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CHAPTER 4

THE RELATIONSHIP BETWEEN ADVERSE CHILDHOOD EXPERIENCES AND SELF-SUFFICIENCY PROBLEMS IN EARLY ADULTHOOD AMONG VIOLENT OFFENDERS

**Menno Segeren
Thijs Fassaert
Christel Grimbergen
Arne Popma
Matty de Wit**

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ABSTRACT

Although adverse childhood experiences (ACE) are related to many single negative outcomes, its relation with multiproblem situations in early adulthood is largely unknown. The study in this chapter examined ACE's relation with self-sufficiency problems (SSP) in important life domains among a sample of young adult violent offenders. Participants were drafted from a local diversion program for violent repeat offenders. Young adults who agreed to a social-psychiatric screening and who had a history of juvenile probation were eligible to participate. The screening included the assessment of SSP (N = 523). ACE prevalences were retrieved from historic juvenile probation files (N = 122). The ACE-SSP relation was assessed with multivariable regression analyses with ACE and SSP as cumulative measures. Offenders presented with 6.1 SSPs from 10 life-domains on average and had been exposed to 3.1 ACEs. Exposure to 4+ ACEs was observed for 42% of the sample. ACE was positively associated with SSP ($\beta = .38, p < .01$) and with impaired functioning in the distinct domains finances (OR = 1.53, $p < .05$), addiction (OR = 1.33, $p < .05$), community participation (OR = 1.28, $p < .05$) and housing (OR = 1.22, $p < .05$). Both ACEs and SSP are common among violent offenders. Higher diversity in ACE was associated with higher diversity in SSPs. Juvenile probation for high-risk juveniles should focus on preventing functioning problems in multiple life domains. Diversion efforts for young adult offenders require sensitivity to personal histories and vigilance about multi-problem situations.

INTRODUCTION

A considerable proportion of children are exposed to adversities such as abuse, neglect and household violence (Hillis, Mercy, Amobi, & Kress, 2016). Different types of such adverse childhood experiences (ACEs) (Felitti et al., 1998) are commonly highly correlated (Anda, Butchart, Felitti, & Brown, 2010; Baglivio et al., 2014; Fox, Perez, Cass, Baglivio, & Epps, 2015). This implies that children exposed to any ACE are likely to have been exposed to multiple ACEs. Research into long-term outcomes of ACE revealed graded dose-response relationships that indicate that as exposure to ACE increases, so does the likelihood and magnitude of a variety of negative outcomes in adulthood (Anda et al., 2006; Hughes et al., 2017). Given ACE's associations with many distinct negative outcomes, it has been suggested that ACE have a nonspecific damaging effect on a range of functions, behaviors and outcomes (Anda et al., 2006). A focus on ACE in public mental health care (PMHC) research may provide important insights because target populations of PMHC (e.g., homeless, chronic drug abusers) typically present with multi-problem situations (Fassaert et al., 2014; Quirouette, 2016), such as having an unstable housing situation, being unemployed and substance dependent at the same time.

However, the majority of studies on adult outcomes of ACE focus on single outcomes. Specific outcomes that have been associated with ACE are psychiatric disorders (Cecil, Viding, Fearon, Glaser, & McCrory, 2017; Chapman, Dube, & Anda, 2007) and substance use disorders (SUD) (Chapman et al., 2004). ACE have also been related to somatic illnesses (Suglia et al., 2017), unhealthy lifestyles and risk behaviors (Bellis et al., 2015; Hughes et al., 2017), externalizing behavioral problems (Duke, Pettingell, McMorris, & Borowsky, 2010; Fuller-Thomson & Lewis, 2015), homelessness (Herman, Susser, Struening, & Link, 1997) and socioeconomic disadvantages (Metzler, Merrick, Klevens, Ports, & Ford, 2017; Nurius, Green, Logan-Greene, & Borja, 2015). However, ACE's relation with multi-problem situations is largely understudied. Considering that PMHC populations tend to present with multi-problems, more insight in the relation between ACE and multi-problem situations in adulthood is important as it may lead to a better prioritization of problems and provide useful insights regarding harm reduction and public safety.

The current study focuses on ACE's relation with impaired functioning in multiple important life domains as a multifaceted outcome in early adulthood. The concept of self-sufficiency provides a means to assess one's functioning in multiple important life domains simultaneously. Self-sufficiency can be defined as the ability to realize an acceptable level of functioning in the important domains of daily life (e.g., housing,

finances, mental health, substance use) independently or, if necessary, by organizing appropriate care or support (Fassaert et al., 2014). Existing self-sufficiency matrices commonly operationalize self-sufficiency as an outcome that indicates the extent to which an individual has attained acceptable levels of functioning in such life domains.

Based on three considerations, this study investigates the relation between ACE and self-sufficiency specifically among a target population of young adult violent offenders. First, ACE prevalence is typically higher in offender groups than in the general population (Reavis, Looman, Franco, & Rojas, 2013). Elevated ACE prevalence has, for example, been documented for juvenile offenders (Baglivio et al., 2014; Dierkhising et al., 2013), violent offenders (Duke et al., 2010; Fox et al., 2015), sex offenders (Levenson, Willis, & Prescott, 2016) and adult probationers (Kim, Park, & Kim, 2016).

Second, focusing on mental health problems and social problems (i.e. public health perspective) has not (yet) found strong footing in diversion programs for violent offenders (van Dijk et al., 2019). In part this can be explained by the fact that diversion programs are commonly directed by the judicial domain. Exposing a relation between ACE and multifaceted outcomes, such as self-sufficiency problems in adulthood, would emphasize the need to include health care elements (i.e. psychopathology and social problems) and interventions that aim to counter the adverse outcomes of ACE in diversion efforts for violent offenders. This is exemplified in a fairly recent systematic review that concluded that focused deterrence programs exert moderate positive effects on crime reduction (Braga, Weisburd, & Turchan, 2018). Importantly, such programs resemble PMHC based interventions by including the provision of social services and opportunities such as employment, housing, mental health care and substance abuse treatment.

Third, studying adult outcomes of ACE also involves the transition from youth to early adulthood. Early adulthood, or emerging adulthood (Arnett, 2000), is an important life-stage in the relation between ACE and adult outcomes. It is increasingly characterized as a transition phase between adolescence and full-fledged adulthood (Arnett, Žukauskienė, & Sugimura, 2014; Sawyer, Azzopardi, Wickremarathne, & Patton, 2018) that is marked by psychological (Blokland, Palmen, & van San, 2012; Lamet, James, Dirkzwager, & Van der Laan, 2010) societal (Blokland et al., 2012; van der Laan, van der Laan, Hoeve, Blom, & Lamet, 2012) and neurobiological changes (Giedd, 2004) in functioning.

In emerging adulthood (age 18-27 years), young adults become increasingly autonomous in decision-making and may adopt a life-style of experimenting and exploring different social identities and responsibilities before settling into adult roles. Especially for vulnerable at-risk individuals with psychosocial, behavioral or psychiatric problems at play (Osgood, Foster, & Courtney, 2010), emerging adulthood marks a phase with an elevated risk of personal derailment and social disengagement that may result in the development of self-sufficiency problems (SSP) in important life domains. In turn, these problems are likely to foster not so much the emergence but the persistence or escalation of specific problems at hand (e.g., Basto-Pereira, Miranda, Ribeiro, & Maia, 2016; Osgood, Foster, Flanagan, & Ruth, 2005; Zajac, Sheidow, & Davis, 2015). Importantly, emerging adulthood has also been associated with escalation of criminal behavior, in terms of frequency and seriousness of offending (Dünkel & Pruin, 2012; Marcus, 2009; Piquero, Brame, Mazerolle, & Haapanen, 2002). The transition to early adulthood is, however, not only a period of increased risk, but also an opportunity for course correction in emerging adults' developmental trajectory.

As such, this study investigates the relation between ACE and SSP in multiple important life domains among a specific sample of young adult (18-27) violent offenders. Because different ACEs tend to co-occur, the cumulative effect of ACE (i.e. diversity) on SSP in early adulthood is given prominence in the study. The research questions of this study are: What are the prevalence of ACE and SSP in early adulthood among violent offenders? How are ACE and SSP related? Considering the nonspecific damaging effect of ACE, this study tested the hypothesis that higher ACE is associated with more self-sufficiency problems in early adulthood.

METHOD

SETTING AND STUDY SAMPLE

Self-sufficiency and mental health indicators in early adulthood were derived from social-psychiatric screenings that were performed in the context of a diversion program for violent repeat offenders in Amsterdam, the Netherlands. This program was launched by the municipality in 2011 to reduce the number of so called high impact crimes (HIC; violent crimes with a large impact on its victims). The program is a person centered approach that aims to reduce recidivism by promoting structural behavior change. In order to do so, individual offenders are matched with a case manager who gathers information, draws up action plans, sets up contacts with individual care providers and social services, and coordinates and supervises care processes. The program emphasizes features from law enforcement (e.g., tit-for-tat, a "fast lane" through

court procedures, closely monitoring someone's whereabouts) in combination with the provision of appropriate mental health care and social services, if needed. Concerning the latter, all offenders in the program are invited to a voluntary social-psychiatric screening. This screening, a key feature of the program, is intended to uncover medical and social problems to substantiate tailored diversion efforts (Nijmeijer & van Dijk, 2014). The screening was designed for the diversion program by a team of psychiatrists. It is a clinical diagnostic interview according to DSM-IV criteria, supplemented with the assessment of self-sufficiency problems and a standard screening instrument for intelligence and learning disabilities (SCIL; Nijman, Kaal, Van Scheppingen, & Moonen, 2018).

The study sample was drawn from this diversion program. It consisted of male young adult violent repeat offenders, operationalized as being between 18-27 years old at the time of their screening, and who had a history of juvenile probation. The diversion program's judicial inclusion criteria were maintained. One needed to have been an arrested suspect for a HIC at least three times in the preceding five years, attempts included, of which at least one was committed or attempted in the last two years. HIC-categories were violent theft/ (home) burglary, manslaughter/homicide, public assault against a person, aggravated assault, street robbery and (armed) invasion/robbery. Also, one needed to have been arraigned to the examining magistrate in the same period.

PROCEDURE AND INSTRUMENTS

All offenders in the program were asked to participate in a voluntary screening. Participants received no monetary reward. Their incentive to cooperate was that the screening might offer opportunities for care and support for medical and/or social problems (e.g., debt assistance, housing, employment) because outcomes of the screening were used by their case manager to formulate their action plans. Certified psycho-diagnosticians (psychiatrists, psychiatric nurses and forensic pedagogues) from an interdisciplinary team of the local public health service performed the screenings. If consent was provided, available reports of recent evaluations of other (forensic) mental health institutions were also consulted. Outcomes of the screening were reported to a supervising psychiatrist who formulated a working diagnosis, including differential diagnoses, according to the DSM-IV classification of psychiatric disorders (American Psychiatric Association, 2000).

The screening also included the Dutch self-sufficiency matrix (SSM-D) (Fassaert et al., 2014). The SSM-D, introduced primarily as an observational screening tool in 2010,

enables a reliable assessment of self-sufficiency levels in important life domains. The SSM-D is an edited version of other self-sufficiency matrices (SSM). Together, the Utah-SSM and Arizona-SSM (Culhane, Gross, Parker, Poppe, & Sykes, 2008) consist of 19 unique life-domains. A Dutch expert group brought back these 19 domains to a selection of 11. The 11-domains instrument was later validated in the Dutch context (Fassaert et al., 2014). In the SSM-D, self-sufficiency is defined as the extent to which a person by himself is able to attain an acceptable level of functioning in these 11 life-domains (e.g., finances, housing, mental health and social network), or by adequately organizing the help of formal/informal care providers. Domain-specific indicators define levels of self-sufficiency that are ordered on a 5-point scale with 1 = acute problems, 2 = not self-sufficient, 3 = barely self-sufficient (i.e. currently steady functioning but only marginally sufficient), 4 = adequately self-sufficient and 5 = completely self-sufficient. As such, the SSM-D forms a matrix of 11 x 5 cells (see also <http://www.selfsufficiencymatrix.org/zrm-int.aspx>). The SSM-D has adequate psychometric properties (i.e. internal consistency, convergent validity and inter-rater agreement) (Fassaert et al., 2014).

As said, young adult offenders in the study sample had a juvenile probation history. Juvenile probation files in general contain comprehensive historic information about the presence of criminogenic factors, including ACEs, during and preceding their juvenile probation period. These files commonly store psychiatric or psychological reports, inquiries of the council for child protection, police reports and court documents. As such, a file study was performed to determine the presence/severity of a comprehensive set of youth criminogenic risk factors using the Juvenile Forensic Profile (FPJ) (Brand & Van Heerde, 2010). The FPJ consists of 70 risk factors arranged in 7 domains including history of criminal behavior, upbringing & environment, psychological functions, psychopathology and social & relational. The FPJ has good psychometric properties (inter-rater reliability, Kappa, convergent and predictive validity) (Brand, 2005a, 2005b; Van Heerde, Brand, Van 't Hoff, & Mulder, 2004; Van Heerde & Mulder, 2005). The current study utilized only those FPJ-items that concerned ACEs (table 1). These were mostly ordinal items with 0 = no risk, 1 = moderate risk and 2 = severe risk and some were yes/no items (see also (Hillege, Brand, Mulder, Vermeiren, & Van Domburgh, 2017)).

Data collection for the FPJ started in 2011 by four educated and trained raters who scored juvenile probation files independently. Files from all young adult offenders who had entered the diversion program in the years 2011-2012 were drawn randomly from the archive of the local juvenile probation agency. One in every ten files was scored by multiple raters to determine inter-rater reliability (IRR). Based on 26 multiple scored

files, IRR was satisfactory with $R = .71$ ($p < .001$), $ICC = .74$ (95% CI [.71 - .78], $p < .001$) and $Kappa = .58$ ($p < .001$). The raw correlation (R) and intra-class correlation coefficients (ICC) were very strong (Cicchetti, 1994). $Kappa$ was substantial according to the Landis and Koch classification (Landis & Koch, 1977). In a one year data collection period as many files as possible were scored. Scoring of a typical file took four hours on average. In total, 206 unique files were scored. Of these, 122 concerned the files of offenders who had participated in the social-psychiatric screening. As such, FPJ data were not available for the entire research population.

DEPENDENT VARIABLES

SSP in early adulthood was a continuous variable obtained by summing dichotomized SSM-D scores in 10 of 11 domains. The domain *Justice* was omitted as it lacked substantive value in an offender population. Dichotomization of scores isolated problematic functioning (SSM-D scores 1-3) from acceptable functioning (SSM-D scores 4, 5) in the domains *Finances, Daytime activities, Housing, Domestic relations, Mental health, Physical health, Addiction, Daily life skills, Social network* and *Community participation*. For subjects with an incomplete SSM-D but with at least 7 valid scores, SSP was computed by multiplying their averaged SSM-D score by 10. SSP could range from 0 to 10. Higher SSP scores indicated more diverse self-sufficiency problems in early adulthood.

INDEPENDENT VARIABLES

ACE was a continuous variable that represented the number of ACEs (Felitti et al., 1998; Finkelhor, Shattuck, Turner, & Hamby, 2013) that had occurred in childhood. This cumulative measure represents the diversity, but not severity or chronicity, of ACE as retrieved from juvenile probation files. Table 1 displays the protocol used to score the presence (1) or absence (0) of 9 different ACEs based on 9 FPJ items and 2 additional items. The ACEs were: *abuse, physical neglect, emotional neglect, sexual abuse, incarceration of a family member, household substance abuse, household mental health problems, household partner violence* and *loss of a parent*. In contrast to the ACE construct commonly used (Finkelhor et al., 2013), the FPJ lacks the distinction between physical and emotional abuse but it distinguishes between abuse by parents or by others. As such, one composite abuse variable was scored 1 in case of a moderate/severe score on either the item abuse by parents or the item abuse by others. Also, only severe scores on the FPJ items criminal family members and unavailability of parents indicated the occurrence of the ACEs incarceration of a family member and emotional neglect, respectively. Two additional yes/no items assessed loss of a parent. These were having experienced the death of a parent and parental divorce. The latter item

was scored yes only when the child was at least 4 years old at the time of the divorce and the divorce resulted in loss of contact with one of the parents for a prolonged period of time. Missing scores on all items were recoded to 0 (no) before computing a cumulative ACE score that ranged from 0 (no ACE exposure) to 9 (exposed to all ACE categories included in the study) (table 1).

Table 1. Scoring protocol for the presence of 9 ACE's based on scores on FPJ-items and additional items

ACE	FPJ items / additional items	Score
Abuse	Abuse by parents (FPJ) Abuse by others (FPJ)	Moderate/severe
Physical neglect	Neglect (FPJ)	Moderate/severe
Emotional neglect	Unavailability of parents (FPJ)	Severe
Sexual abuse	Sexual abuse by parents (FPJ) Sexual abuse by others (FPJ)	Moderate/severe
Incarceration family member	Criminal family members (FPJ)	Severe
Household substance abuse	Parental substance abuse (FPJ)	Moderate/severe
Household mental health problems	Parental mental health problems (FPJ)	Moderate/severe
Household partner violence	Domestic violence (FPJ)	Moderate/severe
Loss of a parent	Death of a parent	Yes
	Parental divorce (witnessed at age 4 or older)	Yes

Note. ACE adverse childhood experience, FPJ Juvenile Forensic Profile, the two additional yes/no items to the FPJ were Death of a parent and Parental divorce

STATISTICAL ANALYSES

Analyses were performed with the SPSS-21 statistical package (Corporation, 2012). Descriptive analyses provided the sociodemographics of the sample, prevalences of psychiatric disorders and ACEs, distributions of SSM-D scores and the primary study measures ACE and SSP. Relationships between all distinct ACEs were investigated using Pearson product-moment correlation coefficients. The ACE-SSP relationship was assessed using univariable and multivariable regression analysis including age, ethnicity and education status as potential predictors. ACE's relations with distinct SSM-D domains were investigated with logistic regression analyses.

RESULTS

As of December 2018, from 1381 offenders who had entered the diversion program in, 865 (62.6%) agreed to a voluntary screening. Within this group, young adults (18-27) were sampled. The sample consisted of 523 young adult male violent offenders with a median age of 21.9 years (*IQR* = 19.7 – 23.6) at the time of the screening. A minority of 14.7% were ethnic Dutch, 85.3% had a non ethnic Dutch (migrant) background with the Moroccan (42.6%) and Surinamese (20.2%) being most prevalent. Overall, 42.2% of the sample had completed no education or primary school, 42.0% had completed secondary education (i.e. UK: O-levels; US: high school), 14.1% tertiary education (intermediate vocational education) and 1.8% higher education (higher vocational education / university). With respect to psychopathology, the prevalence of any disorder was 96.1%, of any Axis I disorder (70.7%) and any Axis II disorder (71.9%). The most prevalent psychiatric disorders were personality disorders (64.8%), intellectual disability (55.5%), substance dependency (35.4%), substance abuse (27.0%) and mood/anxiety disorder (23.8%) (table 2).

Table 2. Sociodemographic characteristics and prevalence estimates of psychiatric disorders (%)

Age (median, IQR)	21.9 (19.7 – 23.6)
Ethnic background	
Native Dutch	14.7
Non native Dutch	85.3
Moroccan	42.6
Suriname	22.0
Antillean / Aruban	4.8
Turkish	4.8
Non Western, other	9.7
Western, other	1.6
Highest level of education (%)	
Primary/none	42.2
Secondary	42.0
Tertiary	14.1
Higher	1.8
Psychiatric disorders (DSM-IV-TR) (%)	
Any disorder	96.1
Any Axis I disorder	70.7
Substance dependency	35.4

Table 2. *Continued.*

Substance abuse	27.0
Mood/anxiety disorder	23.8
Impulse control disorder (incl. ADHD)	18.6
Psychotic disorder	6.4
Other Axis I disorders	18.2
Any Axis II disorder	71.9
Personality disorder	64.8
Intellectual disability	55.5

Note. IQR interquartile range, *DSM-IV-TR* Diagnostic and statistical manual of psychiatric disorders, *ADHD* attention deficit hyperactivity disorder

Table 3. *Distribution of self-sufficiency scores on separate SSM-D domains and mean self-sufficiency problems(%)*

SSM-D domains	Acute problems	Not self-sufficient	Barely self-sufficient	Adequately self-sufficient	Completely self-sufficient	missing
Finances	28.6	26.1	28.4	11.5	5.4	8.4
Housing	16.8	8.4	41.6	27.5	5.7	9.0
Daytime activities	17.0	44.9	16.8	16.1	5.2	8.8
Community participation	11.7	24.3	35.2	20.7	8.1	10.3
Domestic relations	0.8	20.5	45.6	23.2	9.9	9.4
Social network	4.2	22.1	55.0	17.8	0.8	9.9
Addiction	1.7	12.2	23.8	21.3	41.1	9.2
Physical health	0.2	2.7	8.6	14.0	74.5	8.4
Mental health	1.5	21.1	25.7	34.0	17.7	10.1
Daily life skills	-	1.3	36.1	30.8	31.9	9.4
	n	range	mean (sd)			
SSP	477	0-10	6.11 (2.22)			

Note. SSM-D Self-Sufficiency Matrix, Dutch version, SSP self-sufficiency problems computed as a sum score of self-sufficiency problems on 10 SSM-D domains after recoding scores 1-3 (i.e. acute problems, not self-sufficient, barely self-sufficient) to 1 and scores 4-5 (adequately self-sufficient or completely self-sufficient) to 0

SELF-SUFFICIENCY PROBLEMS

Table 3 present the SSM-D scores obtained in the sample. The SSM-D was complete for 435 offenders (83.2%) and 42 (8.0%) offenders had a score in 7-9 SSM-D domains. Because 46 offenders (8.8%) had missing scores in four or more SSM-D domains, SSP was calculated for 477 offenders. Acute problems or being not self-sufficient were most prevalent in the SSM-D domains Finances and Daytime activities. In the domains Social network, Domestic relations, Housing and Community participation, a substantial proportion of the study population was barely self-sufficient. In the domains Physical health, Daily life skills and Addiction, self-sufficiency was highest. Dichotomization and subsequent summation of SSM-D domains yielded a mean SSP of 6.11 ($SD = 2.22$) (table 3).

REPRESENTATIVENESS FPJ-GROUP

FPJ data were collected from 122 offenders who were also screened, 23.3% of the study population. Their FPJ and screening data were matched. No differences between those with and without FPJ data were observed concerning age (at the time of the screening), ethnicity and psychiatric disorders. However, 52.7% of offenders in the FPJ-group had only completed primary school vs. 39.2% in the non-FPJ-group ($\chi^2 = 9.08, p < .05$). No differences between both groups were observed concerning SSP and the SSM-D domains.

ACES

The most prevalent ACEs were loss of a parent (80.0%), abuse (49.5%), incarceration of a family member (50.9%), household partner violence (43.2%), physical neglect (36.2%) and emotional neglect (22.3%). Sexual abuse (4.2%) was the least prevalent. Loss of a parent had many missing observations (59.0%). Offenders had been exposed to 3.1 different ACE types ($SD = 2.36$) in childhood on average and 42.1% had been exposed to 4+ ACEs (table 4). Positive, medium, correlations were found between 16 out of 36 pairs of ACE categories (Cohen, 1988). Correlations were strongest between emotional neglect and loss of a parent ($r = .54$), physical neglect and loss of a parent ($r = .48$), abuse and household partner violence ($r = .43$) and physical neglect and emotional neglect ($r = .41$).

Table 4. Prevalence estimates of distinct childhood adverse experiences and mean ACE score (N = 122)

ACEs	%	% missing
Abuse	49.5	10.7
Physical neglect	36.2	4.9
Emotional neglect	22.3	-
Sexual abuse	4.2	3.3
Incarceration family member	50.9	8.2
Household substance abuse	23.9	7.4
Household mental illness	22.9	13.9
Loss of a parent	80.0	59.0
Household partner violence	43.2	22.1
Number of ACEs	%	
0	16.7	
1	17.5	
2	10.5	
3	13.2	
4+	42.1	
ACE mean (sd)	3.1 (2.36)	

Note. ACE adverse childhood experiences

ACE AS DETERMINANT OF SSP

Univariable regression analyses revealed positive relations between ACE and SSP ($\beta = .33, p < .01$), age and SSP ($\beta = .22, p < .001$) and a negative relation between education status and SSP ($\beta = -.89, p < .001$). In a multivariable regression analysis, the effects of ACE ($\beta = .27, p < .01$) and age ($\beta = .23, p < .01$) were retained but the effect of education status failed to reach statistical significance. Also, no significant interaction effect of ACE and age on SSP was observed. The multivariable model was significant ($F = 7.69, p < .001$) and the adjusted R^2 was .20. ACE's impact in all separate SSM-D domains was evaluated with univariable logistic regression analyses, in order to acquire a better insight into which domains of the SSP construct were most strongly associated with ACE. These analyses revealed that, in descending order of strength, ACE was positively associated with impaired functioning in the SSM-D domains Finances (OR = 1.53, $p < .01$), Addiction (OR = 1.33, $p < .01$), Community participation (OR = 1.28, $p < .01$) and Housing (OR = 1.22, $p < .05$) (table 5).

Table 5. Results of univariable and multivariable regression analyses with SSP as outcome variable and results of logistic regression analyses with ACE as predictor of distinct SSPs

	Univariable			Multivariable		
	β	CI95%	<i>p</i>	β	CI95%	<i>p</i>
ACE	.33	.11 – .52	.003	.27	.08 – .46	.007
Age	.22	.15 – .30	.000	.23	.06 – .40	.009
Ethnicity	.29	-.31 – .88	.342			
Education status	-.89	-1.15 – -.62	.000	-.66	-1.26 – -.03	.054

ACE	OR	1.53*	1.22*	1.22*	1.22	1.22	1.28*	1.15	1.07	1.07	1.33*	1.11	1.28	1.07
	CI 95%	1.12 – 2.07	1.01 – 1.49	1.01 – 1.49	.95 – 1.57	1.01 – 1.63	1.01 – 1.63	.94 – 1.41	.79 – 1.44	1.05 – 1.63	.92 – 1.34	.95 – 1.74	.89 – 1.30	

Note. ACE adverse childhood experiences (sumscore), age age at the time of social-psychiatric screening, ethnicity ethnic Dutch vs. non ethnic Dutch, education status ordinal variable with primary none, secondary, tertiary and higher education

DISCUSSION

This study investigated the relationship between ACE and SSP in important life domains among a group of young adult violent repeat offenders. The focus on SSP, as a broad outcome, was based on the presumption that ACE is related to nonspecific but harmful long-term negative outcomes (Anda et al., 2006). SSPs were recorded in more than 6 from 10 important life domains on average, confirming multi-problem situations among young adult violent offenders. As expected, high prevalence of ACE was observed. The main finding of the study was a positive ACE-SSP relation indicating that more diverse exposure to ACEs was associated with more coinciding SSPs in early adulthood. Additionally, ACE was most strongly related to impaired functioning in the domains finances, addiction, community participation and housing.

The high ACE prevalence observed indicates that this study population had already in childhood been a seriously problematic group. Half of the sample had been exposed to three or more ACEs. ACE exposure was severely elevated in comparison to that commonly found in the general population (Kessler et al., 2010). Consistent with the criminological literature, the most prevalent ACEs were loss of a parent, incarceration of a family member, abuse, neglect and household partner violence (DeLisi et al., 2017; Wolff, Baglivio, & Piquero, 2017). Exposure to 4+ ACEs, which designates a particularly high risk segment within juvenile offender populations for a variety of negative adult outcomes (Bellis et al., 2015), was observed for approximately 40% of the sample. This estimate even exceeds the ACE prevalence observed among a sample of serious, violent and chronic offenders (Fox et al., 2015).

This high ACE prevalence, observed in a particularly severe offender population in terms of both criminal behavior and psychopathology, suggests that more trauma focus in correction programs is warranted (e.g., Black, Woodworth, Tremblay, & Carpenter, 2012; Curran, Adamson, Rosato, De Cock, & Leavey, 2018; Griffin, Germain, & Wilkerson, 2012; Levenson & Willis, 2019). For offenders, this would at least require higher sensitivity to ACE and trauma upon entry in the justice system which can be achieved by adopting a trauma-informed approach (Branson, Baetz, Horwitz, & Hoagwood, 2017; Ezell, Richardson, Salari, & Henry, 2018; Miller & Najavits, 2012). This requires, amongst others, training of professionals to increase their awareness and understanding of the signs and impact of trauma (SAMHSA, 2014). Being arrested, detained or subjected to prison culture entails a high risk of re-traumatization. Certain triggers during offenders' contact with the criminal justice system, such as overreaction, the unnecessary use of force, authority misuse, ordering, shouting and deceiving must therefore be avoided (Griffin, Germain, & Wilkerson, 2012; Ko et al., 2008). Treating offenders with respect,

providing information and offering choice, trust and safety are means to do so (SAMHSA, 2014). Despite the absence of a sharp definition (Hanson & Lang, 2016), being trauma-informed is an important prerequisite for individual caregivers and care providing organizations to gain offenders' trust. As such, it may help to engage offenders for help or treatment which is a crucial intermediate outcome for other positive outcomes (e.g., less externalizing behavior, better recovery).

The strong association between ACE and SSP in early adulthood confirms the presumption that ACE has nonspecific but harmful long-term negative outcomes (Anda et al., 2006). In being cumulative measures, the ACE-SSP relation indicates a dose-response relationship in diversity meaning that more diverse exposure to ACE was related to more diversity in SSP. Strikingly, this relationship was exposed even within a group of violent repeat offenders with overall many problems at play and, therefore, possibly too little variation in both predictor and outcome to detect such a relation. Of course, this dose-response relationship is not applicable to the individual level. Juveniles exposed to "only one" ACE are not necessarily lower on risk for developing negative outcomes than juveniles exposed to multiple ACEs.

With respect to prevention, our results emphasize the importance to routinely screen for ACEs when juveniles enter youth care or juvenile justice systems. Especially for juveniles for whom exposure to multiple ACEs is detected, it is important to monitor their functioning integrally (i.e. in all important life domains) and to bolster juveniles' resilience against stressful events (Bethell, Newacheck, Hawes, & Halfon, 2014). Multi-agency responses that require alliances between, for example, school, police and public mental health care institutions, might help to prevent at-risk juveniles to develop more serious forms of criminal behavior and multi-problem situations.

Concerning diversion efforts, our results also clearly indicate a need for vigilance about personal histories and multi-problem situations. With respect to the former, the high ACE prevalence observed in a particularly severe offender population in terms of both criminal behavior and psychopathology suggests that more trauma focus in correction programs is warranted (e.g., Curran, Adamson, Rosato, De Cock, & Leavey, 2018). Concerning the latter, undetected multi-problem situations, such as having financial problems and the threat of being evicted from one's home, are likely to impede the effectiveness of interventions. Interventions need to be prioritized and aligned to those needs that are most salient with respect to the risk of further deterioration. These notions resonate strongly with the *What Works* theory (Andrews & Bonta, 2010), specifically with its responsivity and needs principles. These dictate that interventions

should be adjusted to personal characteristics such as trauma (Machtiger, Cuca, Khanna, Rose, & Kimberg, 2015) and personal criminogenic needs such as financial problems, antisocial peer affiliations and substance use. Focused deterrence programs, or including PMHC elements in municipal programs for offenders, may provide means for effective diversion.

Although psychiatric disorders in themselves are strongly associated with criminal behavior (Andrews & Bonta, 2010; Fazel, Yoon, & Hayes, 2017), they were not included as an outcome measure in this study. Nevertheless, the prevalence of psychopathology was strikingly high, specifically with respect to substance use disorders, personality disorders and intellectual disability. Here, we would like to stress the importance of being on guard for substance use among juvenile offenders. Offending while under the influence of alcohol/drugs is, in association with other risk factors, an important childhood predictor of later violent offending (reference currently under review). Accurate information about substance use is needed from the different fields around juvenile offenders to form effective alliances if needed. The police, for example, should be conscientious in reporting whether or not a juvenile was under the influence when committing an offense.

Last, we also found that within our sample of young adult offenders higher age was independently associated with more self-sufficiency problems. As we did not perform a longitudinal study, this finding does not necessarily imply that SSP increases with age. Our sample consisted of 18-27 year old offenders whose functioning was assessed at one point in time. It may very well be the case that the 'younger' offenders in our sample will have desisted from crime before reaching the age of 27. Conversely, having more self-sufficiency problems may also be part of the explanation why 'older' offenders have not desisted from crime. Nonetheless, this finding does imply that 'older' young adults who commit violent offenses are likely to present with more multi-problem situations for which an integral approach, such as PMHC based interventions, is required with respect to harm reduction and desistance from crime.

STRENGTHS AND WEAKNESSES

All data concerning the outcome measures were based on extensive social-psychiatric screenings. Data on ACEs were available for a third of the research population only. These data were based on historic juvenile probation files that were compiled by juvenile probation workers at the time during childhood at which the actual problematic situations occurred. Because these data are prospective in nature, common biases associated with retrospective data, such as selective recall, do not apply. The files were

scored by well-trained raters who used a validated instrument and who achieved a high inter-rater reliability. Of course, the findings of this study apply to a specific sample of young adult male SVC offenders only.

Our ACE measure, a cumulative score of nine distinct ACE categories, lacked the distinction between emotional and physical abuse which is common in the literature. A more general limitation of the ACE construct, is that it does not take into account the severity and chronicity, or allostatic load (Danese & McEwen, 2012; McLaughlin & Sheridan, 2016) of ACE exposure. Abuse severity, for example, has been found to be more strongly predictive of adult trauma symptomatology than being exposed to multiple types of abuse (Clemmons, Walsh, DiLillo, & Messman-Moore, 2007). In addition, the instrument that was used to score the juvenile probation files (FPJ), does not take into account the specific age at which ACE exposure occurred. Nonetheless, our ACE measure was in accordance with that commonly used in the literature.

Finally, our study examined the ACE-SSP relation in the Netherlands where a relatively well developed infrastructure of care providers and social services is in place that does not naturally exist in all countries. Even when such infrastructures are in place, it is also important that they are sensitive to ACE, being an important precursor of adversities in adult life. Also, not all people benefit equally from such services (Osgood et al., 2010). Specifically juveniles (or their parents) and young adults without the perceived need or ability to independently use such services may benefit from guidance towards the appropriate care or support providers. This suggests a role for public (mental) health system. Social-psychiatric screenings are a means of how to do so.

CONCLUSION

Our study showed that, among a sample of male violent offenders, ACEs are precursors for coinciding SSP in multiple important life domains in early adulthood. In providing care for youth exposed to multiple ACEs, youth care interventions should not focus exclusively on preventing distinct negative outcomes, such as criminal behavior, but also on promoting self-sufficiency in all life domains. This is important as it emphasizes the necessity to start with the prevention of multi-problem situations before the transition of youth to early adulthood. Failure to do so increases the likelihood that at-risk juveniles fall behind to the extent that independently catching up is no longer feasible.