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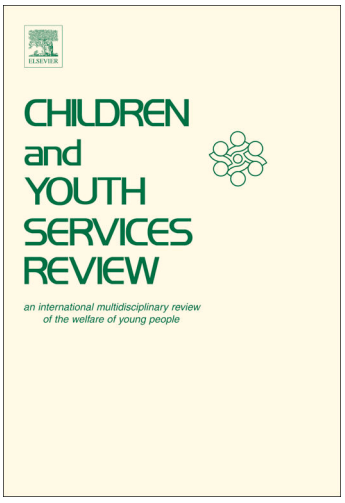

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Out-of-home care in childhood and socio-economic functioning in adulthood: ONS Longitudinal Study 1971-2011

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This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

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Abstract

Background

Children who spent time in non-parental care report poor outcomes in many aspects of their later lives on average, but less is known about differences by type of care. We examined whether socioeconomic, family, and living arrangements of adults who had been in non-parental care across the first three decades of adult life varied by type of care (residential, non-relative and relative).

Methods

We used longitudinal data from the Office for National Statistics Longitudinal Study (LS). Participants were aged<18 years and had never been married at baseline of each census year from 1971-2001 (n=242,843). Separately for each adult follow-up age (20 to 29; 30 to 39; 40 to 49), multi-level logistic regression models were used to compare socioeconomic, family, and living arrangements by different out-of-home care (OHC) experiences.

Results

Any OHC increased the likelihood of poorer functioning in the three domains of socioeconomic circumstances, family formation and relationships, and living arrangements. This was evident in participants' 20s, 30s and 40s; the most adverse outcomes were observed for those with a history of residential care, followed by non-relative OHC, and the least adverse outcomes for relative OHC. Moderation by childhood census year and gender altered the relationship between OHC and some, but not all, adult outcomes. The strongest, most consistent, evidence was for widening of inequalities in outcomes across childhood census years.

Conclusion

Enduring inequalities in social and economic functioning for OHC-experienced adults were found. The evidence supports the policy to place children in relative care whenever possible, with residential care the least favoured option.

Keywords: child; foster; care; longitudinal; socioeconomic; follow-up study; census

1. Introduction

Children in out-of-home care (OHC) are at higher risk of adverse outcomes later in life [1-18]. This includes outcomes such as poorer mental and physical health [1, 4, 5, 7, 9, 11], premature mortality [10, 15, 19-23], less education and lower qualifications [3, 4, 11, 13], unemployment and a more disadvantaged socioeconomic position [3, 4, 11, 24], unstable relationships and earlier family formation [2, 3, 6] and poorer living conditions [4, 14, 18].

1.1. Gaps in the literature

Less well known is whether disadvantage continues throughout adulthood since most prospective research examines outcomes at one stage in adulthood [4, 8, 11, 25, 26], with the immediate post care period [4, 27] or at best early adulthood [8, 11, 20, 25-27] predominating. Rare exceptions extend the follow-up period to mid adulthood [13, 24], but only cover a limited range of outcomes. Added to this limitation, three other themes emerge about gaps in the literature. First, sample sizes can be small [4, 28, 29] and nonprobability samples occasionally used [30], as are designs without a comparator group [4, 25, 30-32], or that rely on retrospective data [2, 3, 12, 33, 34]. The extent to which these sampling and design issues may bias conclusions is unknown. Second, covariates for even basic sociodemographic data in childhood are not always measured [4, 8, 20, 29, 31], prohibiting the ability to control for other factors associated with poorer adult outcomes. Third, type of OHC is not always considered and previous work suggests very different risks for adverse outcomes associated with disaggregated care types [7, 9, 10, 35, 36].

This analysis will address all three concerns. It uses the ONS Longitudinal Study (LS), the largest longitudinal data resource in England and Wales, which is broadly representative of the entire population. It is based on data collected in the England and Wales censuses, starting from the 1971 census. Holding information on approximately 1 million people over the 40 years of the study, the LS allows for robust research into subgroups of the population such as children in OHC using prospectively collected data. The design of the LS makes it possible to estimate models that include the basic social and demographic data that have been missing to date. With up to 40 years follow-up data on children in the LS, we can chart, amongst other factors, markers of adult functioning such as acquiring qualifications, getting on in work, finding a partner, establishing a family and providing a secure home.

1.2. Type of out-of-home care

Outcomes are consistently worse for children in OHC compared to children not in care [37, 38]. Possible explanations include residential care putting children, particularly young children, at risk of attachment disorder and developmental delays. A few studies have shown that children in residential care have more problems in adulthood than those fostered in private households [7, 35, 39], while those in relative households have fewer problems than those in non-relative foster care [27]. Various theories explaining these findings include minimisation of trauma through residing with kin [40] and more regular contact with a parent [41]. Since much of relative care 'goes under the wire' and is not known to social services [42], we separate OHC into i) residential care; ii) relative care (both formal and informal placements); and iii) non-relative care (both formal and more rarely informal fostering) and hypothesise that adult outcomes will differ systematically across the OHC types, with outcomes likely to be poorest for those who were in residential care.

1.3. Moderation effects

The size of the LS also makes it possible to examine hypotheses about moderation, which have hitherto been hampered by a lack of power and the inherent difficulty that small sample sizes

increase the probability of making a Type II error and rejecting a "true" moderating effect. We address three moderation questions suggested by the literature: i) have things improved more recently - consistent with changes in recommendations for placements in different types of OHC? and ii) are there gendered responses in adulthood to a history of OHC? Moderation by ethnicity or migration history is a complex issue which will be reported on separately [43].

1.3.1. Moderation by census year

We first observe children in OHC in April 1971. Prior to the Seebohm Report in 1968 [44], local government social services for children were spread between different departments, predominantly welfare, health and housing. Following publication of the report, social work services and social care provision for children were merged into social services departments. The establishment of these departments started in April 1971, making it unlikely that any will have been incorporated by the census date. However, the tragic death of Maria Cowell at the hands of her stepfather highlighted that there was still a serious lack of coordination within child protection services. The report from the subsequent inquiry led to the setting up of area child protection committees to coordinate decisions by agencies responsible for children's safety when at risk. This may have affected children observed in 1981. Following this, the United Kingdom's (UK's) 1989 Children Act recommended that placement priority be given to a child's extended relatives and friends. The Act came into effect in 1991, too early to have had an impact on OHC observed in the 1991 census. But since then new placements into residential care have decreased and placements into relative household care increased [45, 46], and outcomes for children in OHC in the 2001 census might be more beneficial for their long-term well-being. Therefore, it is important to gain some understanding of the potential long-term impact of changes in child protection legislation. This leads to the hypothesis that children will have more positive outcomes in adulthood if they are observed in OHC in more recent census years.

1.3.2. Moderation by gender

Some studies have shown gendered associations between care status and adolescent and adult outcomes [11, 41]. Others suggest that gendered adult functioning applies across the whole population and is not specific to those with a history of OHC [24]. One possible explanation for moderation by gender concerns gender differences in resilience, with girls more likely to be resilient to stressful circumstances than boys [18, 47-49]. Another explanation is that the nature and timing of transitions to adulthood differ for men and women and the risks associated with OHC may affect adult social functioning differentially via different transition patterns [50]. Overall, it seems that gender has not been the focus of most studies and reviews, possibly because of study limitations such as insufficient statistical power. Therefore, with our larger sample size, we propose the third moderation hypothesis – that there will be different patterns of functioning across a range of social outcomes for men and women.

1.4. The current study

The current study examines the impact of OHC on adult functioning in the domains of socioeconomic position, family formation and relationships, and living arrangements. Given the reliable data on the impact of OHC on multiple health outcomes, we hypothesised that OHC would increase the likelihood of poorer functioning in all three domains. Moreover, we expect outcomes to differ across placement type with the most adverse outcomes for those with a history of residential care and the least adverse outcomes for those with a history of relative OHC. Finally, we explore moderation by

childhood census year and gender, with the expectation that each will be shown to alter the relationship between OHC and adult outcomes.

2. Materials and methods

2.1. Data

The Office for National Statistics Longitudinal Study (LS) is a 1% representative sample of the population of England and Wales, drawn initially from respondents to the 1971 census who were born on one of four dates in the calendar year [51]. New members – newly born or immigrants - are added to the LS if they have the same four birth dates. Similar 1% samples have also been drawn from the 1981, 1991, 2001 and 2011 censuses. The 1971 census took place on 25th April, the 1981 census on 5th April, the 1991 census on 21st April and the 2001 census on 29th April. All were pen and paper questionnaires; the head of household completed a household questionnaire and all adults completed individual questionnaires. Information on the coverage and quality of the censuses is available elsewhere [52-57]. The LS has linked records for each census after LS members were first sampled to create a longitudinal dataset. Census data are also collected on the LS members' co-residents, but these are not linked and are cross-sectional only. LS members' data from birth, death and cancer registers have been added to the LS since 1971. Data from the questionnaires and birth register have been used here.

2.2. Inclusion and exclusion criteria

2.3. Main exposures

The main exposure was experience of non-parental care in childhood, taken from the 1971 to 2001 censuses.

2.3.1. Care type

For each census from 1971 to 2001, household grid and residential type data were used to classify dependent children as either: (1) living with a parent, (2) living with a relative > 18, (3) living with a non-relative family, or (4) living in residential care (a children's home or place of detention) on the respective census day. Those living in other types of communal establishment (e.g. hotel, hostel, hospital) at the time of the census were excluded from the sample. For the interaction analyses, non-parental care (types 2-4) were combined into an 'any care' category.

2.4. Outcomes

Social outcomes are taken from the 1981 to 2011 censuses. Hence, LS members from the 1971 have outcomes at 10-, 20-, 30- and 40-year follow-up whereas LS members from the 2001 census have outcomes at 10-year follow-up only. The outcome variables cover the domains of socioeconomic circumstances, family formation and relationships, and living arrangements.

2.4.1. Socioeconomic circumstances

There are four indicators of adult socioeconomic circumstances: qualifications; social class; current employment status; and long-term non-employed.

Highest qualification level was derived by ONS based on census questions on professional, vocational and academic qualifications. To harmonise across census years, we collapsed highest qualification

level into the categories 0: ≥18 years qualifications (A levels and equivalent or higher); and 1: <18 years qualifications.

Social class is measured using the 3-category version of the National Statistics Socioeconomic Classification (NS-SEC): Managerial/professional; Intermediate occupations; Routine occupations [58], plus a not known category if the LS member did not give sufficient details of their current or last held job to assign them to a social class.

Those who were ≥ 16 years old were asked if they were currently working and if not the number of years since last worked (census year 1991) or if they had no paid work in the last 10 years (2001-2002). From these responses, we derived the employment status and long-term non-employed variables.

Current employment status is a 4-category variable indicating whether the LS member was i) employed, ii) unemployed, iii) in education or iv) other (out of the labour force for reasons other than education) at the time of the census. *Long-term non-employed* (i.e. ≥ 10 years or not) was a binary variable taking the value 1 if long-term non-employed.

2.4.2. Living arrangements

Housing tenure indicates whether the home is owner occupied, rented, or other. *Overcrowding* was defined as a ratio > 1.5 of the number of persons in the household to the number of rooms. *Living alone* is a binary indicator derived from questions on household composition.

2.4.3. Family formation and relationships

Legal marital status is defined as i) married, ii) divorced/widowed, iii) single. The 1971-1991 censuses instructed separated respondents to choose married or re-married categories; information on cohabiting is only available from 2001. For women only, the LS is linked to the Births Registration form, from which *teenage mother* (age at first child < 20) and *number of children* was derived. *Number of children* was categorised into 0, 1-2, 3+ children.

2.5. Covariates

2.5.1. Demographic variables

Age, in years, and *gender* (0 male; 1 female) were taken from the census in which the LS child was identified. Childhood census year identifies which census the LS member was observed (0: 1971; 1: 1981; 2: 1991; and 4: 2001).

Ethnicity was grouped into 0 White; 1 Black; 2 South Asian; and 4 Other. Information on ethnicity is only available from 1991, so for LS children in the 1971 and 1981 censuses, ethnicity was extrapolated from their responses in later censuses. A 5th category (not known) was added where this could not be defined due to loss to follow-up, or no ethnicity information being provided.

2.5.2. Country of birth

Information from a census question on *country of birth* was dichotomised to create a variable indicating whether LS children were born in the UK or elsewhere.

2.5.3. Childhood socioeconomic variables

Data on the socioeconomic environment in childhood was only available for children observed in a private household. If children were observed in residential care, an extra category indicated that data were missing.

Head of household (HoH) social class was measured using the 3-category version of the NS-SEC described above. *Educational level* identified whether the HoH had 18+ years qualifications or not, as above. *HoH employment* indicated if they were currently in work or not. *HoH marital status* was collapsed into 2 categories: legally married or not.

2.6. Analyses

Data from census years 1971 to 2001 were pooled and linked to follow-up records from 1981 to 2011. The distribution of LS members' childhood characteristics in the analytical sample was compared with i) all available data, ii) all complete childhood data; iii) incomplete childhood data, and iv) data for those with missing follow-up data. Details are shown in online Supplementary table S1. The distribution of the variables in the complete case sample are very similar to that in the full data sample, apart from childhood census, HoH marital status and HoH employment status. The majority of the childhood census differences can be explained by missing follow-up date due to linkage failures and by study design, neither of which are associated with attributes of the LS child or their family. There were more LS members in the analysis sample where the HoH was married and in employment than in the full sample.

Supplementary table S2 shows the data pattern for each follow-up age group. Missing by design is relevant for the 1991 and 2001 childhood census years. The non-systematic patterns of missing data indicate linkage problems for some census years. For example, there are more children in the 1971 census who are lost to follow-up after their 20s than expected. Non-response is more evident among those with a history of non-parental care than parental care. There were no cases where there was no follow-up data at all.

The sociodemographic characteristics of children in parental care, relative care, non-relative care and residential care were compared using chi-square tests or ANOVA, as appropriate. Multiple exposure models were fitted as parallel regression models that allowed for 1 or two census records in childhood with outcomes measured when they were aged 20-29 years, 30-39 years and 40-49 years old. Models estimated the main effect of care type with outcomes separately for each adult age-group. All models controlled for child gender, age at childhood census, ethnicity, and HoH qualifications, marital status, social class and employment status.

The coefficients from the models were used to estimate adjusted predictions (probabilities) for each outcome. assuming all covariate values are at the mean. The difference between the adjusted predictions associated with being in care and the adjusted predictions associated with not being in care are known as marginal effects at the means (MEM).

We then repeated the models combining care-type into a binary 'any care' (vs not) variable before estimating 2 interaction models: care by childhood census and care by gender. MEM for these models were also calculated.

A first sensitivity analysis replaced HoH qualifications, marital status, social class and employment status covariate values for children in care by HoH qualifications, marital status, social class and employment status covariate values when they lived with a parent or family member (when known). Replacement of the HoH covariates was carried out as follows: i) priority was given to values from the previous census otherwise a subsequent census's values were used; ii) priority was given to

values if living with a parent, otherwise kinship care covariates replaced values for foster care and residential care. Intergenerational and intragenerational transmission of socioeconomic conditions suggest that kinship care covariates are a good proxy for parental care covariates [59, 60].

A second sensitivity analysis selected households where there was no parent in work as the reference group since children in care are more likely to be from a disadvantaged family and to be living with a more disadvantaged family while in care [61, 62].

3. Results

In total, there were 348,924 observations from 242,843 individuals (table 1). Around 1.45% of children in the sample were in care for one or more observations. In table 2, the observations are divided up by type of care and follow-up at different ages in adulthood. On average, care type observations split into 99.0% in parental care, 0.47% in relative care, 0.34% in non-relative care and 0.19% in residential care.

Table 3 shows the distribution of children's sociodemographic characteristics by care type, averaged over all observations. All characteristics varied across care types. However, note that childhood census counts cannot be interpreted simply because they are affected by follow-ups missing by design, non-response, and linkage problems.

The main findings are that boys were overrepresented in residential care while girls were more often seen in unrelated care and children in non-parental care were older on average than children in parental care; more often born outside the UK; Black ethnic groups were more commonly in non-parental care and South Asian ethnic groups in relative care than other ethnic groups; and the HoH for children in non-parental care was more socially disadvantaged (characterised by being single, divorced or widowed, in a less privileged social class, without age 18+ qualifications and non-employed).

The relationship between care type in childhood and social outcomes, averaged over all observations, is presented in table 4. All the outcomes varied across care type, with those who had not been in OHC having the best outcomes and those who had been in residential care the poorest outcomes. In the next section, these differences are examined more systematically by modelling the relationship between OHC and adult outcomes after controlling for their childhood sociodemographic characteristics observed.

3.1 Age 20-29 outcomes

Findings (predicted probabilities) at 20-29 years' follow-up are detailed in table 5, panel 1 (model coefficients in supplementary table S3). Overall, the results show a graded impact of non-parental care such that residential care was associated with the poorest social outcomes and relative care the least poor outcomes compared with those who had been with their parent(s) in childhood. Key socioeconomic findings are that few of those who had been in residential care were predicted to have 18-year qualifications in early adulthood (93% with <NVQ 3; 95% CI 90, 95); over a quarter were predicted to be unemployed and had a 35% probability of being out of the labour market for reasons other than education (95% CI 31, 40); a 400% increased chance of long-term unemployment; and almost a 50% probability of being in a routine social class (47%; 95% CI 42, 52).

Non-parental care-experienced adults in their 20s had less stable living arrangements: they had a higher probability of renting than those in relative care, 43% (95% CI 40, 46) rising to 63 (95% CI 59, 67) risk if in residential care compared with being in parental care (35%, 95% CI 35, 35). Those who had been in residential care were particularly at risk of having "other" living arrangements, such as

"sofa-surfing", or in communal establishments such as hostels, hospitals, and prison (12%; 95% CI 9, 14). The probability of living in overcrowded accommodation or alone were also higher for those who had been in non-parental care, rising from 5% (95% CI 4, 6) for relative care experiences 8% (95% CI 7, 12) for residential care experiences compared with 4% (95% CI 4, 4) for parental care.

Family formation and relationships in the 20s were also found to be affected by a history of non-parental care: those who had been in relative care were less likely to be single and more likely to be married, while those in other types of care were more likely to have married and for some, subsequently divorced. Women who had been in relative care were more likely to have not yet started a family and were no more likely to be teenage mothers than women who had been in parental care. Women who had been in unrelated care, and some women in residential care, were more likely to start their family in their teens and to have 3 or more children, while other women who had been in residential care were more likely to be childless in their 20s.

3.2. Age 30-39 outcomes

Table 5, panel 2 covers the age 30-39 year follow-up results (model coefficients in supplementary table S4). Across the board, the main finding is the remarkable stability of the pattern of differences when comparing them with the age 20-29 probabilities in panel 1. There was no change in the associations between care experiences in living arrangements, and little change for most of the socioeconomic outcomes and adult family formation and relationships.

The one exception in the socioeconomic domain was that in their 30s, adults who had been in non-parental care in childhood were more likely to be out of the labour force than when in their 20s. In their 30s, adults who had been in residential care had a higher probability of being in education and economically inactive for other reasons that those who had been in parental care in childhood. Being more likely to be in education in their 30s was replicated for those in non-relative and relative care, albeit at lower levels than estimated for residential care: residential9% (95% CI 6, 12); non-relative care 5% (4, 6), relative care 2% (1, 4), parental care 1% (1, 1).

In the family domain, a similar trend across OHC groups was seen for the relative risk of no longer being married. But an increasing trend across OHC groups from relative to residential care was now established for the chances of being single.

3.3. Age 40-49 outcomes

The age 40-49 follow-up relationships between care experiences in childhood and adult social outcomes are shown in table 5, panel 3 with model coefficients given in supplementary table S5). Again, the overall picture was one of stability of differences rather than a change for the better or worse. There was little difference in the strength of the associations between care experiences in childhood and housing tenure nor for adult family formation and functioning between the 30s and 40s. Differences in associations between care experiences in childhood and socioeconomic functioning in their 40s, when they occurred, indicated more positive outcomes than earlier in life.

For those who were followed-up into their 40s, there was a trend towards a higher probability of having 18-year level qualifications or better associated with care type than the probabilities for those followed-up into their 20s. The reduction in the probability of low qualifications was most marked for those who had been in non-relative or relative care: from an 83% (95% CI 81, 85) in their 20s to 66% (95% CI 62, 69) in their 40s and from 90% (95% CI 88, 92) to 70% (95% CI 65, 74), respectively), compared with the difference in probability for those who had been in residential care (93 (95% CI 90, 95) to 82% (95% CI 78, 86)).

The raised probability of being out of the labour force associated with non-parental care for educational or other reasons, noted for the age 30-39 follow-up, was still evident for the age 40-49 follow-up although the predicted differences in probabilities were somewhat smaller in magnitude and no longer different from the age 20-29 follow-up in the case of relative care.

The final change was a reduction in the probability of being in a routine social class position in their 40s compared with their 20s. Although there was a general downward trend in the odds ratios across care types, a quantifiable difference between the probability of a routine social class position in early- and mid-adulthood was only observed for those who had been in parental or non-relative care.

3.4. Moderation by childhood census and gender

To reliably test for moderation by childhood census and gender, we combined the care types into one 'any care' category. Supplementary table S6 shows the models in table 5 repeated for this new dichotomous care variable. Table S7 provides results of the Wald tests for statistical interactions between any care experience and childhood census and gender. The test results in these tables indicate that there is evidence of moderation by childhood census and gender (25 of 54 Wald tests below a 5% alpha value), although not necessarily in a consistent manner over the follow-up stages or across follow-up outcomes in adulthood. We then applied the Holm-Bonferroni correction for multiple testing [63] and found 19 were still of interest after the correction had been applied (threshold $p \approx 0.014$). Tables S8 and S9 give the estimates for the care by childhood census and by gender models, respectively.

Summarising the findings, 16 of the 19 models relate to care by childhood census interactions, with some consistency in the findings for the employment status, social class, living alone and fertility outcomes at different stages of adulthood. Of the remaining interaction models of interest, 3 relate to care by childhood census year interactions and 3 to care by gender interactions. All 6 models were only observed for one follow-up age group. We report MEMs which give the difference in the probability of an outcome for an 'average' person who has been in care compared to the probability for an 'average' person who has not. A positive MEM implies that the probability if care-experienced was higher than if not (negative MEM the probability if care-experienced was lower).

3.4.1. Moderation by childhood census

Compared to people in their 20s who had not been in care (see figure 1, panel a), people had a lower probability of being in work if they had been in care, but mean differences varied across census years: with a suggestion of differences for 1981 and clear differences for 1991 and 2001 compared with 1971 when there was no care difference: MEM_{1971} = -0.008 (95%CI -0.028, 0.012); MEM_{1981} = -0.021 (-0.039, -0.003); MEM_{1991} = -0.048 (-0.072, -0.024); MEM_{2001} = -0.038(-0.065, -0.010). They had a higher probability of being unemployed (Supplementary figure S1, panel a) if they had been in care in 1971 to 1991 but not in 2001: MEM_{1971} = 0.042 (0.020, 0.065); MEM_{1981} = 0.043 (0.024, 0.062); MEM_{1991} = 0.049 (0.024, 0.074); MEM_{2001} = 0.012 (-0.019, 0.042). Absolute differences in the chances of being in education were greatest if in care in 1971 or 2001 (figure 1, panel b), but the direction of effect switched from a lower probability in 1971 and 1981 to a higher probability in 1991 and 2001: MEM_{1971} = -0.033 (-0.043, -0.022); MEM_{1981} = -0.017 (-0.030, -0.004); MEM_{1991} = 0.010 (-0.007, 0.026); MEM_{2001} = 0.034 (0.018, 0.051). The probability of being out of the labour force or economically inactive in their 20s (figure S1, panel b) was higher after being in OHC in 1971 to 1991, but not after OHC in 2001: MEM_{1971} = -0.002 (-0.006, 0.003); MEM_{1981} = -0.005 (-0.009, -0.001); MEM_{1991} = -0.011 (-0.016, -0.005); MEM_{2001} = -0.008 (-0.014, -0.002).

Similar patterns were observed for the age 30-39 year follow-up but with the suggestion that differences in the probability of being in education or out of the labour force by childhood census for care experienced individuals versus not were more likely to be due to the increase in educational and work opportunities in more recent periods than an age when observed in care effect.

Adults who had been in OHC in 1981 and 1991 had a higher probability of living alone in their 20s than other adults (MEM_{1981} = 0.026, 95%CI 0.011, 0.041; MEM_{1991} = 0.027, 95%CI 0.011, 0.042) but not if they had been in care in 1971 or 2001, albeit at a low predicted probability of 5.3%-6.5% in 1981/91 compared with 2.6%-3.9% in 1971/2001(see figure 2). These differences were replicated at ages 30-39 years, but at lower levels in terms of predicted probability (1.4%-1.6% versus 0.2-0.3% and marginal effects: MEM_{1981} = 0.010 (0.005, 0.016); MEM_{1991} = 0.014 (0.007, 0.022).

Figure 3 shows how differences in the number of children born to women who had been in care or not varied across childhood census years. It reveals that if we only look at early fertility (i.e. age 20-29) then OHC in 1971 was associated with having no children and a lower probability of being a teenage mother. But by 2001, OHC was associated with a lower probability of being childless than non-care experienced women: MEM_{1971} = 0.26 (95%CI 0.24, 0.28); MEM_{2001} = -0.07 (-0.12, -0.03). In addition, OHC was associated with having a larger family in 2001 with an 8% probability of being a teenage mother: 3+ children MEM_{2001} = 0.025 (0.009, 0.041); teenage mother MEM_{2001} = 0.036 (0.009, 0.062). Looking at the 30-39 year and 40-49 year follow-ups, we no longer have data for the more recent childhood census years. Nevertheless, in their 30s when many women would have completed their families, there was an 88% chance of being childless after being in care in 1971, 61% higher than the chance for women in parental care at that time. A smaller difference was predicted for those who had been in care in 1981 and 1991: MEM_{1981} = 0.18 (0.14, 0.22); MEM_{1991} = 0.11 (0.04, 0.19). Finally, at the 40-49 year follow-up, childlessness associated with OHC experience in 1971 and 1981 was confirmed (MEM_{1971} = 0.66 (0.63, 0.70); MEM_{1981} = 0.19 (0.13,0.24)).

3.4.2. Moderation by gender

Interaction estimates are given in table S7 and suggest that where gender differences are seen they are most often such that men who had been in care did less well in adulthood than women who had been in care when compared with non-care experienced adults of the same gender.

3.5. Sensitivity analyses

For the first sensitivity analysis, adjustments to the HoH covariates led to 30% of non-parental households changing values (366 related care; 109 unrelated care; 622 residential care). The results are shown in supplementary table S10 and show that while point estimates did change, mainly attenuating very slightly, the overall findings remain unaltered.

In the second sensitivity analysis, the reference group consisted of 34,148 children with 50,453 observations where the head of household was not in work. Findings are given in supplementary table S11 and clearly demonstrate that this made no substantive difference to the estimated probabilities.

4. Discussion

4.1. Summary of principal findings

Consistent with our first hypothesis, OHC increased the likelihood of poorer functioning in the three domains of socioeconomic circumstances, family formation and relationships, and living arrangements in adulthood. This was evident in OHC-experienced adults in their 20s, 30s and 40s. Our second hypothesis was also fully supported: outcomes differed across placement type, with the most adverse outcomes observed for those with a history of residential care, followed by outcomes for non-relative OHC, and the least adverse outcomes for those with a history of relative OHC. The moderation hypotheses were partially supported. Childhood census year and gender, in order of importance, altered the relationship between OHC and some, but not all, adult outcomes. The strongest and most consistent evidence was for moderation of outcomes by childhood census year and the weakest evidence for moderation of outcomes by gender.

4.2. Strengths and limitations

The main strength of this paper was the repeated prospective collection of care type, social outcomes and covariates across four decades. Coupled with the data being nationally representative, this allowed us to investigate whether adults who had a history of OHC had different social outcomes up to 30 years later from individuals without any experience of OHC. We could estimate differences throughout early to mid-adulthood when LS members were in their 20s, 30s and 40s. This would have been impossible using a dataset with shorter follow-up. The use of the large LS dataset also allowed us to disaggregate types of care, something impossible with smaller sample sizes. Using longitudinally linked census data reduced loss to follow-up and the availability of covariate data improved the precision of, and reduced potential confounding in, our results.

However, some limitations must be acknowledged. A major disadvantage of using the LS dataset is a lack of data on reason(s) for OHC and family characteristics prior to OHC, which are both likely to correlate with adult functioning and selection into OHC. Selection into different types of OHC must also be acknowledged. For the most part, children will have only been placed in residential care if they were unable to have been placed elsewhere, either because their health or behaviour precluded placement in a family setting. Placement in relative care may have been excluded as an option due to parental and wider family circumstances. Selection into relative care suggests children might already have had a better environment for positive social development. In this context, finding graded differences in adult outcomes between types of OHC is perhaps unsurprising, but the magnitude, range and persistence of the differences is noteworthy.

Another disadvantage of using census data is that information is only available every 10 years. Therefore, we were not able to identify the exact timings of when children were in OHC and for how long, or whether they moved between care settings in the intervening 10 years. Moreover, we were unable to identify children with and without local authority care orders. Extrapolating from national care statistics, children in non-relative care without a care order would account for only a handful of LS children in non-relative care. Our relative care group though comprises children with care orders and those with informal kinship arrangements. Care orders into relative care were less common in 1971 to 1991 than in 2001 [45, 46], but how this might have influenced the findings is unknown. As in any longitudinal study, sample attrition occurred, albeit at lower levels than reported elsewhere [11, 64]. There were indications in our data that loss to follow-up was greater in the non-parental care groups, particularly for residential care, suggesting that differential associations of outcomes by care type may be even larger than estimated.

We had to combine the care types in a binary any care variable for the moderation analyses due to small cell sizes contributing to estimation difficulties otherwise. Neither were we able to model the interaction terms jointly. Future studies may be able to combine the censuses from around the UK to increase sample sizes and make finer grained moderation analyses feasible. We took a conservative approach to adjustment for multiple comparisons. If we had used the FDR adjustment [65], then 27 instead of 19 out of 54 Wald tests would have been considered of interest.

Employing routine data usually necessitates some compromises and this study was no exception. For example, one might argue that current marital status is a weak marker of having formed a stable relationship, especially in more recent years. Finally, as in any study using self-reported data, we cannot rule out the possibility of measurement error.

4.3. Results in relation to other studies

4.3.1. Background socio-demographics

A recent briefing note [66], reported that in 2019, there were more males and Black children in care, and fewer Asian, White and female children. We also found these demographic differences but could refine the differences by placement type: boys were more often placed in residential care than girls; Black children were over-represented in residential care and South Asian children more commonly in relative care.

Comparing the LS children in OHC with the 1958 and 1970 British birth cohorts' children in OHC [11, 67], we also found that children in OHC came from more disadvantaged homes and were more likely to be non-White. The LS households were similarly disadvantaged but there was not a uniform pattern across care types: relative care households were headed by more non-married individuals who more often had lower qualifications and were in routine occupations than unrelated care households, presumably because many of the relative carers were grandparents. Added to this, we found that South Asian children were most likely to be with relatives and Black children in residential care.

4.3.2. Socioeconomic circumstances

Our finding that adults with a history of care had lower qualification levels is consistent with previous work in the US [3], Australia [4], Sweden [13] and the UK [11]. Viner and Taylor [11] reported poorer educational outcomes for men but not women whereas we found no gender effects. Forsman [13] commented that differences were more modest in their study compared to findings from more recent Swedish cohorts while the latest evidence from Scotland [68] reported improvements in educational attainment since the 2011 census and that looked-after school leavers who were in foster care or with relatives had higher attainment than other placement types. Our study found no evidence for differences in educational attainment up to 2011 and more differentiated placement types once population trends in qualifications had been accounted for. However, we were only able to follow-up children in care into their 20s in 2011.

Returning to education at older ages was seen though and highlights the need to take a life course perspective. Differences in being in education emerged in their 30s for LS members who were children observed in the 1991 census, and again in their 40s for childhood observations at the 1981 census. This means that effects for OHC-experienced adults returning to education were only seen in 2011. The 1991 census was the first year when the expansion in higher education might be reflected in the numbers in education. The delay in having an impact on OHC-experienced adults might reflect the increased support for OHC-experienced students more recently. The Children and Young Persons

Act 2008 recommended that OHC leavers starting a recognised higher education course be entitled to a minimum one-off bursary of £2,000 from their local authority. Some universities in the UK now offer annual bursaries and year-round accommodation to those who have been in OHC.

Our findings are also consistent with the evidence on employment with an increased odds of poorer quality work, unemployment – both current and long-term – and of being out of the labour force [3, 4, 11, 24]. We found similar rates of employment among care-experienced young adults as Cashmore and Paxman [4] if they were in family placements but with the addition of finding much lower rates if young adults had a history of residential care. Like Brannstrom et al [69] and Viner and Taylor [11], we found men more likely to be unemployed than women. However, inequalities in rates of employment for care-experienced LS adults increased over the childhood census years whereas they narrowed in Scotland after 2010 before increasing again from 2016 onwards [68].

The differences in the probability of being in work or unemployed by childhood census for OHC-experienced individuals versus not were the same across the follow-ups. For example, the same patterns are seen for the 1971 to 1991 censuses in people's 20s and 30s, and similarly the same patterns are seen for the 1971 to 1981 censuses in people's 30s and 40s. Hence, the moderation findings suggest that the economic cycle from 1981 to 2011 that care experienced adults lived through are a likely explanation for the observed differences across childhood censuses: there were economic recessions in 1980-81, 1990-91, and the Great Recession in 2008-09 which had long-lasting effects on the job market.

Viner and Taylor [11] also found social class differences at age 30 for those who had been in care sometime between 1970 and 1988 with around 27.5% in managerial or professional occupations compared with 38.5% of non-care leavers. We found a much lower probability of membership of the managerial and professional social class, ≈16% of care leavers versus ≈29% of the rest of the general population in their 20s and 30s. However, it is not clear from Viner and Taylor's paper whether the same social class outcome measure was used, although the adjustment for childhood social class was different.

4.3.3 Living arrangements

The most consistent finding in the literature was for an increased risk of homelessness and unstable or inadequate accommodation [3, 4, 14]. We were not able to investigate these issues with our study design but the excess of 'other' types of living arrangements does suggest a risk of unstable and inadequate housing. Buehler et al [3] reported that 40% of care leavers were owner-occupiers compared with 64% of their random sample control group. This is very similar to our estimate of 31% to 47% owner occupation among care-experienced adults depending on care type compared with 60% in the general population. We also found higher rates of overcrowding and living alone, both suggestive of poorer quality accommodation. Overcrowding might indicate a greater propensity to be in shared accommodation or a hostel, consistent with the findings of Cashmore and Paxman [4]. Alternatively, living alone might suggest that care-experienced adults were more likely to be housed in a bedsit, which is known to be associated with isolation and poor wellbeing [70]; Barratt, 2015 #274}.

4.3.4. Family formation and relationships

Previous research has highlighted the increased risk for teenage pregnancies among OHC young women [4, 6], and larger families [2]. Earlier marriages and a greater divorce rate have also been found [3].

Our findings are only partially consistent with the evidence on marital status: We found care-experienced individuals at the first observation in adulthood were more likely to be married (table 5). We add to the evidence by showing that a gradient in marriage across care type emerged more clearly in the 30-39 year follow-up. Divorce was also seen to have increased with age (none were widowed, data not shown), so that the increased probability of being married in the OHC groups might reflect some second marriages. Low rates of marriage across adulthood among those with experience of residential care may have been due to their less favourable economic circumstances or health reasons, as both were found to be more likely among this group [71, 72]. Why those previously in residential or non-relative care were less likely to be single in their 20s but more likely to be single in their 30s and 40s is unclear. It is possibly a combination of some individuals self-reporting their marital status as single rather than divorced, some preferring cohabitation over marriage, and others failing to find a long-term partner.

We did not observe any moderation of the association between OHC and marital status by childhood census which was somewhat surprising given that rates of marriage and divorce have changed dramatically since 1981 with peaks in the divorce rate linked with recessions. There is some suggestion from other work that these changes in divorce rates have affected the OHC-experienced more than those in parental care [73].

Our findings do not totally agree with the previous evidence on childbearing either. Consistent with the literature, OHC was associated with a higher probability of teenage births, especially for those who had been in residential care. If we had just taken a short-term view, then we would have agreed that OHC was associated with larger families too. But care-experienced women at the end of their reproductive years were shown to have no or fewer children than those in parental care, especially if they had been in residential care.

4.4 Implications and future research

Inequalities between OHC groups and the general population are widespread and long-lasting. This should be monitored and acted on as a priority. More work is needed on the trends in inequalities, especially in the areas of employment and family planning. Our results suggest that monitoring the immediate outcomes of OHC in terms of school qualifications and initial destinations is insufficient to quantify what could potentially be permanent damage to life chances and well-being for this vulnerable group. Unfortunately, the Staying Put programme [74, 75], a formal extended care scheme for former fostered children which is currently being implemented, does not extend to residential care. The newer Staying Close arrangements [76], aimed at enabling young people leaving residential care to live near their former care home so that they are able to continue to be supported by professionals with whom they have established relationships, are not yet implemented. Among the catalysts to implementation of extended care cited by van Breda et al [77] is research highlighting that care-leavers are at greater risk of poor outcomes. One can only hope that our evidence of the enduring negative legacy of OHC experiences, going well beyond the transition to adulthood phase, will add impetus to speedily implementing these programmes nationwide. The European Convention on Human Rights 1998 and UK's Children Act 1989 underpin the legal framework that when OHC is required, priority be given to non-residential care, especially

the child's extended relatives and friends [78, 79]. Our findings also provide evidence supporting this policy.

The moderation results could be particularly useful for policy and practice as they suggest areas for improvement of intervention. Nevertheless, replication of these findings is recommended to confirm the results and to clarify if and why we found some inconsistent results across age in adulthood. We found scant evidence for moderation of differences between the OHC groups and the reference group by gender but stronger evidence for moderation by childhood census year. If replicated, it is a worrying finding that the trends we have found suggest decline rather than improvements for OHC children grown up.

We conjectured that the results for moderation by childhood census year are more likely to be due to the increase in educational and work opportunities in more recent periods than an age observed in care effect. Future studies might consider integrating time-varying covariates representing trends in educational and employment opportunities, and family formation. Long-term follow-ups of hard-to-reach populations are notoriously difficult. Greater access to routine data, exemplified in the Nordic countries, could help move research forward.

5. Conclusions

Enduring inequalities for OHC-experienced adults in social and economic functioning add to the evidence on health inequalities. Further work is needed that can ascertain the relative contribution of children's experiences to the inequalities in adulthood that we have highlighted. That is, experiences of the care system and while with their parents throughout their childhoods. Nevertheless, the findings suggest that policy should be that the default action is to place children in the type of care that will benefit them most in the long-term, where feasible. In many cases this might be relative care as this is more likely to provide a long-lasting and loving home [80], and when not achievable, to place children in foster care as a 2nd choice.

References

1. Akister, J., M. Owens, and I.M. Goodyer, *Leaving care and mental health: outcomes for children in out-of-home care during the transition to adulthood.* Health Research Policy and Systems, 2010. **8**(1): p. 10.
2. Botchway, S.K., M.A. Quigley, and R. Gray, *Pregnancy-associated outcomes in women who spent some of their childhood looked after by local authorities: findings from the UK Millennium Cohort Study.* BMJ open, 2014. **4**(12): p. e005468.
3. Buehler, C., J.G. Orme, J. Post, and D.A. Patterson, *The long-term correlates of family foster care.* Children and Youth Services Review, 2000. **22**(8): p. 595-625.
4. Cashmore, J. and M. Paxman, *Wards leaving care: Follow up five years on.* Children Australia, 2006. **31**(03): p. 18-25.
5. Cheung, S.Y. and A. Buchanan, *Malaise scores in adulthood of children and young people who have been in care.* Journal of Child Psychology and Psychiatry, 1997. **38**(5): p. 575-580.

6. Craine, N., C. Midgley, L. Zou, H. Evans, R. Whitaker, and M. Lyons, *Elevated teenage conception risk amongst looked after children; a national audit.* Public Health, 2014. **128**(7): p. 668-670 DOI: 10.1016/j.puhe.2014.05.008.
7. Dregan, A. and M. Gulliford, *Foster care, residential care and public care placement patterns are associated with adult life trajectories: population-based cohort study.* Social psychiatry and psychiatric epidemiology, 2012. **47**(9): p. 1517-1526.
8. Meltzer, H., D. Guinea-Martin, B. Millard, and L. Blackwell, *A thirty-year prospective study of children in residential care in the 1970s.* Scottish Journal of Residential Child Care, 2008. **7**(1).
9. Murray, E.T., R. Lacey, B. Maughan, and A. Sacker, *Non-parental care in childhood and health up to 30 years later: ONS Longitudinal Study 1971–2011.* European Journal of Public Health, 2020.
10. Murray, E.T., R. Lacey, B. Maughan, and A. Sacker, *Association of childhood out-of-home care status with all-cause mortality up to 42-years later: Office of National Statistics Longitudinal Study.* BMC Public Health, 2020. **20**: p. 1-10.
11. Viner, R.M. and B. Taylor, *Adult health and social outcomes of children who have been in public care: population-based study.* Pediatrics, 2005. **115**(4): p. 894-899.
12. Zlotnick, C., T.W. Tam, and L.A. Soman, *Life course outcomes on mental and physical health: the impact of foster care on adulthood.* American Journal of Public Health, 2012. **102**(3): p. 534-540.
13. Forsman, H., *Exploring educational pathways over the life course in children with out-of-home care experience: A multi-group path analysis.* Children and Youth Services Review, 2020. **111** DOI: 10.1016/j.childyouth.2020.104852.
14. Fowler, P.J., K.E. Marcal, J.J. Zhang, O. Day, and J. Landsverk, *Homelessness and aging out of foster care: A national comparison of child welfare-involved adolescents.* Children and Youth Services Review, 2017. **77**: p. 27-33 DOI: 10.1016/j.childyouth.2017.03.017.
15. Gao, M., L. Brännström, and Y.B. Almquist, *Exposure to out-of-home care in childhood and adult all-cause mortality: a cohort study.* International Journal of Epidemiology, 2017. **46**(3): p. 1010-1017 DOI: 10.1093/ije/dyw295.
16. Haggman-Laitila, A., P. Salokekkila, M. Satka, K. Toivonen, P. Kekolahti, and O.P. Ryynanen, *The coping of young Finnish adults after out-of-home care and aftercare services: A document-based analysis.* Children and Youth Services Review, 2019. **102**: p. 150-157 DOI: 10.1016/j.childyouth.2019.05.009.

17. Memarzia, J., M.C. St Clair, M. Owens, I.M. Goodyer, and V.J. Dunn, *Adolescents leaving mental health or social care services: predictors of mental health and psychosocial outcomes one year later.* Bmc Health Services Research, 2015. **15** DOI: 10.1186/s12913-015-0853-9.

18. Prince, D.M., S. Vidal, N. Okpych, and C.M. Connell, *Effects of individual risk and state housing factors on adverse outcomes in a national sample of youth transitioning out of foster care.* Journal of Adolescence, 2019. **74**: p. 33-44 DOI: 10.1016/j.adolescence.2019.05.004.

19. Almquist, Y.B. and L. Brannstrom, *Do trajectories of economic, work- and health-related disadvantages explain child welfare clients' increased mortality risk? A prospective cohort study.* Bmc Public Health, 2019. **19** DOI: 10.1186/s12889-019-6752-y.

20. Bullock, R. and E. Gaehl, *Children in care: A long-term follow up of criminality and mortality.* Children and Youth Services Review, 2012. **34**(9): p. 1947-1955 DOI: 10.1016/j.childyouth.2012.06.003.

21. Hjern, A., B. Vinnerljung, and F. Lindblad, *Avoidable mortality among child welfare recipients and intercountry adoptees: a national cohort study.* Journal of Epidemiology & Community Health, 2004. **58**(5): p. 412-417.

22. Kalland, M., T.H. Pensola, J. Meriläinen, and J. Sinkkonen, *Mortality in children registered in the Finnish child welfare registry: population based study.* BMJ, 2001. **323**(7306): p. 207-208 DOI: 10.1136/bmj.323.7306.207.

23. Vinnerljung, B. and M. Ribe, *Mortality after care among young adult foster children in Sweden.* International Journal of Social Welfare, 2001. **10**(3): p. 164-173.

24. Brannstrom, L., H. Forsman, B. Vinnerljung, and Y.B. Almquist, *The truly disadvantaged? Midlife outcome dynamics of individuals with experiences of out-of-home care.* Child Abuse & Neglect, 2017. **67**: p. 408-418 DOI: 10.1016/j.chiabu.2016.11.009.

25. Dumaret, A.C., P. Donati, and M. Crost, *After a Long-Term Placement: Investigating Educational Achievement, Behaviour, and Transition to Independent Living.* Children & Society, 2011. **25**(3): p. 215-227 DOI: 10.1111/j.1099-0860.2009.00283.x.

26. Vinnerljung, B. and A. Hjern, *Consumption of psychotropic drugs among adults who were in societal care during their childhood—A Swedish national cohort study.* Nordic Journal of Psychiatry, 2014. **68**(8): p. 611-619 DOI: 10.3109/08039488.2014.902501.

27. Benedict, M.I., S. Zuravin, and R.Y. Stallings, *Adult functioning of children who lived in kin versus nonrelative family foster homes.* Child welfare, 1996. **75**(5): p. 529.

28. Averdijk, M., D. Ribeaud, and M. Eisner, *The long-term effects of out-of-home placement in late adolescence: A propensity score matching analysis among Swiss youths.* Longitudinal and Life Course Studies, 2018. **9**(1): p. 30-57 DOI: http://dx.doi.org/10.14301/llcs.v9i1.450.

29. Heath, A.F., M.J. Colton, and J. Aldgate, *Failure to escape: A longitudinal study of foster children's educational attainment.* British journal of social work, 1994. **24**(3): p. 241-260.
30. Tyrell, F.A. and T.M. Yates, *A Growth Curve Analysis of Housing Quality among Transition-Aged Foster Youth.* Child & Youth Care Forum, 2017. **46**(1): p. 91-117 DOI: 10.1007/s10566-016-9370-1.
31. Combs, K.M., S. Begun, D.J. Rinehart, and H. Taussig, *Pregnancy and Childbearing Among Young Adults Who Experienced Foster Care.* Child Maltreatment, 2018. **23**(2): p. 166-174 DOI: 10.1177/1077559517733816.
32. Pecora, P.J., R.C. Kessler, K. O'Brien, C.R. White, J. Williams, E. Hiripi, . . . M.A. Herrick, *Educational and employment outcomes of adults formerly placed in foster care: Results from the Northwest Foster Care Alumni Study.* Children and youth services review, 2006. **28**(12): p. 1459-1481.
33. Cook-Fong, S.K., *The Adult Well-Being of Individuals Reared in Family Foster Care Placements.* Child and Youth Care Forum, 2000. **29**(1): p. 7-25 DOI: 10.1023/A:1009440422651.
34. Pritchard, C. and R. Williams, *Does Social Work Make a Difference? A Controlled Study of Former 'Looked-After-Children' and 'Excluded-From-School' Adolescents Now Men Aged 16-24 Subsequent Offences, Being Victims of Crime and Suicide.* Journal of Social Work, 2009. **9**(3): p. 285-307 DOI: 10.1177/1468017309334903.
35. Gutterswijk, R.V., C.H.Z. Kuiper, N. Lautan, E.G. Kunst, F.C.P. van der Horst, G. Stams, and P. Prinzie, *The outcome of non-residential youth care compared to residential youth care: A multilevel meta-analysis.* Children and Youth Services Review, 2020. **113** DOI: 10.1016/j.childyouth.2020.104950.
36. Kaariala, A., P. Haapakorva, E. Pekkarinen, and R. Sund, *From care to education and work? Education and employment trajectories in early adulthood by children in out-of-home care.* Child Abuse & Neglect, 2019. **98** DOI: 10.1016/j.chiabu.2019.104144.
37. Kaariala, A. and H. Hiilamo, *Children in out-of-home care as young adults: A systematic review of outcomes in the Nordic countries.* Children and Youth Services Review, 2017. **79**: p. 107-114 DOI: 10.1016/j.childyouth.2017.05.030.
38. Simkiss, D., *Outcomes for looked after children and young people.* Paediatrics and Child Health, 2012. **22**(9): p. 388-392.
39. McDonald, T.P., *Assessing the long-term effects of foster care: A research synthesis*. 1996: ERIC.

40. Berger, L.M., S.K. Bruch, E.I. Johnson, S. James, and D. Rubin, *Estimating the "impact" of out-of-home placement on child well-being: Approaching the problem of selection bias.* Child development, 2009. **80**(6): p. 1856-1876.

41. Strijbosch, E., J. Huijs, G. Stams, I. Wissink, G. Van der Helm, J. De Swart, and Z. Van der Veen, *The outcome of institutional youth care compared to non-institutional youth care for children of primary school age and early adolescence: A multi-level meta-analysis.* Children and Youth Services Review, 2015. **58**: p. 208-218.

42. Nandy, S., J. Selwyn, E. Farmer, and P. Vaisey, *Spotlight on kinship care: Using census microdata to examine the extent and nature of kinship care in the UK at the turn of the twentieth century.* Bristol: University of Bristol, 2011.

43. Sacker, A., R.E. Lacey, B. Maughan, and E.T. Murray *Non-parental care in childhood and adult outcomes: double whammy for minority children?* SocArXiv, 2021. DOI: https://doi.org/10.31235/osf.io/fg6cy.

44. Seebohm, F., *Report of the Committee on Local Authority and Allied Personal Services*. 1968: HM Stationery Office.

45. Munro, E.R. and R. Gilligan, *The 'dance'of kinship care in England and Ireland: Navigating a course between regulation and relationships.* Psychosocial Intervention, 2013. **22**(3): p. 185-192.

46. Rowlands, J. and J. Statham, *Numbers of children looked after in England: a historical analysis.* Child & Family Social Work, 2009. **14**(1): p. 79-89 DOI: 10.1111/j.1365-2206.2008.00583.x.

47. Crawford, B., A.B. Pharris, and R. Dorsett-Burrell, *Risk of serious criminal involvement among former foster youth aging out of care.* Children and Youth Services Review, 2018. **93**: p. 451-457 DOI: 10.1016/j.childyouth.2018.08.027.

48. El Mhamdi, S., A. Lemieux, I. Bouanene, A. Ben Salah, M. Nakajima, K. Ben Salem, and M. al'Absi, *Gender differences in adverse childhood experiences, collective violence, and the risk for addictive behaviors among university students in Tunisia.* Preventive Medicine, 2017. **99**: p. 99-104 DOI: https://doi.org/10.1016/j.ypmed.2017.02.011.

49. Flynn, R.J., N.G. Tessier, and D. Coulombe, *Placement, protective and risk factors in the educational success of young people in care: cross-sectional and longitudinal analyses.* European Journal of Social Work, 2013. **16**(1): p. 70-87 DOI: 10.1080/13691457.2012.722985.

50. Oesterle, S., J.D. Hawkins, K.G. Hill, and J.A. Bailey, *Men's and Women's Pathways to Adulthood and Their Adolescent Precursors.* Journal of marriage and the family, 2010. **72**(5): p. 1436-1453 DOI: 10.1111/j.1741-3737.2010.00775.x.
51. Lynch, K., S. Leib, J. Warren, N. Rogers, and J. Buxton, *Longitudinal Study 2001–2011: Completeness of Census Linkage*, in *Series LS No 11*. 2015, Office for National Statistics: London.
52. Lynch, K., S. Leib, J. Warren, N. Rogers, and J. Buxton, *Longitudinal Study 2001–2011: Completeness of Census Linkage.* Office for National Statistics Series LS No, 2015. **11**.
53. Thompson, E.J., *The 1991 census of population in England and Wales.* Journal of the Royal Statistical Society: Series A (Statistics in Society), 1995. **158**(2): p. 203-229.
54. Thatcher, A., *Topic of Public Interest the 1981 Census of Population in England and Wales.* Journal of the Royal Statistical Society: Series A (General), 1984. **147**(2): p. 222-230.
55. Hattersley, L. and R. Creeser, *Longitudinal study 1971-1991: history, organisation and quality of data*. 1995: HM Stationery Office London.
56. Shelton, N., C.E. Marshall, R. Stuchbury, E. Grundy, A. Dennett, J. Tomlinson, . . . W. Xun, *Cohort profile: the office for national statistics longitudinal study (the LS).* International journal of epidemiology, 2019. **48**(2): p. 383-384g.
57. Blackwell, L., B. Akinwale, A. Antonatos, and J. Haskey, *Opportunities for new research using the post-2001 ONS Longitudinal Study.* POPULATION TRENDS-LONDON-, 2005. **121**: p. 8.
58. Office for National Statistics, *Standard Occupational Classification 2010*. 2010, Basingstoke, UK: Palgrave Macmillan.
59. Clark, G. and N. Cummins, *Intergenerational wealth mobility in England, 1858–2012: surnames and social mobility.* The Economic Journal, 2015. **125**(582): p. 61-85.
60. Plewis, I. and M. Bartley, *Intra-generational social mobility and educational qualifications.* Research in Social Stratification and Mobility, 2014. **36**: p. 1-11.
61. Berridge, D., *Theory and explanation in child welfare: education and looked-after children.* Child & Family Social Work, 2007. **12**(1): p. 1-10.
62. McDermid, S., L. Holmes, D. Kirton, and P. Signoretta, *The demographic characteristics of foster carers in the UK: Motivations, barriers and messages for recruitment and retention.* 2012.
63. Holm, S., *A simple sequentially rejective multiple test procedure.* Scandinavian journal of statistics, 1979: p. 65-70.
64. Cameron, C., K. Hollingworth, I. Schoon, E. van Santen, W. Schroer, T. Ristikari, . . . E. Pekkarinen, *Care leavers in early adulthood: How do they fare in Britain, Finland and*

Germany? Children and Youth Services Review, 2018. **87**: p. 163-172 DOI: 10.1016/j.childyouth.2018.02.031.

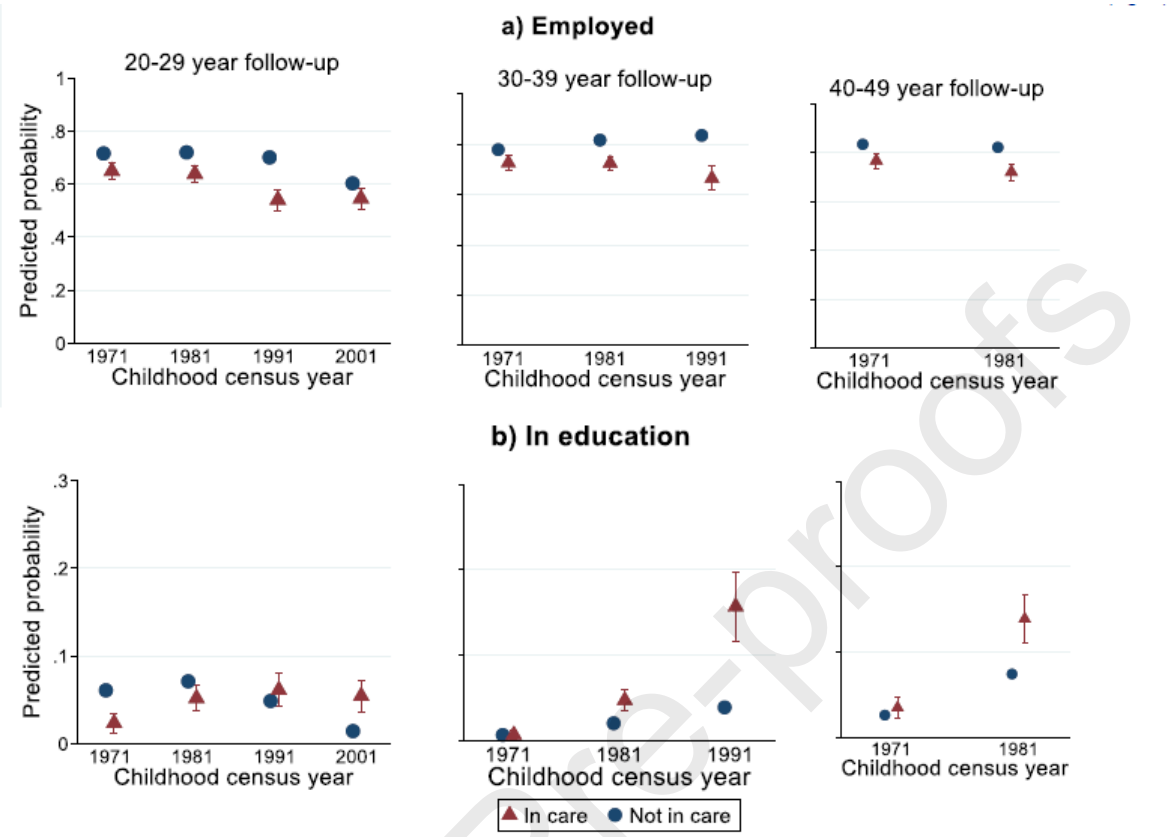
65. Benjamini, Y. and Y. Hochberg, *Controlling the false discovery rate: a practical and powerful approach to multiple testing.* Journal of the Royal statistical society: series B (Methodological), 1995. **57**(1): p. 289-300.
66. NSPCC Learning. *Statistics briefing: looked after children*. 2021 [cited 2021 19/08/2021]; Available from: https://learning.nspcc.org.uk/media/1622/statistics-briefing-looked-after-children.pdf.
67. Xie, T., C. de Mestral, and G.D. Batty, *Association of public care in childhood with social, criminal, cognitive, and health outcomes in middle-age: five decades of follow-up of members of the 1958 birth cohort study.* J Epidemiol Community Health, 2021. **75**(3): p. 289-296.
68. Scottish Government *Looked after children: education outcomes 2018-2019*. 2000.
69. Brannstrom, L., B. Vinnerljung, H. Forsman, and Y.B. Almquist, *Children Placed In Out-of-Home Care as Midlife Adults: Are They Still Disadvantaged or Have They Caught Up With Their Peers?* Child Maltreatment, 2017. **22**(3): p. 205-214 DOI: 10.1177/1077559517701855.
70. Biehal, N. and J. Wade, *Looking back, looking forward: Care leavers, families and change.* Children and Youth Services Review, 1996. **18**(4): p. 425-445 DOI: https://doi.org/10.1016/0190-7409(96)00013-8.
71. Emily Murray, Rebecca Lacey, and Amanda Sacker, *The Health and Well-Being of Adults Who Had Been in Care up to 40 Years Earlier: Are There Differences by Type of Care?*, in *Society for Longitudinal and Life Course Studies International Annual Conference*. 2018: University of Milano-Bicocca, Italy.
72. Emily Murray, Rebecca Lacey, and Amanda Sacker, *The health of adults who had been in care up to 40 years earlier: are there differences by type of care? Findings from the ONS Longitudinal Study*, in *Society for Social Medicine Annual Scientific Meeting,* . 2018: University of Glasgow, Scotland.
73. Sedghi, A. and S. Rogers, *Divorce rates data, 1858 to now: how has it changed.* The Guardian. Retrived from http://www. theguardian. com/news/datablog/2010/jan/28/divorce-ratesmarriage-ons, 2014.
74. Government, H., *Children and families act*. 2014.
75. Government, H., *Children and social work act*. 2017.
76. Education, D.f., *Government response to Sir Martin Narey's independent review of residential care*. 2016.

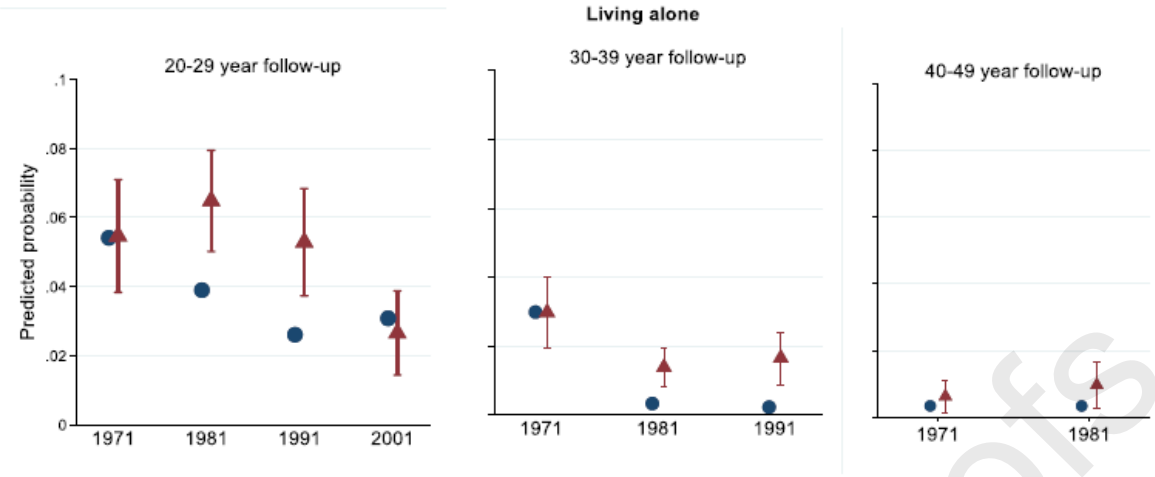
77. van Breda, A.D., E.R. Munro, R. Gilligan, R. Anghel, A. Harder, M. Incarnato, . . . J. Storø, *Extended care: Global dialogue on policy, practice and research.* Children and Youth Services Review, 2020: p. 105596.

78. Department of Health *Statutory guidance on promoting the health and well-being of looked after children*. 2009.

79. National Institute for Health and Care Excellence *Looked-after children and young people. Quality Standard.* 2013.

80. MacAlister, J. *The Case for Change. The independent review of children's social care*. 2021 [cited 2021 19/08/2021]; Available from: https://childrenssocialcare.independent-review.uk/wp-content/uploads/2021/06/case-for-change.pdf.





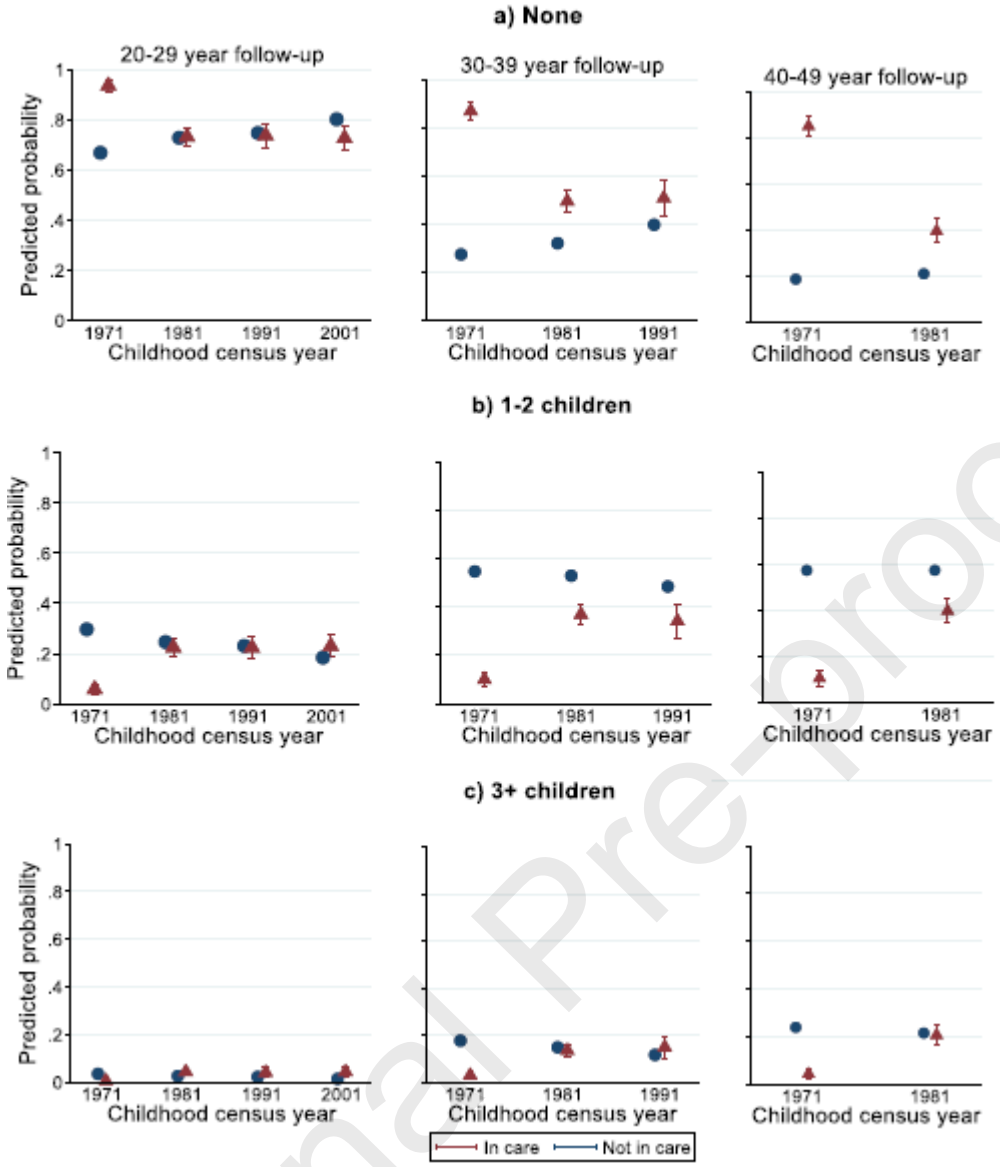


Table 1. Distribution of care status by number of observations in childhood, ONS Longitudinal Study

Number of observations	Care status	N	%
One	Y	1,877	0.54
	N	134,885	38.66
Two	Y Y	126	0.07
	Y N	447	0.26
	N Y	1027	0.59
	N N	104,481	59.89
Total		348,924	100
N		242,843	

Y in care; N not in care

Table 2. Number (%) of observations by care type for age 20-29, 30-39 and 40-49 year follow-up models, ONS Longitudinal Study

Care type	**Age 20-29**	**Age 30-39**	**Age 40-49**
Parental	321,122 (99.03)	225,559 (98.99)	146,869 (98.94)
Relative care	1,543 (0.48)	1,024 (0.45)	747 (0.50)
Unrelated care	1,093 (0.34)	810 (0.36)	472 (0.32)
Residential	521 (0.16)	462 (0.20)	358 (0.24)
Total	324,279 (100.00)	227,855 (100.00)	148,446 (100.00)

Table 3. Sociodemographic characteristics by care type[1], ONS Longitudinal Study

	Parental care	**Relative care**	**Unrelated care**	**Residential**	**p**
Gender					0.003
Male	173,201 (50.16)	875 (50.49)	596 (47.76)	353 (56.75)	
Female	172,120 (49.84)	858 (49.51)	652 (52.24)	269 (43.25)	
Census cohort					<0.0005
1971	117,023 (33.89)	410 (23.66)	345 (27.64)	333 (53.54)	
1981	97,385 (28.20)	651 (37.56)	403 (32.29)	154 (24.76)	

1991	87,425 (25.32)	205 (11.83)	373 (29.89)	135 (21.70)	
Country of birth					<0.0005
UK	336,396 (97.42)	1,548 (89.32)	1,166 (93.43)	595 (95.66)	
Non-UK	8,925 (2.58)	185 (10.68)	82 (6.57)	27 (4.34)	
Ethnicity					<0.0005
White	311,888 (90.32)	1,359 (78.42)	990 (79.33)	480 (78.56)[2]	
Black	6,237 (1.81)	101 (5.83)	98 (7.85)	45 (7.18)[2]	
South Asian	12,024 (3.48)	199 (11.48)	64 (5.13)	<10 (1.59)[2]	
Other	1,250 (0.36)	16 (0.92)	18 (1.44)	<10 (1.59)[2]	
Not known	13,922 (4.03)	58 (3.35)	78 (6.25)	82 (13.08)[2]	
HOH marital status					<0.0005
Married	315,379 (91.33)	1,169 (67.46)	931 (74.60)	n/a	
Widowed/divorced/single	29,942 (8.67)	564 (32.54)	317 (25.40)	n/a	
HOH social class					<0.0005
Manager/professional	106,071 (30.72)	365 (21.06)	309 (24.76)	n/a	
Intermediate	117,792 (34.11)	528 (30.47)	402 (32.21)	n/a	
Routine	121,458 (35.17)	840 (48.47)	537 (43.03)	n/a	
HOH education					<0.0005
18+ qualifications	56,593 (16.39)	175 (10.10)	165 (13.22)	n/a	
<18 qualifications	288,728 (83.61)	1,558 (89.90)	1,083 (86.78)	n/a	
HOH employment status					<0.0005
Employed	314,776 (91.15)	1,299 (74.96)	1,055 (84.54)	n/a	
Unemployed	16,827 (4.87)	103 (5.94)	97 (7.77)	n/a	
OLF	13,718 (3.97)	331 (19.10)	96 (7.69)	n/a	
Age, mean (s.e.)	7.55 (0.01)	10.49 (0.15)	8.77 (0.18)	11.06 (0.21)	<0.0005

[1] Averaged over all observations; [2] Percentages based on replacing cell counts < 10 by a value of 10

HOH: Head of household; OLF: out of the labour force; s.e.: standard error; n/a: not applicable

Table 4. Distribution of outcomes by care type[1], ONS Longitudinal Study

	Parental care	Relative care	Unrelated care	Residential care	p
< 18-year qualifications (%)	72.25	78.82	86.30	90.84	<0.0005
Employment status (%)					<0.0005
Employed	70.39	62.26	53.21	43.41	
Unemployed	9.30	14.37	15.38	21.54	
In education	5.15	4.50	6.01	4.98	
OLF	15.17	18.87	25.40	30.06	
Long-term nonemployed (%)	2.51	3.48	5.43	11.67	<0.0005
Social class (%)					<0.0005
Managerial/professional	24.24	17.83	12.71	12.24	
Intermediate/technical	28.52	25.90	21.96	18.36	
Routine occupations	31.29	36.64	42.48	38.16	
Not known	15.94	19.63	22.85	31.24	
Housing tenure (%)					<0.0005
Owner occupier	60.91	47.64	40.62	31.38	
Renting	35.31	48.34	54.10	57.21	
Other	3.78	4.01	5.28	11.41	
Overcrowding (%)	3.33	6.74	6.48	6.72	<0.0005
Lives alone (%)	4.02	4.73	6.01	13.18	<0.0005

Marital status (%)					<0.0005
Currently married	22.27	27.93	25.24	30.87	
Previously married	1.87	2.94	3.85	5.14	
Single	75.86	69.13	70.91	63.99	
Teenage mother	6.31	6.76	11.50	7.06	<0.0005
Children (women only)					<0.0005
0	70.08	75.76	67.02	84.01	
1-2	26.66	20.28	25.46	11.15	
3+	3.27	3.96	7.52	4.83	

[1] Averaged over observations

Table 5. Modelled probability[1] of outcomes by care type, ONS Longitudinal Study

	Age 20-29 follow-up				**Age 30-39 follow-up**				**Age 40-49 follow-up**			
	Parental care	**Relative care**	**Unrelated care**	**Residential care**	**Parental care**	**Relative care**	**Unrelated care**	**Residential care**	**Parental care**	**Relative care**	**Unrelated care**	**Residential care**
< 18-year qualifications	0.77 (0.77, 0.77)	0.83 (0.81, 0.85)	0.90 (0.88, 0.92)	0.93 (0.90, 0.95)	0.67 (0.67, 0.67)	0.75 (0.72, 0.78)	0.79 (0.76, 0.83)	0.89 (0.86, 0.92)	0.62 (0.61, 0.62)	0.66 (0.62, 0.69)	0.70 (0.65, 0.74)	0.82 (0.78, 0.86)
Employment status												
Employed	0.73 (0.73, 0.73)	0.69 (0.67, 0.71)	0.56 (0.53, 0.60)	0.36 (0.32, 0.41)	0.84 (0.84, 0.85)	0.79 (0.77, 0.82)	0.72 (0.69, 0.75)	0.47 (0.42, 0.52)	0.86 (0.86, 0.86)	0.82 (0.79, 0.85)	0.73 (0.69, 0.77)	0.52 (0.46, 0.58)
Unemployed	0.09 (0.09, 0.09)	0.11 (0.10, 0.13)	0.15 (0.13, 0.18)	0.26 (0.22, 0.30)	0.04 (0.04, 0.04)	0.06 (0.05, 0.07)	0.07 (0.05, 0.09)	0.14 (0.11, 0.18)	0.03 (0.03, 0.03)	0.05 (0.04, 0.07)	0.04 (0.02, 0.05)	0.10 (0.06, 0.13)
In education	0.04 (0.04, 0.04)	0.04 (0.03, 0.05)	0.04 (0.03, 0.06)	0.02 (0.01, 0.04)	0.01 (0.01, 0.01)	0.02 (0.01, 0.03)	0.05 (0.04, 0.06)	0.09 (0.06, 0.12)	0.03 (0.03, 0.03)	0.04 (0.02, 0.05)	0.08 (0.06, 0.11)	0.16 (0.12, 0.21)
OLF	0.14 (0.13, 0.14)	0.16 (0.14, 0.17)	0.24 (0.21, 0.26)	0.35 (0.31, 0.40)	0.10 (0.10, 0.11)	0.12 (0.10, 0.14)	0.16 (0.14, 0.19)	0.30 (0.25, 0.35)	0.08 (0.08, 0.08)	0.09 (0.07, 0.11)	0.15 (0.11, 0.18)	0.22 (0.17, 0.26)

	Age 20-29 follow-up				Age 30-39 follow-up				Age 40-49 follow-up			
	Parental care	Relative care	Unrelated care	Residential care	Parental care	Relative care	Unrelated care	Residential care	Parental care	Relative care	Unrelated care	Residential care
Long-term nonemployed	0.01 (0.01, 0.01)	0.01 (0.01, 0.01)	0.02 (0.01, 0.02)	0.04 (0.03, 0.06)	0.02 (0.02, 0.02)	0.03 (0.02, 0.04)	0.05 (0.04, 0.06)	0.09 (0.06, 0.12)	0.04 (0.04, 0.04)	0.05 (0.03, 0.06)	0.09 (0.07, 0.12)	0.13 (0.09, 0.17)
Social class												
Managerial/ professional	0.23 (0.23, 0.23)	0.19 (0.17, 0.21)	0.11 (0.09, 0.13)	0.07 (0.05, 0.08)	0.38 (0.38, 0.39)	0.29 (0.26, 0.32)	0.23 (0.19, 0.26)	0.11 (0.08, 0.13)	0.39 (0.38, 0.39)	0.33 (0.29, 0.36)	0.29 (0.24, 0.33)	0.14 (0.11, 0.17)
Intermediate / technical	0.29 (0.29, 0.29)	0.28 (0.26, 0.31)	0.23 (0.20, 0.25)	0.14 (0.11, 0.16)	0.30 (0.30, 0.31)	0.30 (0.27, 0.33)	0.29 (0.25, 0.32)	0.16 (0.13, 0.19)	0.29 (0.29, 0.30)	0.30 (0.27, 0.34)	0.29 (0.25, 0.33)	0.15 (0.12, 0.19)
Routine occupations	0.32 (0.31, 0.32)	0.35 (0.33, 0.38)	0.43 (0.40, 0.47)	0.47 (0.42, 0.52)	0.26 (0.26, 0.26)	0.33 (0.30, 0.36)	0.37 (0.33, 0.40)	0.46 (0.41, 0.51)	0.28 (0.28, 0.29)	0.32 (0.28, 0.35)	0.36 (0.31, 0.40)	0.51 (0.45, 0.56)
Not known	0.16 (0.16, 0.16)	0.18 (0.16, 0.20)	0.23 (0.20, 0.25)	0.33 (0.28, 0.37)	0.05 (0.05, 0.05)	0.08 (0.06, 0.10)	0.12 (0.10, 0.14)	0.27 (0.23, 0.32)	0.04 (0.04, 0.04)	0.05 (0.04, 0.07)	0.07 (0.05, 0.09)	0.20 (0.15, 0.24)
Housing tenure												
Owner occupier	0.61 (0.61, 0.62)	0.53 (0.50, 0.55)	0.44 (0.41, 0.47)	0.25 (0.22, 0.29)	0.75 (0.75, 0.75)	0.66 (0.63, 0.69)	0.56 (0.52, 0.59)	0.34 (0.30, 0.39)	0.79 (0.79, 0.80)	0.74 (0.70, 0.77)	0.58 (0.53, 0.63)	0.38 (0.33, 0.44)
Renting	0.35 (0.35, 0.35)	0.43 (0.40, 0.46)	0.51 (0.48, 0.54)	0.63 (0.59, 0.67)	0.23 (0.22, 0.23)	0.30 (0.28, 0.33)	0.40 (0.36, 0.43)	0.59 (0.54, 0.63)	0.19 (0.19, 0.20)	0.25 (0.22, 0.28)	0.39 (0.35, 0.44)	0.57 (0.51, 0.62)
Other	0.04 (0.04,	0.04 (0.03,	0.05 (0.04, 0.06)	0.12 (0.09, 0.14)	0.02 (0.02,	0.03 (0.02,	0.05 (0.03, 0.07)	0.07 (0.05, 0.09)	0.01 (0.01,	0.01 (0.01,	0.02 (0.01, 0.04)	0.05 (0.03, 0.07)

	Age 20-29 follow-up				Age 30-39 follow-up				Age 40-49 follow-up			
	Parental care	Relative care	Unrelated care	Residential care	Parental care	Relative care	Unrelated care	Residential care	Parental care	Relative care	Unrelated care	Residential care
	0.04)	0.05)			0.02)	0.04)			0.01)	0.02)		
Overcrowding	0.03 (0.02, 0.03)	0.03 (0.03, 0.04)	0.04 (0.03, 0.05)	0.08 (0.05, 0.10)	0.02 (0.02, 0.02)	0.03 (0.02, 0.04)	0.04 (0.03, 0.06)	0.06 (0.04, 0.09)	0.01 (0.01, 0.01)	0.02 (0.02, 0.03)	0.01 (0.00, 0.02)	0.01 (0.00, 0.03)
Lives alone	0.04 (0.04, 0.04)	0.05 (0.04, 0.06)	0.06 (0.04, 0.07)	0.09 (0.07, 0.12)	0.01 (0.01, 0.01)	0.01 (0.01, 0.01)	0.02 (0.01, 0.03)	0.02 (0.01, 0.03)	0.00 (0.00, 0.00)	0.00 (0.00, 0.01)	0.01 (0.00, 0.02)	0.04 (0.02, 0.06)
Marital status												
Currently married	0.16 (0.15, 0.16)	0.19 (0.17, 0.21)	0.18 (0.16, 0.20)	0.18 (0.15, 0.21)	0.58 (0.58, 0.58)	0.55 (0.52, 0.58)	0.50 (0.47, 0.54)	0.36 (0.32, 0.41)	0.66 (0.66, 0.66)	0.63 (0.59, 0.67	0.57 (0.53, 0.62)	0.49 (0.43, 0.55)
Previously married	0.01 (0.01, 0.01)	0.01 (0.01, 0.02)	0.02 (0.01, 0.03)	0.02 (0.01, 0.03)	0.07 (0.07, 0.07)	0.08 (0.07, 0.10)	0.10 (0.08, 0.12)	0.10 (0.07, 0.12)	0.14 (0.14, 0.14)	0.17 (0.14, 0.20)	0.20 (0.16, 0.23)	0.17 (0.13, 0.21)
Single	0.83 (0.83, 0.84)	0.79 (0.77, 0.82)	0.80 (0.78, 0.83)	0.80 (0.76, 0.83)	0.35 (0.35, 0.35)	0.37 (0.34, 0.40)	0.40 (0.36, 0.43)	0.54 (0.49, 0.59)	0.20 (0.20, 0.20)	0.20 (0.17, 0.23)	0.23 (0.19, 0.27)	0.33 (0.28, 0.39)
Children (women only)												
0	0.74 (0.74, 0.75)	0.83 (0.80, 0.85)	0.75 (0.71, 0.79)	0.82 (0.77, 0.88)	0.31 (0.31, 0.31)	0.66 (0.62, 0.70)	0.59 (0.54, 0.64)	0.77 (0.71, 0.83)	0.19 (0.19, 0.20)	0.63 (0.58, 0.68)	0.58 (0.52, 0.64)	0.77 (0.70, 0.84)
1 - 2	0.24 (0.23, 0.24)	0.16 (0.13, 0.18)	0.21 (0.17, 0.24)	0.13 (0.08, 0.17)	0.54 (0.54, 0.54)	0.26 (0.22, 0.30)	0.29 (0.24, 0.33)	0.11 (0.07, 0.16)	0.58 (0.57, 0.58)	0.26 (0.22, 0.31)	0.26 (0.20, 0.31)	0.12 (0.06, 0.17)

	Age 20-29 follow-up				Age 30-39 follow-up				Age 40-49 follow-up			
	Parental care	**Relative care**	**Unrelated care**	**Residential care**	**Parental care**	**Relative care**	**Unrelated care**	**Residential care**	**Parental care**	**Relative care**	**Unrelated care**	**Residential care**
3+	0.02 (0.02, 0.02)	0.02 (0.01, 0.03)	0.04 (0.03, 0.06)	0.05 (0.02, 0.08)	0.15 (0.15, 0.15)	0.08 (0.06, 0.10)	0.12 (0.09, 0.15)	0.12 (0.07, 0.17)	0.23 (0.23, 0.23)	0.11 (0.08, 0.14)	0.17 (0.12, 0.21)	0.11 (0.06, 0.17)
Teenage mother	0.05 (0.05, 0.05)	0.04 (0.03, 0.06)	0.08 (0.06, 0.10)	0.10 (0.05, 0.15)	0.05 (0.05, 0.06)	0.04 (0.02, 0.05)	0.07 (0.05, 0.09)	0.11 (0.06, 0.16)	0.06 (0.05, 0.06)	0.03 (0.02, 0.05)	0.08 (0.05, 0.11)	0.08 (0.03, 0.14)

[1] Predicted probabilities conditional on gender, age, census cohort, ethnicity, and Head of household qualifications, marital status, social class and employment status in childhood, i.e. assuming mean values for all covariates

OLF: out of the labour forceFigure legends

Figure 1. Moderation of out-of-home care on a) employment and b) in education in adulthood by childhood census year, ONS Longitudinal Study

Figure 2. Moderation of out-of-home care on living alone in adulthood by childhood census year, ONS Longitudinal Study

Figure 3. Moderation of out-of-home care on number of children in adulthood by age in childhood, ONS Longitudinal Study (women only)

- Socioeconomic, family and living arrangements in adulthood depend on care placement
- Residential care predicted the worst outcomes, care by a relative the best
- Differences were found in people's 20s, 30s and 40s
- Inequalities tended to widen not narrow from 1981 to 2011
- Some returned to education later in life, with improvements to their circumstances

ICMJE DISCLOSURE FORM

Date:_____11 February 2021_____

Your Name:_____Amanda Sacker_____

Manuscript Title:_ Out-of-home care in childhood and socio-economic functioning in adulthood: ONS Longitudinal

Study 1971-2011

Manuscript number (if known):_____

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