, life events, and quality of life. When all questionnaires were completed, participants were invited for a 1- to 2-day assessment at the University Psychiatric Hospital in Basel (German-speaking participants), at the University Psychiatric Hospital in Lausanne (French-speaking participants), or at the Regional Hospital and Psychosocial Services in Lugano (Italian-speaking participants). Semistructured interviews were conducted during the assessment to explore the participants’ general situation, psychological functioning, and mental health.

The procedures for both studies were approved by the Ethics Committees for Human Research in Basel and Vaud states. All participants received verbal and written information about the study, and their informed consent was obtained online and during face-to-face interviews. Data collected during the MAZ study are referred to as  $T_1$  and data collected during the JAEL study (10-year follow-up from MAZ) are referred to as  $T_2$ .

### **Sample description**

Of the 165 participants included in the study, 120 (72.2%) were men, and 144 (87.3%) were Swiss citizens. The mean age at  $T_2$  was 26 years old ( $SD = 3.35$ ). Most participants came from the German-speaking part of Switzerland ( $n = 121$ ; 73.3%), 25 participants came from the Italian-speaking part (15.2%), and 19 came from the French-speaking part (11.5%). Regarding living arrangements, 53 (35.1%) lived with a partner, 50 (33.1%) lived alone, 38 (25.2%) lived with relatives (friends or family), and 8 (5.3%) lived in institutions/prisons at  $T_2$ . Thirty-seven (24.5%) participants had children at  $T_2$ . Half of the sample ( $n = 85$ ) were employed and approximately 16% ( $n = 24$ ) were still in formation at  $T_2$ . A third of the sample ( $n = 47$ ) reported satisfaction with their occupational status, and just over one-third ( $n = 57$ ) reported dissatisfaction at  $T_2$ . In terms of income, half of the sample ( $n = 80$ ) received a salary, 28.5% ( $n = 43$ ) received social welfare assistance; 6% ( $n = 9$ ) collected unemployment insurance; 13.2% ( $n = 20$ ) collected disability insurance, 13.2% ( $n = 20$ ) lived with financial support from their partner, family and/or friends; and 16.6% ( $n = 25$ ) received financial support from other sources at  $T_2$ .<sup>1</sup> In addition, approximately half of the sample reported being satisfied with their financial status ( $n = 71$ ), while 22.5% ( $n = 34$ ) reported being dissatisfied at  $T_2$ . Finally, 32 participants (21.1%) had been involved in the Swiss army at  $T_2$ .

### **Measures**

#### **Offending behavior before $T_1$**

Delinquent behavior prior to  $T_1$  was measured using a self-report, computer-administered questionnaire adapted from the Crime Questionnaire developed in the Münster Longitudinal Study (Boers & Reinecke, 2007) at  $T_1$ . This 41-item instrument assesses past delinquency. Participants had to answer *yes* or *no* to questions such as, *Have you ever broken into a car to steal something (e.g. radio, money, cell phone, etc.)? Have you ever attacked or tried to attack and injure someone with an object (e.g., stick) or a weapon (e.g., knife or tear gas)? or Have you ever forced another person of the same age, older or younger (less than 2 years) to have sex by threatening violence?* Any participant who answered *yes* to a question was included in the study.

#### **Psychopathic traits at $T_1$ and $T_2$**

Psychopathic traits at  $T_1$  and  $T_2$  were measured using the total score of the Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002), a 50-item self-report questionnaire for children and adolescents assessing the core personality traits of psychopathy. Items such as *I have the ability to con people by using my charm and smile, I'm better than everyone on almost everything,*

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<sup>1</sup>Participants can be in one or more categories.

*Sometimes I lie for no reason, other than because it's fun* are rated on a 4-point Likert-type scale (1 = *does not apply at all*, 2 = *does not apply well*, 3 = *applies fairly well*, and 4 = *applies very well*). The Cronbach's  $\alpha$  are of = .921 for  $T_1$  and of .892 for  $T_2$  measures.

### ***Sociodemographic data and turning point variables at $T_2$***

Sociodemographic data such as age, nationality (i.e., Swiss, non-Swiss), sex (i.e., male/female), Swiss language area (i.e., German, Italian, and French), living status (i.e., living with a partner, alone, with family or friends, or in an institution/prison), family status (i.e., with or without children), military service (i.e., fulfilled or no military obligations), type of income (i.e., salary, social welfare assistance, unemployment insurance, disability insurance, financial support from relatives, other sources of financial support), occupational status (i.e., employed or not, student or not), satisfaction with the partner, satisfaction with financial status, and satisfaction with occupational status were obtained from online anamnestic questionnaires. Satisfaction with financial status and satisfaction with occupational status were rated on a 5-point scale ranging from *very dissatisfied* to *very satisfied*. Satisfaction with the romantic relationships was assessed using the Quality Marriage Index (Norton, 1983). This questionnaire consists of five statements about the relationship with the affective partner, which participants rate on a 7-point scale, ranging from *very true* to *very untrue*, and an additional item for which the participant must rate his or her marital happiness on a 10-point scale ranging from 1 = *very unhappy* to 10 = *very happy* (Cronbach's  $\alpha$  = .950).

### ***Psychosocial maturation at $T_2$***

Psychosocial maturation variables were assessed using the Levels of Personality functioning questionnaire adult-form (LOPF-Q Adult, Goth & Schmeck, 2023), a 97-item self-report questionnaire that includes four main domains: identity, self-direction, empathy/social behavior, and intimacy/attachment. Items such as *I often don't understand what others are thinking*, *I quit tasks shortly before finishing them*, or *Until now, I have not found anything that would be really worth pursuing* are rated on a 5-point scale ranging from 0 = *strongly disagree* to 4 = *strongly agree*. Subscales are then calculated by adding the corresponding items. The Identity domain (23 items (Cronbach's  $\alpha$  = .908) include information on the experience of self-sameness and ego stability over time, positive bonding and identification with significant others, identity coherence, and autonomy. The self-direction domain (25 items, Cronbach's  $\alpha$  = .941) includes information on self-congruence (self-acceptance, self-regard, self-regulation) and purposefulness (self-determination, goal setting, goal attainment, resources, and persistence). The empathy/social behavior domain (26 items, Cronbach's  $\alpha$  = .841) was not included as it is a concept too close to psychopathic traits. The intimacy/

attachment domain (23 items, Cronbach's  $\alpha = .878$ ) includes information on the capacity for close relationships (closeness, emotional openness, trust) and reciprocity (depth, affiliation, sociability, and mutuality).

Self-efficacy was measured using the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1999), a 10-item self-reported questionnaire. Items such as *No matter what happens, I can usually cope* or *I can solve most of my problems if I put in the necessary effort* are rated on a 4-point scale ranging from *very untrue* to *very true* (Cronbach's  $\alpha = .885$ ).

Satisfaction with social support was measured with the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988), a 12-item self-reported questionnaire. Participants rated items such as *There is a special person with whom I can share joys and sorrows* or *I can talk about my problems with my family* on a 7-point scale ranging from 1 = *very strongly disagree* to 7 = *very strongly agree* (Cronbach's  $\alpha = .919$ ). Items are combined into a total score that reflected participants' overall satisfaction with their social support.

### **Delinquent behaviors at T<sub>2</sub>**

Delinquent behavior at T<sub>2</sub> was measured by the delinquent behavior subscale of the Young Adult Self Report (YASR; Achenbach & Edelbrock, 1987), a 132-item self-report questionnaire assessing emotional and behavioral problems over the past 6 months. The delinquent behavior subscale consists of nine items that examine age-appropriated delinquent behaviors such as stealing, threatening, fighting, or attacking others. Items are rated on a 3-point scale ranging from 0 = *not true* to 2 = *very true or very often true* (Cronbach's  $\alpha = .709$ ). The total subscale score is calculated by summing the scores for each item.

### **Statistical analyses**

Comparisons between participants included in the analyses and participants who dropped out between T<sub>1</sub> and T<sub>2</sub> were made using *t* tests (for continuous variables) or  $\chi^2$  tests (for categorical variables). To achieve our first objective, we used a *t* test for paired samples to assess the evolution of psychopathic traits across the 10-year follow-up. Then, we conducted successive mediation analyses ( $n = 10$ ) to examine the mediating effects of psychosocial factors and turning points in the association between psychopathic traits (from baseline) and desistance from delinquent behavior. Finally, we conducted successive moderation analyses ( $n = 10$ ) to assess the moderation effects of psychosocial maturation factors and turning points in the association between psychopathic traits (at follow-up) and desistance from delinquency. All analyses were conducted with JAMOVI 2.3.21. The standard procedure implemented in JAMOVI, version 2.3.21, was used. JAMOVI is a user-friendly interface built on the R programming language and statistical computing environment. The

“*medmod*” module in JAMOVI is based on the “*lavaan*” package in R, which employs structural equation modeling (SEM) to estimate mediation and moderation effects. Bootstrap confidence intervals at the 95% level, with 1,000 repetitions, were computed.

## Results

### Comparison between participants included in T<sub>2</sub> and those who dropped out after T<sub>1</sub>

Participants who dropped out after T<sub>1</sub> and those who were included in T<sub>2</sub> differed significantly in the type of offense committed before T<sub>1</sub> (Table 1). In fact, significantly more participants who committed interpersonal violence before T<sub>1</sub> dropped out from the study. Furthermore, participants included in T<sub>2</sub> showed significantly more psychopathic traits at T<sub>1</sub> than participants who dropped out. Non-Swiss participants more frequently dropped out. Furthermore, participants whose father’s last level of education was lower more frequently dropped out (about 40% of participants have missing data for this variable).

**Table 1.** Comparison between participants who dropped out and are included.

	Participants who dropped out (n = 262) M (SD)	Participants included (n = 165) M (SD)	t	p
Age at T <sub>1</sub>	16.19 (2.89)	16.33 (2.95)	0.46	.646
Psychopathic traits at T <sub>1</sub>	110.16 (22.30)	118.03 (22.39)	3.63	< .001
	N (%)	N (%)	χ <sup>2</sup>	p
Gender (male)	192 (73.3)	120 (72.2)	1.93	.238
Offense type at T <sub>1</sub>				
Against property	244 (93.5)	156 (94.5)		.657
Interpersonal violence	117 (46.1)	45 (27.4)		< .001
Others	193 (75.1)	117 (72.7)		.581
Swiss nationality (yes)	209 (79.8)	144 (87.3)	3.98	.046
Father’s last education level at T <sub>1</sub>				.044
Did not finish compulsory school	12 (7.8)	5 (4.9)		
Compulsory school achieved	(1) (20.0)	11 (10.7)		
Highschool/apprenticeship	(1) (69.7)	79 (76.7)		
Higher education	4 (2.6)	8 (7.8)		
N/A	107 (40.8)	62 (37.6)		
Mother’s last education level at T <sub>1</sub>				.788
Did not finish compulsory school	21 (13.0)	14 (12.2)		
Compulsory school achieved	(1) (31.1)	30 (26.1)		
Highschool/apprenticeship	(1) (53.7)	67 (58.3)		
Higher education	4 (1.5)	4 (3.5)		
N/A	100 (38.2)	50 (30.3)		

### **Evolution of psychopathic traits across the 10-year follow-up**

Psychopathic traits significantly ( $t(134) = 6.62, p < .001$ ) decreases from  $T_1$  ( $M = 117.0; SD = 22.6$ ) to  $T_2$  ( $M = 105.0; SD = 17.9$ ) and are significantly correlated to each other ( $r = .406, p < .001$ ).

### **Mediation analyses**

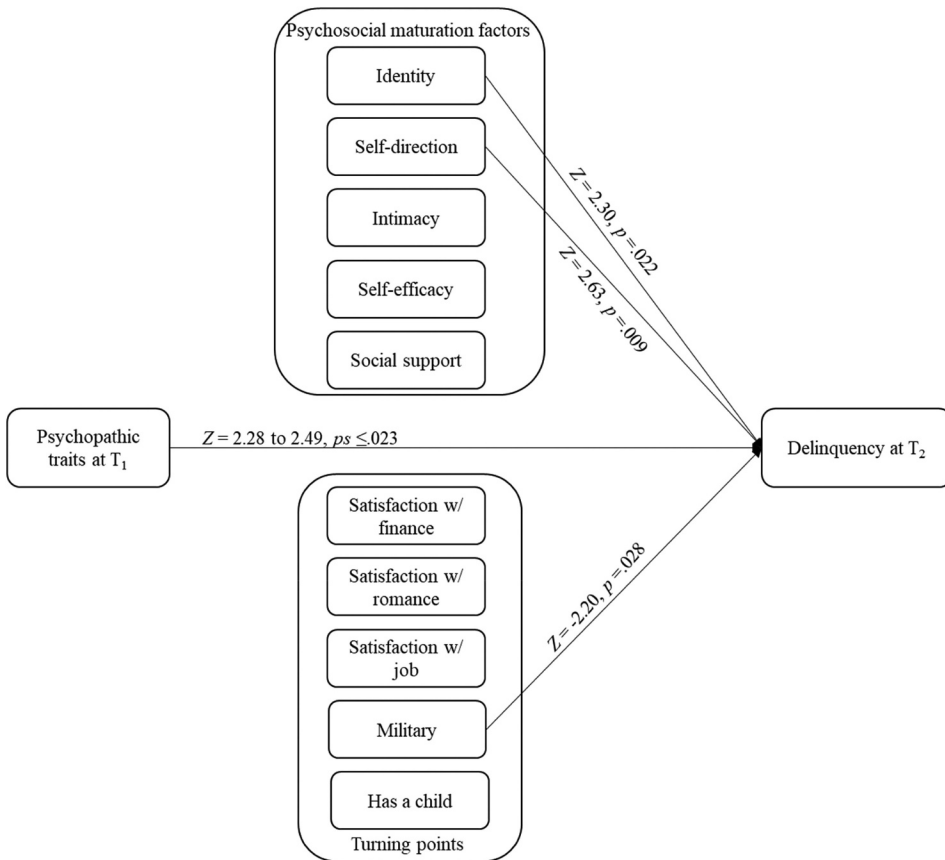
Higher psychopathic traits at  $T_1$  predicted directly and significantly more delinquency (or less desistance) at  $T_2$  in each model. No indirect path (mediation effect) has been observed. As well psychopathic traits have no direct influence on psychosocial factors or turning points. However, higher psychopathic traits at  $T_1$  are associated with higher age ( $Z = 2.13, p = .033$ ). In addition, having done military service ( $Z = -2.20, p = .028$ ), lower identity problems ( $Z = 2.30, p = .022$ ), and lower self-direction problems ( $Z = 2.63, p = .009$ ) are associated with lower delinquency. The results are visually summarized in [Figure 1](#).

### **Moderation analyses**

Higher psychopathic traits at  $T_2$  are significantly associated with more delinquency (or less desistance) at  $T_2$  in each model. Higher delinquency is associated with being a male ( $Z = 2.45, p = .014$ ), more identity problems ( $Z = 2.26, p = .024$ ), more self-direction problems ( $Z = 2.48, p = .013$ ), not having satisfied the military duty ( $Z = -2.36, p = .019$ ). No specific moderation effect of psychosocial maturation or turning points is observed between psychopathic traits (at  $T_2$ ) and delinquency ( $T_2$ ).

### **Discussion**

The present study sought to examine the stability of psychopathic traits over 10 years as well as its effect on classic desistance variables (psychosocial maturation and turning points) and on delinquent behavior using a 10-year longitudinal sample of emerging adults who had committed offenses during adolescence and were placed in juvenile justice and social welfare institutions. The results revealed a robust effect of psychopathic traits on delinquent behaviors at both baseline and during follow-up, despite a general reduction in psychopathic traits over the follow-up. However, these effects were neither mediated nor moderated by psychosocial maturation factors or turning points. Finally, our analysis revealed that identity and self-direction problems and the absence of military service were associated with a lower likelihood of desistance from delinquent behaviors.



**Figure 1.** Summary of the mediation models. Only significant paths are shown. The residual variances are not displayed.

First, while many studies have found that psychopathic traits are stable over the life course (Asscher et al., 2011; Bergström & Farrington, 2021; Edens et al., 2001; Lynam et al., 2007), we found a significant decline over time. A previous study by Cauffman et al. (2016) however found that psychopathic traits were less stable in adolescence than in adulthood, corroborating our findings. Furthermore, McCuish and Lussier (2018) found that adolescents with higher scores in psychopathic traits were also the most likely to experience a decrease over the years. Our relatively long time span between the two measurements, especially at a time when many changes occur, may explain our findings. Indeed, adolescence is a time when traits included in the definition of psychopathy, such as risky behaviors, sensation seeking, irresponsibility, or difficulties in emotion regulation are usually elevated (Steinberg, 2007; Steinberg et al., 2018; Willoughby et al., 2021), whereas, they naturally decrease in adulthood when our second measurement took place. Furthermore, it is important to note that the adolescents’ participants were living in institutions

at the time of the first assessment of psychopathic traits; whereas, this was no longer the case at the time of the second measurement. According to social learning theory, antisocial behavior is learned within intimate relationships (see for example Akers & Jennings, 2015). Indeed, social welfare and juvenile justice institutions for adolescents accommodate, under the same roof, individuals who have been exposed to early trauma, parental neglect or abuse, parental substance abuse or psychiatric conditions, and so on. These young people have usually shown behavior problems from an early age. In our experience, the culture among adolescents in institutions promotes strength and masculinity, not showing emotions and breaking rules. Therefore, in this climate, it is possible that the display of psychopathic traits, such as callous-unemotional traits, low empathy, or risky behaviors are adaptive to develop a sense of belonging to a group or simply to be accepted. Therefore, in this context, they could be not deeply rooted in the individual's functioning.

On leaving the institutions and transitioning to independent living, the institutional group culture or pressure to belong is no longer felt anymore and the traits associated with this culture are alleviated, resulting in a decrease of psychopathic traits from  $T_1$  (adolescents living in institutions) to  $T_2$  (adults living in autonomy). Another possibility to explain the decrease in psychopathic traits between  $T_1$  and  $T_2$  is that most of these individuals received psychotherapeutic care as part of their routine care while in the institution. It is therefore possible that this clinical psychological follow-up helped to develop more control over their behavior and social skills. While some authors have found that psychopathy is impervious to treatment, some other authors have argued that a specific program aimed at developing social skills and emotional regulation may have a positive effect in individuals with psychopathic personality disorders (da Silva et al., 2020; Hawes et al., 2014; Olver, 2018; Polaschek & Skeem, 2018). Importantly, although the participants in our study were not psychopaths, they exhibited significant levels of psychopathic traits, some of which are relatively common in adolescence.

Second, within the framework of desistance, results revealed that psychopathic traits predict delinquent behavior 10 years later. In fact, the more psychopathic traits at  $T_1$ , the more delinquent behavior at  $T_2$ . Furthermore, higher psychopathic traits at  $T_2$  are associated with higher delinquent behavior at the same time. The direct relationship between psychopathic traits and chronic offending has been well established in previous literature (see for instance the meta-analysis by Geerlings et al., 2020) and at many points in life (e.g., Brandt et al., 1997; Lynam, Charnigo, et al., 2009; Lynam, Miller, et al., 2009). Leaving aside antisocial traits (which are understandably highly related to delinquency but not specific to psychopathy; see for example Corrado et al., 2015), the combination of affective, lifestyle, and interpersonal characteristics of psychopathic traits may account for this direct and seemingly immutable association. Indeed, for example, the lack of empathy,

manipulativeness, self-centeredness, and self-justifying included in the affective and interpersonal dimensions reduce the ability to empathize with others, making individuals more likely to harm others without remorse as they feel entitled to use others for their own benefit. In addition, impulsivity and thrill-seeking, included in the lifestyle dimension, can lead individuals to engage in risky criminal behaviors without regard to the consequences as a form of excitement or stimulation. Poor behavioral control contributes to an increased likelihood of engaging in violence when faced with adversity or frustration.

A third important finding of the present study is that known desistance variables such as self-direction problems and identity problems as well as not having fulfilled compulsory military service at  $T_2$  are associated with more delinquency at  $T_2$ . First, it is important to note that, in Switzerland, individuals who do not have Swiss citizenship or who have a serious criminal record are not accepted for compulsory military service, which may explain the relationship between military service and less delinquency at  $T_2$ . Second, identity problems and problems with self-direction are known factors that hinder desistance from delinquency (Forney & Ward, 2019; Na & Paternoster, 2019; Walters, 2019). Therefore, the findings of the present study are in line with previous literature. Indeed, the interplay between identity problems and self-direction problems may hinder desistance at several levels. For example, individuals with identity problems often struggle to establish clear life goals or long-term aspirations. Without a sense of direction, they may find it difficult to envision a positive future that motivates them to avoid criminal behavior. In addition, an unstable sense of self can lead to confusion about one's moral values, making it easier to engage in criminal behavior compared to individuals with a strong internal moral compass that guides their behaviors. Problems with self-direction can manifest as difficulties in making considered decisions or taking responsibility for one's actions, which can lead to impulsivity and a tendency to resort to criminal behavior as a default response to challenges. Finally, individuals struggling with their identity may seek validation from peers or social groups who engage in criminal behavior, particularly if they are in an institution where these groups are in the majority. This can reinforce criminal affiliations and behavior. Furthermore, as a default, their criminal identity may, over time if they remain among their delinquent peers, become a significant part of their identity. If they see themselves primarily as criminals, it can be difficult to move away from this identity, making desistance a challenge. Finally, people with identity and self-direction problems may be more resistant to change because they fear losing their precarious sense of self or identity. This can inhibit efforts to make positive life changes or engage in rehabilitation programs.

Finally, a fourth result of the present study is the fact that, contrary to our expectations, no prospective (mediation) or cross-sectional (moderation) association was found between psychopathic traits, turning points and

psychosocial maturation variables and delinquency at  $T_2$ . In fact, it appears that the association between psychopathic traits and delinquent behaviors remains stable despite typical turning points in life or psychosocial maturation variables. For example, Fox et al. (2015), citing Caspi (1998), suggest that turning points associated with desistance processes, such as marriage or employment, have little impact on the behavior of individuals with psychopathic traits as they selectively interpret the social environment to reinforce rather than change their personality. Indeed, individuals with high levels of psychopathic traits may be adept at manipulating their circumstances to their advantage, which may allow them to exploit turning points without actually changing their behaviors. Furthermore, while turning points such as marriage or parenthood often foster emotional bonds that discourage delinquent behaviors, individuals with psychopathic traits may struggle to form genuine emotional bonds, reducing the likelihood that these turning points will act as a deterrent. They are also less influenced by social norms and expectations, which may make them less responsive to the positive effects of turning points that often promote desistance in others. Finally, the cumulative effect of a history of antisocial behaviors can create entrenched patterns that are difficult to break, making it difficult for turning points to serve as catalysts for change. Overall, the specific ways in which these individuals interact with their environment can lead to a persistent association between psychopathic traits and delinquent behaviors, even in the face of typical life turning points.

### **Limitations**

The results of this study should be understood in the light of several limitations. First, we note that there are significant differences between participants included in the follow-up study ( $T_2$ ) and those who dropped out after  $T_1$ . The most notable differences are related to the fact that participants who dropped out were more likely to have committed an offense of interpersonal violence than those included in  $T_2$ . In addition, participants who dropped out were less likely to have the Swiss nationality and had a possibly lower socioeconomic background (e.g., lower education levels of fathers). In 2010, the Swiss federal constitution was modified to deprive foreigners who have been found guilty of serious offenses of their residence permit and to prohibit them from entry on Swiss territory for a period ranging from 5 to 15 years. This law may be an explanation for the differences in interpersonal violence and nationality between the original sample and the follow-up sample. In any case, these differences between included participants and those who dropped out after  $T_1$  suggest a selection bias that may have affected the generalizability of our results.

In this regard, a second limitation that should be highlighted is the fact that the severity and chronicity of delinquent behavior was not considered at the time of inclusion. Indeed, participants included were adolescents in child welfare and juvenile justice institutions who had committed an offense, but the severity of the offense committed or whether they had committed one or multiple offenses and had already established a pattern of chronic delinquent behavior has not been considered. In this regard, we cannot speak strictly of desistance, for example, for adolescents who have committed only one minor offense during adolescence.

Another limitation to this study is that all variables were self-reported and may therefore be affected by various biases such as social desirability bias but also difficulties in introspective abilities, interpretations of questions, restrictions of rating scales, or measurement directiveness (see for instance Brenner & DeLamater, 2016; Chan, 2010; Dunford & Elliott, 1984; Gonyea, 2005). Note also that the mediating and moderating factors were measured at T<sub>2</sub> along with the outcome variable (cross-sectional measure), making it difficult to best measure and assess the temporal impact of these factors on desistance. Furthermore, our sample was composed of adolescents who grew up in institutions, therefore, representing a high-risk group of juveniles, limiting the generalization of the present results to the general population. Replication studies using observational and test data should be conducted to confirm our results.

## Conclusion

This study revealed a decrease in psychopathic traits between adolescence and adulthood in the case of transition from institution to independent living. Moreover, findings of the present study confirm the prospective and cross-sectional positive association between psychopathic traits and delinquent behaviors. Finally, although psychosocial maturation variables such as problems in identity and self-direction and turning points such as military service were associated with desistance from delinquent behaviors, they did not mediate longitudinal or moderate cross-sectional the association between psychopathic traits and delinquent behaviors. Indeed, it is suggested that the specific ways in which individuals with psychopathic traits interact with their environment can lead to a persistent association between psychopathy and delinquent behaviors, even in the face of typical desistance variables.

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## References

- Abeling-Judge, D. (2021). Social opportunities and controls: Revisiting the desistance effect of employment. *Deviant Behavior*, 42(9), 1177–1193. <https://doi.org/10.1080/01639625.2020.1734169>
- Achenbach, T. M., & Edelbrock, C. (1987). Manual for the youth self-report and profile. University of Vermont Department of Psychiatry.
- Akers, R. L., & Jennings, W. G. (2015). Social learning theory. *Handbook of Criminological Theory*, 230–240.
- Andershed, H., Kerr, M., Stattin, H., & Levander, S. (2002). Psychopathic traits in non-referred youths: A new assessment tool. In E. Blauuw & L. Sheridan (Eds.), *Psychopaths: Current international perspectives* (pp. 131–158). Elsevier.
- Asscher, J. J., van Vugt, E. S., Stams, G. J. J., Deković, M., Eichelsheim, V. I., & Yousfi, S. (2011). The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A meta-analysis. *Journal of Child Psychology and Psychiatry*, 52(11), 1134–1143. <https://doi.org/10.1111/j.1469-7610.2011.02412.x>
- Bares, K. J. (2021). Reconceptualizing Desistance: An Examination of the Effect of Latent Adult Behaviors and Latent Adult Cognitions on Desistance from Crime Over Time [Doctoral dissertation, Bowling Green State University]. OhioLINK Electronic Theses and Dissertations Center. [http://rave.ohiolink.edu/etdc/view?acc\\_num=bgsu1626013997380126](http://rave.ohiolink.edu/etdc/view?acc_num=bgsu1626013997380126)
- Baroncelli, A., Facci, C., Sica, L. S., Fusco, L., DiPalma, T., & Ciucci, E. (2023). Attachment to others and callous-unemotional traits in a sample of high school students. *Current Psychology*, 43(1), 1–13. <https://doi.org/10.1007/s12144-023-04237-5>
- Bekbolatkyzy, D. S., Yerenatovna, D. R., Maratuly, Y. A., Makhatovna, A. G., & Beaver, K. M. (2019). Aging out of adolescent delinquency: Results from a longitudinal sample of youth and young adults. *Journal of Criminal Justice*, 60, 108–116. <https://doi.org/10.1016/j.jcrimjus.2018.09.001>
- Bergström, H., & Farrington, D. P. (2021). Stability of psychopathy in a prospective longitudinal study: Results from the Cambridge study in delinquent development. *Behavioral Sciences & the Law*, 39(5), 611–623. <https://doi.org/10.1002/bsl.2543>
- Blair, R. J. (2003). Neurobiological basis of psychopathy. *British Journal of Psychiatry*, 182(1), 5–7. <https://doi.org/10.1192/bjp.182.1.5>

- Blair, R. J. (2022). Moral development: Value formation and its selective dysfunction in individuals with psychopathic/callous-unemotional traits. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 422–436). Routledge.
- Boers, K., & Reinecke, J. (2007). *Delinquenz im Jugendalter* (Vol. 3). Waxmann Verlag.
- Brandt, J. R., Kennedy, W. A., Patrick, C. J., & Curtin, J. J. (1997). Assessment of psychopathy in a population of incarcerated adolescent offenders. *Psychological Assessment*, 9(4), 429. <https://doi.org/10.1037/1040-3590.9.4.429>
- Brenner, P. S., & DeLamater, J. (2016). Lies, damned lies, and survey self-reports? Identity as a cause of measurement bias. *Social Psychology Quarterly*, 79(4), 333–354. <https://doi.org/10.1177/0190272516628298>
- Caspi, A. (1998). Personality development across the life course. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (5th ed., pp. 311–388). John Wiley & Sons, Inc.
- Cauuffman, E., Skeem, J., Dmitrieva, J., & Cavanagh, C. (2016). Comparing the stability of psychopathy scores in adolescents versus adults: How often is “fledgling psychopathy” misdiagnosed? *Psychology, Public Policy, & Law*, 22(1), 77. <https://doi.org/10.1037/law0000078>
- Cauuffman, E., & Steinberg, L. (2000). Im maturity of judgment in adolescence: Why adolescents may be less culpable than adults. *Behavioral Sciences & the Law*, 18(6), 741–760. <https://doi.org/10.1002/bsl.416>
- Chan, D. (2010). So why ask me? Are self-report data really that bad? In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends* (pp. 329–356). Routledge.
- Ciucci, E., Baroncelli, A., Franchi, M., Golmaryami, F. N., & Frick, P. J. (2014). The association between callous-unemotional traits and behavioral and academic adjustment in children: Further validation of the inventory of callous-unemotional traits. *Journal of Psychopathology & Behavioral Assessment*, 36(2), 189–200. <https://doi.org/10.1007/s10862-013-9384-z>
- Cooke, D. J., Michie, C., & Hart, S. D. (2006). Facets of clinical psychopathy: Towards clearer measurement. In C. J. Patrick (Ed.), *Handbook of psychopathy* (pp. 91–106). Guilford Press.
- Corrado, R. R., DeLisi, M., Hart, S. D., & McCuish, E. C. (2015). Can the causal mechanisms underlying chronic, serious, and violent offending trajectories be elucidated using the psychopathy construct? *Journal of Criminal Justice*, 43(4), 251–261. <https://doi.org/10.1016/j.jcrimjus.2015.04.006>
- Craig, J. M., & Foster, H. (2013). Desistance in the transition to adulthood: The roles of marriage, military, and gender. *Deviant Behavior*, 34(3), 208–223. <https://doi.org/10.1080/01639625.2012.726173>
- Craig, J. M., Guerra, C., & Piquero, A. R. (2020). Immigrant status, offending, and desistance: Do relationship characteristics matter? *Journal of Developmental and Life-Course Criminology*, 6(1), 67–94. <https://doi.org/10.1007/s40865-019-00133-4>
- Crank, B. R., & Brezina, T. (2019). Self-control, emerging adulthood, and desistance from crime: A partial test of Pratt’s integrated self-control/life-course theory of offending. *Journal of Developmental and Life-Course Criminology*, 5(1), 38–59. <https://doi.org/10.1007/s40865-018-0099-4>
- da Silva, D. R., Rijo, D., & Salekin, R. T. (2020). Psychopathic traits in children and youth: The state-of-the-art after 30 years of research. *Aggression & Violent Behavior*, 55, 101454. <https://doi.org/10.1016/j.avb.2020.101454>
- Debowska, A., Boduszek, D., Hyland, P., & Goodson, S. (2014). Biological correlates of psychopathy: A brief review. *Mental Health Review Journal*, 19(2), 110–123. <https://doi.org/10.1108/MHRJ-10-2013-0034>

- De Brito, S. A., Forth, A. E., Baskin-Sommers, A. R., Brazil, I. A., Kimonis, E. R., Pardini, D., Frick, P. J., Blair, R. J., & Viding, E. (2021). Psychopathy. *Nature Reviews Disease Primers*, 7(1), 49. <https://doi.org/10.1038/s41572-021-00282-1>
- Deming, P., & Koenigs, M. (2020). Functional neural correlates of psychopathy: A meta-analysis of MRI data. *Translational Psychiatry*, 10(1), 133. <https://doi.org/10.1038/s41398-020-0816-8>
- Dunford, F. W., & Elliott, D. S. (1984). Identifying career offenders using self-reported data. *The Journal of Research in Crime and Delinquency*, 21(1), 57–86. <https://doi.org/10.1177/0022427884021001004>
- Edens, J. F., Skeem, J. L., Cruise, K. R., & Cauffman, E. (2001). Assessment of “juvenile psychopathy” and its association with violence: A critical review. *Behavioral Sciences & the Law*, 19(1), 53–80. <https://doi.org/10.1002/bsl.425>
- Facci, C., Imbimbo, E., Stefanelli, F., Ciucci, E., Guazzini, A., Baroncelli, A., & Frick, P. J. (2023). The social correlates to callous-unemotional traits in a sample of high school students. *Behavior Therapy*, 54(3), 595–604. <https://doi.org/10.1016/j.beth.2023.01.001>
- Forney, M., & Ward, J. T. (2019). Identity, peer resistance, and antisocial influence: Modeling direct and indirect causes of desistance. *Journal of Developmental and Life-Course Criminology*, 5(1), 107–135. <https://doi.org/10.1007/s40865-018-0102-0>
- Fox, B. H., Jennings, W. G., & Farrington, D. P. (2015). Bringing psychopathy into developmental and life-course criminology theories and research. *Journal of Criminal Justice*, 43(4), 274–289. <https://doi.org/10.1016/j.jcrimjus.2015.06.003>
- Geerlings, Y., Asscher, J. J., Stams, G.-J.-J., & Assink, M. (2020). The association between psychopathy and delinquency in juveniles: A three-level meta-analysis. *Aggression & Violent Behavior*, 50, 101342. <https://doi.org/10.1016/j.avb.2019.101342>
- Giordano, P. C., Cernkovich, S. A., & Rudolph, J. L. (2002). Gender, crime, and desistance: Toward a theory of cognitive transformation. *The American Journal of Sociology*, 107(4), 990–1064. <https://doi.org/10.1086/343191>
- Golmaryami, F. N., Vaughan, E. P., & Frick, P. J. (2021). Callous-unemotional traits and romantic relationships. *Personality & Individual Differences*, 168, 110408. <https://doi.org/10.1016/j.paid.2020.110408>
- Gonyea, R. M. (2005). Self-reported data in institutional research: Review and recommendations. *New Directions for Institutional Research*, 2005(127), 73–89. <https://doi.org/10.1002/ir.156>
- Goth, K., & Schmeck, K. (2023). *LoPF-Q adult (levels of personality functioning questionnaire) German version: A self-report questionnaire for measuring personality functioning in adulthood - short manual*. Academic-tests. <https://academic-tests.com>
- Hare, R. D., & Neumann, C. S. (2009). Psychopathy and its measurement. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 660–686). Cambridge University Press. <https://doi.org/10.1017/CBO9780511596544.041>
- Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous-unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. *Clinical Child & Family Psychology Review*, 17(3), 248–267. <https://doi.org/10.1007/s10567-014-0167-1>
- Hemphälä, M., Kosson, D., Westerman, J., & Hodgins, S. (2015). Stability and predictors of psychopathic traits from mid-adolescence through early adulthood. *Scandinavian Journal of Psychology*, 56(6), 649–658. <https://doi.org/10.1111/sjop.12257>
- Hill, J. M., van der Geest, V. R., & Blokland, A. A. (2017). Leaving the bank of mum and dad: Financial independence and delinquency desistance in emerging adulthood. *Journal of Developmental and Life-Course Criminology*, 3(4), 419–439. <https://doi.org/10.1007/s40865-017-0058-5>

- Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. *The American Journal of Sociology*, 89(3), 552–584. <https://doi.org/10.1086/227905>
- Hwang, S., Waller, R., Hawes, D. J., & Allen, J. L. (2021). The influence of antisocial behavior and callous-unemotional traits on trajectories of school engagement and achievement in South-Korean children. *Journal of Youth & Adolescence*, 50(4), 788–802. <https://doi.org/10.1007/s10964-021-01414-2>
- Jäggi, L., Schmid, M., Bürgin, D., Saladin, N., Grob, A., & Boonmann, C. (2021). Shared residential placement for child welfare and juvenile justice youth: Current treatment needs and risk of adult criminal conviction. *Child and Adolescent Psychiatry and Mental Health*, 15(1), 1–13. <https://doi.org/10.1186/s13034-020-00355-1>
- Johanson, M., Vaurio, O., Tiihonen, J., & Lähteenvuo, M. (2020). A systematic literature review of neuroimaging of psychopathic traits. *Frontiers in Psychiatry*, 10, 1027. <https://doi.org/10.3389/fpsy.2019.01027>
- Johnson, W. L., & Giordano, P. C. (2021). The role of marriage and military service on reoffending: Race, “the respectability package,” and the desistance process. *Armed Forces & Society*, 47(1), 106–125. <https://doi.org/10.1177/0095327X20905124>
- Johnston, T. M., Brezina, T., & Crank, B. R. (2019). Agency, self-efficacy, and desistance from crime: An application of social cognitive theory. *Journal of Developmental and Life-Course Criminology*, 5(1), 60–85. <https://doi.org/10.1007/s40865-018-0101-1>
- Kahn, R. E., Byrd, A. L., & Pardini, D. A. (2013). Callous-unemotional traits robustly predict future criminal offending in young men. *Law and Human Behavior*, 37(2), 87. <https://doi.org/10.1037/b0000003>
- Kang, T. (2019). The transition to adulthood of contemporary delinquent adolescents. *Journal of Developmental and Life-Course Criminology*, 5(2), 176–202. <https://doi.org/10.1007/s40865-019-00115-6>
- Kreager, D. A., Matsueda, R. L., & Erosheva, E. A. (2010). Motherhood and criminal desistance in disadvantaged neighborhoods. *Criminology*, 48(1), 221–258. <https://doi.org/10.1111/j.1745-9125.2010.00184.x>
- Laub, J. H., Nagin, D. S., & Sampson, R. J. (2017). Trajectories of change in criminal offending: Good marriages and the desistance process. In S. Farrall (Ed.), *The termination of criminal careers* (pp. 433–446). Routledge.
- Lee, W., Moon, J., & Garcia, V. (2020). The pathways to desistance: A longitudinal study of juvenile delinquency. *Deviant Behavior*, 41(1), 87–102. <https://doi.org/10.1080/01639625.2018.1519138>
- Levine, R. S., Smith, K., & Wagner, N. J. (2023). The impact of callous-unemotional traits on achievement, behaviors, and relationships in school: A systematic review. *Child Psychiatry and Human Development*, 54(6), 1546–1566. <https://doi.org/10.1007/s10578-022-01344-5>
- Lynam, D. R., Caspi, A., Moffitt, T. E., Loeber, R., & Stouthamer-Loeber, M. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict adult psychopathy. *Journal of Abnormal Psychology*, 116(1), 155. <https://doi.org/10.1037/0021-843X.116.1.155>
- Lynam, D. R., Charnigo, R., Moffitt, T. E., Raine, A., Loeber, R., & Stouthamer-Loeber, M. (2009). The stability of psychopathy across adolescence. *Development & Psychopathology*, 21(4), 1133–1153. <https://doi.org/10.1017/S0954579409990083>
- Lynam, D. R., Miller, D. J., Vachon, D., Loeber, R., & Stouthamer-Loeber, M. (2009). Psychopathy in adolescence predicts official reports of offending in adulthood. *Youth Violence and Juvenile Justice*, 7(3), 189–207. <https://doi.org/10.1177/1541204009333797>
- McCuish, E. C. (2016). Bringing psychopathy into research on offending trajectories: Understanding the construct’s role as a barrier to desistance. [PhD thesis, Simon Fraser University].

- McCuish, E. C., & Gushue, K. (2022). Maturation as a promoter of change in features of psychopathy between adolescence and emerging adulthood. *Youth Violence and Juvenile Justice*, 20(1), 3–21. <https://doi.org/10.1177/15412040211030978>
- McCuish, E. C., & Lussier, P. (2018). A developmental perspective on the stability and change of psychopathic personality traits across the adolescence-adulthood transition. *Criminal Justice & Behavior*, 45(5), 666–692. <https://doi.org/10.1177/0093854818761992>
- McCuish, E. C., Lussier, P., & Rocque, M. (2020). Maturation beyond age: Interrelationships among psychosocial, adult role, and identity maturation and their implications for desistance from crime. *Journal of Youth & Adolescence*, 49(2), 479–493. <https://doi.org/10.1007/s10964-019-01178-w>
- McGloin, J. M., Sullivan, C. J., Piquero, A. R., Blokland, A., & Nieuwebeerta, P. (2011). Marriage and offending specialization: Expanding the impact of turning points and the process of desistance. *European Journal of Criminology*, 8(5), 361–376. <https://doi.org/10.1177/1477370811414103>
- Na, C., & Paternoster, R. (2019). Prosocial identities and youth violence. *The Journal of Research in Crime and Delinquency*, 56(1), 84–128. <https://doi.org/10.1177/0022427818796552>
- Neil, R., & Sampson, R. J. (2021). The birth lottery of history: Arrest over the life course of multiple cohorts coming of age, 1995–2018. *The American Journal of Sociology*, 126(5), 1127–1178. <https://doi.org/10.1086/714062>
- Norton, R. (1983). Measuring marital quality: A critical look at the dependent variable. *Journal of Marriage and the Family*, 45(1), 141–151. <https://doi.org/10.2307/351302>
- Nugent, B., & Schinkel, M. (2016). The pains of desistance. *Criminology & Criminal Justice*, 16(5), 568–584. <https://doi.org/10.1177/1748895816634812>
- Olver, M. E. (2018). Can psychopathy be treated? What the research tells us. In E. Jeglic & C. Calkins (Eds.), *New Frontiers in offender treatment: the translation of evidence-based practices to correctional settings* (pp. 287–306). Springer. [https://doi.org/10.1007/978-3-030-01030-0\\_15](https://doi.org/10.1007/978-3-030-01030-0_15).
- Paternoster, R., & Bushway, S. (2009). Desistance and the “feared self”: Toward an identity theory of criminal desistance. *Journal of Criminal Law & Criminology*, 99(4), 1103–1156.
- Patrick, C., Drislane, L., & Strickland, C. (2012). Conceptualizing psychopathy in triarchic terms: Implications for treatment. *International Journal of Forensic Mental Health*, 11(4), 253–266. <https://doi.org/10.1080/14999013.2012.746761>
- Polaschek, D. L., & Skeem, J. L. (2018). Treatment of adults and juveniles with psychopathy. In C. J. Patrick (Ed.), *Handbook of psychopathy* (2nd ed., pp. 710–731). The Guilford Press.
- Rocque, M. (2015). The lost concept: The (re) emerging link between maturation and desistance from crime. *Criminology & Criminal Justice*, 15(3), 340–360. <https://doi.org/10.1177/1748895814547710>
- Rocque, M., Beckley, A. L., & Piquero, A. R. (2019). Psychosocial maturation, race, and desistance from crime. *Journal of Youth & Adolescence*, 48(7), 1403–1417. <https://doi.org/10.1007/s10964-019-01029-8>
- Sampson, R. J., & Laub, J. H. (1995). *Crime in the making: Pathways and turning points through life*. Harvard University Press.
- Schmid, M., Kölch, M., Fegert, J. M., Schmeck, K., & MAZ-Team. (2013). Abschlussbericht modellversuch abklärung und zielerreichung in stationären massnahmen. *Bern, Bundesamt für Justiz*.
- Schmid, M., Kölch, M., Fegert, J., & Schmeck, K. (2013). Abschlussbericht für den Fachausschuss für die Modellversuche und das Bundesamt für Justiz. In *Zusammenfassung der wichtigsten Ergebnisse und Erkenntnisse des Modellversuchs*

- Abklärung und Zielerreichung in stationären Massnahmen (MAZ).* Universitäre Psychiatrische Kliniken Basel.
- Schwarzer, R., & Jerusalem, M. (1999). Skalen zur Erfassung von Lehrer- und Schülermerkmalen. In *Dokumentation der psychometrischen Verfahren im Rahmen der Wissenschaftlichen Begleitung des Modellversuchs Selbstwirksame Schulen*. Berlin: Freie Universität.
- Seara-Cardoso, A., Vasconcelos, M., Sampaio, A., & Neumann, C. S. (2022). Neural correlates of psychopathy: A comprehensive review. *Psychopathy and Criminal Behavior*, 43–73. <https://doi.org/10.1016/B978-0-12-811419-3.00019-4>
- Skardhamar, T., & Savolainen, J. (2014). Changes in criminal offending around the time of job entry: A study of employment and desistance. *Criminology*, 52(2), 263–291. <https://doi.org/10.1111/1745-9125.12037>
- Skeem, J. L., & Cooke, D. J. (2010). Is criminal behavior a central component of psychopathy? Conceptual directions for resolving the debate. *Psychological Assessment*, 22(2), 433. <https://doi.org/10.1037/a0008512>
- Steffensmeier, D., Slepicka, J., & Schwartz, J. (2025). International and historical variation in the age-crime curve. *Annual Review of Criminology*, 8(1), 239–268. <https://doi.org/10.1146/annurev-criminol-111523-122451>
- Steffensmeier, D., Slepicka, J., Schwartz, J., & Lu, Y. (2024). Has postponed entry into adult roles modified US age-crime curves? Age-arrest patterns of teens, emerging adults and adult age groups, 1980–2019. *Justice Quarterly*, 42(4), 1–34. <https://doi.org/10.1080/07418825.2024.2410260>
- Steinberg, L. (2007). Risk taking in adolescence: New perspectives from brain and behavioral science. *The Current Directions in Psychological Science*, 16(2), 55–59. <https://doi.org/10.1111/j.1467-8721.2007.00475.x>
- Steinberg, L., & Cauffman, E. (1996). Maturity of judgment in adolescence: Psychosocial factors in adolescent decision making. *Law and Human Behavior*, 20(3), 249–272. <https://doi.org/10.1007/BF01499023>
- Steinberg, L., Icenogle, G., Shulman, E. P., Breiner, K., Chein, J., Bacchini, D., Chang, L., Chaudhary, N., Giunta, L. D., Dodge, K. A., Fanti, K. A., Lansford, J. E., Malone, P. S., Oburu, P., Pastorelli, C., Skinner, A. T., Sorbring, E., Tapanya, S., Tirado, L. M. U. . . . Al-Hassan, S. M. (2018). Around the world, adolescence is a time of heightened sensation seeking and immature self-regulation. *Developmental Science*, 21(2), e12532. <https://doi.org/10.1111/desc.12532>
- Steinert, S. W., Lishner, D. A., Vitacco, M. J., & Hong, P. Y. (2017). Conceptualizing successful psychopathy: An elaboration of the moderated-expression model. *Aggression & Violent Behavior*, 36, 44–51. <https://doi.org/10.1016/j.avb.2017.07.005>
- Tuttle, J. (2024). The end of the age-crime curve? A historical comparison of male arrest rates in the United States, 1985–2019. *The British Journal of Criminology*, 64(3), 638–655. <https://doi.org/10.1093/bjc/azad049>
- Uggen, C., & Staff, J. (2001). Work as a turning point for criminal offenders. *Corrections Management Quarterly*, 5(4), 1–16.
- Vaughan, E. P., Frick, P. J., Robertson, E. L., Ray, J. V., Thornton, L. C., Wall Myers, T. D., Steinberg, L., & Cauffman, E. (2023). Interpersonal relationships and callous-unemotional traits during adolescence and young adulthood: An investigation of bidirectional effects in parent, peer, and romantic relationships. *Clinical Psychological Science*, 11(3), 391–408. <https://doi.org/10.1177/21677026221101070>
- Walters, G. D. (2019). Maturing out of delinquency: Unpacking the effects of identity achievement and future orientation on crime desistance. *Self and Identity*, 18(3), 267–283. <https://doi.org/10.1080/15298868.2018.1439848>

- Weaver, B. (2019). Understanding desistance: A critical review of theories of desistance. *Psychology Crime & Law*, 25(6), 641–658. <https://doi.org/10.1080/1068316X.2018.1560444>
- Willoughby, T., Heffer, T., Good, M., & Magnacca, C. (2021). Is adolescence a time of heightened risk taking? An overview of types of risk-taking behaviors across age groups. *Developmental Review*, 61, 100980. <https://doi.org/10.1016/j.dr.2021.100980>
- Zedaker, S. B. (2017). Romantic relationships and time-varying moderators of desistance: A focus on adolescence, emerging adulthood, and adulthood. [Phd Thesis, Sam Houston State University].
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30–41. [https://doi.org/10.1207/s15327752jpa5201\\_2](https://doi.org/10.1207/s15327752jpa5201_2)