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ORIGINAL ARTICLE

Do adult emotional and behavioural outcomes vary as a function of diverse childhood experiences of the public care system?

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Background. Longitudinal data from the 1970 British Cohort Study were used to examine the long-term adult outcomes of those who, as children, were placed in public care.

Method. Multivariate logistic estimation models were used to determine whether public care and placement patterns were associated with adult psychosocial outcomes. Seven emotional and behavioural outcomes measured at age 30 years were considered: depression, life dissatisfaction, self-efficacy, alcohol problems, smoking, drug abuse, and criminal convictions.

Results. The analyses revealed a significant association between public care status and adult maladjustment on depression [odds ratio (OR) 1.74], life dissatisfaction (OR 1.45), low self-efficacy (OR 1.95), smoking (OR 1.70) and criminal convictions (OR 2.13).

Conclusions. Overall, the present study findings suggest that there are enduring influences of a childhood admission to public care on emotional and behavioural adjustment from birth to adulthood. Some of the associations with childhood public care were relatively strong, particularly with respect to depression, self-efficacy and criminal convictions.

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Introduction

There is a greater concern nowadays about how best to ensure positive developmental outcomes for children in our society. Within this broad agenda, increasing attention is being paid to the emotional and behavioural consequences for adults with childhood experience of public care. Several longitudinal studies from the USA (Fanshel & Shinn, 1978; Benedict *et al*. 1996; Lawrence *et al*. 2006; Buehler *et al*. 2000; Courtney *et al*. 2007), Sweden (Bohman & Sigvardsson, 1990) and the UK (Triseliotis & Russell, 1984; Rutter *et al*. 1990) suggest these children are at increased risk of a range of emotional and behavioural problems in late adolescence/young adulthood. Other evidence, however, is less consistent with this negative view. For instance, Festinger (1983) found no evidence for increased emotional and behavioural problems in early adulthood for 277 children with a long-term foster care placement.

The focus of these studies on the transition period from adolescence to young adulthood and their methodological complexities makes it difficult to draw any definitive conclusions about the later life emotional and behavioural well-being of children from public care. Differences in the legal status of the children, the choice (or lack) of comparison groups, variation in sampling strategies and in the age at measurement between the studies hamper any direct comparisons. For instance, the outcomes from highly specialized samples (Rutter *et al*. 1990; Courtney *et al*. 2007) might not extend to the public care population as a whole; the characteristics of the public care system may have changed over time; and the transition point from care to adult independent living represents a vulnerable period as these children try to adapt to independent living, which might affect their psychosocial well-being. For instance, Dixon (2008) found increased prevalence rates of self-reported mental health problems at the transition from care to independent living. The first aim of the present study

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was to assess the enduring influence of a childhood admission to public care on mid-adulthood well-being.

Birth cohort studies that track the same group of people from birth throughout adulthood represent a powerful research method for examining the life course development of children from public care. Within the UK context, several studies (Cheung & Buchanan, 1997; Buchanan *et al*. 2000; Power *et al*. 2002) based on the 1958 National Child Development Study (NCDS) cohort found a relationship between childhood public care and adult depressive symptoms. These studies have also suffered from various methodological weaknesses and inconclusive findings. For instance, the estimation strategy of these studies relied exclusively on retrospective (age 23) data that might be affected by individual ability to remember past public care experiences. Furthermore, the evidence based on the NCDS data potentially reflect public care influences during a particular time period (the 1960s) and it is not clear whether these findings extend to children who experience public care at other time points. A second aim of this study was therefore to assess whether the findings from the NCDS are replicated to children placed in public care system during the 1970s/1980s using a different cohort, the British Cohort Study (BCS70).

Another important issue is that, despite a growing emphasis on the multi-dimensionality of competence, the NCDS evidence has typically focused on a single functional domain. One potential problem with focusing on a domain-specific competence is that the impact of public care on other aspects of an individual's life is missed. A narrow focus on depression, for example, might miss a more positive impact of public care on other areas of functioning such as alcohol problems. Therefore, a between-functional domains comparison allows a broader understanding about potential positive and negative outcomes of public care. Such investigation would evaluate whether certain adult emotional and behavioural outcomes are more susceptible to childhood public care (Collishaw *et al*. 2010). This investigation represents the final aim of the present study.

Overall, existing public care literature is limited with respect to the persistence of the impact of childhood public care on adult well-being at mid-adulthood. It is also worthwhile replicating NCDS data findings to a different public care context, such as the 1970s and 1980s. Finally, little is understood about the impact of public care on multiple adult life competences. The present study used BCS70 data to address the following questions: Do poor outcomes of public care persist into mid-adulthood? Do findings observed in an earlier cohort extend to a more recent cohort? Does the effect of childhood public care vary with adult outcome?

Method

Sample

Present analyses were drawn from the BCS70, a prospective population-based study that followed the life trajectories, from birth to adulthood, of over 17 000 children born during one week in April 1970. The study methodology has been described previously in detail (Plewis *et al*. 2004).

In total, 738 cohort members were identified for whom a public care placement was reported at the 1975, 1980, 1986 or 2000 surveys, representing about 4% of the total number of cohort members in the BCS1970 study. For a public care placement to be recorded, it required the child to have experienced a minimum of four consecutive weeks of Local Authority care placement. In this study the comparison of interest was between those placed in care and the population who were neither placed in care nor adopted ($n = 231$). Following this selection procedure, the final sample was restricted to cohort members who took part in the age 30 sweep and included 431 cohort members with a public care experience and 10 530 cohort members without a public care experience.

Public care status

Information about public care placements was based on questions that enquired whether or not cohort members were ever in care in the past or at the time of the survey. This information was available at ages 5, 10, 16 and 30. The age 30 information was particularly valuable in identifying a possible public care experience between the ages of 10 and 16 for those cohort members who were missing from the age 16 data when a teachers' strike coincided with data collection. Other variables were also used to complement information on public care experiences when not available from the main, 'ever in care' variable. For example, if both parental figures were foster parents at the time of the survey but no public care placement was reported, then the child was included in the public care group. The use of these additional variables to identify cohort members with a public care history ensured greater accuracy in identifying those cases where, for different reasons, this information was not provided. The responses to the public care variables at each of the childhood and age 30 surveys were coded into a binary variable according to whether the cohort member has been placed in public care for a continuous period of at least 4 weeks or not (1 = public care, and 0 = no public care).

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Childhood covariates

A broad range of factors were used to adjust for potential background differences between the public care and no public care groups. These factors encompass a range of personal, family and contextual factors known or assumed to be associated with children's emotional and behavioural development (Bowlby, 1980; Schofield, 2001) and the risk of public care (Bebbington & Miles, 1989). The selection of the factors was constrained by the study data and guided by previous empirical evidence. These measures represented circumstances or experiences at birth, prior to entry into public care. These factors were 'family characteristics' (socio-economic status, mother's age, mother's marital status, number of siblings, father and mother education, mother smoking and drinking during pregnancy, and child breastfeeding), 'neighbourhood aspects' (residential area at child's birth) and 'child's traits' (premature birth, birthweight, gender and ethnicity). All these variables were treated as categorical with an explicitly coded missing category, which included those cohort members with missing information on the respective factor. This procedure enabled an increase in the sample size for the analyses and an understanding of whether missing information was informative.

Adult outcome measures

The data for the outcome measures were based on the age 30 survey and were collected by trained interviewers using a self-completion computer-assisted personal interviewing (CAPI) instrument.

The Malaise Inventory

Cohort members' depression status was measured with the Malaise Inventory (Rutter *et al*. 1970), which comprises 24 items including 'whether often feels miserable and depressed', 'whether often gets worried about things', and 'whether is constantly keyed up and jittery'. It is conventional to classify a total of at least eight symptoms as indicative of depressive symptoms (Power *et al*. 1991), and binary indicators of high/low scores at this cut-point were used for the present analyses.

Life dissatisfaction

The life dissatisfaction measure was based on a single item ('satisfaction or dissatisfaction about the way life has turned out so far') that asked cohort members to report how satisfied they were with their life in general at the time of the surveys. Cohort members rated their life dissatisfaction on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). For the purpose of analysis, a binary variable (0/1) was developed with a score of 6 (representing the bottom quartile of the distribution scores, commonly used cut-off point; Dowd & Goldman, 2006) or below indicating life dissatisfaction (1).

Self-efficacy

Cohort members' self-efficacy at adulthood was assessed with a scale comprising three dichotomous items asking respondents how much they felt in control of their life: 'whether feels can run life as he/she wants', 'whether feels has control of his/her life', and 'whether feels gets what he/she wants out of life'. These items were coded as 1 (no) or 2 (yes). Cut-off points proposed by the Centre for Longitudinal Studies at the Institute of Education, London were used to differentiate cohort members into two groups: cohort members with scores $\geqslant 5$ were classified as 'poor self-efficacy skills' and scores <5 indicated 'good self-efficacy skills'.

Alcohol problems

An alcohol problem at age 30 was based on four items of the CAGE scale (Mayfield *et al*. 1974), which asked whether, over the past year, a cohort member felt that he or she 'ought to cut down on drinking', 'felt bad or guilty about drinking', 'had to have a drink first thing in the morning to steady hands', and 'have people annoyed you by criticising your drinking'. A total score for recent alcohol problems was derived by adding individuals' scores on each of the four items. As in Mayfield *et al*. (1974), two categories of alcohol problems were defined within alcohol scores: (*a*) alcohol problems (1), a CAGE score $\geqslant 2$, and (*b*) no alcohol problems (0), a CAGE score <2.

Smoking behaviour

Smoking behaviour assessment was based on individuals' self-reports of their current smoking habits. The measure grouped individuals into four different categories: non smokers, ex-smokers, occasional smokers, and daily smokers. This measure was developed by the Centre for Longitudinal Studies at the Institute of Education. For the purposes of the present study, cohort members were classified either as non-smokers (if they never smoked or were ex-smokers), which represented the reference category, or as smokers (if they were occasional or daily smokers).

Criminal convictions

A criminal conviction during adulthood was based on cohort members' self-reports. The measure was based

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on one item that asked individuals to report the number of times they had been found guilty of a criminal offence in a court of law since the last interview. At age 30, a 'criminal offences' variable was dichotomized as one if the respondent had one or more court convictions since the 1986 survey and zero if no court convictions were reported during the period.

Drug use

The measure for drug use at adulthood was assessed according to whether or not the cohort member reported a recent use of various illegal drug substances. At age 30, cohort members who reported that they had tried any one of 12 illegal drugs (e.g. cannabis, cocaine, heroin, amphetamine, crack) over the past 12 months were coded positively (1). Those who reported that they have never used illegal drugs since the 1986 survey and those with a prior report of illegal drugs use but not in the past 12 months were coded negatively (0).

Statistical analysis

Missing data

The complex nature of the missing information both within and between waves renders the analysis very difficult, in some respects. The great advantage of BCS70 prospective data is that it is possible to examine related variables or outcomes for individual items where information is missing. To understand whether missing information is informative, the present analyses explicitly retained codes (indicating 'missing' for each factor) for missing values on all explanatory variables. Multiple imputations represent a commonly advocated method for dealing with missing data. However, this method is computationally intensive with large datasets and can sometimes lead to biased estimates (Zhou *et al*. 2001).

Estimation strategy

To estimate the unique contributions of public care status and placement patterns to the variance in adult psychosocial adjustment, a series of hierarchical logistic regression analyses were conducted treating all factors as categorical with an explicitly defined missing category. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated by logistic regression, comparing each group with the most advantaged baseline group for each factor. The reference category, in addition to being considered to be an advantaged group, is always the first listed category following the generic labelling of the categorical variable in question.

Table 1. *Descriptive statistics and adjusted odds ratios for adult outcomes for the public care versus the no public care groups at the age of 30 years*

	Public care ($n=431$)	No public care ($n=10\,530$)	OR (95% CI)
Depression	21 (0.02)	12 (0.00)	1.73*** (1.34–2.24)
Life dissatisfaction	35 (0.02)	24 (0.00)	1.47*** (1.18–1.82)
Self-efficacy	16 (0.02)	7 (0.00)	1.97*** (1.47–2.65)
Alcohol problems	10 (0.02)	9 (0.00)	1.24 (0.88–1.75)
Smoking	53 (0.03)	36 (0.01)	1.71*** (1.39–2.10)
Drug abuse	21 (0.02)	17 (0.00)	1.27 (0.89–1.78)
Criminal convictions	28 (0.02)	14 (0.00)	2.16*** (1.67–2.78)

OR, Odds ratio; CI, confidence interval.

Values given as percentage (standard error), where the percentage is the proportion of cohort members with the outcome.

*** $p<0.001$.

Each emotional and behavioural disorder was analysed in independent logistic regression models with the direct entry method. The no public care group represented the reference category for public care variable in all the analyses. Birth and pre-birth characteristics were added as potential confounding factors. The analyses were based on all cohort members who took part in the age 30 survey, but excluding the group of cohort members who were adopted at birth and had no report of a public care experience. A p value of 0.05 was considered statistically significant. All analyses were carried out using SPSS version 16 (SPSS Inc., USA).

Results

Descriptive statistics

Means and standard errors for the all seven outcomes (depression, life dissatisfaction, self-efficacy, alcohol problems, smoking, drug use, and criminal convictions) for both public care and no public care groups are presented in Table 1. The public care group scored worse on these outcome measures compared to the no public care group, with the exception of alcohol problems and drug abuse.

Emotional outcomes

The results of the adjusted model (last column of Table 1 and online Supplementary Table 1) indicated that an experience of public care was associated with 1.7 greater odds of being depressed at age 30 compared to no public care experience after adjusting for birth and pre-birth covariates. The results for the life dissatisfaction outcome present a similar pattern to the

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depression outcome, with children in public care being at 1.5 greater odds of reporting life dissatisfaction at the age of 30 comparing to children without a public care experience. In a similar fashion to depression and life dissatisfaction outcomes, when accounting for birth covariates, having a childhood admission to public care was associated with 2.0 greater odds of reporting adult low self-efficacy skills compared to cohort members without a childhood experience of public care. These findings imply that, even after accounting for various pre-birth and birth risk factors, an admission to public care during childhood was associated with poorer emotional adjustment at the age of 30.

Behavioural outcomes

As shown in the last column of Table 1, adult behavioural outcomes of childhood public care depend on the outcome under consideration. In particular, the results show no significant association between an admission to public care during childhood and adult alcohol or drug use problems. By contrast, a significant association emerged with respect to smoking and criminal convictions measures. For instance, an admission to public care during childhood was associated with 1.7 increased odds of adult smoking compared to no admission to public care. Furthermore, the association remained significant after adjusting for birth and pre-birth factors. Likewise, cohort members with a childhood admission into public care had 2.1 greater odds of a criminal conviction at age 30 compared to those without an admission to public care. The relationship between admission to public care during childhood and adult criminal convictions remained significant after adjusting for confounding factors at birth.

Discussion

This study used data from the BCS70 to examine whether the adversity associated with admission to public care persisted into mid-adult years. The main aim of the study was to explore a possible association of childhood public care with adult emotional and behavioural outcomes independent of those factors that might have led to an admission to public care in the first place.

Overall, the present study identified a range of concerns related to five of the seven adult outcomes measures; namely, depression, life dissatisfaction, low self-efficacy, smoking, and criminal convictions. These associations remained significant after controlling for a broad range of personal, family and regional covariates at birth and during pregnancy. The findings of the present study extend existing evidence (Cheung & Buchanan, 1997; Buchanan *et al*. 2000; Power *et al*. 2002) to children born in a different period and who experienced care at a different time period. As such, the present findings raise concerns over the fact that possible changes in public care policy over time may have done too little in the way of alleviating the long-term adverse outcomes of children from public care. The broader emotional and behavioural outcomes explored in the present study compared to previous research (Gale & Martyn, 2004; Viner & Taylor, 2005) provide clear evidence for between-domains adversity in the care population.

Such findings suggest that escape from early disadvantage is difficult for children with a public care experience. The majority of our current knowledge about adult outcome of children in public care comes from studies (Bohman & Sigvardsson, 1980; Festinger, 1983; Triseliotis & Russell, 1984; Lawrence *et al*. 2006; Courtney *et al*. 2007) around the transition period from adolescence to young adulthood. The present findings are valuable in documenting the possibility that children from public care continue to be at a disadvantage to their peers at least until mid-adulthood.

The only exception emerged with respect to drug use and alcohol problems. According to the present findings, adults formerly in public care grow out of drug and alcohol problems by mid-adulthood. These results substantiate earlier research (Ward *et al*. 2003) suggesting that young people leaving care tend to grow out of drug use at the transition to independent living. The relatively reassuring findings in relation to drug and alcohol use have to be interpreted with some caution because children from public care are the most difficult to trace and tend to be at increased risk of premature death (Vinnerljung *et al*. 2006).

The finding of an association between public care and an adult outcome does not necessarily imply that public care caused the adult effect. Public care, as measured in the present study, is likely to represent a marker for early life adversity rather than a causal predictor. To determine that public care caused poorer adult outcomes it would be necessary to compare a group of cohort members from public care with a group of cohort members exposed to similar family adversities but who were not admitted to public care. The present data do not allow such a design and it is likely that such a study would be ethically impossible.

Other major risk factors (Supplementary Table 1) across the seven adult outcomes were having a greater number of siblings at birth, low socio-economic status, teenage mum, and mothers smoking and drinking during pregnancy. Although some of these factors are common to previous research (Triseliotis & Russell, 1984; Rutter *et al*. 1990; Courtney *et al*. 2007), others such as mothers smoking and drinking during

pregnancy and premature birth represent novel confounding factors. The inclusion of these factors as confounders in the present study represents a distinctive advantage over previous cohort studies. This is not to say that the present confounders were able to control out for all important childhood confounders, as this is a difficult task. Nonetheless, by considering novel predictors of adult functioning, the present study was able to control out for additional markers of earlier disadvantage.

Implications

Relatively little attention has been paid within the UK to adult well-being of children from public care. The long-term outcomes are important criteria for evaluation of the public care interventions whose main concern is to ensure the well-being of vulnerable groups of children. The present findings document the value such an enterprise can have in evaluating the long-term impact of public care. By showing associations between admission to public care and adult functioning of a group of children admitted to care during the 1970s and 1980s, the present findings point to the need to attend to the emotional and behavioural well-being for the present care generation and to the continuous need for targeted interventions at later life stages. Society's concern with the well-being of these children should not be limited to childhood or adolescence but extend to adult years. The severe adversity in these children's early life warrants long-term intervention to promote positive well-being.

Although the quality of public care may be better at present than during the 1970s/1980s because of increased regulation or funding, a certain degree of overlap in children's experiences of the care system also may exist. For example, social deprivation remains a common characteristic of children admitted to care both during the 1970s and currently. The experience of stigma and discrimination associated with being placed in public care is also as common today as in the past (Stein & Carey, 1986). In so far as data capture these particular elements of the care experience, the analysis from past data would provide useful pointers about their likely adult outcomes even for the current generation of children in care. The onus would also be on policy makers to consider seriously providing greater help and support where unfavourable outcomes are predicted, even if based on data from the past.

Study limitations

The present study has included one of the largest samples of public care individuals assessed over a long-term period within the UK; however, it may be biased because of the lack of data on cohort members who did not participate in the adult surveys. There are several reasons for the potential loss of the cohort members from the public care group into adulthood: (1) cohort members being unable to be located by the researchers, (2) cohort members declining to participate when contacted by the researchers, and (3) cohort members agreeing to participate but not answering the outcome measures (item non-response). Analyses of non-response and attrition in the BCS70 surveys have concluded that, overall, the BCS70 survey sweeps are reasonably representative of the original population (Plewis *et al*. 2004) and that biases are typically minimal, although where there is evidence of bias it is typically the more disadvantaged groups that are under-represented.

In addition, the measures of the public care system used within the study were not very good proxy measures for the quality of the care system. One limitation of proxy measures is that they may fail to capture the full experience of public care that these cohort members have been through. However, the proxy measures used in the present study have been frequently associated with the quality of public care (i.e. residential care was commonly associated with poor rearing environment; Rutter *et al*. 1990). They are also valuable when the variable of interest is too complex to be operationalized into a discrete entity (e.g. child–carer relationship). In addition, it would have been ethically and practically challenging to get the participants to take part in another qualitative study given that they had just participated in the 2008/2009 BCS70 survey. Finally, the data collected have not made it possible to calculate the length of time that each individual has spent in the care system. This information would have helped to clarify whether lengthier placements are associated with worse (or better) adult outcomes.

Study strengths

The use of covariates derived from the BCS70 birth wave in exploring the adult outcomes of public care ensured that these factors preceded these cohort members' care experiences. This is in contrast to previous studies (Viner & Taylor, 2005) that included as 'controls' factors from different childhood surveys. For instance, conditioning on age 10 factors in earlier studies means covariates have sometimes been before the public care experience, sometimes coinciding with it and even, in some cases, following care. The present study comparison is not without limitations, but at a minimum it ensures that the covariates preceded the care placement. As noted above, however, distinguishing between the impact of care and the

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counterfactual of what would have occurred otherwise is a difficult task, and one that cannot be fully answered with the present data.

The larger number of outcomes used to assess the impact of public care on adult outcomes constitute an additional advance. Many studies used only measures of internalized mental health outcomes, especially depression (Cheung & Buchanan, 1997). Yet the use of single outcome variables can systemically distort comparisons of the mental health impact of public care between different social groups (Horwitz *et al*. 2001). Children with different characteristics or family background, for example, may react differently to the stressors associated with public care. By using both emotional and behavioural measures, the present research had a greater chance of capturing the broader impact of public care on the outcomes of different groups of people.

Conclusions

In summary, the present study findings suggest that there are enduring influences of a childhood admission to public care on emotional and behavioural adjustment from birth to mid-adulthood. Some of the associations with childhood public care were relatively strong, particularly with respect to depression, self-efficacy and criminal convictions. The broad range of factors used in the analyses enabled us to control the effects of some of the children's earlier disadvantages; disadvantages that were likely to have been important in their being selected into public care. Additionally, adjusting for birth factors ensured that their impact preceded public care experience, an important condition to establish an association between public care and adult outcomes. By doing so, the study substantiated the association between childhood public care and mid-adulthood outcomes independent of a cluster of early adverse factors.

Key points

(1) It is unclear whether poor developmental outcomes at the transition point from public care into independent living extend to mid-adulthood.
(2) The study suggests that cohort members who had contact with the care system during the 1970s and 1980s on average have worse psychosocial measures in adulthood.
(3) These results remained significant even after adjusting for pre-care adversities, suggesting that public care may be an independent predictor of adult adjustment.
(4) The concern about the well-being of children from public care should extend at later stages of their lives, including mid-adulthood.

Note

Supplementary material accompanies this paper on the Journal's website (http://journals.cambridge.org/psm).

Declaration of Interest

None.

References

Bebbington A, Miles J (1989). The background of children who enter local authority care. *British Journal of Social Work* **19**, 349–368.

Bohman M, Sigvardsson S (1980). A prospective, longitudinal study of children registered for adoption. *Acta Psychiatrica Scandinavica* **61**, 339–355.

Bowlby J (1980). *Attachment and Loss: Vol. 3. Sadness and Depression*. Basic Books: New York.

Buchanan A, Brinke T, Flouri E (2000). Parental background, social disadvantage, public 'care', and psychological problems in adolescence and adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry* **39**, 1415–1423.

Buehler C, Orme J, Post J, Patterson D (2000). Long-term correlates of family foster care. *Children and Youth Services Review* **22**, 595–625.

Cheung SY, Buchanan A (1997). Malaise score in adulthood of children and young people who have been in care. *Journal of Child Psychology and Psychiatry* **38**, 575–580.

Collishaw S, Maughan B, Natarajan L, Pickles A (2010). Trends in adolescent emotional problems in England: a comparison of two national cohorts twenty years apart. *Journal of Child Psychology and Psychiatry* **51**, 885–894.

Courtney ME, Dworsky A, Cusick RG, Havlicek J, Perez A, Keller T (2007). *Midwest Evaluation of the Adult Functioning of Former Foster Youth: Outcomes at Age 21*. Chapin Hall Center for Children at the University of Chicago: Chicago, IL.

Dixon J (2008). Young people leaving care: health, well-being and outcomes. *Child and Family Social Work* **13**, 207–217.

Dowd JB, Goldman N (2006). Do biomarkers of stress mediate the relation between socioeconomic status and health? *Journal of Epidemiology and Community Health* **60**, 633–639.

Fanshel D, Shinn EB (1978). *Children in Foster Care: A Longitudinal Investigation*. Columbia University Press: New York.

Festinger T (1983). *No One Ever Asked Us: A Postscript to Foster Care*. Columbia University Press: New York.

Gale CR, Martyn CN (2004). Birth weight and later risk of depression in a national birth cohort. *British Journal of Psychiatry* **184**, 28–33.

Horwitz SM, Balestracci K, Simms MD (2001). Foster care placement improves children's functioning. *Archives of Pediatrics and Adolescent Medicine* **155**, 1255–1260.

Lawrence CR, Carlson EA, Egeland B (2006). The impact of foster care on development. *Development and Psychopathology* **18**, 57–76.

Mayfield D, McLeod G, Hall P (1974). The CAGE Questionnaire: validation of a new alcoholism screening instrument. *American Journal of Psychiatry* **131**, 1121–1123.

Plewis I, Calderwood L, Hawkes D, Nathan G (2004). *National Child Development Study and 1970 British Cohort Study Technical Report: Changes in the NCDS and BCS70 Populations and Samples over Time*. Centre for Longitudinal Studies, Institute of Education: London.

Power C, Manor O, Fox J (1991). *Health and Class: The Early Years*. Chapman & Hall: London.

Power C, Stansfeld SA, Matthews S, Manor O, Hope S (2002). Childhood and adulthood risk factors for socio-economic differentials in psychological distress: evidence from the 1958 British birth cohort. *Social Science and Medicine* **55**, 1989–2004.

Rutter M, Quinton D, Hill J (1990). Adult outcome of institution-reared children: males and females compared. In *Straight and Devious Pathways from Childhood to Adulthood* (ed. L. Robins and M. Rutter), pp. 135–157. Cambridge University Press: Cambridge.

Rutter MJ, Tizard J, Whitmore K (1970). *Education, Health, and Behaviour*. Longman: London.

Schofield G (2001). Resilience and family placement: a lifespan perspective. *Adoption and Fostering* **25**, 6–19.

Stein M, Carey K (1986). *Leaving Care*. Blackwell: Oxford.

Triseliotis J, Russell J (1984). *Hard to Place: The Outcomes of Adoption and Residential Care*. Gower: London.

Viner RM, Taylor B (2005). Adult health and social outcomes of children who have been in public care: population-based study. *Pediatrics* **115**, 894–899.

Vinnerljung B, Hjern A, Lindblad F (2006). Suicide attempts and severe psychiatric morbidity among former child welfare clients – a national cohort study. *Journal of Child Psychology and Psychiatry* **47**, 723–733.

Ward J, Henderson Z, Pearson G (2003). *One Problem Among Many: Drug Use Among Care Leavers in Transition to Independent Living*. Home Office: London.

Zhou X, Eckert GJ, Tierney WM (2001). Multiple imputations in public health research. *Statistics in Medicine* **20**, 1541–1549.