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Looked after children in prison as adults: Life adversity and neurodisability

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1 **Looked After Children in prison as adults: Life adversity and**

2 **neurodisability**

3 **Abstract**

4 *Purpose.* Looked After Children (LAC) are criminalised at 5 times the rate of children in the

5 general population. ~~Evidence suggests that c~~Children in contact with both child welfare and

6 child justice systems have higher rates of neurodisability and substance use problems, and

7 LAC in general have high rates of school exclusion, homelessness, and unemployment. We

8 aimed to understand whether these factors persist in LAC who are in prison as adults.

9 *Methodology.* Administrative data collected by the Do-IT profiler screening tool in ~~HMP~~

10 ~~Parc (a prison in~~ Wales, UK~~)~~ were analysed to compare ~~adults in prison~~sentenced prisoners

11 who were LAC (n=631) to ~~adults in prison~~sentenced prisoners who were~~n't~~ ~~never~~ LAC

12 (n=2,201). The sample comprised all prisoners who were screened on entry to prison in a

13 two-year period.

14 *Findings.* ~~Adults in prison~~Prisoners who were LAC scored more poorly on a functional

15 screener for neurodisability (effect size = 0.24), and on four self-report measures capturing

16 traits of dyslexia (0.22), attention-deficit hyperactivity disorder~~ADHD~~ (0.40), autism

17 spectrum disorders (0.34), and developmental co-ordination disorder (0.33). ~~Adults in~~

18 ~~prison~~Prisoners who were LAC were more likely to have been to a Pupil Referral Unit (0.24),

19 have substance use problems (0.16), be homeless or marginally housed (0.18), and be

20 unemployed or unable to work due to disability (0.13).

21 *Originality/Value.* This study uniquely contributes to our understanding of prisoners who

22 were LAC as a target group for intervention and support with re-integration into the

23 community upon release. LAC in prison as adults may require additional interventions to help

24 with employment, housing, and substance use. Education programmes in prison should

25 screen for neurodisability, ~~in order to~~to develop strategies to support engagement.

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Introduction

30   Looked After Children (LAC) are defined in the United Kingdom under the Children

31 Act of 1989 as children whom the local authority provides with accommodation for 24 hours

32 or more, and children who are subject to a care or placement order. The most common reason

33 for children becoming LAC is being identified as at risk of abuse or neglect, but other reasons

34 also include absent parenting, family in acute stress, and family dysfunction (DfE, 2019). A

35 2018 report indicates that LAC are five times more likely to be criminalised than the general

36 populationLAC who have been in care for at least 12 months are five times more likely to be

37 criminalised than children in the general population (DfE, 2018a). The reasons for this are

38 complex but include frequent police presence in residential care homes for issues that would

39 not normally warrant police intervention in domestic homes (Shaw, 2016). LAC are also at

40 greater risk of criminal exploitation (i.e. the coercion or manipulation of a child into criminal

41 activity) by adult gangs, who utilise vulnerable children to shield themselves from

42 prosecution (Baidawi et al., 2020). It is also well established in the literature that

43 experiencing Adverse Childhood Experiences (ACEs), which LAC are exposed to at

44 disproportionate rates, is associated with later contact with the criminal justice system and

45 that this effect is cumulative; experiencing multiple ACEs increases risk exponentially (Testa

46 et al., 2022). The 'Stress Proliferation Model' offers an explanation for this association,

47 positing that stress begets stress over the lifetime, and thus early exposure to ACEs increase

48 risk of a range of problematic circumstances such as low socio-economic status, health-

49 related stressors, stressful relationships, and maladaptive coping strategies, all of which

50 increase vulnerability to later justice system contact and other negative life course outcomes

51 (see Pearlin et al., 2005 for a full discussion).

52   While the number of LAC ending up in contact with the criminal justice system in the

53   UK is decreasing - 15% of ~~care leavers~~children in residential care homes were formally

54   criminalised in 2014, compared to 10% in 2018 (The Howard League for Penal Reform,

55   2019), it is still considerably higher than children in the general population - 0.5% of children

56   in 2018/19 (YJB and MoJ, 2020). This follows significant advocacy and policy attention over

57   the last five years. In 2016, the Howard League for Penal Reform launched a 'Programme to

58   end the criminalisation of children in residential care' (2016), and in 2018 the Department for

59   Education, the Home Office, and the Ministry of Justice launched the 'National protocol on

60   reducing criminalisation of looked after children and care leavers' (2018). However, despite

61   this increased policy attention for this vulnerable group of children, little attention has been

62   paid to the population of adults in prison who were LAC. The legacy of these high

63   criminalisation rates is evident as 24% of adult male prisoners are reported to have been

64   Looked After Children (MoJ, 2012), despite LAC constituting about 0.7% of the general

65   population (NSPCC, 2021). It is important to understand the specific challenges faced by this

66   group, in order to direct resources and interventions to avoid cyclical justice system contact,

67   and support rehabilitation and community reintegration.

68   **Neurodisability and Special Educational Needs.** LAC in the general population

69   have higher levels of neurodisabilities (Ogundele, 2020) and special educational needs (SEN)

70   (DfE, 2019) – which is an umbrella term, incorporating formal diagnoses of neurodisabilities,

71   other disabilities and learning difficulties, as well as 'social, emotional, and mental health'

72   ~~(SEMH)~~ needs. Neurodisability is also an umbrella term, encompassing several

73   neurodevelopmental conditions. These include (but are not limited to) Dyslexia, Attention-

74   Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), and

75   Developmental Co-ordination Disorder (DCD) (also known as Dyspraxia). A study of 80

76   LAC found that 70% had one or more neurodisability, compared with a prevalence of 15% in

77   the general population (Ogundele, 2020). The causes of neurodisability are complex and

78   varied, but include genetics, prenatal substance use, birth trauma, infection, injury, and

79   nutritional deprivation (Patel *et al*., 2011). Whilst the resultant presentation is heterogeneous,

80   neurodisabilities frequently result in impairments in key developmental domains: cognition,

81   memory, social and communication skills, attention and concentration, emotion regulation,

82   impulse control, and physical motor skills. Neurodivergence and neurodiversity are terms

83   often used interchangeably with neurodisability, but in this instance we choose the term

84   neurodisability to elicit the social model of disability (Oliver, 1983; Oliver, 1990). Individual

85   or medical models of disability place the locus of the problem within the disabled person,

86   whereas social models of disability locate the problem within the systems the disabled person

87   is navigating, which are frequently inaccessible and inappropriate. Those given the label of

88   '~~SEMH~~ social, emotional, and mental health' are at particular risk of permanent school

89   exclusion (Timpson, 2019), and often have high rates of neurodisabilities including

90   ~~d~~Dyslexia and ADHD but importantly don't receive appropriate screening (Regan, 2010;

91   Clegg *et al*., 2009) as the focus tends to lie on 'disruptive behaviours' rather than the

92   underlying drivers of this. In 2019, 56% of LAC had a SEN, compared to 15% of those who

93   aren't LAC (DfE, 2019).

94   **School Exclusion.** Children with SEN are over-represented in school exclusions. In

95   2016/2017, 47% of all permanent exclusions were children with SEN, despite children with

96   SEN representing only 14% of the general school population (Timpson, 2019; DfE, 2018b).

97   LAC are more than five-times more likely to be excluded from school (Timpson, 2019).

98   Children who are excluded from mainstream school in the UK spend time in Alternative

99   Provision settings, which are frequently Pupil Referral Units (PRUs). Children in PRUs often

100   have poor outcomes in terms of employment, educational attainment, and later contact with

101   the criminal justice system (DfE, 2018b). These interactions build a picture of cumulative

102   adversity for children in the care system, having levels of neurodisability, and at inflated risk

103   of school exclusion.

104   **Crossover Children.** In general, outcomes for 'crossover' children involved in both

105   child justice and child welfare systems are more negative than outcomes for children

106   involved in only one system (Herz *et al*., 2012). Instability in placements is a factor strongly

107   linked to poor psychosocial outcomes for LAC, compounding feelings of rejection, and

108   impacting on educational attainment, criminalisation, and poor physical and mental health

109   (Staines, 2016; The Howard League for Penal Reform, 2016). There is sparse literature

110   exploring rates of neurodisability amongst crossover children. However, in 2021, an

111   Australian study of 300 crossover children aged 10-21 found that 48% had an identified

112   neurodisability (Baidawi and Piquero, 2021). A key limitation of that study is that identified

113   neurodisability was found using a record search – which is likely to be an under-

114   identification, as this requires a formal diagnosis. To address this, the current study utilises

115   data from the Do-IT profiler screening tool (Kirby, 2016) for neurodisability. No current

116   evidence exists, to our knowledge, exploring the characteristics of adults in prison who were

117   LAC.

118   In addition to high levels of neurodisability, crossover children have vulnerability to

119   substance use problems (Simkiss, 2012), which has been linked to neurodisabilities including

120   ADHD in prison populations (Gonzalez *et al*., 2017). There is a high association between

121   criminal justice system involvement and substance use (Bennett *et al*., 2008), and those in

122   prison with substance use problems face complex challenges when reintegrating back into the

123   community (Visher *et al*., 2004).

124   **Multidimensional Life Adversity.** In general populations it is known that adults who

125   were previously LAC have high levels of homelessness and unemployment (Tyler and

126 Melander, 2010). Glover and Clewett (2011) reported that LAC in custody received

127 insufficient support in finding suitable and stable living accommodation when released. This

128 then was a significant contributor to a lack of engagement with other services, and eventual

129 reoffending. Homelessness and unemployment are inextricably linked, as are homelessness

130 and disability which renders people unable to work (Steen *et al.*, 2012). Unemployment is

131 also linked to educational disruption (Sutherland and Eisner, 2014), which LAC are

132 vulnerable to as discussed above.

133   Viewpoints that consider broad sociological perspectives and the interactions of all

134 these above factors are important in understanding the multidimensional risk of

135 criminalisation and the appropriate policy response (Berridge, 2006). These multidimensional

136 adversities are a key area for intervention, to ensure successful community reintegration on

137 release from custody for crossover children. These relationships haven't yet been explored in

138 crossover children who are now in the adult secure estate, and this is an aim of the current

139 study. This could elucidate key targets for rehabilitation for crossover children who have

140 'grown up' in contact with the justice system. As justice system contact is criminogenic,

141 these children may have been caught in cyclical 'revolving door' justice system contact and

142 therefore still be in the secure estate as adults, with the same psychosocial needs (McAra and

143 McVie, 2010).

144 **The Current Study.** The current study aimed to assess whether adults in prison who

145 had been LAC have higher levels of neurodisability, as screened for by the Do-IT profiler. It

146 is important to note here that the measure of LAC in the Do-IT profiler only asks whether the

147 individual has ever been fostered or adopted, so only captures a subset of LAC. We refer to

148 this group as LAC in this manuscript, but note that the group may not capture those who

149 spent time in residential care homes but were never fostered or adopted. This study expands

150 on existing literature which has so far relied on record searching (which can be an

151 underestimate as it relies on diagnostic thresholds being met and screening taking place

152 reliably) and to our knowledge has only studied children and young people in the justice

153 system (rather than adults). In addition, we aimed to establish whether adults in prison who

154 had been LAC were more likely to have lifelong psychosocial vulnerabilities including being

155 referred to a PRU as a child, substance use, unemployment, and homelessness, compared to

156 those who were never LAC. It is also important to note that our data are cross-sectional and

157 may be confounded by variables not captured here (such as socio-economic status and

158 educational attainment); as such we did not aim to infer causality from our findings. We

159 aimed instead to produce normative rates of comorbidities in the LAC versus non-LAC adult

160 prison population.

161 **Method**

162 **Data.** Administrative screening data from HMP Parc (a male ~~institution~~ prison in

163 Wales, UK) were analysed. 3544 adult male prisoners completed the Do-IT profiler during

164 2017 and 2018 as part of usual practice during the first six weeks in prison. Prisons screen

165 individuals with the Do-IT profiler to collect background information about individual

166 vulnerabilities (e.g. substance use), and to identify deficits and strengths in functional skills

167 that may impact engagement with education. 413 individuals were removed from the analysis

168 as they were being held on remand, and so had not been convicted of a crime. 299 individuals

169 had missing data in one or more variables. Those who had missing data made up <10% of the

170 sample, and did not significantly differ on age, which was the only administrative variable

171 collected for all respondents (Welch's t = -0.035, Cohen's d = -0.002, p = .972, missing mean

172 age = 32.4, non-missing mean age = 32.2). See supplementary material for more information

173 about individuals with missing data. They were removed listwise, so the final sample

174 comprised 2832 convicted adult males.

175   **Ethics.** Ethical approval for this study was granted by the HMPPS National Research

176   Committee (NRC) and the University of Exeter Department of Psychology Research Ethics

177   Committee. Permission to analyse the data was granted by HMP Parc as data controllers.

178   Participants provided consent for their anonymised data to be used for research, and this is a

179   routine part of the screening process.

180   **Measures.** The Do-IT profiler (Kirby, 2016) is a computerised screening tool, divided

181   into modules which can be completed at once or at different time points depending on

182   concentration and time available. Optional accessibility features are built into each module,

183   including the ability to change the text and background colour, and the option to have each

184   question read aloud. A member of prison staff was present to help with completion if any

185   problems were encountered.

186   Participants completed the following modules:

187   ***About Me (Demographics and Background Information).*** This is a self-report

188   module comprising questions about conviction status, ethnicity, gender, and being a LAC

189   ('Have you ever been fostered or adopted?'). It asks whether the individual has experienced

190   substance use problems ('yes' or 'no'), what their employment status was before coming to

191   prison (with drop-down options including but not limited to 'self-employed', 'unemployed',

192   'employed full-time', 'employed part-time'), and whether they have ever attended a PRU

193   ('yes' or 'no').

194   It also includes questions about housing - 'What were your living arrangements before

195   coming to prison?' with drop-down answers (including but not limited to 'Homeless',

196   'Supported Accommodation', and 'Living Independently (with or without others)' and the

197   option to enter a free-text description of living arrangements if preferred. In recognition of

198   the fact that those housed 'marginally' in unstable living situations have similarly poor

199 outcomes in terms of mental health and substance use to those who are 'literally' homeless,

200 and that these outcomes differ in the literature to those who are stably housed (Eyrich-Garg *et*

201 *al.*, 2008), we created a dichotomy - 'homeless or marginally housed' and 'stably housed'.

202 Those who self-reported unstable living conditions (such as 'sofa-surfing' or 'staying with

203 friends') were classed as being marginally housed. Respondents can select 'prefer not to say'

204 for any question in this module.

205 **K***nowledge and Skills Screener (K**ASS).* KASS comprises 42 items assessing

206 transdiagnostic functional skills in domains relevant to everyday life. The items are multiple

207 choice, and the correct answer receives a score of 1 whilst all other answers receive a score of

208 0. Higher scores therefore indicate better functional skills. The maximum score is therefore

209 42. Example questions include: 'Click on the clock which is showing 8:25' accompanied by a

210 selection of analogue clocks, and 'Which coin is worth the least?' accompanied by a selection

211 of coins.

212 *How I Learn.* This module includes 60 self-report items, which are divided into four

213 subscales. These broadly represent difficulties indicative of the spectrums of dyslexia, ASD,

214 ADHD, and DCD. Example questions include 'I find it hard to read aloud' (dyslexia), 'I find

215 it hard to make direct eye contact with people' (ASD), 'I get distracted easily' (ADHD), and

216 'I often knock into people or things' (DCD). Responses are on a Likert Scale where 1 = Very

217 like me, 2 = A bit like me, 3 = Not really like me, and 4 = Not like me at all. Each scale is

218 therefore scored out of 60, with low scores reflecting self-assessed difficulties in that domain.

219 These measures have not been validated against traditional diagnostic criteria, as the

220 philosophy of the screening tool is to be transdiagnostic. This includes rejecting the medical

221 model of diagnostic threshold criteria, in favour of a transdiagnostic functional needs

222 assessment. The Do-IT assessments were developed in collaboration with forensic

223   psychologists and prison services to ensure their practical utility in prison populations who

224   typically have complex, multifaceted profiles of need (see Kirby, 2016; Kirby and Saunders,

225   2015), and have been used in other published studies of justice-involved samples (e.g. Kirby

226   *et al*., 2020).

Analysis

228   Welch's t-tests (with Cohen's d effect sizes) were used to compare prisoners who

229   were LAC to prisoners who were not LAC in all continuous variables (age, KASS Score, and

230   the four 'How I Learn' scales). Chi-Square tests (with Cramer's V effect sizes) were used to

231   compare LAC to non-LAC in categorical or binary variables. Significance was reported at p

232   < 0.001. According to Cohen (1992), d >0.2 indicates there is a small effect size, d >0.4 a

233   medium effect size, and d >0.6 a large effect size. Cramer's V can be interpreted as V >0.1

234   indicates a small effect size, V >0.3 a medium effect size, and V >0.5 a large effect size

235   (Cramer, 1946). However, more recent literature indicates that these are high thresholds with

236   which to define effect size groups, particularly in social research, (Lovakov and Agadullina,

237   2021) and this is reflected in our interpretation of results. In addition, prison populations are

238   relatively homogenous compared to the general population in terms of negative life outcomes

239   and neurodisability, so any differences found have potentially important implications for this

240   group of prisoners.

Results

242   22% of prisoners self-reported having been LAC. Table I shows characteristics of

243   those who were LAC and those who were not. We found that adults in prison who were LAC

244   were more likely to have been homeless or marginally housed before coming to prison (38%

245   of LAC compared to 20% of non-LAC), more likely to have substance misuse problems

246   (50% of LAC compared to 32% of non-LAC), and more likely to have been referred to a

247 PRU as a child (49% of LAC compared with 22% of non-LAC). LAC in prison as adults

248 were different to prisoners who were not LAC in employment before prison – higher

249 proportions of LAC were unemployed (40 % of LAC compared with 33% of non-LAC) or

250 unable to work due to illness or disability (19% of LAC compared to 13% of non-LAC)

251 compared to prisoners who were not LAC. Cramer's V sizes for these comparisons ranged

252 from 0.13 to 0.24. LAC in prison also differed from prisoners who were not LAC in ethnicity

253 – a higher proportion of LAC were White British/White European, but this effect size was

254 very small. Adults in prison who were LAC scored worse than those who were never LAC in

255 the KASS functional screener, and the four domains of the How I Learn measure (indicative

256 of traits of dDyslexia, ASD, ADHD, and DCD). Cohen's D effect sizes here ranged from

257 0.22 to 0.40. We confirmed that these results weren't confounded by age (as LAC are on

258 average only two years older) or ethnicity (as the percentage of LAC who are White is only

259 three percentage points higher than non-LAC) by comparing adjusted and unadjusted models

260 (see supplementary material).

261 *[Table I here]*

262

263 **Discussion**

264 Despite the homogeneity of prison populations compared to general populations in

265 life outcomes, we found meaningful differences between prisoners who were LAC and

266 prisoners who were never LAC. Prisoners who had been LAC were more likely to have spent

267 time in a PRU. This indicates that education settings have been inappropriate or inaccessible

268 for these individuals in the past, or they may not have been properly screened to identify

269 functional difficulties associated with neurodisability. Our comparison indicates higher levels

270 of neurodisability in LAC in prison as adults compared to those who were never LAC, in line

271   with emerging literature which indicates that children in contact with both child welfare and

272   child justice courts have elevated levels of neurodisability (Baidawi and Piquero, 2021). LAC

273   were more likely to be unemployed or be unable to work due to illness or disability.

274   Interventions in prison focussed on future employment after prison will be particularly

275   important for this group, as employment is a key factor in preventing cyclical re-offending

276   (MoJ 2013). They were also more likely to have problems with substance use, and more

277   likely to be homeless or marginally housed, indicating that providing substance use

278   rehabilitation programs and housing support is also key in wrap-around support for LAC in

279   prison as adults.

280   These differences are also likely an under-estimation of true differences between

281   these groups as prisoners who spent time in residential care were excluded from the LAC

282   sample. Children in residential care may have more complex needs relative to other LAC

283   who have been fostered or adopted. For example, they may enter care for behavioural reasons

284   (rather than maltreatment being the primary reason), have poorer academic outcomes, be

285   subject to more instability in care placements, and be older at the point of entry to care (Trout

286   et al., 2008; Baskin & Sommers, 2011; Ryan, 2012). We therefore recommend that prisons

287   collect more robust and detailed data regarding looked-after status of prisoners in future

288   which is inclusive of residential care to support future research into this group.

289   **Implications.** These findings are important, as they indicate that there are a high

290   proportion of LACs in prison as adults, who are a particularly vulnerable group that may

291   require higher levels of support with re-integration into the community. This includes

292   additional support with housing, employment, and substance use problems. LAC may also

293   require specialist, multi-agency intervention in prison education settings, to provide support

294   for challenges to learning created by neurodisability. Holistic, rather than siloed approaches

295   to screening and intervention inside prison and on release could be better equipped to support

296   individuals with a very complex picture of adversity. Whilst significant efforts are currently

297   being made currently to reduce the criminalisation of LACs, it is important to also allocate

298   resource to support adults in prison who were in contact with the social care system as

299   children. We have found evidence that they are a vulnerable group within prisons, and

300   additional support with rehabilitation could reduce cyclical, repeat contact with the justice

301   system, as well as providing social support that may have been missing when they were

302   children.

303   Additionally, these findings have implications in broader justice-system settings,

304   including in court and in community justice rehabilitation programmes. The Risk – Need –

305   Responsivity (RNR) model of assessment and rehabilitation of people in contact with the

306   justice system identifies three core principles (Bonta & Andrews, 2007). First, risk: matching

307   the level of service to the individual's risk of reoffending. Second, need: assessing

308   criminogenic needs and targeting them in treatment. Finally, responsivity: maximising

309   efficacy of rehabilitative interventions by tailoring the intervention to the learning style and

310   specific needs of the individual. Neurodisability represents a responsivity factor that could

311   impact the efficacy of community justice interventions (such as restorative justice sentences).

312   If not properly identified and responded to, this could hinder efficacy of the programme and

313   increase risk of reoffending. Understanding whether an individual is a LAC in these contexts

314   could also therefore provide insight into complex needs and challenges which will inform the

315   responsivity element of interventions.

316   **Limitations.** Self-report measures have natural limitations. By their nature, they rely

317   on insight, attention, and choice to report from the individuals. This could impact our

318   findings, particularly for sensitive measures such as substance misuse. However, it should be

319   noted that Schofield and colleagues (2011) found prisoners to be reliable survey respondents

320   when asked to self-report traumatic brain injury. Whilst every effort was made to ensure

321 completion was accurate, including the assistance of a prison staff member to improve

322 attention and understanding of questions, it is possible that falsely anticipated punishment for

323 substance use may have had an impact. When considering neurodisability we posit that the

324 combination of self-report measures (which provide insight into domains where the

325 individual perceives they are having difficulties) and functional screening measures (the

326 KASS, which assesses functional ability in a more objective manner) provides insight into the

327 level of neurodisability as well as its impact on the individual, however we accept that this

328 requires a level of insight into functional difficulties experienced. The measure of being a

329 LAC 'have you ever been fostered or adopted?' also has limitations. We might not capture

330 those who spent time in residential care homes but were never actually fostered or adopted,

331 so they may be missing from our LAC group. We also did not have a measure of the length of

332 time spent in care, so the LAC group in the current study is likely to be a very heterogenous

333 population – some may have been in care for short placements (e.g. emergency foster care),

334 and others may have spent years in care. Future research should seek to capture more

335 complete data about being a LAC.

336   Our findings are also drawn from cross-sectional data. We therefore present them as

337 correlational, rather than drawing any conclusions about causality. Like much research in the

338 field, uncontrolled confounders could account for the differences seen between adults in

339 prison who were LAC compared to those who weren't LAC. Factors like socio-economic

340 status could be distorting these effects, causing the measured LAC effect to be amplified.

341 Temporal order of variables isn't clear, as the data did not capture age at becoming a LAC,

342 age at referral to a PRU, and age at onset of substance misuse problems. We would

343 recommend longitudinal studies of education and justice data in future to disentangle the

344 temporal order of these relationships. Ascertaining the temporal order of these factors would

345   allow more complex modelling to assess which variables impact each other, and whether

346   pathways into prison differ for LAC, and those who were never LAC.

347   Finally, our sample was from a male prison. Exploring these relationships in female

348   prisons is also important, as women in prison have particularly high levels of adverse

349   childhood experiences, and this early life trauma could also contribute to negative outcomes

350   for female LAC (Friestad *et al*., 2014).

351   **Conclusion.** Adults in prison who were LAC are likely to have experienced multi-

352   dimensional life adversity, including school exclusion, substance use problems,

353   homelessness, and unemployment. They therefore should be a target group for intervention

354   and support with re-integration into the community upon release. LAC in prison as adults

355   also have indications of higher levels of neurodisability. This neurodisability may create

356   complex barriers to engagement in education in prison and contribute to cyclical

357   incarceration. Proper holistic assessment is key to understanding an individual's strengths and

358   weaknesses and designing multi-agency interventions. Reducing the criminalisation of LAC

359   is an essential focus of new policy, but we should additionally take care not to forget the LAC

360   who are currently in prison as adults in this paradigm shift away from punitive responses to

361   children in contact with the welfare system.

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Table I: Sample description, including test statistics for Welch's t-tests to compare outcomes on continuous variables for adults in prison who were LAC compared to those who were not LAC, and Chi-Square tests of independence to make this comparison for categorical or binary variables. Cohen's d and Cramer's V effect sizes are also provided for each comparison.

Variable		Total Sample Description (n = 2832)	Description of LAC (22.3%, n = 631)	Description of those who were not LAC (77.7%, n = 2,201)	Test Statistic comparing LAC with not LAC. (Cohen's d/Cramer's V Effect Size)
Age		M = 32.2 (SD = 11.4)	M = 32.7 (SD = 11.6)	M = 30.2 (SD = 10.5)	t = 5.12*** (d = 0.23)
Ethnicity	Asian or Asian British	3.4% (n = 96)	1.4% (n = 9)	3.9% (n = 87)	X^2 = 16.09*** (V = 0.075)
	Black African	2.5% (n = 71)	1.3% (n = 8)	2.9% (n = 63)	
	Black Caribbean	2.7% (n = 79)	2.7% (n = 17)	2.8% (n = 62)	
	Mixed	5.8% (n = 166)	6.8% (n = 43)	5.6% (n = 123)	
	White British/White European	85.5% (n = 2420)	87.8% (n = 554)	84.8% (n = 1866)	
PRU		28.2% (n = 800)	48.5% (n = 306)	22.4% (n = 494)	X^2 = 164.19*** (V = 0.24)
Homeless or Marginally Housed		24.3% (n = 688)	38.4% (n = 242)	20.3% (n = 446)	X^2 = 87.24*** (V = 0.18)
Substance Misuse		35.7% (n = 1012)	49.9% (n = 315)	31.7% (n = 697)	X^2 = 71.15*** (V = 0.16)
Employment Status Prior to Prison	Employed (full or part time)	22.7% (n = 643)	15.1% (n = 95)	24.9% (n = 548)	X^2 = 83.41*** (V = 0.13)
	Self-Employed	21.9% (n = 621)	18.1% (n = 114)	23.0% (n = 507)	
	Unable to work – illness or disability	14.5% (n = 410)	19.2% (n = 121)	13.1% (n = 289)	
	Unemployed	34.4% (n = 973)	40.1% (n = 253)	32.7% (n = 720)	
	Other	6.5% (n = 185)	7.6% (n = 48)	6.2% (n = 137)	
KASS Score		M = 36.1 (SD = 5.9)	M = 35.0 (SD = 6.7)	M = 36.5 (SD = 5.5)	t = 5.00*** (d = 0.24)
How I Learn	Dyslexia traits	M = 42.7 (SD = 7.6)	M = 41.4 (SD = 7.9)	M = 43.1 (SD = 7.5)	t = 4.81*** (d = 0.22)
	ASD traits	M = 42.5 (SD = 7.8)	M = 40.4 (SD = 7.8)	M = 43.1 (SD = 7.7)	t = 7.54*** (d = 0.34)
	ADHD traits	M = 41.5 (SD = 7.7)	M = 39.1 (SD = 7.6)	M = 42.1 (SD = 7.6)	t = 8.80*** (d = 0.40)
	DCD traits	M = 43.5 (SD = 7.6)	M = 41.6 (SD = 6.8)	M = 44.0 (SD = 7.8)	t = 7.61*** (d = 0.33)

Note: *** = p < .001

Lower scores on the KASS and How I Learn measures indicate poorer functional skills, and therefore higher levels of neurodisability. No comparison was made between prisoners who self-identified as male vs female, as cell counts would have been too small, revealing identifying information about individuals. Similarly, those who identified as White European have been combined with those who identified as White British, to avoid small cell counts.

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Supplementary Material

Supplementary table I: Results of linear and logistic regression models indicating association between each variable of interest and being a LAC, unadjusted and adjusted for age and ethnicity. This table indicates that observed differences between LAC and non-LAC groups were not confounded by age and ethnicity.

Dependent Variable		Unadjusted LAC Co-efficient (95% Confidence Intervals)	Adjusted LAC Co-efficient (95% Confidence Intervals)
PRU		1.18*** (0.99 – 1.37)	1.11*** (0.91 – 1.30)
Homeless or Marginally Housed		0.90*** (0.70 – 1.09)	0.87*** (0.68 – 1.06)
Substance Misuse		0.77*** (0.59 – 0.95)	0.75*** (0.57 – 0.94)
Employment Status Prior to Prison	Employed (full or part time)	Reference Category	Reference Category
	Self-Employed	0.26 (-0.04 – 0.56)	0.29 (-0.01 – 0.59)
	Unable to work – illness or disability	0.88*** (0.58 – 1.19)	0.98*** (0.67 – 1.29)
	Unemployed	0.71*** (0.45 – 0.97)	0.70*** (0.44 – 0.96)
	Other	0.70*** (0.31 – 1.10)	0.81*** (0.40 – 1.21)
KASS Score		-0.04*** (-0.05 - -0.03)	-0.04*** (-0.05 - -0.02)
How I Learn	Dyslexia traits	-0.03*** (-0.04 - -0.02)	-0.03*** (-0.04 - -0.02)
	ASD traits	-0.04*** (-0.06 - -0.03)	-0.04*** (-0.06 - -0.03)
	ADHD traits	-0.05*** (-0.06 - -0.04)	-0.05*** (-0.06 - -0.04)
	DCD traits	-0.04*** (-0.06 - -0.03)	-0.04*** (-0.05 - -0.3)

Note:
*** = $p < .001$

Supplementary table II: Number and characteristics of those removed from the sample for having missing data (n = 299).

Variable		Number of Individuals with Missing Data	Mean/n of individuals excluded for having missing data on other variables. n = 299 - n of missing on that variable.	Mean/n of non-missing (included in main sample) n = 2832
Age		0	M = 32.4 (SD = 10.33)	M = 32.2 (SD = 11.4)
Ethnicity	Asian or Asian British		NA - Low Cell Counts	3.4% (n = 96)
	Black African		7.4% (n = 14/187)	2.5% (n = 71)
	Black Caribbean	112	NA – Low Cell Counts	2.7% (n = 79)
	Mixed		NA – Low Cell Counts	5.8% (n = 166)
	White British/White European		82.8% (n = 155/187)	85.5% (n = 2420)
LAC		55	24.6% (n = 60/244)	22.3% (n = 631)
PRU		5	36.3% (n = 107/294)	28.2% (n = 800)
Homeless or Marginally Housed		29	40.0% (n = 108/270)	24.3% (n = 688)
Substance Misuse		127	38.9% (n = 67/172	35.7% (n = 1012)
Employment Status Prior to Prison	Employed (full or part time)		27.7% (n = 83/294)	22.7% (n = 643)
	Self-Employed		7.6% (n = 23/294)	21.9% (n = 621)
	Unable to work – illness or disability	5	19.7% (n = 59/294)	14.5% (n = 410)
	Unemployed		36.5% (n = 109/294)	34.4% (n = 973)
	Other		8.4% (n = 25/294)	6.5% (n = 185)
KASS Score		93	M = 34.1 (SD = 7.4)	M = 36.1 (SD = 5.9)
How I Learn	Dyslexia traits	93	M = 43.8 (SD = 8.1)	M = 42.7 (SD = 7.6)
	ASD traits	93	M = 41.7 (SD = 7.5)	M = 42.5 (SD = 7.8)
	ADHD traits	93	M = 40.4 (SD = 7.7)	M = 41.5 (SD = 7.7)
	DCD traits	93	M = 41.5 (SD = 6.8)	M = 43.5 (SD = 7.6)