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Adverse childhood experiences, juvenile violent victimization, and victim–offender overlap in multiple successive birth cohorts

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Abstract

There is a well-established relationship between adverse childhood experiences (ACEs) and juvenile delinquency, but the associations between ACEs and juvenile victimization, and between ACEs and victim–offender overlap, remain less studied. We explore the associations between ACEs and victimization, violent offending and victim–offender overlap, and examine whether these associations have changed over time. The data cover multiple successive birth cohorts (1,006,028 individuals) born in Finland between 1987 and 2003, obtained from national registers. ACEs were measured at ages 0–14 and included parental social assistance recipiency, unemployment, substance abuse, psychiatric disorders, violent offending, and parental death. Juvenile victimization and delinquency were defined as police-reported assaults and robberies at age 15–17. All individual ACEs were associated with an increased risk of juvenile victimization, and the cumulative ACE sum score showed a clear graded relationship with victimization. These associations remained relatively constant over time. ACEs increased the relative risk of offender-only, victim-only, and victim–offender statuses. The relative risk was weakest for the victim-only group and highest for victim–offender group and risks remained stable over time for these groups, whereas the relative risk between ACEs and offender-only status increased over time. The findings call for effective early-life interventions to prevent ACEs.

Keywords
adolescents, adverse childhood experiences, register data, victim-offender overlap, victimization

Introduction

More than 25 years ago, the CDC-Kaiser Adverse Childhood Experience Study identified the relationship between childhood adversities and the leading causes of illness and death among a sample of adults from the United States (Felitti et al., 1998). Following this seminal study, adverse childhood experiences (ACEs) have been commonly measured as physical, sexual, or emotional abuse, neglect, and exposure to a dysfunctional household environment. The latter includes experiences such as parental substance abuse, domestic violence, or the presence of mental health problems in the household. Studies indicate that ACEs are associated with an increased risk of short- and long-term negative outcomes, such as somatic and mental illnesses and substance misuse, with the harmful impact intensifying in a dose–response manner (Felitti et al., 1998; Hughes et al., 2017; Petruccelli et al., 2019).

Adverse childhood experiences (ACEs) have also been identified as a major risk factor of criminal behavior. Previous studies indicate that ACEs are linked to the onset of criminal activities (Brown & Shillington, 2017; Duke et al., 2010; Jahanshahi et al., 2022; Meldrum et al., 2022), as well as their persistence and severity (Baglivio et al., 2015; Craig et al., 2017), and the likelihood of reoffending (Astridge et al., 2023; Yohros, 2023). The connection between ACEs and delinquency in adolescents is underscored by a systematic review conducted by Malvaso et al. (2022), which found that youths involved in the justice system from various Western and non-Western nations were more likely to have faced at least one adverse or traumatic experience compared to their peers who were not involved with the justice system. Similarly, Basto-Pereira et al. (2022) showed that ACEs were universally linked to criminal behavior in a cross-sectional study of 10 countries across five continents with substantially different economic, cultural, and religious contexts, underscoring the impact of ACEs on the cycle of violence.

However, compared to research related to offending, relatively few studies have addressed the association between ACEs and later juvenile victimization. This is surprising, since the association between early trauma, such as abuse and neglect, and later victimization is well established (e.g., Widom, 2024), and research has suggested quite similar social determinants in offending and victimization outcomes (Ousey et al., 2011; Sullivan et al., 2016). Beyond the shared determinants associated with offending and victimization, a significant cumulative relationship exists between the two, resulting in the well-documented phenomenon of victim–offender overlap (Jennings et al., 2010). Nevertheless, the association between ACEs and victim–offender overlap remains underexplored in the existing literature.

The association between ACEs and violent victimization can be theoretically explained by ACEs' potential to disturb psychological, social, and behavioral development. According to neuroscientific studies, chronic stress from ACEs may disrupt brain development, particularly emotional regulation and executive function, leading to difficulties in conflict-monitoring and decision-making (Cross et al., 2017) and increasing vulnerability to risk-behaviors and victimization. ACEs predict selection into negative peer groups and gangs (Trinidad, 2021) along with fostering maladaptive behaviors such as high-risk drinking (Silveira et al., 2020; Afifi et al., 2020), embedding youth in environments linked to violent victimization. Finally, according to poly-victimization theory (Finkelhor et al., 2007) victimization is not equally distributed among children, and victimization experiences tend to accumulate: children who experience ACEs are more likely to face other forms of victimization later in their life.

A further limitation in the literature regarding the relationship between ACEs and negative outcomes is that associations are often taken as being constant over calendar time, although studies have suggested that period and cohort effects may influence the magnitude of the association between ACEs and various negative outcomes (Finkelhor et al., 2013). In this article, we analyze the association between ACEs and violent victimization, as well as ACEs and victim–offender status overlap, and whether these associations are stable across multiple successive birth cohorts. We examined the police-reported juvenile violent victimization at ages 15–17 years for successive birth cohorts born in Finland between 1987 and 2003.

Previous research on ACEs and victimization

Most studies on ACEs and victimization rely on cross-sectional, self-reported survey data. In a study of adolescents aged 10–14 in Zuo et al. (2021) found that youths with all types of ACEs (abuse, neglect, and household dysfunction), measured with 13 items modified from the CDC-Kaiser ACE study, were nearly four times more likely to experience violent victimization. All ACE subtypes—abuse, neglect, and household dysfunction—were significantly related to experiences of violent victimization. Folayan et al. (2020) observed a significant dose-response relationship between the risk of being bullied and the number of ACEs. In Forster et al.'s (2020) examination of retrospective self-report data from adults, ninth graders with ACEs were at a greater risk for violent victimization in school. Of those experiencing violent victimization in school, 39% were exposed to a family ACE. They also discovered that cumulative ACEs were particularly detrimental for boys compared to girls. Finally, based on retrospective, cross-sectional survey data, Pusch (2019) found that ACEs predicted victimization; however, protective factors, such as parental supervision and parental attachment, somewhat moderated this relationship.

Few studies based on prospective longitudinal data have addressed the association between ACEs and victimization. Based on longitudinal data, Fagan (2022) examined a high-risk sample of 1,354 children and their caregivers from early childhood to the age of 18. The study revealed that an increase in number of ACEs corresponded with an increase in likelihood of experiencing physical violence. Conversely, there was no connection between ACEs and experiences of verbal violence or witnessing violence. Additionally, the study found that ACEs significantly elevated the likelihood of intimidation and physical violence among girls, but this association was not observed among boys. Conversely, ACEs significantly increased the likelihood of witnessing violence for boys, but not for girls (Fagan, 2022). Finally, also based on prospective longitudinal data, Connolly (2020) studied the relationship between ACEs and violent victimization among adolescents and young adults aged 14–21. The study found that participants were 58% likelier to be violently victimized for each ACE they experienced. However, after controlling for family-level and child-specific covariates, the association diminished slightly, and after controlling for shared genetic and environmental factors in sibling fixed effects design, the association between ACEs and violent victimization was no longer significant.

Along with studying the association between ACEs and victimization, the association between ACEs and the well-documented victim–offender overlap (Beckley et al., 2018) also merits attention. Victim-offender overlap means that both offending and victimization are experienced by same individuals during their life courses. The victim-offender overlap literature separates three statuses accordingly: only victims, only offenders and victim-offenders. Although victims, offenders, and victim–offenders can be differentiated in terms of their exposure to risk and protective factors (TenEyck & Barnes, 2017), and

variation in the magnitude of the association depending on the developmental period has been observed, the victimization–offending association has been shown to remain constant across all ages (Erdmann & Reinecke, 2018; Schreck et al., 2017). Prospective longitudinal studies have also suggested similar underlying risk factors for both juvenile delinquency and juvenile violent victimization (Beckley et al., 2018; Ousey et al., 2011; Sullivan et al., 2016). Beckley et al. (2018) studied the association between ACEs and victim–offender status based on prospective longitudinal data. They found that each additional ACE increased the odds of becoming a victim–offender, compared to a victim only or an offender only, by approximately 12%. To date, we are unaware of other studies examining the association between ACEs and the victim-offender overlap.

Cohort changes in associations between ACEs and outcomes

Given the widely reported negative effects associated with ACE, screening ACEs has become routine for health and child welfare practitioners in many countries (Cibralic et al., 2022). Screening tools typically assume a time-invariant relationship between predictors and outcomes (Montana et al., 2023). However, societal changes may influence associations and result in violations of this assumption. For instance, parental divorce is now less predictive of poor child outcomes compared to the earliest ACE studies, perhaps due to societal shifts, such as reduced stigma and increased efforts by parents to mitigate the possible harmful impact of divorce on children (Finkelhor et al., 2013). As important as the Felitti et al. study was in the late 1990s, the links between ACEs and negative outcomes may no longer be the same, and these potential changes should be acknowledged and explored in research. At least in the Nordic context, it is noteworthy that societies' responses to individual ACEs have changed over time due to increasing knowledge, various preventive interventions, and even legislative changes aimed at mitigating the effects of child abuse (Johansson et al., 2024) and improving the consideration of children in vulnerable situations, such as those with incarcerated parents (Smith, 2015) or parents involved in substance abuse and mental health services (Solantaus et al., 2010; Stavnes et al., 2022).

By tracking changes across successive multiple birth cohorts, researchers can identify potential shifts, thereby informing targeted strategies to mitigate the impact of ACEs on negative outcomes. We identified only one earlier study that assessed temporal variations in the effects of adverse childhood experiences (ACEs) across multiple birth cohorts. Dube et al. (2003) demonstrated that ACEs significantly increased the likelihood of various health risks and risk behaviors in a consistent and graded manner across four successive cohorts (1900–1931, 1932–1946, 1947–1961,, and 1962–1978). This finding suggests that the influence of ACEs on health-related outcomes has remained stable despite changes in societal conditions.

In our previous research, we investigated whether the association between ACEs and violent delinquency remained stable or changed over time across multiple successive birth cohorts (Laajasalo et al., 2025). We examined changes in police-reported violent crime and its relation to cumulative ACE scores, as well as individual ACE experiences among Finnish adolescents born between 1986 and 2003, followed until 2020. The results supported previous research on the associations between individual and cumulative ACEs and violent delinquency, with the associations being relatively consistent over time. However, recent U.S. studies not utilizing the ACE framework have indicated that individual, family, and neighborhood risk factors associated with future arrest fluctuated over time for individuals born between the 1970 s and 1990 s (Montana et al., 2023; Neil et al., 2021).

In this article, we will analyze the changes in the association between individual ACEs and cumulative ACEs to victimization using a multicohort design. Because our previous article suggested a relatively consistent association between ACEs and violent delinquency, our hypothesis is that a similar association will be observed between ACEs and violent victimization. We will also analyze the relationship between ACEs and the overlap between offender and victim statuses.

Our research questions are as follows: First, are there associations between individual ACE experiences and violent victimization, and how have these associations changed over time among men and women? Second, are there associations between cumulative ACEs and violent victimization, and have these associations changed over time among men and women? Third, are there associations between cumulative ACEs and the overlap between offender and victim statuses, and have these associations changed over time?

Methods

Study population

Our analysis utilized multicohort data representing the entire population of children born in Finland between 1987 and 2003 (n = 1,006,028), followed until the end of the year during which they turn 17. The dataset included annual sociodemographic information for each child and their biological parents. For parents who relocated abroad or passed away during the study period, we incorporated all the available observations for these participants in our analyses.[1] Socioeconomic and criminal history data were derived from administrative registers maintained by Statistics Finland, and health-related data were obtained from the Care Register for Health Care, maintained by the Finnish Institute for Health and Welfare and classified according to versions 9 and 10 of the International Classification of Diseases and Causes of Death. The data structure was created by linking records from the registers using pseudonymized personal identification numbers.

The Statistics Finland Board of Statistical Ethics and the Social and Health Data Permit Authority (Findata) granted approval to use the data under permission numbers TK-53–1490-18 and THL/2180/14.02.00/2020, respectively. In Finland, register-based studies do not require informed consent if participants are not directly contacted.

Study variables

Adverse experiences were selected based on relevant literature and register availability, were measured from birth to age 14, and included parental social assistance recipiency, parental unemployment, parental substance abuse treatment, parental mental health treatment, parental death, and parental conviction for violent crime. ACE sum scores were calculated by summing up binary indicators of aforementioned variables. The sum score ranged from 0 to 6 and was grouped into four categories (0,1, 2, 3 and ≥ 4) for analysis.

Juvenile violent victimization was defined from police reports involving assault and robberies at ages 15–17. Juvenile violent delinquency was defined as a police report involving assault- or homicide-related crimes and robberies at ages 15–17, meaning that the definition of victimization and offending is based on the exact same criminal codes and measurement ages. Homicide-related crimes were excluded from both measures.[1] The victimization and delinquency variables were combined in the analyses of victim-offender overlap. As the measure of juvenile victimization and delinquency are based on police reports, the data should not be considered as representing juvenile victimization or violent crime in general. It is well known that the majority of violence against children and

adolescents, especially less serious violence, is not reported to police. The detailed definitions and sources of the study variables are presented in Table 1.

Statistical analysis

We analyzed absolute and relative differences in violent victimization among children with and without exposure to ACEs. Initially, we calculated the cohort-specific proportions of children victimized of violent crime separately for each independent variable and the ACE sum score. Using these proportions as a basis, we derived odds ratios and risk differences, illustrating the excess risk associated with each ACE on both the relative and absolute scales. For statistical inference (95% confidence intervals), we fitted logistic regression models that included an interaction term between categorical birth cohort variable and the ACE sum variable. We used the model results to calculate odds ratios that represent comparisons within each birth cohort (children with no ACEs as the reference category in each cohort). The same model results were then used to calculate predicted probabilities and their 95% confidence intervals to examine similar between-cohort changes in absolute terms.

Finally, we fitted a multinominal regression analysis to analyze victim-offender overlap and its change over time. In these models the reference category of the outcome variable comprises of youths with no experience of either victimization or violent offending. Youths with experience of either form separate categories, and the final category consists of youth who have been both a victim and an offender in at least one violent crime reported to the police between ages of 15 and 17. The results of these models are presented as relative risk ratios and their 95% confidence intervals. To facilitate easier visualization of key results, for this analysis the birth cohorts were combined into three groups (1987–1992, 1993–1997 and 1998–2003) and the models were run separately for each birth cohort group.

Results

In the total sample (n = 1,006,028), 41% were exposed to at least one ACE. The proportion of children not experiencing ACEs has increased, whereas the proportion experiencing 3 or 4+ ACEs has remained relatively stable. Additionally, 2.2% (21,831) had a police report of violent victimization between the ages of 15 and 17, a proportion that has decreased in more recent cohorts (Table 2).

The associations between individual adversities and juvenile victimization were examined using odds ratios (ORs). Parental conviction and reliance on social assistance showed the highest ORs, ranging from 2.82 (95% CI = 2.40–3.32) to 4.66 (95% CI = 4.01–5.42) and 2.85 (95% CI = 2.57–3.15) to 3.81 (95% CI = 3.37–4.32) across different time periods. Conversely, parental death had the lowest ORs, ranging from 1.34 (95% CI = 0.94–1.91) to 1.91 (95% CI = 1.52–2.39). The associations on relative scale were relatively stable across birth cohorts (Figure 1, Appendix A). Risk differences generally decreased across birth cohorts, mirroring the overall decline in victimization prevalence, particularly among youths who have experienced ACEs.

When analyzed separately for boys and girls, the highest relative risks were again associated with parental violent crime and reliance on income support. Variations in odds ratios over time were more pronounced among girls; however, these changes should be interpreted with caution due to the smaller size of this subgroup within each cohort.

Table 1. Variable definitions and data sources

Adverse Childhood Experience	Definition	Data source
Parental death	At least one biological parent deceased when the child was 0–14 years old	Causes of Death Register; Statistics Finland
Parental substance abuse	At least one inpatient hospitalization for alcohol or narcotics related substance abuse when the child was 0–14 years old, defined by ICD classification codes ICD9 (1987–1995): 2650A, 291, 292, 303, 3040–3045, 3049, 3050, 3052, 3575, 4255, 5307, 5353, 5710–3, 5770D–F, 5771C–D, 965, 967, 9680–9, 969, 9701, 980: ICD10: (1996–): B171, B182, E244, E52, F10– F16, F18–F19, F55, G312, G4051, G621, G721, I426, K292, K70, K852, K860, R780, R781–5, T36, T40, T423, T424, T426, T427, T430–T435, T438–439, T507, T51, Z502, Z503, Z714, Z715, Z721, Z722	Care Register for Healthcare; Finnish Institute of Health and Welfare
Parental criminal offending	Conviction of homicide/bodily injury under Chapter 21 of the Finnish Criminal Code when the child was 0–14 years old.	Statistics on Offences and Coercive Measures; Statistics Finland
Parental psychiatric disorder	At least one inpatient hospitalization for a psychiatric disorder when the child was 0–14 years old, defined by ICD classification codes ICD-9 codes (1987–1995): 295–302, 306, 307, 308, 309, 311, 312, 313, 314; ICD-10 codes (1996–): F20–F29, F30–F39, F40–F49, F50–F59, F90–F98, F99	Care Register for Healthcare; Finnish Institute of Health and Welfare
Household living on social assistance	Parental public social assistance provided for a minimum of three years when the child was 0–14 years old	Income Distribution Statistics; Statistics Finland
Unemployment	Parent unemployed for a minimum of three years when the child was 0–14 years old	Employment statistics; Statistics Finland
Violent victimization in childhood	Police report of a robbery or suspected bodily injury under Chapter 21 of the Finnish Criminal Code at 15–17 years old	Statistics on Offences and Coercive Measures, Statistics Finland
Violent juvenile delinquency (for victim-offender overlap)	Police report of a robbery or suspected homicide/bodily injury under Chapter 21 of the Finnish Criminal Code when the child was 15–17 years old	Statistics on Offences and Coercive Measures, Statistics Finland

Table 2. Prevalence of adversities and violent victimization

Variable	1987–1992 (%)	1993–1998 (%)	1999 –2003 (%)	Total n (%)
Social assistance	23.5%	22.2%	19.7%	221605 (22.0%)
Parental unemployment	35.0%	28.4%	24.1%	298562 (29.7%)
Parental psychiatric disorder	6.5%	6.6%	6.5%	65632 (6.5%)
Parental substance abuse	5.3%	4.9%	4.4%	49555 |(4.9%)
Parental violent crime	5.1%	5.7%	6.4%	56938 (5.7%)
Parental death	3.2%	2.9%	2.5%	29442 (2.9%)
Cumulative number of adversities at age 0–14				
0	54.4%	59.8%	64.2%	593340 (59.0%)
1	23.9%	20.8%	18.5%	214788 (21.4%)
2	13.9%	12.1%	10.3%	123630 (12.3%)
3	4.9%	4.6%	4.3%	46769 (4.65%)
4+	2.8%	2.8%	2.7%	27501 (2,7%)
Juvenile victimization at 15–17	2.3%	2.3%	1.8%	21831 (2.2%)

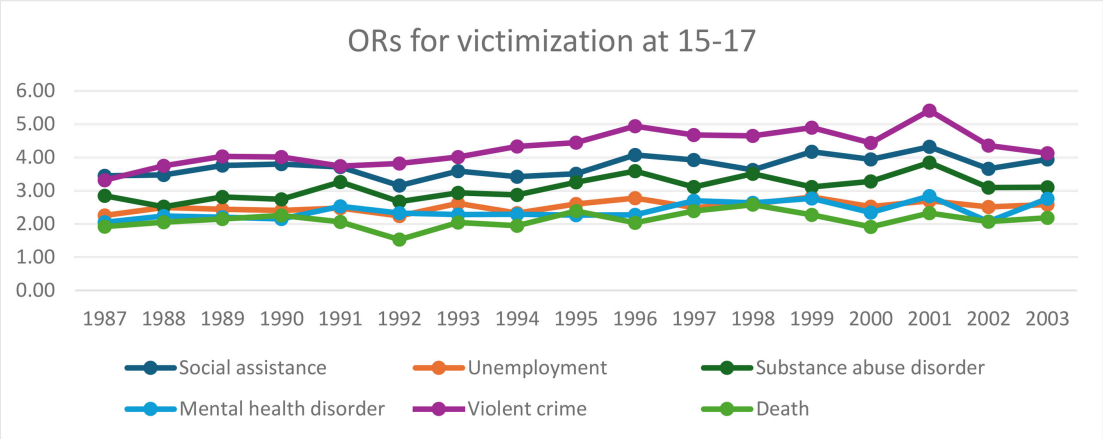

Figure 1. Odds ratios for violent victimization for each individual ACE category

In Appendix B, we have included detailed prevalences of violent victimization across all cohorts categorized by type of adversity, along with odds ratios and risk differences.

Figure 2 illustrates the prevalence of violent victimization among youths by ACE sum scores, demonstrating a graded association with cumulative ACEs. Among those with zero ACEs, the prevalence ranged from 1.00% to 1.60%, while individuals with four or more ACEs showed percentages ranging from 5.10% to 8.90%. The association remained notably stable over time for individuals with 0 to 2 ACEs but exhibited more variability for those with three or more ACEs, peaking among those with four or more adversities in cohorts born between 1994 and 1996.

In Figure 3, odds ratios (ORs) for juvenile victimization, accompanied by 95% confidence intervals, were computed using the ACE sum score, with zero ACEs as the reference category. The logistic regression models consistently revealed a graded association with juvenile victimization. Specifically, for individuals with four or more ACEs, ORs ranged from 3.90 (95% CI = 3.09–4.92) to 7.46 (95% CI = 5.98–9.32). Predicted probabilities range from 1.00% to 1.56% for individuals with zero ACEs across the study period. In

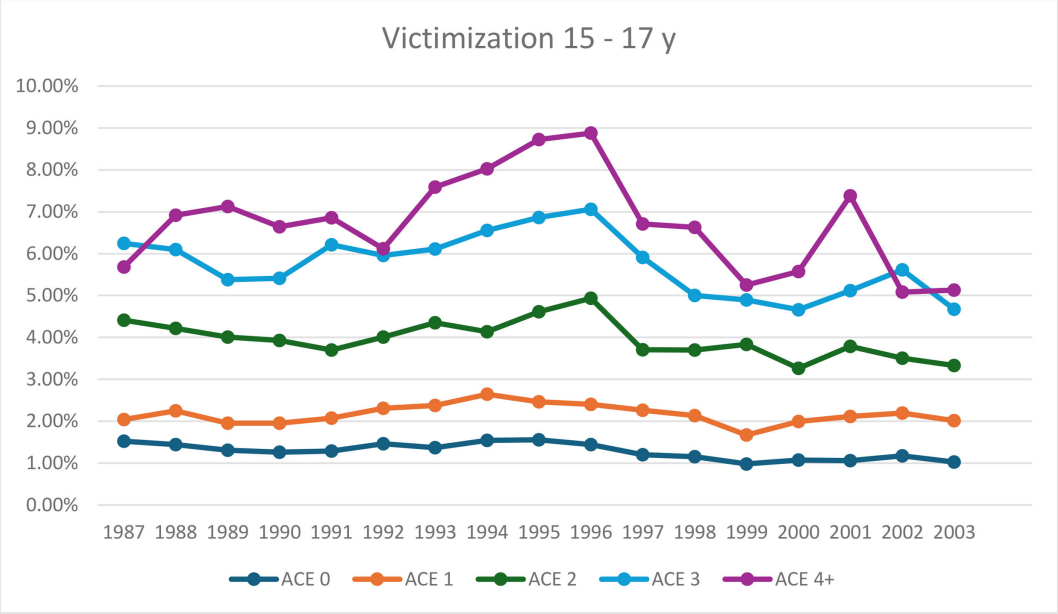

Figure 2. Percentage of youth with violent victimization at ages 15–17 across ACE sum score categories

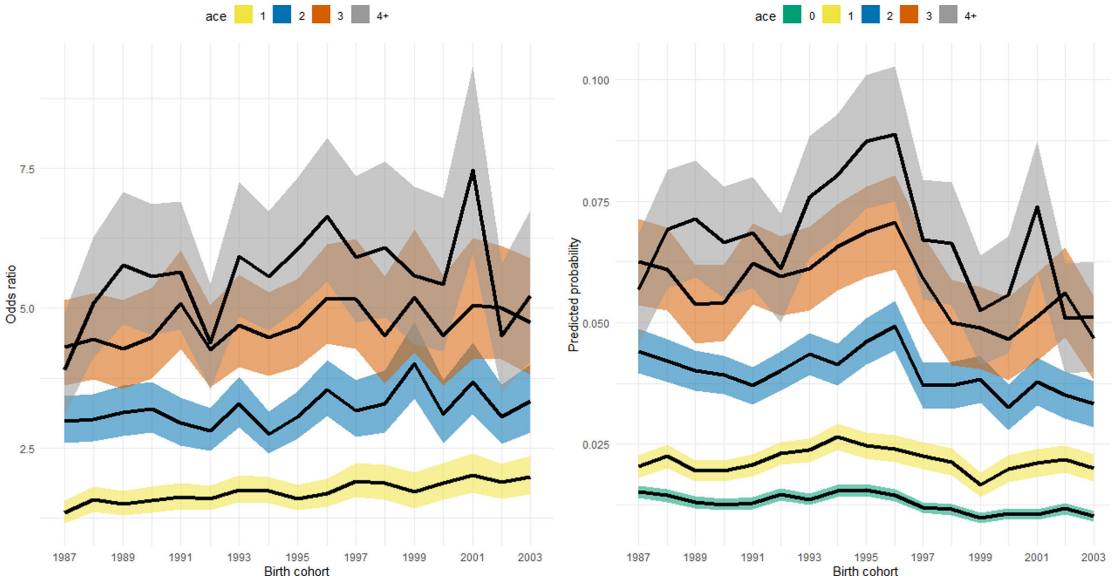

Figure 3. Odds ratios and predicted probabilities for violent victimization with 95% confidence intervals by ACE sum score (ACE = 0 as the reference category)

comparison, predicted probabilities for those with four or more ACEs range between 5.10% and 8.88%. While there are some cohorts in which the associations appear stronger, the confidence intervals in different cohorts are mainly overlapping, suggesting that annual fluctuations should be interpreted with caution, particularly as the results do not indicate a systematic development into increasing or decreasing disparities.

ORs were higher among girls with four or more ACEs, ranging from 4.19 (95% CI = 2.83–6.20) to 10.18 (95% CI = 7.41–14.00), compared to boys, with ORs ranging from 3.80 (95% CI = 2.84–5.07) to 6.39 (95% CI = 4.81–8.58) (results not shown).

Finally, we examined the associations of cumulative ACEs with offender, victim, and offender–victim status. Of the entire sample (n = 1,006,028), 0.6% had been both victims

and offenders, 1.6% only victims, and 1.1% only offenders. The prevalence of all three groups decreased over time (Figure 4).

To examine how cumulative ACEs are associated with these groups, multinomial regression models with 95% confidence intervals were calculated, using "no violence" as the reference category. The analysis revealed a distinctly systematic association of ACEs across all three groups: more ACEs increased the relative risk of offender-only, victim-only, and victim–offender statuses, when compared to the no violence group. The relative risk was weakest for the victim-only group and highest for victim–offenders and remained stable over time, whereas the relative risk between ACEs and offender-only status increased over time (Figure 5). Thus, while the actual number of individuals falling into the offender-only category has declined, the relative risk of ACEs contributing to becoming an offender only (compared to the group of "no violence") has risen.

Discussion

The aim of this study was to examine the associations between adverse childhood experiences (ACEs) and juvenile violent victimization across multiple successive birth cohorts of Finnish adolescents, focusing on individual ACE experiences and cumulative ACE scores. In addition, the association between cumulative ACEs and victim–offender overlap status was explored. In comparison to our previous findings on ACEs and violent offending (Laajasalo et al., 2025) the results of this study were strikingly similar. The relative ranking of associations for individual ACEs closely mirrored those found in our previous study: parental violent crime conviction and reliance on social assistance had the highest ORs, while parental death had the lowest ORs. Further, similarly to violent offending, cumulative ACEs showed a strong association with violent victimization over time.

Jointly, the findings of the studies imply that the effects of individual ACEs and cumulative ACEs on both victimization and offending may be interconnected and

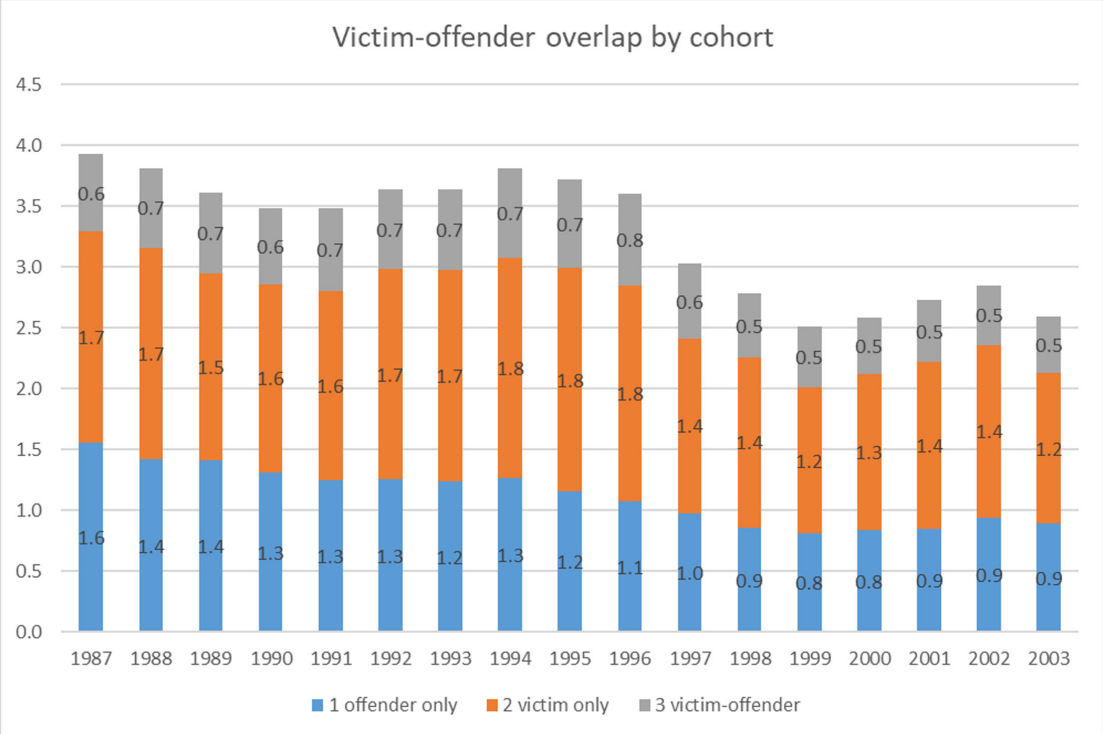

Figure 4. Prevalence of three victim-offender overlap status groups in time, %

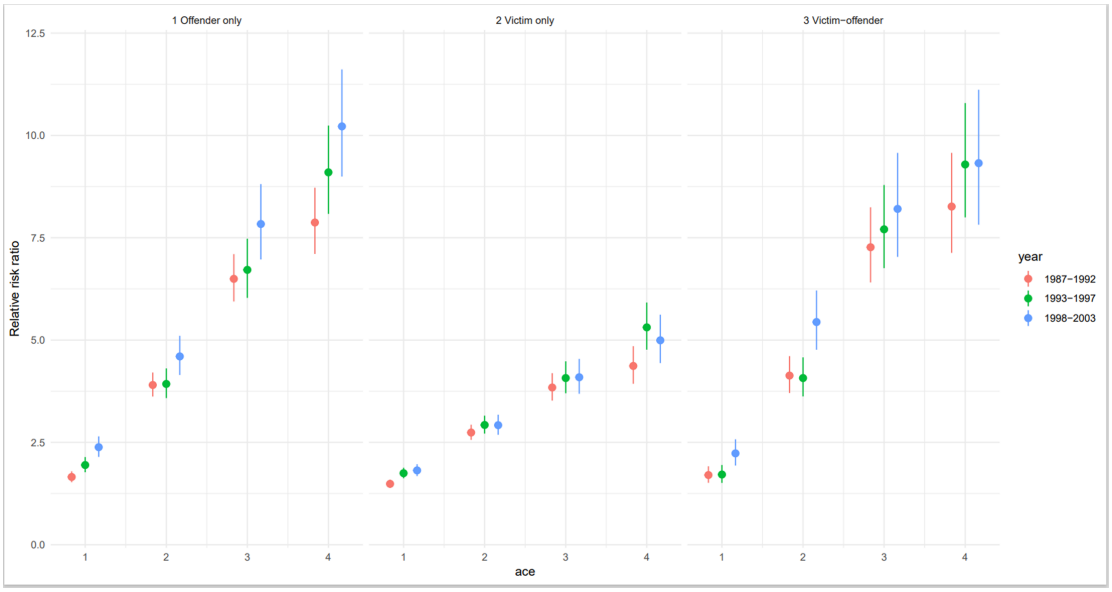

Figure 5. Relative risk ratios with 95% CIs of victim-offender overlap status according to cumulative ACEs

mediated through similar pathways. These could include factors such as impaired socio-emotional development, maladaptive coping strategies, impaired interpersonal relationships, and genetics. Many of the postulated consequences of ACEs, such as insecure attachments or affective dysregulation, have been associated with both victimization and offending (Kerig & Becker, 2015; Papalia & Widom, 2024; Voith et al. (2020)).

As hypothesized, the association between individual ACEs and victimization, as well as cumulative ACEs and victimization, was relatively consistent over time. This suggests that the effects of societal changes on these associations are quite small. In our earlier analysis of ACEs and delinquency, we interpreted this finding as both negative and positive. It is negative in the sense that considerable effort has been devoted to preventing child abuse and addressing the negative effects of parental challenges, yet these endeavors are not reflected in diminishing effects of ACEs on victimization. From a victimization perspective, this is particularly concerning, especially since Finland, along with other Nordic countries, ratified the Child Rights Convention (CRC) during the period covered by this study and is committed to reducing violence against children in all forms. However, a positive development is that the absolute levels of ACEs and victimization have declined. Furthermore, from the point of view of the current debate on polarization and increasing exclusion (Sivertsson et al., 2019), the result is positive, in the sense that the observed risk of victimization by disadvantaged youth with multiple ACEs has not increased over the decades.

While the association between ACEs and violent victimization remained consistent across different periods, we observed a modest peak in the associations for the cohorts born in 1995 and 1996. In our previous analysis of ACEs and delinquency, we found a similar peak and suggested that this was due to random fluctuations in the data (Laajasalo et al., 2025). However, the recurrence of this observation in the current study, while exploring the association between ACEs and victimization, suggests that this finding requires further attention.

In addition to associations with violent victimization, we investigated the role of cumulative ACEs in predicting offender-only, victim-only, and offender–victim statuses,

which have been explored only once in relation to ACEs (Beckley et al., 2018). The novel contribution of our study is in assessing the changes over time in these associations. We found that within younger cohorts those who have experiences cumulative ACEs are more likely to be offenders only compared to older cohorts. At the same time there is a decrease in the number of individuals engaged solely in offending behavior. This trend suggests a potential shift in the profile of individuals involved in violent situations, highlighting the growing importance of ACEs as risk factors in the development of violent behavior. In our previous study (Laajasalo et al., 2025), we did not observe such time-dependent changes in the relationship between ACEs and offending; however, this analysis did not directly assess the victim–offender overlap.

Our results underscore the significance of cumulative ACEs in relation to victim–offender status, similar to findings by Beckley et al. (2018), who reported that cumulative ACEs were associated with the likelihood of becoming a victim–offender, but not solely a victim or an offender. According to our findings, cumulative ACEs are in relation to all groups (victim only, offender only and victim-offender) but the association is strongest to the victim-offender group. Beckley et al. (2018) also highlighted that victim–offender overlap is influenced by both genetic factors and environmental risks common to victimization and offending. In addition to genetic pathways, the accumulation of ACEs may influence the victim–offender overlap through intertwined mechanisms, such as low self-control and substance abuse, which are known to correlate with both adolescent victimization and offending (Beckley et al., 2018). On the other hand, different types of adversity may evoke varied emotional and behavioral responses. Farrell (2017) showed that links between victimization and offending differ by victimization type, offense type, and neighborhood context, highlighting the necessity of considering individual ACEs and associated qualitative and contextual factors when exploring the mechanisms leading to various offending trajectories. Finally, it must be borne in mind that our findings on the victim–offender overlap are limited to a relatively narrow age-span, namely 15- to 17-year-olds, and a few studies indicate that the association of victimization and offending may change as individuals age (Erdmann & Reinecke, 2018; Schreck et al., 2017). Finally, to avoid reinforcing stigma associated with ACEs (Purtle et al., 2021), it should be noted that the absolute number of youths involved in violent incidents—whether as victims or victim-offenders—remained low and decreased over time even among those in the highest ACE categories.

In interpreting the findings of this study, several methodological considerations need to be taken into account. First, we did not measure childhood maltreatment, a well-recognized precursor to future victimization, which restricted the examination of changes over time across the entire range of ACEs. Second, our data did not include indicators of ACEs in broader contextual dimensions, for example measures of community or neighborhood disadvantage. Overall, information derived from registers does not inform us on how the adversities are perceived by the individuals. Additionally, our categorical approach did not account for the severity or frequency of adverse experiences, potentially affecting the findings. Evaluating violent victimization exclusively through police reports omits violent incidents not reported to authorities, and our findings are thus likely to reflect more serious crime. Similarly, in using hospital discharge data to estimate mental and substance abuse disorders our results reflect more serious cases. However, the primary strength of this study was its utilization of a large population-based register dataset, which effectively addresses issues such as nonresponse and recall bias commonly encountered in survey-based ACE studies. Nevertheless, our estimates are descriptive and do

not reflect causal associations. Further, regarding the victim–offender overlap, we did not assess the sequence of victimization and offending, which would have presented an advanced understanding of mechanisms. Finally, our outcome variable aggregated all types of violent victimization experiences. In future studies, the impact of various types of victimization could be delineated further, as previous research indicates that experiencing either familial-only violence or familial and nonfamilial violence is significantly associated with victim–offender status, while experiencing only nonfamilial victimization is not significantly associated with violent offending (Kushner, 2022).

Both policymakers and practitioners should consider these findings when designing prevention policies and interventions targeting ACEs. While all ACEs were associated with later victimization experiences, household reliance on social assistance and parental conviction for violent crime emerged as particularly strong predictors. Together with other recent large register-based studies (e.g. Kreshpaj et al., 2025), our findings underscore the urgency of addressing structural and economic disadvantage alongside family-level risks in the formative years. Further, implementing trauma-informed services for correctional settings and educating new police officers about the victim–offender overlap could support youth rehabilitation (see also Bucerius et al., 2020). These interventions may have the potential to both support victims and reduce reoffending. Beyond our results it is also important to better understand the role of positive or benevolent childhood experiences – including supportive relationships and neighborhood or school connectedness – in prevention, as their presence may associate to why some children with multiple ACEs are less likely to experience victimization and delinquency through factors such as improved resilience (Han et al., 2023; Baglivio & Wolff, 2021; Davis et al., 2019).

Data availability statement

The data underlying this article may be obtained by applying for data access from Statistics Finland and Findata.

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Notes

1. As the mean of the parental information available spanned a period of at least 17.5 years across birth cohorts, exclusions were not deemed necessary.

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