Challenges in Identifying Factors Which Determine the Placement of Children in Care? An International Review

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Abstract   Placing a child in out-of-home care is one of the most important decisions made by professionals in the child care system, with substantial social, psychological, educational, medical and economic consequences. This paper considers the challenges and difficulties of building statistical models of this decision by reviewing the available international evidence. Despite the large number of empirical investigations over a 50 year period, a consensus on the variables associated with this decision is hard to identify. In addition, the individual models have low explanatory and predictive power and should not be relied on to make placement decisions. A number of reasons for this poor performance are offered, and some ways forwards suggested. This paper also aims to facilitate the emergence of a coherent and integrated international literature from the disconnected and fragmented empirical studies. Rather than one placement problem, there are many slightly different problems, and therefore it is expected that a number of related sub-literatures will emerge, each concentrating on a particular definition of the placement problem.

Keywords   Placement decision · Foster care · Out-of-home care · Modelling

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Introduction

This paper reviews previous research which has used statistical analysis to identify the variables associated with the decision to place a child in care. It analyses 63 empirical studies of children placed in out-of-home care, the difficulties and challenges involved in building and comparing such research, and the extent to which these studies have been successful. The decision on whether or not to place a child can have important social, psychological, educational, medical and economic implications. Equally, placing children in care (rather than leaving them at home) can lead to behavioural problems. Rosenthal et al. (1991), Poertner et al. (1999) and Hobbs et al. (1999) have documented the abuse and neglect of 6,878 children in out-of-home placements in Colorado, USA, Illinois, USA and Leeds, UK, respectively. As well as personal costs, out-of-home placements can add to public sector spending; for example, Barth et al. (2006a) estimated the average cost of keeping a child in foster care in North Carolina, USA, at \$16,000 per year in 1995, equivalent to \$24,000 in 2011. In 2011 there were 400,540 children in care in the USA (Children's Bureau 2012). Therefore, the total costs of placement are formidable, and of interest to policy makers responsible for welfare funding.

Placement decision models entail a number of important challenges and difficulties, and an international review of the available studies should be helpful in providing a summary of the current state of knowledge on the extent to which the factors determining placement can be identified. Placement researchers usually reference only a few previous studies, and this has discouraged the development of national and international comparisons. The aim of this paper is to unify the disconnected and fragmented literature, identify the challenges and difficulties facing researchers, and encourage the emergence of an accepted set of important factors for each type of placement decision.

"Literature" describes the international literature on the placement decision, and "Modelling Challenges" considers various challenges and difficulties in modelling this decision. "Definition of the Placement Problem" summarises the different definitions of the placement problem used in previous research, while "Factors Leading to Out-of-Home Placement" attempts to identify the factors associated with different definitions of out-of-home placement. "The Data Used in Placement Studies" describes various aspects of the data used in these studies and how these can complicate comparisons between studies. Finally, "Conclusions" appear in the last section.

Literature

Three previous papers have reviewed the literature on placement decisions (Jones 1993; DePanfilis and Scannapieco 1994; Lindsey 1992a), but these are almost 20 years old, and only use evidence from the USA. Sixty further studies have been published in subsequent years, and together with the earlier non-US studies, form a substantial body of unreviewed papers which are included in the present study.

A variety of search engines (Web of Knowledge, International Bibliography of the Social Sciences, Google) were used to identify research published in English which used statistical analysis to identify the factors leading to children being placed in out-of-home care. Studies of any country at any date were included, as were studies at both the national and sub-national levels. References within the identified papers were also examined, and this process led to the identification of 96 studies. Eight studies with no control group, eight focusing on the views of child care workers, and 17 where the placement decision was the choice between different types of out-of-home care were excluded. Therefore, the final list of research papers comprised 63 studies of the choice between leaving a child at home and placing them in some form of out-of-home care.

Academic interest in the placement decision began approximately 50 years ago in the USA (e.g. Briar 1963; Boehm 1962). Of the 63 empirical studies published in English since then, 45 have used American data, and the remainder are from Canada (5), Denmark (4), Sweden (3), UK (3), Israel (1), the Netherlands (1) and Australia (1), see Table 1. The international spread of these studies is very uneven, with 71 % relating to the USA. Thirty-six of the 63 studies were conducted at the sub-national level (regions, states, counties, cities, etc.), and the remaining 27 at the national level. The number of placement studies has increased over time, suggesting that interest in the placement decision is growing. There was one study in the 1970s, seven in the 1980s, 15 in the 1990s, and 28 in the 2000s. For 2010 and 2011 there were 12 studies, i.e. a rate of 60 per decade.

Modelling Challenges

Every child and family situation is unique, and this complexity makes statistical modelling of the placement decision difficult. Individual needs can lead to substantial unexplained variation in placement decisions, making it difficult to find powerful independent variables. Furthermore, studies have been conducted at different times and in different countries, adding a further level of complexity to comparisons.[1] However, most of the empirical studies quantify the decision making of many child protection workers, across a large number of different situations, resulting in the measurement of the average relationship between the independent variables considered and the placement decision. Therefore idiosyncratic differences between cases should tend to average out over large samples. The extent to which this permits successful model building is an empirical question considered below.

The criteria for placing children vary across local authorities, child protection teams, and individual professionals. Using a common set of case studies to control for variations in the child and their circumstances, a number of studies have found substantial disagreement between individual child protection workers when recommending whether or not to place a particular child in care (Schuerman,

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[1] Gilbert, Parton and Skivenes (2011) contains a description of the child protection systems in all the countries included in this paper, apart from Australia and Israel.

Table 1 Summary of empirical studies of the placement decision

	Study	Location	Differentiation		No. of children		Technique	R^2
			A	B	A	B		
1	Phillips et al. (1971)	Eastern USA	Out-of-home care	Service at home	71	238	MLR	–
2	Runyan et al. (1981)	N. Carolina, USA	Foster care	Child maltreatment	685	7,085	LR	17 %
3	Quinton et al. (1984)	London borough, UK	Out-of-home care	General population	48	47	DS	–
4	Jones (1985)	New York, USA	Foster care	At risk of placement	90	153	MLR	25 %
5	Katz et al. (1986)	Boston, USA	Out-of-home care	Abused or neglected	38	147	LLA	–
6	Bebbington et al. (1988)	England, UK	Out-of-home care	General population	2,020	4,996	LR	32 %
7	Bebbington et al. (1989)	England, UK	Out-of-home care	General population	2,016	4,996	LR	33 %
8	Dalgleish et al. (1989)	Brisbane, Australia	Out-of-home care	Suspected child abuse	56	96	MLR	51 %
9	Hunter et al. (1990)	N. Carolina, USA	Out-of-home care	Sexual abuse	50	50	LR	25 %
10	Pellegrin et al. (1990)	A US county	Out-of-home care	Sexual abuse	18	25	DA	–
11	Jaudes and Morris (1990)	Chicago, USA	Out-of-home care	Sexual abuse	55	83	LR	–
12	Nelson (1990) (a)	Six US states	Out-of-home care	Delinquency	97		DA	–
13	Nelson (1990) (b)	Six US states	Out-of-home care	Status offence	67		DA	–
14	Nelson (1991) (a)	Six US states	Out-of-home care	Abused or neglected	96		DA	29 %
15	Nelson (1991) (b)	Six US states	Out-of-home care	Status offence	82		DA	27 %
16	Yuan et al. (1991) (a)	California, USA	Out-of-home care	At risk of placement	229	1,347	DA	15 %
17	Yuan et al. (1991) (b)	California, USA	Out-of-home care	At risk of placement	123	479	DA	27 %

Table 1 continued

	Study	Location	Differentiation		No. of children		Technique	R^2
			A	B	A	B		
18	Lindsey (1991)	USA	Foster care	Service at home	350,812	466,498	DA	–
19	Lindsey (1992b)	USA	Out-of-home care	At risk of placement	9,507		OR	–
20	Thieman and Dail (1992)	Iowa, USA	Out-of-home care	At risk of placement	200?	800?	DS	–
21	Leifer et al. (1993)	USA	Foster care	Sexually abused black girls	28	40	LR	–
22	Thieman and Dail (1997)	Iowa, USA	Out-of-home care	Service at home	904	3,131	LR	–
23	Zuravin et al. (1997)	Large US city	Foster care	Child maltreatment	458	577	LR	–
24	Needell and Barth (1998)	California, USA	Foster care	General population	26,460	68,401	LR	–
25	Zuravin et al. (1999)	Baltimore, USA	Foster care	Abused or neglected	458	185	LR	–
26	Hestbæk (1999)	Denmark	Out-of-home care	General population	494	5.2 m.	CS	–
27	Tittle et al. (2000)	Illinois, USA	Foster care	Abused or neglected	190	203	LR	–
28	McDonald et al. (2001)	Illinois, USA	Foster care	Abused or neglected	2,886	3,866	LR & ANN	–
29	De Kemp et al. (2003)	Netherlands	Out-of-home care	At risk of placement	19	88	ARS	–
30	Needell et al. (2003)	California, USA	Foster care	Child maltreatment	29,093	108,207	LR	–
31	Lau et al. (2003)	San Diego, USA	Foster care	Self-reported maltreatment	264	781	LR	–
32	Leschied et al. (2003)	Ontario, Canada	Out-of-home care	At risk of placement	234	216	DA	–
33	Trocmé et al. (2004)	Canada	Out-of-home care	Abused or neglected	2,891		LR	28 %
34	Berger et al. (2004)	USA	Out-of-home living	General population	88,504		MLR	–
35	Wobie et al. (2004)	Southern USA (cocaine)	Out-of-home care	Control sample	66	220	LR	–

Table 1 continued

	Study	Location	Differentiation		No. of children		Technique	R^2
			A	B	A	B		
36	English et al. (2005)	Washington State, USA	Out-of-home care	At risk of placement	1,990		LR	31 %
37	Hill (2005)	USA	Out-of-home care	Abused or neglected	2,109		LR	20 %
38	Goerge and Lee (2005)	Illinois, USA	Out-of-home care	Entered AFDC-TANF	644,570		HM	–
39	Harris et al. (2005) (a)	Illinois, USA	Out-of-home care	Abused or neglected	2,886	3,866	LR	–
40	Harris et al. (2005) (b)	Illinois, USA	Out-of-home care	Abused or neglected	190	203	LR	–
41	Barth et al. (2006b) (a)	USA (urban)	Out-of-home care	Child maltreatment	2,176		LR	9 %
42	Barth et al. (2006b) (b)	USA (non-urban)	Out-of-home care	Child maltreatment	708		LR	6 %
43	Davidson-Arad et al. (2006)	Central Israel	Out-of-home care	At risk of placement	54	45	DA	–
44	Berger (2006)	USA	Out-of-home living	General Population	28,143	234	PA	25 %
45	Chang et al. (2006)	Los Angeles (Koreans)	Out-of-home care	Abused or neglected	50	120	LR	–
46	Glisson et al. (2006)	Tennessee, USA	Out-of-home care	Referred by the court	1,019		LR	–
47	Knoke et al. (2007) (a)	Toronto, Canada (0–11)	Out-of-home care	At risk of placement	297	2,715	LR	–
48	Knoke et al. (2007) (b)	Toronto, Canada (12–16)	Out-of-home care	At risk of placement	191	961	LR	–
49	Park et al. (2007)	Philadelphia, USA	Out-of-home care	Mental health problems	500?	1,390?	SA	–
50	Elmund et al. (2007)	Sweden (Foreign adoptees)	Out-of-home care	General population	16,522	1,026,523	LR	–
51	Franzen et al. (2008) (a)	Sweden (0–6)	Out-of-home care	General population	4,968	546,779	LR	–

Table 1 continued

	Study	Location	Differentiation		No. of children		Technique	R^2
			A	B	A	B		
52	Franzen et al. (2008) (b)	Sweden (7–12)	Out-of-home care	General population	3,485	549,377	LR	–
53	Franzen et al. (2008) (c)	Sweden (13–17)	Out-of-home care	General population	6,386	457,229	LR	–
54	Farmer et al. (2008)	USA	Out-of-home care	Mental health problems	980?	2,086?	HM	–
55	Vinnerljung et al. (2008) (a)	Sweden (7–12)	Out-of-home care	General population	3,717	554,169	LR	–
56	Vinnerljung et al. (2008) (b)	Sweden (13–17)	Out-of-home care	General population	7,571	471,993	LR	–
57	Harpaz-Rotem et al. (2008)	10 US cities	Out-of-home care	Exposed to violence	88	587	LR	–
58	Rhee et al. (2008)	Los Angeles (Chinese)	Out-of-home care	At risk of placement	58	162	LR	–
59	Rivaux et al. (2008)	Texas, USA	Out-of-home care	Service at home	6,352	9,635	LR	–
60	Carter (2009)	USA (Indians)	Out-of-home care	At risk of placement	280		LR	–
61	Carter (2010)	USA (Indians)	Out-of-home care	At risk of placement	84	1,957	LR	–
62	Knott and Donovan (2010)	USA	Foster care	Child maltreatment	14,144	57,658	LR	13 %
63	Fluke et al. (2010)	Canada	Out-of-home care	Child maltreatment	256	1,048	LR	–
64	Hearn (2010)	Richmond, USA	Out-of-home care	Service at home	11	40	DA	–
65	Andersen et al. (2010) (a)	Denmark (0–6)	Out-of-home care	General population	6,113	34,490	LR	–
66	Andersen et al. (2010) (b)	Denmark (13–17)	Out-of-home care	General population	31,490	25,885	LR	–
67	Andersen (2010)	Denmark	Out-of-home care	General population	3,960	2,270,887	LR	–

Table 1 continued

	Study	Location	Differentiation		No. of children		Technique	R^2
			A	B	A	B		
68	Damashek et al. (2010)	Oklahoma, USA	Out-of-home care	Sibling maltreatment death	168		LR	–
69	Park et al. (2010)	USA	Out-of-home care	Child maltreatment	3,038		LR	–
70	Horowitz et al. (2011)	USA	Out-of-home care	Abused or neglected	294?	2,854?	LR	–
71	Ejrnæs et al. (2011) (a)	Denmark (0–6)	Out-of-home care	General population	2,897	2,220,611	LR	–
72	Ejrnæs et al. (2011) (b)	Denmark (7–12)	Out-of-home care	General population	1,884	1,884,942	LR	–
73	Ejrnæs et al. (2011) (c)	Denmark (13–17)	Out-of-home care	General population	8,094	1,329,678	LR	–
74	Lavergne et al. (2011)	Montreal, Canada	Out-of-home care	Substantiated maltreatment	449		LR	18 %
75	Lightfoot et al. (2011)	Minnesota, USA	Out-of-home care	Child maltreatment	854	3,128	LR	–

LR logistic regression, *DA* discriminant analysis, *DS* descriptive statistics, *ANN* artificial neural network, *MLR* multiple linear regression, *PA* probit analysis, *LLA* log linear analysis, *HM* hazard model, *SA* survival analysis, *ARS* aggregate risk scores, *OR* odds ratios, *CS* chi squared

Rossi and Budde 1999; Rapp 1982; Phillips, Shyne, Sherman and Harding 1971; Kang and Poertner 2006). This may be because professionals have significant differences in the importance they attach to the same piece of information (Britner and Mossler 2002). Such inconsistencies in practice raise questions about the extent to which placement decisions are based on a systematic analysis and established knowledge, and make it difficult to build statistical models of the placement decision.

All the researchers used a statistical technique to analyse the data. Forty-one previous studies used logistic regression (or logit analysis), while discriminant analysis was used in eight studies, with one study using probit analysis and one using an artificial neural network. In addition, as shown in Table 1, a range of other techniques were deployed—multiple linear regression (4), Chi squared tests (1), log linear analysis (1), descriptive statistics (2), odds ratios (1), survival analysis (1), hazard models (2) and aggregate risk scores (1). These results reveal that logistic regression is the technique of choice for tackling the placement problem. However, discriminant analysis, probit analysis and artificial neural networks are valid alternatives to logistic regression. Some new classification techniques are also

available, but have yet to be applied to the placement problem, e.g. random forests (Breiman 2001). Besides raising the possibility that the conclusions are influenced by the chosen statistical technique, some of the previously used techniques are unsuitable for the placement problem, e.g. multiple linear regression, making the findings of such studies unreliable.[2]

Definition of the Placement Problem

Despite the use of different definitions of the placement decision in previous studies, it has often been seen as a single problem when, in fact, it consists of many slightly different classification problems. Table 1 presents an overview of the literature with evidence from eight counties, highlighting the importance of carefully defining the particular placement decision under consideration. (Ten studies present results for two or more samples, and so Table 1 has 75 entries.) The observations for each study are divided into groups A and B in columns 3 and 4 of Table 1; (A) the placed group, and (B) the children not placed (the control group). These give the definitions of the two groups involved in the two-way classification problem, while columns 5 and 6 contain the numbers of children in each group. (The definitions of the two groups used in Table 1 rely on the definitions used by the studies, and in some cases the precise definitions are unclear.) Table 1 shows that three different definitions have been used for the "placed" group of children (Group A); i.e. out-of-home care (61), foster care (12), and out-of-home living (2).

The definitions of the "non-placed" children (Group B) are much wider, and have been classified in Table 1 as follows: general population (19), at risk of placement (14), abused or neglected (11), child maltreatment (9), service at home (6), sexual abuse (3), status offence (2), mental health problems (2), control sample (1), exposed to violence (1), suspected child abuse (1), delinquency (1) substantiated maltreatment (1), sibling maltreatment death (1), sexually abused black girls (1), referred by the court (1) and self-reported maltreatment (1).

Different definitions of the "placed" and "non-placed" children will result in different discriminating variables; for example, the differences between apples and oranges are quite different from the differences between apples and plums. Such differences between studies make it difficult to draw general conclusions on what factors are important, and the magnitude of the association of these factors with the placement decision. In essence, many different placement decisions have been studied. For example, if there are three alternatives for group A, and 17 alternatives for group B, there are potentially 51 different placement problems.

While accepting there are many different placement problems, 43 existing studies can be allocated to five main groups. The remaining 20 studies were of some particular sub-group, e.g. Korean Americans, Chinese Americans, American Indians, children exposed to cocaine, violence or sexual abuse, referred by the

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[2] A few authors have used multiple linear regression to estimate the factors associated with the placement decision, but there are powerful objections to this approach (Brooks 2008). Because the dependent variable is a probability, it must lie in the zero–one range. However multiple linear regression can easily predict negative probabilities, or probabilities above one, which are impossible.

court, living in urban/non-urban areas, experienced an inpatient psychiatric episode or had a sibling die from maltreatment, referred for a status offence, delinquency, substantiated maltreatment or suspected child abuse. These studies are heterogeneous with too few of each type to draw more general conclusions, and so have been excluded from this review.

Factors Leading to Out-of-Home Placement

Column B of Table 1 identifies the control group for the remaining 43 studies as falling into one of five groups—general population (13), abused and neglected (9), children receiving service at home (6), maltreated children (7) and children at risk of placement (8). Each of these groups represents a slightly different definition of the placement problem, and so each group will be examined separately to look for a set of common independent variables associated with the placement decision.

General Population

Comparisons of the general population with placed children provide one of the sharpest comparisons, and therefore increase the chances of finding significant differences between the two groups. The 13 studies under question cover four countries—Denmark (4), Sweden (3), USA (3) and the UK (3). In every study single parent families were more likely to have a child placed. The placement risk also increased in many studies if the mother was unemployed, received state benefits, had only a basic education or had a criminal conviction. Other factors associated with an increased risk of placement included low family income, overcrowded housing, non-immigrant parents, parental mental health problems, living in council or rented housing, a teenage mother, a low birth weight, a birth abnormality, frequent residential moves, and having parents who were themselves in care.

The next four sections consider children brought to the attention of the child protection system. For these children, distinguishing between the placed and non-placed is a greater challenge than when the non-selected group is the general population, as both sets of children already possess the common characteristic of receiving attention from the child care system. However, this is also the more relevant question for child protection workers because this is closer to the choice they actually have to make.

Abused and Neglected Children

Parental substance abuse and families with a history of involvement with child care services were the most common factors for abused and neglected children. Parental mental disorder, poverty, and families with infant children were also found by three studies.

Children Receiving Service at Home

Five of the studies identified poverty, while three specified a family history of involvement with child care services and the child being an infant as associated with placement. Other factors include single parent families, mental illness, being African-American and child behavioural difficulties.

Maltreated Children

The three most common factors were being African–American, parental substance abuse and emotional abuse. Being an infant, parental mental health problems and poverty were also found to contribute, but to a lesser extent.

Children at Risk of Placement

Five of these studies used unconventional independent variables for children seen as at risk of placement, e.g. indices constructed from a quality of life questionnaire or the Nijmegen child-rearing situation questionnaire. Of the remaining three studies, two identified being a single parent family as important.

This broad brush summary of the findings of previous studies reveals that the important independent variables differ from one group of studies to another, supporting the view that different placement problems have different discriminating variables. Therefore, any particular piece of research on placement decision-making relates to only a small number of these studies. However, within any one group of studies there is only modest agreement on the powerful independent variables. The one exception is those studies using the general population, which all found that being a single parent family increased the risk of placement. As well as being clear about the definition of the placement problem they are studying, researchers also need to consider the issues concerning the data discussed in the next section.

The Data Used in Placement Studies

It is difficult to divide the sources of data on children into discrete categories, but some general observations are possible. The data ranges from specially conducted large scale surveys to research studies relying on a small number of case studies. Administrative data already held on children living in a particular area has also been analysed, or used to select cases for interview. In some cases national administrative data were used to perform large scale studies. Problems arising from the data, and its use in model building, and in interpreting and comparing studies is considered below.

Subjective Variables

The administrative and survey data commonly includes just facts, such as age or gender, while the studies using casework information also include highly subjective

variables (e.g. psychological and behavioural indices) generated by the child protection professionals or the researchers. Since the measurement and definition of these subjective variables is arbitrary and differs from study to study, it is hard to interpret the magnitude of their effect on the placement decision, or to compare the results of different studies.

Sample Size

The sample sizes used in previous studies vary considerably. Studies using administrative or survey data can be very large, e.g. Lindsey (1991) studied 350,812 children placed in foster care, compared with 466,498 children who received service at home (see Table 1 for the wide range of sample sizes). In contrast, studies based on case work data generally have much smaller samples, e.g. Pellegrin and Wagner (1990) studied 18 sexually abused children placed in out-of-home care, and 25 sexually abused children not placed in care. Due to differences in statistical power stemming from variations in sample size, variables that are significant in a large sample study may be insignificant in a small sample study, complicating any comparison of the conclusions from different studies.

Many Explanatory Variables

A great many variables are thought to be relevant to placement decisions, and some empirical studies have considered over a hundred different variables. This raises the difficulty of identifying and measuring all these variables, with the problem of multicollinearity affecting the estimation of their individual effects. In addition, since there is a very large number of potential independent variables, and the data available to researchers differs, studies have investigated the effects of different sets of variables on the placement decision. In consequence, even if two researchers have studied the same placement decision, different sets of independent variables will probably have been used, making it difficult to compare their results.

Omitted Variables

While there is a large number of potential independent variables, the availability of data constrains the factors that can be examined in an empirical analysis. So it is possible that a powerful independent variable has been omitted from the analysis, leading to omitted variable bias. This causes the estimated coefficients for the included independent variables to be biased, unless the independent variable has zero correlation with the omitted variable. In addition, omitted variable bias inflates the estimated standard errors for all the estimated coefficients, reducing their apparent significance.

The possibility of important variables being omitted can be investigated by computing a measure of the explanatory power of the fitted models, i.e. what proportion of the total variation in the dependent variable is explained by the independent variables in the model (R^2). Only 18 of the 63 studies provided a measure of the explanatory power of their model, and these R^2 values are low, averaging under

23 %, i.e. the models explain only 23 % of the variation in the placement decision.[3] Substantial unexplained variation is expected due to the exercise of judgment by the decision-makers; but the very large unexplained variation in the dependent variable should result in research into identifying missing independent variables that are quantifiable and increase the explanatory power of the models.

There are a few variables whose omission appears not to be a problem. For example, Rossi et al. (1999) found that the characteristics of the case worker do not affect the placement decision (e.g. their background and work experience), and so excluding this variable from the analysis does not alter the results. Another concern is highlighted by Britner and Mossler (2002), who show that there are differences between professional groups (social and mental health workers, judges and guardians, special advisors) in the importance they attach to various pieces of information. However, since the research is of the decision-making process in its entirety, this omission is also unimportant.

Reason for Placement

It is possible that what appears to be a homogenous placement problem, e.g. out-of-home care versus the general population, actually comprises a number of separate placement problems. It may be that the characteristics of parents/carer and children vary with the primary reason for placement. If the child is placed due to the short-term serious physical illness of the primary carer, or because of some short-term family emergency, the characteristics of the parents/carer and children may differ from those where the placement is for drug addiction. In some previous studies the decision-makers have specified the main reason for the placement, while in other cases this is unknown. When using survey data the primary reason for placement is often unspecified, making it impossible to disaggregate the sample according to the primary reason for placement. However, it is possible to use the child's age as a proxy for the reason for placement. Delfabbro et al. (2002) argue that children taken into out-of-home care fall into two distinct groups—young children whose parents have problems, and adolescents who themselves have problems, and a study of 235 children taken into care in South Australia found evidence of two such distinct clusters. This suggests that studies that do not include the primary reason for placement as an independent variable should analyse children and adolescents separately. This has been done by six recent studies (Elmund et al. 2007; Knoke et al. 2007; Franzen et al. 2008; Vinnerljung et al. 2008; Andersen and Fallesen 2010; Ejrnæs et al. 2011).

Constraints Omitted

It is possible that placement decisions are influenced by capacity constraints on the supply of various types of service; for example, a child is not placed in care because some capacity limit has been reached. This issue has not been considered in placement studies, probably because of difficulties in determining the service

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[3] Low R^2 values are common in social science research, particularly in cross-section studies.

capacity available at the time and place of each placement decision. Rapp (1982), showed that the availability of family support services has little effect on the foster care placement decision, while Duncan and Argys (2007) found that increasing the payment to US foster parents leads to more children being placed in foster care, presumably because the supply of foster care places is increased. Berger (2006) reached a similar conclusion. Capacity constraints could be an important factor in the placement of some children, even though at different places or times within the sample there is no lack of capacity. With such constraints omitted, when averaged out over the sample area and over time, the results reflect the effects of the average capacity constraint on placement decisions. However, the models do not specifically quantify these capacity effects, and so they are conflated into the coefficients of the model's independent variables.

Neighbourhood Effects

Andersen (2010) found that out-of-home placement rates for areas of Denmark vary with the level of local preventative measures, school class sizes, local cultural and sport expenditure, urbanization, rented housing, immigrants and single parent families. Lery (2009) also found that out-of-home placement rates in Alameda County, California vary with neighbourhood factors such as residential instability and impoverishment. Variations in foster care placement rates between 579 zip codes in California were studied by Freisthaler, Gruenwald, Remer, Lery and Needell (2007). They discovered that placement rates differed with the number of alcohol outlets, average household size, median household income, median child age and the proportion of black Americans. Curtis and Alexander (2010) looked for neighbourhood effects on the placement of black children in Franklin County, California, but failed to find any significant effects.

In Finland the annual rate of change in the proportion of children with out-of-home placements varies with regional differences in sales of alcohol, the divorce rate and the unemployment rate (Hiilamo 2009). Some of the regional and neighbourhood variables (e.g. unemployment, alcohol abuse, single parent family, rented housing) appear in the individual case data, and so some of their effects on individual families are picked up at the case level, although not their indirect neighbourhood effects. These regional and neighbourhood factors vary from case to case, and if these variables are omitted from the analysis the model coefficients reflect their average indirect effects (although their effects are not specifically quantified). Including neighbourhood effects into studies of the placement decision requires data on the spatial location of each child, as well as the characteristics of each neighbourhood. Data on the location of children may be unavailable due to confidentiality policies and procedures, making it impossible to determine which neighbourhood data to use.

Time Series Effects

As well as neighbourhood (cross-sectional) effects, there may be time series effects. For example, Catalano et al. (1999) showed that changes in the number of children

in foster care each month vary with changes in the monthly state unemployment rate in California. Such time series effects imply that the coefficients of a placement model may change over time, although it is also possible that the unemployment variable in a model using observations on individual children picks up some or all of these state-wide time series effects.

Conclusions

The placement decision is one of the most important decisions made by child protection workers, and has attracted a considerable number of research studies (96). The main aim of the models estimated in these studies is to understand the factors involved in making and predicting placement decisions. This paper has set out the challenges rather than definitive answers to the difficulties of analysing data to inform policy and practice. It has also collected together the fragmented literature, and demonstrated that research on making the placement decision is international.

Rather than one placement problem, there are many; and for a particular placement problem, the results of different studies need to be interpreted with care, as there are substantial differences between studies. Despite the large number of empirical investigations, a consensus on the variables associated with this decision is hard to identify. This is partly due to variations between studies in the definition of the placement decision, the type, identity and measurement of the variables, the sample size, family circumstances, the way care workers make placement decisions, the time period and the country studied. In addition, for some studies the definition of the placed and non-placed groups are unclear. These differences and definitional issues make it difficult to make comparisons. Modelling and predicting the placement decision is also challenging because every placement decision is unique, involving a multitude of independent variables, many of which are hard to quantify. There is also the issue that child care workers may make idiosyncratic decisions which do not conform with a set of commonly held professional criteria.

In consequence, the success of these studies has been very limited, and the classification of children using these models should not be relied on to make placement decisions for three reasons. First, while the models have some highly significant estimated coefficients, their R^2 values are disappointingly low and the models have poor predictive power. Second, these models rely on the decisions actually made by child protection workers, which may not be optimal. Third, there is an absence of a generally accepted set of key variables which are strongly associated with the placement decision.

Further child-centered research is needed to inform professionals seeking to make informed decisions within specific practice contexts. Such models require high R^2 values based on an accepted set of key variables, and clear definitions based on discriminating variables aligned with the experience of children in care.

Future research could replicate placement studies with data for a later period, with all other aspects of the analysis held constant, permitting an investigation of the temporal stability of the estimated coefficients. The extent to which placement

decision-making varies between regions may be analysed by disaggregating a large national dataset. Access to data held by related welfare organizations (for example, those holding health data) would enable the analysis of new independent variables which may improve the performance of the models. Researchers could also include neighbourhood variables, out-of-home care capacity constraints, and the reason for placement as independent variables. Finally, different statistical techniques could be applied.

It is possible that, despite such efforts, satisfactory models of the placement decision cannot be developed. This may be either because the problem is too complex, with its focus on individual needs; or because child care workers make inconsistent decisions which no model is capable of explaining.

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