

Adult criminality among former residential school adolescents

MARKO MANNINEN¹, JAANA SUVISAARI¹, NIKO MAROLA¹ AND MIKKO AALTONEN², ¹National Institute for Health and Welfare, Mental Health Unit, Helsinki, Finland; ²Institute of Criminology and Legal Policy (Krimo), University of Helsinki, Helsinki, Finland

ABSTRACT

Background *There is evidence from around the world that disruptive behaviour during adolescence is associated with increased risk of later criminality. Outcomes for young people placed in the Finnish residential school because of severe conduct problems are not known.*

Aims *Our aims were to investigate criminality after leaving a residential school placement during adolescence, and to compare trends in criminality between four successive graduate cohorts (1991, 1996, 2001 and 2006).*

Methods *We used official records to study complete national cohort of all 861 people who had been resident in the Finnish residential school system on the last day of each of the years 1991, 1996, 2001 and 2006. They were compared with 4255 matched general population controls. The follow-up time was up to 20 years.*

Results *Two-thirds (66%) of all residential school graduates (N = 566: 448/78% men, 118/41% women) had at least one criminal conviction in adulthood, a 13-fold elevation over the general population rate. The most prevalent crime categories were violence (N = 409, 48%: 331/58% men, 78/27% women) and property crimes (N = 405: 47%: 346/60% men, 51/21% women). The risk of violent crime was 18 times that among controls; 13 of residential school males (2.3%) had a homicide conviction. Once adult, the risk of offending decreased with age. There was a significant trend for improvement in offending rates between the earliest and latest residential school cohorts.*

Conclusions *The risk of committing crimes after a residential school placement is sufficiently elevated that alternative strategies, perhaps particularly longer-term post-release supervision and aftercare, should be considered. Indications of lower crime rates in later cohorts suggest that some positive changes to the school regime and/or aftercare may have been made already. Copyright © 2017 John Wiley & Sons, Ltd.*

Background

Residential schools (RS) in Finland and other Nordic countries are child welfare institutions for adolescents with disruptive behaviours that, typically, include juvenile delinquency, substance use and severe school dysfunction (Kitinoja, 2005). In 2011, there were 14,783 children and adolescents (1.4% of population under 18 years) placed outside the home by child welfare in Finland; 274 (1.8%) of these resided in one of eight RS (Kuoppala and Säkkinen, 2012). The RS system is part of the child welfare system, not juridical or correctional. The aim of the placement is rehabilitation, not punishment, and education is a priority: since the 1980s, all residents have completed compulsory education. Typically, placement there starts at about 15.5 years of age (range 13–17; Kitinoja, 2005). Legally, placement ends on reaching adulthood – 18 years in Finland – but some adolescents stay on to complete vocational or secondary education. Comprehensive studies on later adult-age criminality have not been conducted, even though previous small-scale follow-up studies have shown that criminal behaviour is common after RS placement (Jahnukainen, 2004; Manninen et al., 2013; Toivola, 1987).

Previous studies of RS have revealed that these adolescents have an excess of mental health problems (Lehto-Salo et al., 2009; Manninen et al., 2010; Manninen et al., 2011; Manninen et al. 2014) and neuropsychological deficits (Manninen et al., 2013; Närhi et al., 2010). A register-based follow-up study into early adulthood showed that they have a sevenfold higher mortality risk compared with the general population, which was entirely explained by ‘external causes’ of death; the risk for substance-related death was 24 times and suicide seven times that of the general population (Manninen et al., 2015). Taken together, health problems among RS residents resemble those found among adult prisoners (Fazel and Baillargeon, 2011). If necessary, psychiatric help like individual therapy is provided by national specialist healthcare system professionals.

Criminality is most prevalent during late adolescence, and the so-called age-crime curve (Rocque et al., 2015) tends to replicate over countries and datasets. A small minority of persistent offenders, however, accounts for a large share of all crime (Elonheimo et al., 2014). The search for antecedents of ‘life-course persistent offending’ (Moffitt, 1993) has been identified as a crucial task in preventing criminal careers, and longitudinal analyses show that childhood conduct problems and anti-social behaviour predict crime and violence in adulthood (Farrington, 2007; Savolainen et al., 2010).

In Finland, the number of children placed outside the home has doubled since 1991 (THL, 2014). Even though the RS system has been systematically developed in the past two decades, no one knows whether the adult age prognosis has changed since then. The aim of this study was to investigate adult-age criminality among RS graduates by comparing them with matched general population controls. Our principal hypothesis was that the development of RS care since 1991 would be associated with lower crime rates after leaving.

Methods

The sample was identified from the Finnish welfare register kept by the National Institute for Health and Welfare [Terveyden ja Hyvinvoinnin Laitos, (THL)]. This register includes data on out-of-home placements. The inclusion criterion was out-of-home placement status in an RS at the last day of year in 1991, 1996, 2001 or 2006. Accordingly, the data acquired were organised in four cohorts, to enable assessment of possible changes in the outcome of for the residents over time. The birth years ranged from 1973 to 1994. The use of data was approved by the register authorities, and the study protocol was reviewed and approved by the institutional review board of the National Institute for Health and Welfare, Finland (THL/383/8/2011).

For every RS adolescent identified, five adolescents who had never been in a RS were sought from the Population Register Centre, Finland, as controls, matched by sex, age and place of birth (municipality); for 50 (6%) RS cases, only four controls were located. The latter arose mostly when the proband had been born in a small municipality.

Data on criminality are based on all court convictions during the years 1992–2011. Crimes where the sanction was a summary penal fee or a penal notice (e.g. speeding and shoplifting) are not included in the conviction register. The data were obtained from the Legal Register Centre, kept by Statistics Finland. The follow-up time ranged from 1 to 20 years, as only the convictions acquired after age 18 years were included in the statistical analysis.

We extracted six variables from the criminality data: the total number of convictions (regardless of type) and at least one recorded conviction in each of the following categories of crime: property, violence, drug related, drunk driving and traffic related. Property crime includes stealing, shoplifting, burglary, car theft, damage to property and economic crime such as fraud and forgery. Violence includes homicide, assault, robbery, rape and violent resistance to a public authority (e.g. police). Drug related includes all drug-related activity like manufacturing, importing, exporting and distributing illegal drugs. Drunk driving means driving with a blood alcohol concentration over 0.05%. Traffic related includes reckless driving and driving without a licence.

Statistical methods

Differences between RS population and matched controls on criminality and on different crime types were analysed by the χ^2 test of association where possible and Fisher's exact test when numbers fell below 5 in any cell. Two-by-two tables and odds ratios were calculated for assessing the strength of the association. Associations between crime categories were assessed by calculating Spearman correlations. The accumulation of convictions was assessed by dividing the offenders in percentiles according to the frequency of criminal acts and analysed by comparing

associated empirical cumulative distribution functions by the non-parametric discretised Kolmogorov–Smirnov test. Cohort differences were analysed by comparing their convictions during a 5-year follow-up period. To investigate a possible linear trend between the four cohorts, we applied a logistic regression model with a time trend as an additional explanatory variable. We accounted for clustering in regression models; each RS subject and its four or five matched controls form one cluster. Statistical analyses and visualisation were performed with the R statistical software (version 3.2 for Windows) (R Core Team, 2014).

Results

The sample consisted of 861 young people (576 male and 285 female) and 4255 controls (2841 male and 1414 female). The RS cohort had significantly more convictions than controls, in total and also in specific categories. Two-thirds (566, 65.7%) of the RS adolescents sustained at least one criminal conviction after leaving the school. Half of them were convicted of a crime of interpersonal violence (409, 47.5%) and an overlapping group of about the same size of property crimes (405, 47.0%). New crimes were invariably more likely among the young men than the young women (overall: 448/77.8% vs 118/41.4%; property crimes 346/60.0% vs 59/20.7%; violence 331/57.5% vs 78/27.4%). RS leavers were between 10 and 34 times more likely to have offended than the controls, depending on crime type and gender. Details are shown in Table 1. The Supporting Information confirms moderate correlations between categories of criminal offending among both RS leavers and controls.

Convictions for homicides (murder and manslaughter) were assessed separately. There were 16 homicides among RS leavers, significantly more than among controls, among whom there was only one (Fisher's exact test $p < 0.001$). Two of the perpetrators had convictions for two homicides, so there were just 14 homicide perpetrators among the RS leavers (1.6%), 13 men and 1 woman.

The accumulation of convictions was lower among male RS leavers than among controls (two-sided Kolmogorov–Smirnov test statistics $D = 0.298$, $p < 0.001$); n (11.4%) of RS men accounted for approximately half of all convictions, while among control men, the corresponding percentage was 7.6% (Figure 1). This pattern was reversed among the women: 9.3% of RS leavers for approximately half of all convictions, but about one-fifth of controls did so (Figure 1), the latter difference being significant (Kolmogorov–Smirnov test $D = 0.252$, p -value = 0.042).

For both RS leavers and controls, the number of convictions was highest in early adulthood (from age 18 years in Finland). As the rate of fall of re-offending was similar between groups, the conviction rate among RS leavers remained higher than among controls throughout (Figure 2). Among the young men, RS

Table 1: Numbers and percentages of young people in residential schools (RS) and controls with criminal convictions, odds ratios (ORs) and 95% confidence intervals (CIs)

		RS (N = 861)	Controls (N = 4255)	OR	Wald 95% CI	
					Lower	Upper
All		N	N			
	Any conviction	566 (65.7%)	532 (12.5%)	13.4	11.3	15.8
	Property crime	405 (47.0%)	132 (3.1%)	27.3	22.0	34.0
	Violent crime	409 (47.5%)	179 (4.2%)	18.1	14.9	21.9
	Drug offences	273 (31.7%)	98 (2.3%)	19.7	15.4	25.2
	Drunk driving	326 (37.9%)	234 (5.5%)	10.5	8.7	12.7
	Traffic offences	351 (40.8%)	268 (6.3%)	10.3	8.6	12.4
Male		(N = 576)	(N = 2841)			
	Any conviction	448 (77.8%)	489 (17.2%)	16.9	13.6	21.0
	Property crime	346 (60.0%)	119 (4.2%)	34.1	26.6	43.7
	Violent crime	331 (57.5%)	188 (6.6%)	19.2	15.4	23.9
	Drug offences	226 (39.2%)	88 (3.1%)	20.4	15.6	26.8
	Drunk driving	285 (49.5%)	219 (7.7%)	11.7	9.5	14.5
	Traffic offences	311 (54.0%)	247 (8.7%)	12.3	10.0	15.2
Female		(N = 285)	(N = 1414)			
	Any conviction	118 (41.4%)	47 (3.3%)	21.0	14.4	30.6
	Property crime	59 (20.7%)	14 (1.0%)	26.1	14.3	47.5
	Violent crime	78 (27.4%)	16 (1.1%)	32.9	18.9	57.5
	Drug offences	47 (16.5%)	11 (0.8%)	25.2	12.9	49.3
	Drunk driving	41 (14.4%)	16 (1.1%)	15.7	8.5	28.7
	Traffic offences	40 (14.0%)	20 (1.4%)	11.4	6.5	19.8

Differences between RS subjects and controls tested using χ^2 test. All comparisons implied statistically significant differences at $p < 0.001$.

leavers had about 10 times as many convictions as controls at every age point; this order of difference was sustained for the young women only during the first 10 years of their follow-up. By its end, former resident girls had about five times as many convictions as their community peers.

A comparison of convictions between RS leavers with and without a conviction for homicide was possible only for the men as only one woman was convicted of homicide. Table 2 confirms that these homicidal men had significantly more interpersonal violence convictions than the non-homicidal RS leavers.

Figure 3 shows that, for both male and female RS leavers, there was a statistically significant, decreasing linear trend for *any conviction* and for *violent crime*; for *drunk driving*, the difference was just under the set threshold. These trends were also analysed separately for men and women. For RS males, the decreasing linear trend was significant for *any conviction*, *violent crime* and *drunk driving*; for the girls, there were no significant trends. Odds ratios for the four cohorts, overall and for men and women separately are detailed in Table 3. Significance values for the linear trends are shown in Table 4.

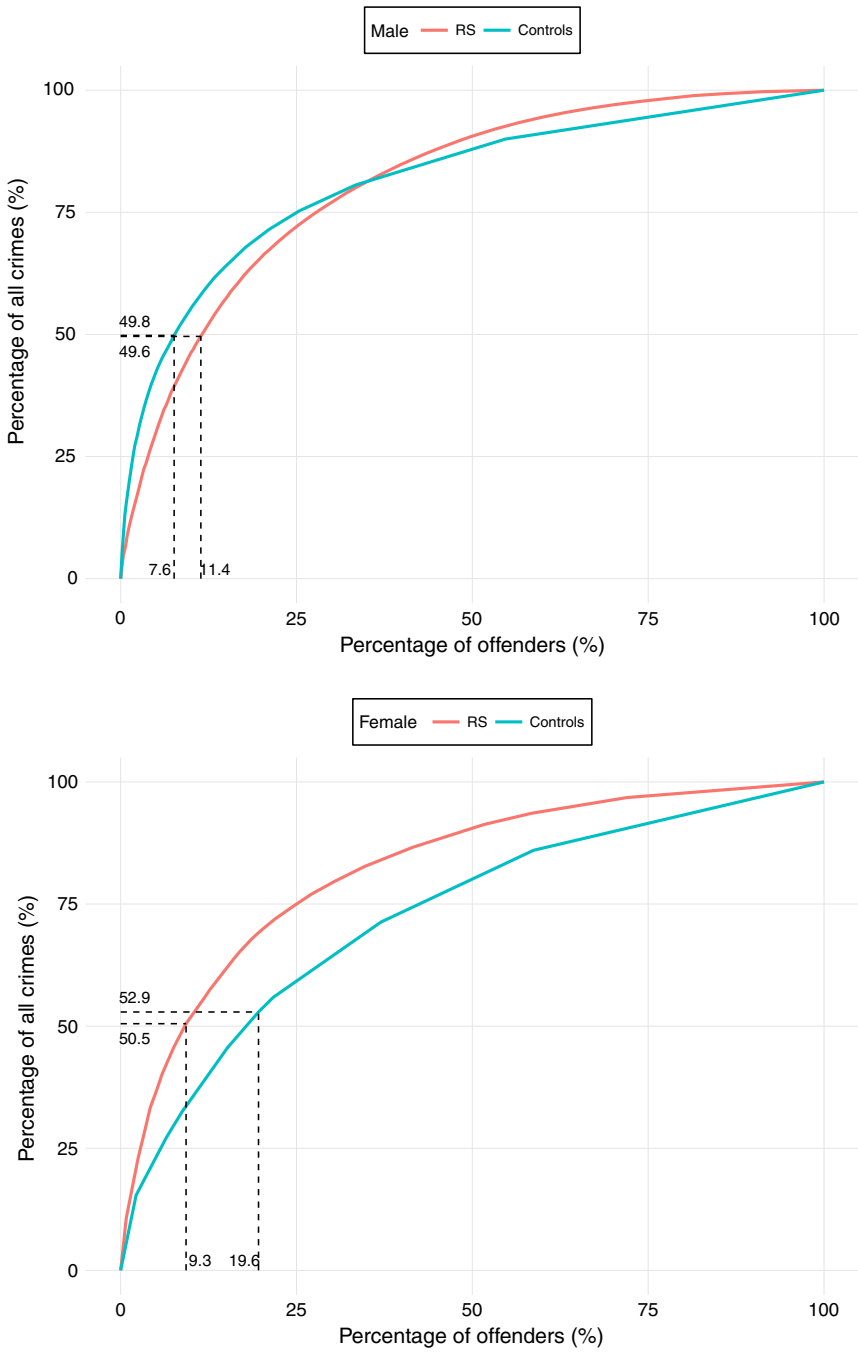


Figure 1: The accumulation of crimes for residential school (RS) subjects and controls for males and for females separately [Colour figure can be viewed at wileyonlinelibrary.com]

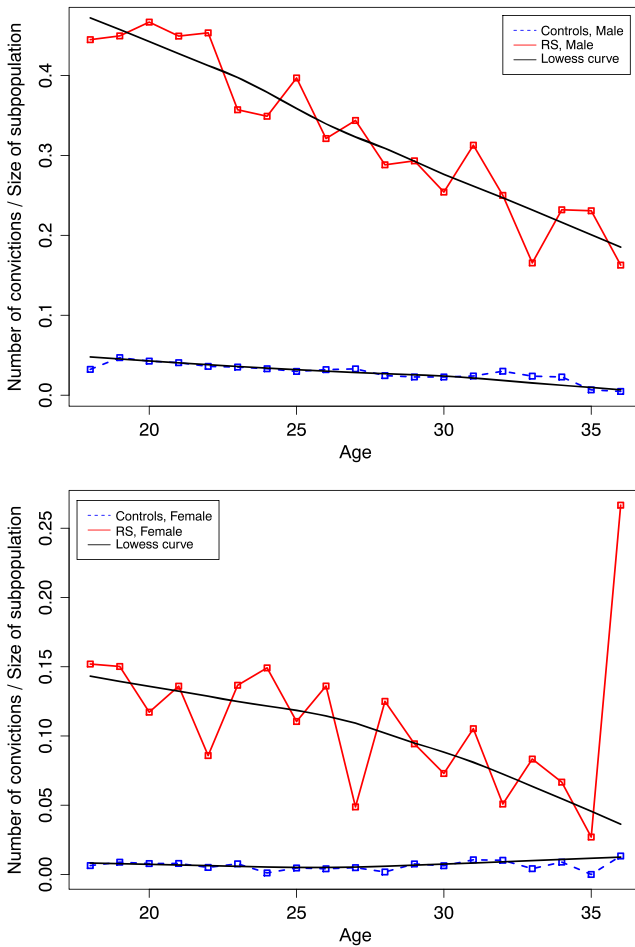


Figure 2: The age–crime curve for residential school (RS) subjects and controls, stratified by gender [Colour figure can be viewed at wileyonlinelibrary.com]

Discussion

We found that adolescent placement in an RS was associated with a substantially elevated rate of later offending compared with general population controls. Two-thirds of the RS graduates had at least one adult criminal conviction, mainly violent or property crimes; four out of five had convictions as men, compared with two out of five of the women. This gender *ratio* for criminal behaviour resembles that found in the Finnish general population (Elonheimo et al., 2014), even though the overall prevalence in the residential cohort was much higher for both sexes.

The very high risk of violence after an RS placement is a problem that may need specific attention. There are effective methods like The Structured Assessment of Violence Risk in Youth for screening violence risk in general (Dolan and

Table 2: The median number and range of convictions among all male adolescents in residential school with and without a homicide conviction

Offence type other than homicide	All N = 576		Homicide N = 13		No homicide N = 563		Statistical difference ¹	
	Median	Min–Max	Median	Min–Max	Median	Min–Max	U	p
Total	18	0–765	34	3–144	18	0–765	2802.5	0.149
Property crime	2	0–235	6	0–29	2	0–235	3007	0.264
Violent crime	1	0–32	7	1–25	1	0–32	1596	<0.001***
Drug offences	0	0–35	0	0–4	0	0–35	3084.5	0.284
Drunk driving	1	0–28	1	0–18	1	0–28	3098	0.316
Traffic offences	1	0–140	2	0–28	1	0–140	2960	0.222

¹Mann–Whitney U-test.
***for stating significance.

Rennie, 2008), or assessing psychopathy traits (Vincent et al., 2008) associated with poor outcomes. There has been a tendency to view the latter as treatment resistant, but there is a growing body of evidence for effective intervention methods for both reducing aggressive behaviour (Fossum et al., 2008; McGuire, 2008) and even key features of psychopathy (Caldwell et al., 2012; Wilkinson et al., 2016). We have previously observed that low verbal ability predicts later violence in male RS leavers (Manninen et al., 2013), so this group might benefit from specific interventions to reduce such problems. In addition, The Oregon Multidimensional Treatment Foster Care model has shown promising effects for reducing anti-social behaviour in the community (Chamberlain, 2003).

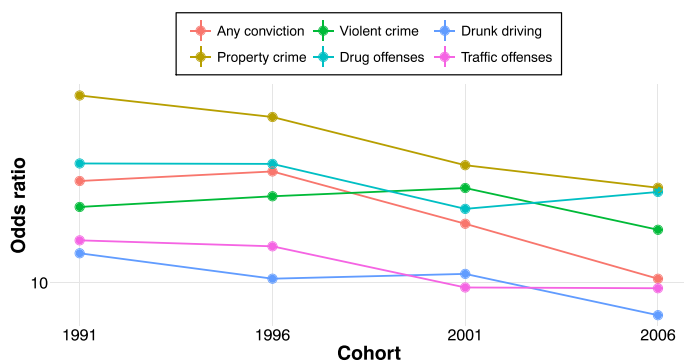


Figure 3: The odds ratio for any conviction and criminality subtypes among the residential school (RS) population among cohorts 1991, 1996, 2001 and 2006 during a 5-year follow-up [Colour figure can be viewed at wileyonlinelibrary.com]

Table 3: Odds ratios (ORs) and 95% confidence intervals (CIs) for the total number of convictions and different crime types across the four residential school cohorts during 5-year follow-up

	1991		1996		2001		2006		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Any conviction	All	23.7	(16.2–34.7)	25.7	(17.6–37.5)	16.5	(11.6–23.3)	10.3	(7.4–14.5)
	M	36.3	(22.3–59.2)	43.1	(24.8–74.7)	21.6	(13.6–34.3)	10.2	(6.9–15.2)
	F	23.6	(8.1–69.1)	34.7	(14.7–81.8)	23.1	(11–48.3)	18.8	(8.5–41.5)
Property crime	All	48.8	(30.1–79.3)	40.7	(26–63.6)	27.0	(16.8–43.6)	22.3	(12.8–39.1)
	M	68.5	(40–117.5)	64.2	(37.8–109)	31.3	(18.6–52.7)	25.8	(13.5–49.2)
	F	47.8	(5.8–392.8)	29.5	(8.2–106.5)	64.4	(8.2–507.7)	16.6	(5.3–52.8)
Violent crime	All	19.0	(12.1–29.8)	20.8	(13.7–31.5)	22.3	(14.7–33.8)	15.7	(10.1–24.2)
	M	19.9	(12.3–32.1)	22.9	(14.4–36.4)	22.7	(14.1–36.3)	15.6	(9.5–25.7)
	F	N/A	N/A	48.6	(10.8–219.2)	48.7	(14–169.2)	21.3	(7.7–59)
Drug offences	All	27.5	(14.3–52.8)	27.3	(16.8–44.5)	18.7	(10.7–32.8)	21.6	(9.8–47.5)
	M	29.0	(14.9–56.5)	33.0	(18.8–58.1)	18.8	(10.2–34.8)	17.3	(7.6–39.3)
	F	N/A	N/A	17.4	(6.5–46.7)	25.4	(5.4–120.5)	N/A	N/A
Drunk driving	All	12.8	(6.7–24.6)	10.3	(6.9–15.5)	10.8	(7.2–16)	7.6	(4.6–12.5)
	M	14.6	(7.4–28.8)	10.9	(7–17)	12.7	(8.1–19.8)	7.6	(4.5–13.1)
	F	N/A	N/A	45.4	(5.6–370)	10.1	(3.3–31.1)	10.4	(2.6–42.4)
Traffic offences	All	14.3	(9.6–21.3)	13.6	(9.1–20.3)	9.6	(6.5–14.1)	9.5	(6–15.2)
	M	17.8	(11.4–27.6)	16.6	(10.6–26)	11.6	(7.5–18)	10.4	(6.2–17.4)
	F	8.4	(2.3–31.1)	19.4	(3.9–96)	9.5	(2.7–33.5)	9.2	(2.6–32.1)

Table 4: The significance of linear trends between residential school cohorts

	All <i>p</i>	Males <i>p</i>	Females <i>p</i>
Any conviction	<0.01**	<0.01**	0.125
Property crime	0.476	0.342	0.575
Violent crime	0.012**	<0.01**	0.168
Drug offences	0.566	0.486	0.785
Drunk driving	0.053	0.018*	0.624
Traffic offences	0.355	0.162	0.826

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Compared with recent Nordic country studies on accumulation of crime (Elonheimo et al., 2014; Falk et al., 2013), the clustering of crimes in a small group of persistent offenders is not quite as strong in the data presented here, where roughly 10% of offenders, whether in the residential or community control group, were responsible for about half of all crimes. In a prior Finnish study (Elonheimo et al., 2014), just 3% of males accounted for just over half of all crimes. One explanation for this difference lies in the outcome, as our data included only more serious convictions. Lesser property crimes, for instance, were not included, and it may be these lesser crimes that are especially cumulative among small numbers of any population. On the other hand, RS pupils form a highly pre-selected subgroup of adolescents, among whom delinquency is one of the main reasons for placement. Criminal behaviour was especially common among boys going to RS, with a median of 18 convictions. Among their female peers, roughly 10% accounted for half the convictions, compared with 20% of controls. The low accumulation in controls reflects the infrequency of crimes among women in the general population. Accumulation of criminality was more similar between RS males and females than between each sex group and their community controls. Further, accumulation among male RS graduates compared with community controls appears to be particularly strong when the crime was seriously violent; we found, for example, only one homicide among controls but 16 homicides in which the perpetrator had an RS background.

Our results on age and criminality were in line with the well-replicated finding (e.g. Rocque et al., 2015) showing that criminality peaks during adolescence and early adulthood. Among RS leavers and controls alike, whether male or female, the number of convictions per year was highest around age 18 and showed a steady decline thereafter, albeit more obvious in the RS group. Particularly for male RS leavers, the number of convictions stays approximately 10 times higher than among controls, over the years. This finding suggests that the after-care programmes that should support these young people after being in an RS may not be very effective in preventing re-offending.

The comparison of crime rates between the four RS cohorts – 1991, 1996, 2001 and 2006 – was encouraging because it suggested that the outcome for RS leavers has improved from the highest post-release reconviction rate in the cohort of 1996 and the lowest in the cohort of 2006. While this may indicate improvements in RS regimes, the financial depression in Finland in the early 1990s must also be taken into account as it resulted in funding cuts in the welfare system. Both pre-residence welfare and aftercare during the early 1990s were, consequently, considerably less intensive than for the later cohorts. These positive findings are in line with our previous report of other outcomes from the same sample – specifically reduction in premature mortality (Manninen et al., 2015) and, for women, improvement in reproductive health (Lehti et al., 2015) over successive RS cohorts.

To the best of our knowledge, this was the first study to examine criminality among RS graduates over successive cohorts. The use of extensive follow-up data from Finnish registries with no dropouts was the most important strength of the study. There were two major limitations, which should make us cautious about generalising the results. First, the Finnish RS system differs from corresponding institutions in other countries, as it is a part of the welfare rather than criminal justice system and the decision for placement is made for a variety of reasons that are not always related to delinquency. Second, we did not have information on known risk factors for adult criminality, like a diagnosis of conduct disorder or substance use disorder or parental criminality. This is important as there is evidence for an association between high psychopathy scale scores and particularly callous and unemotional traits and violent recidivism (Asscher et al., 2011; Edens et al., 2007), but the registry from which data were extracted does not carry measures for these traits. In addition, it can be argued that number of convictions is different from the actual number of crimes committed, for various reasons, but agreement between self-reported and official criminality has been shown to be fairly strong (e.g. Piquero et al., 2014).

Conclusions

Criminality is one of the many intertwined problems found among young people in RS, both during placement and in adulthood after leaving. Despite the high initial rates of arrest or conviction on criminal charges after leaving these schools, these apparently poor outcomes do not imply poor quality of care in the schools. Indeed, it cannot be known what the rate of offending would have been for these young people had they not been in the schools. The Finnish RS system has been described as *a second chance* (Lehto-Salo, 2011) for these adolescents, and our finding that outcomes appear to be improving across successive cohorts is encouraging. The high rates of offending relative to young people not in such schools, however, stress the importance of the after-care system. After reaching the age of consent and leaving the controlled environment, adolescents from RS face a

difficult transition from relatively intensive care to self-sustaining adulthood. The newly acquired independence exposes each young person to numerous risks, perhaps the greatest in this context being substance misuse. Even aftercare may, however, not be enough. Currently, dropout rates in the after-care programmes are high, with the main stated reason for attrition being the lack of personal, long-term relationships between the adolescents and after-care staff. Future research should evaluate the potential benefits of strengthening the skills and stability of the after-care workforce.

Acknowledgements

The authors are grateful for M.Sc. (Econ.), Director Anna-Maija Kujala and M.Sc., Psychologist Pirjo Toivola from Residential School of Vuorela for sharing their expert knowledge and clinical experience on RS system's past, present and future.

Sohlberg and Jahansson provided funding for the author M. M. for this study.

Abbreviations

THL National Institute for Health and Welfare, Finland (Terveyden ja Hyvinvoinnin Laitos)

Supporting information

Additional supporting information may be found in the online version of this article at the publisher's web-site.

References

- Asscher JJ, van Vugt ES, Stams GJJM, Deković M, Eichelsheim VI, Yousfi S (2011) The relationship between juvenile psychopathic traits, delinquency and (violent) recidivism: A meta-analysis. *Journal of Child Psychology and Psychiatry* 52: 1134–1143. DOI:10.1111/j.1469-7610.2011.02412.x.
- Caldwell MF, McCormick D, Wolfe J, Umstead D (2012) Treatment-related changes in psychopathy features and behavior in adolescent offenders. *Criminal Justice and Behavior* 39: 144–155. DOI:10.1177/0093854811429542.
- Chamberlain P (2003) The Oregon Multidimensional Treatment Foster Care model: Features, outcomes, and progress in dissemination. *Cogn Behav Practice* 10: 303–312.
- Dolan MC, Rennie CE (2008) The structured assessment of violence risk in youth as a predictor of recidivism in a United Kingdom cohort of adolescent offenders with conduct disorder. *Psychological Assessment* 20: 35–46. DOI:10.1037/1040-3590.20.1.35.
- Edens JF, Campbell JS, Weir JM (2007) Youth psychopathy and criminal recidivism: A meta-analysis of the psychopathy checklist measures. *Law and Human Behavior* 31: 53–75. DOI:10.1007/s10979-006-9019-y.

- Elonheimo, H, Gyllenberg, D, Huttunen, J, Ristkari, T, Sillanmäki, L, & Sourander, A (2014). Criminal offending among males and females between ages 15 and 30 in a population-based nationwide 1981 birth cohort: Results from the FinnCrime study. *Journal of Adolescence*, *37*, 1269–1279. doi:10.1016/j.adolescence.2014.09.005
- Falk O, Wallinius M, Lundstrom S, Frisell T, Anckarsater H, Kerekes N (2013) The 1% of the population accountable for 63% of all violent crime convictions. *Social Psychiatry and Psychiatric Epidemiology*, Apr *49*: 559–71. DOI:10.1007/s00127-013-0783-y.
- Farrington, DP (2007). Origins of violent behavior over the life span. In DJ. Flannery, AT Vazsonyi & ID. Waldman (Eds.), *The Cambridge Handbook of Violent Behavior and Aggression 19–48* Cambridge University Press. doi: 10.1017/CBO9780511816840.003
- Fazel S, Baillargeon J (2011) The health of prisoners. *Lancet* *377*: 956–965. DOI:10.1016/S0140-6736(10)61053-7.
- Fossum S, Handegard BH, Martinussen M, Morch WT (2008) Psychosocial interventions for disruptive and aggressive behaviour in children and adolescents: A meta-analysis. *European Child & Adolescent Psychiatry* *17*: 438–451. DOI:10.1007/s00787-008-0686-8.
- Jahnukainen, M. (2004). Koulukodissa ja koulukodin jälkeen. Vuosina 1996 ja 2000 valtion koulukodeista kotiutettujen nuorten koulukotikokemukset ja jälkiseuranta vuoteen 2002. Aiheita 29/2004. Helsinki: STAKES.
- Kitinoja, M (2005). At the end of the road, a reform school. A study of the child welfare clienting and school history of children placed in reform schools. [At the end of the road, a reform school. A study of the child welfare clienting and school history of children placed in reform schools]. Helsinki: STAKES.
- Kuoppala, T, & Säkkinen, S (2012). Child welfare 2011. Statistical report. Statistical report 26, 2012. Helsinki: National Institute for Health and Welfare.
- Lehti V, Gissler M, Suvisaari J, Manninen M (2015) Induced abortions and birth outcomes of women with a history of severe psychosocial problems in adolescence. *European Psychiatry : The Journal of the Association of European Psychiatrists* *30*: 750–755. DOI:10.1016/j.eurpsy.2015.05.005.
- Lehto-Salo P, Närhi V, Ahonen T, Marttunen M (2009) Psychiatric comorbidity more common among adolescent females with CD/ODD than among males. *Nordic Journal of Psychiatry*: 1–8. DOI:10.1080/08039480902730615.
- Lehto-Salo, P (2011). The placement on a reform school – The second chance for an adolescent? [koulukotisijoitus – nuoren toinen mahdollisuus?]. Dissertation thesis. Jyväskylä: Jyväskylä University.
- Manninen, M, Lindgren, M, Huttunen, M, Ebeling, H, Moilanen, I, Kalska, H, et al. (2013). Low verbal ability predicts later violence in adolescent boys with serious conduct problems. *Nordic Journal of Psychiatry*, *67*, 289–297. doi:10.3109/08039488.2012.738245 [doi]
- Manninen M, Lindgren M, Therman S, Huttunen M, Ebeling H, Moilanen I, Suvisaari J (2014) Clinical high-risk state does not predict later psychosis in a delinquent adolescent population. *Early Intervention in Psychiatry* *8*: 87–90. DOI:10.1111/eip.12045.
- Manninen M, Pankakoski M, Gissler M, Suvisaari J (2015) Adolescents in a residential school for behavior disorders have an elevated mortality risk in young adulthood. *Child and Adolescent Psychiatry and Mental Health* *9*: 46. DOI:10.1186/s13034-015-0078-z.
- Manninen M, Therman S, Suvisaari J, Ebeling H, Huttunen MO, Joskitt L, Kalska H, Marttunen M, Moilanen I (2010) Psychiatric symptoms and their recognition in adolescents institutionalized for behavior problems. *Psychiatria Fennica* *41*: 111–129.
- Manninen M, Therman S, Suvisaari J, Ebeling H, Moilanen I, Huttunen M, Joukamaa M (2011) Alexithymia is common among adolescents with severe disruptive behavior. *Journal of Nervous and Mental Disease* *199*: 506–9. DOI:10.1097/NMD.0b013e318221428100005053-201107000-00013.

- Manninen, M (2013). Koulukotiin sijoitettujen nuorten psykiatrisen oirekuva ja ennuste [Reform school adolescents: Psychiatric symptoms and prognosis]. Dissertation Thesis. Helsinki: University of Helsinki.
- McGuire J (2008) A review of effective interventions for reducing aggression and violence. *Philosophical Transactions of the Royal Society of London – Series B: Biological Sciences* 363: 2577–2597. DOI:10.1098/rstb.2008.0035.
- Moffitt TE (1993) Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychology Review* 100: 674–701. DOI:10.1037/0033-295X.100.4.674.
- Närhi V, Lehto-Salo P, Ahonen T, Marttunen M (2010) Neuropsychological subgroups of adolescents with conduct disorder. *Scandinavian Journal of Psychology* 51: 278–284. DOI:10.1111/j.1467-9450.2009.00767.x.
- Piquero AR, Schubert CA, Brame R (2014) Comparing official and self-report records of offending across gender and race/ethnicity in a longitudinal study of serious youthful offenders. *Journal of Research in Crime and Delinquency* 51. DOI:10.1177/0022427813520445.
- R Core Team. (2014). R: A language and environment for statistical computing. Available from <https://www.r-project.org/>. [05/10, 2016]
- Rocque, M, Posick, C, & Hoyle, J (2015). Age and crime. The Encyclopedia of Crime and Punishment. John Wiley & Sons, Inc. doi:10.1002/9781118519639.wbecpx275
- Savolainen J, Hurtig T, Ebeling H, Moilanen I, Hughes L, Taanila A (2010) Attention deficit hyperactivity disorder (ADHD) and criminal behaviour: The role of adolescent marginalization. *European Journal of Criminology* 7: 442–459. DOI:10.1177/1477370810376568.
- THL. (2014). Child welfare 2013. Available from <http://www.thl.fi/en/web/thlfi-en/statistics/statistics-by-topic/social-services-children-adolescents-and-families/childwelfare>. [02/26, 2015]
- Toivola, P (1987). Koulukotinuorten seurantatutkimus. 1980–1982 kotiutetut oppilaat. Sosiaalihuollituksen julkaisuja 20/1987. Helsinki: Valtion Painatuskeskus.
- Vincent, GM, Odgers, CL, McCormick, AV, & Corrado, RR (2008). The PCL: YV and recidivism in male and female juveniles: A follow-up into young adulthood. *International Journal of Law and Psychiatry*, 31, 287–296. doi:10.1016/j.ijlp.2008.04.012
- Wilkinson S, Waller R, Viding E (2016) Practitioner review: Involving young people with callous unemotional traits in treatment – Does it work? A systematic review. *Journal of Child Psychology and Psychiatry, and Allied Disciplines* 57: 552–565. DOI:10.1111/jcpp.12494.

Address correspondence to: Manninen Marko, Mental Health Unit, National Institute for Health and Welfare, Mannerheimintie 166, Helsinki 00271, Finland.
E-mail: marko.manninen@thl.fi