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## 7 One Thousand Families over Three Generations: Method and Some Preliminary Findings

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A unique opportunity to study deprivation across three generations arose from the possibility of following up the thousand Newcastle families originally contacted in 1947. Good records have been kept on these families, and advantage was taken of these to examine, longitudinally, whether children who had grown up in deprived families were more at risk, for their own and for their children's functioning, in adulthood.

The follow-up investigation is not yet complete, and we cannot yet report on intergenerational patterns of deprivation. Nevertheless we can indicate some of the methodological issues that have arisen, and decisions we have had to take, so far. We can also present some preliminary data on deprivation over the life-cycle which begin to suggest that problems at one age increase the risk of problems in later years.

### **The thousand family survey**

A series of local studies in Newcastle upon Tyne in the 1930s (Spence 1931; Charles 1934; Brewis *et al.* 1940; Spence and Miller 1941) demonstrated that health in children was related to conditions of family life and pointed to the need for a study of acute infections in infancy. Such a study was undertaken, after the Second World War, of all infants born in the city between 1 May and 30 June 1947. As each baby was born, parents were asked if members of the research team could visit their home and observe the progress of their infant. In all, 1,142 babies were included in the study, and only seven families withdrew their co-operation in the first year. Although planned originally for one year only, the study continued until the children entered school and then until they were aged 15. A detailed description of the planning and organisation of the investigation over this period is

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presented by Spence *et al.* (1954), Miller *et al.* (1960), and Miller *et al.* (1974).

By the end of the first five years a close relationship had developed between the families of the Red Spot babies<sup>1</sup>, 847 of whom remained in the study, and the survey team decided to continue until the children were 15 years old. Thus by 1962 continuous records of some 760 children and their families over fifteen years had been collected. Throughout the school years the Thousand Family survey team sought and received increasing help from the Education Committee and school teachers, a series of studies of special groups of children was conducted, housing was surveyed, records of growth were collected and school achievement was documented.

After 1962 no further work was done apart from gathering information on schooling and employment – and following up some 500 families in 1969 to study growth between the ages of 15 and 22 years – until in 1975 it was suggested that the families might be recontacted to see whether the original subjects, as adults, were the parents of children showing similar social handicaps. In other words, were children in families with problems likely to become the parents of children with problems? As the data on the Thousand Families had, over the years, been carefully and systematically catalogued, it became feasible to examine this question, and a follow-up investigation was mounted.

#### **The method of the recent follow-up**

##### *Tracing the families*

The initial task of the recent follow-up of the Newcastle Thousand Families was to trace a sample of the 847 Red Spot children who were 5 years old in 1952. The tracing exercise took place from 1979 to 1981 when the average age of these subjects was 33. A high rate of success was achieved: we were able to trace 96 per cent of the members of the original sample, and interview and assess 92 per cent of the members of this group. The search was made easier by the very static nature of the population in the north-east of England: only one in five of our Red Spots were found to be living outside this region, and less than 3 per cent were known to have emigrated.

We started our search with an appeal on local radio and in newspapers, and about 30 per cent of families contacted us as a result. The next step in the search was through the offices of the Registrar General from which we obtained the names of the current general practitioners of our sample. We then wrote to these GPs to ask for permission to contact the families, and in this way we were able to trace a further 37 per cent of the Red Spots. Families not found through these sources

were usually found via local housing agencies or through direct home searches.

*Criteria of deprivation*

Areas of family deprivation relating to the Red Spots' first five years of life were described and collected (Miller *et al.* 1960). In the current follow-up these were reorganised in a way that allowed us to identify the main areas of deprivation and to study overlap between them. Six main areas of family deprivation were accordingly identified for the Red Spots at 5 years of age, and these were:

- (A) *Family/marital disruption*
  - (i) Divorce/separation
  - (ii) Marital instability
- (B) *Parental illness*  
Parent incapacitated by illness
- (C) *Defective care*
  - (i) Personal cleanliness
  - (ii) Domestic cleanliness
  - (iii) Poor clothing
- (D) *Social dependence*
  - (i) Debt
  - (ii) Unemployment
  - (iii) National Assistance
- (E) *Housing (overcrowding)*
- (F) *Poor maternal capacity (coping)*

All families were given a score of zero or one on each of the above six criteria and their scores were added to give a total deprivation rating.

*Selecting the four groups for study*

The next step was to identify all the children with evidence of 'deprivation' in any of these six areas at 5 years of age. From the records it was found that of the 847 families, 482 (57 per cent) were not deprived in any respect, 365 (43 per cent) were deprived on at least one criterion, and 116 (14 per cent) were deprived on at least three criteria. The degree of overlap between pairs of criteria is shown in Table 7.1.

We had three main aims in selecting sub-samples for special study. The first was that, to avoid focusing only on mild rather than significant deprivation, a multiply deprived group should be identified. Second, we wanted to be able to compare a deprived group not only with a control sample representative of families living in the city but also with a comparison group in which there was no evidence of deprivation.

Table 7.1 Percentage overlap between pairs of criteria

		(A)	(B)	(C)	(D)	(E)
Family/marital disruption	— (A)	—				
Parental illness	— (B)	16.5	—			
Defective care	— (C)	17.4	18.6	—		
Social dependence	— (D)	22.6	37.9	25.6	—	
Housing (overcrowding)	— (E)	14.7	15.0	27.4	25.4	—
Poor maternal capacity (coping)	— (F)	22.4	18.4	50.3	25.3	26.4

And third, we wished to examine each of the types of deprivation separately and hence in a reasonably pure form.

To satisfy these criteria we selected four samples of families as follows:

- (a) *Supercontrols*: a random sample of families in which there was no evidence of deprivation (N = 63; 7.4 per cent of total sample of 847).
- (b) *Random controls*: a randomly selected group representative of the 847 families in Newcastle in 1952 (N = 67; 7.9 per cent of total sample of 847).
- (c) *Deprived group*: a 50 per cent random sample of families deprived in at least one respect (N = 185; 21.8 per cent of total sample of 847).
- (d) *Multiply deprived group*: a random sample of families deprived in at least three respects (N = 78; 9.2 per cent of total sample of 847).

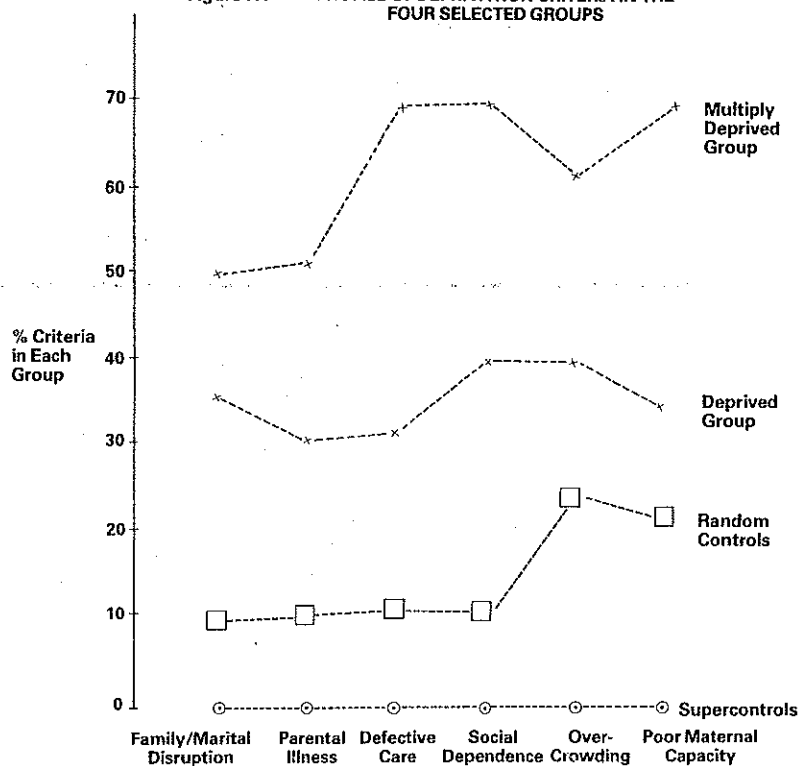
These groups of families were selected so that there was no overlap of the control and the deprived groups, and the profile of deprivation in these four groups is shown in Figure 7.1. In addition we isolated six groups of families representing each type of deprivation under study. These showed evidence of: Family/marital disruption (70 families); parental illness (63 families); defective care (66 families); social dependence (89 families); overcrowding (92 families); and poor maternal capacity (81 families). As these groups were not mutually exclusive, they can be compared only with the supercontrols.

#### *Hypotheses*

The main aim in following up the Red Spots was to establish whether or not there were continuities of deprivation within their families and over a generation.

In the strict sense, continuity can be defined as occurring when circumstances of deprivation appear to repeat themselves in successive generations at an equivalent point in the life-cycle. Alternatively, continuity can indicate the presence of certain criteria of deprivation at

Figure 7.1 PROFILE OF DEPRIVATION CRITERIA IN THE FOUR SELECTED GROUPS



different points of the life-cycle in the *same* generation. A wider concept still of continuity is that it occurs when underprivileged *family* environments give rise to underfunctioning children showing poorer than average physical development and poorer social, behavioural and educational functioning in the school years. Further, such underfunctioning in childhood may subsequently reveal itself, when the children become adults, in poorer emotional, social and economic functioning, and also in a relatively poor ability to provide adequate care for their own children. These children may, in turn, show poor development, and so on. The concept of continuity is used in all these senses in the current study which examines deprivation both within and across generations.

The main hypotheses under investigation are that:

- (1) Underprivileged family environments are associated with poorer social, behavioural and educational functioning during the school years.
- (2) Underprivileged family environments are associated with poorer

emotional, social and economic functioning in adult life, and hence poorer ability to care adequately for children.

(3) Underprivileged family environments lead to the transmission of poorer social, behavioural and educational functioning from generation 1 to generation 3.

(4) Specific criteria of underprivilege (deprivation) persist across the life-cycle.

(5) Specific criteria of deprivation will be roughly repeated in two successive generations.

(6) Multiple criteria of social disadvantage have an even stronger association with all types of subsequent underfunctioning.

(7) Certain indices of social and family disadvantage appear to have more harmful influences than others. These may be specific for certain types of later functioning.

(8) Certain factors have protective effects.

(9) Experiences of deprivation in the first generation are predictive of poor outcome both for the Red Spots and for their offspring.

#### **Deprivation at 5 years**

The starting point of our study was when the Red Spots were 5 years old, and it is useful to provide an account of the families at that point. Some of these data will simply reflect the criteria of deprivation by which the families were selected, but some will provide a more fine-grain picture of differences between the groups in terms of family and social factors, and illness. In some instances we report on relevant data covering the whole span of the first five years of life.

#### *Family size and position in the family*

Our data confirm that deprived children tend to come from larger families. Thus, at 5 years, the mean family size was 2.2 (with a standard deviation of 1.1) for the supercontrols and 3.1 (s.d. = 1.8) for the random controls, but 3.4 (s.d. = 2.0) for the deprived group and 4.3 (s.d. = 2.2) for the multiply deprived. Furthermore, the Red Spot was the third or subsequent child in only 14 per cent of the families of the supercontrols, but in 58 per cent of the multiply deprived families. Most of the groups showing particular types of disadvantage had a mean family size comparable to that of the deprived group. Only within the family/marital disruption group was the mean family size less than for the other deprived groups and similar to that of the random controls.

#### *Parental loss*

Just over one in fifteen of the Red Spots either entered a family in

which there was no father or permanently lost their fathers before the age of 5, and our data indicate that absence of a father was significantly associated with the degree of deprivation. Loss of father was, as might be expected, particularly common in the family/marital disruption group, but uncommon in the overcrowding group. Loss of mother showed a similar pattern of associations, although it was comparatively rare for mothers to be absent.

#### *Maternal employment*

During their infants' first five years of life, just over a quarter of the mothers of Red Spots were employed for various periods in either full-time or part-time work.

The work pattern of the groups is not easy to explain. Mothers in less disadvantaged circumstances seemed more likely to have full-time employment, whereas those from more disadvantaged circumstances tended to hold part-time posts. The rate of full-time and part-time working was extremely high in the family/marital disruption group and rather high in the poor maternal capacity group.

#### *Housing*

Considerable information on housing was collected in 1949. At this point four in ten of the control families, but only half this proportion of multiply deprived families, lived in adequate housing – that is, in detached or semi-detached houses, bungalows, council or terrace houses, but not in prefabricated houses, flats in houses, sublet rooms, etc. The substandard housing was, in the main, old properties without the basic requirements of hot water, bath or indoor sanitation (Miller *et al.* 1960). In addition, degree of deprivation was clearly associated with inadequate toilet and bathing facilities in 1948. Such amenities were especially lacking in the defective care and the overcrowding groups. Shared toilets were particularly common among the defective care group.

About 85 per cent of the families over all were living in rented accommodation, and information on rent paid was available in most cases. It was found that about four in ten families among the super-controls and the random controls paid rents in the upper third of the range, but that the same applied to only two in ten of the deprived families and one in eight of the multiply deprived. In other words, there was a clear association between the degree of deprivation and the proportion of families paying lower rents. Low rents were particularly prevalent within the overcrowding and the defective care groups.

Miller *et al.* (1960) report that a lack of sleep or poor sleeping arrangements were noted in 8.5 per cent of families when the Red

Spots were 5 years old. The risk of these circumstances rose sharply with increased deprivation and they affected 44 per cent of multiply deprived families. They were, surprisingly, not particularly frequent in the overcrowding group, but they were prominent in the defective care group and also fairly common in the poor maternal capacity group.

#### *Health of the children*

Between the ages of 1 and 5 years the Red Spots showed a high rate of severe respiratory infection, the risk of which was significantly related to degree of deprivation.

Use of health services over this period was also related to family deprivation. On the one hand the multiply deprived were half as likely as the supercontrols to attend child welfare centres six or more times, but on the other hand hospital out-patient and in-patient attendances progressively increased as the degree of deprivation became more severe (69 per cent of the children from multiply deprived families had had hospital out-patient consultations and 27 per cent had had hospital in-patient admissions, whereas the respective proportions of the super-control children were 49 and 11 per cent).

#### *Speech disorders*

It was demonstrated by Miller *et al.* (1960) that about one in five of the children had disorders of speech at some stage during their first five years in that they 'were slow in developing language, had defective articulation or stammered'. From our reanalysis it is evident that the incidence of speech disorders in the deprived groups was more than double that in the control groups. It also emerged that speech defects were relatively common in the defective care group (over half the children were affected) but comparatively rare in the family/marital disruption group (one in five children were affected).

#### **Deprivation in the first year of life**

There is much empirical and theoretical evidence to suggest that a child's pre-school years are crucially important for physical, cognitive and personality development, as well as for behaviour adjustment (Pringle 1974; Clarke and Clarke 1976). In the light of such evidence, we consider it important to sketch a picture of the children's life experiences before the fifth year, which is our baseline. The first year data we have available cover social factors, family factors, marital factors and health/illness.



*Social factors*

The four deprived and control groups differed significantly in social class assessed according to the Registrar General's occupational classificatory system. Thus greater deprivation meant a lesser likelihood of belonging to the upper and middle occupational strata and a greater probability of coming from the lower occupational strata. An examination of the groups classified by type of deprivation revealed a similar pattern. Although the lower social strata were significantly represented in all six groups, they were especially common within the social dependence, defective care, poor maternal capacity and, notably, overcrowding groups.

As at 5 years, the housing conditions of children at 1 year were more likely to be substandard, lacking in amenities and overcrowded, within the most severely deprived families. In addition these families were less likely than others to have a cot for the infant to sleep in. Overcrowding and lack of cots were associated with all types of deprivation, but most strongly with defective care, poor maternal capacity and, unsurprisingly, overcrowding.

*Family factors*

A number of family characteristics were found to relate to degree of deprivation. For instance, the greater the deprivation, the more likely were mothers to have been married by the age of 19 years and to have shown a high parity. As mothers in the deprived groups not only married younger, but also had larger families, more tended to have children at younger as well as older ages than the mothers in the control groups. Among families with different types of deprivation, it was those showing defective care and overcrowding who were most likely to have four or more children by the first year of the Red Spot's life.

It is relevant to mention at this stage that no cases of illegitimacy were recorded for the supercontrol and random control groups, whereas 10 per cent of the deprived group and 17 per cent of the multiply deprived group had illegitimate children. Illegitimacy, moreover, was most prevalent in the family/marital disruption group (occurring in 17 per cent of families) but lowest in the overcrowding group (only 6 per cent of families were affected). In addition, the more severe the degree of deprivation, the less mothers seemed able to cope during the first year of life: just over a quarter of mothers in the multiply deprived group, as compared with all those in the supercontrols, appeared competent in this sense. Inability to cope was especially common in the poor maternal capacity and the defective care groups.

*Marital factors*

The risk of marital instability was heightened in deprived families. Thus a high proportion of the children from the deprived groups was exposed to and experienced distressing marital, and consequently family pressures during the highly formative first year of life. It is interesting to note that in almost six in ten cases of family/marital disruption identified during the fifth year of the Red Spot's life, the condition had already been present by the first year. Marital instability proved widespread in that it was significantly more prevalent within each of the groups identified by type of deprivation than among the supercontrols.

*Illness*

Mothers in the deprived groups experienced more ill health during the first year of their children's lives than their more advantaged counterparts. A similar pattern was found for each of the groups showing a specific *type* of deprivation, and in all cases rates of ill health were almost treble the rate found among the supercontrols. However, as expected, maternal ill health was particularly common in the group identified on the basis of poor maternal capacity when the children were 5 years of age.

Children's health was also related to deprivation, and there was a greater degree of serious respiratory illness during the first year in the deprived groups than in the control groups. This difference was maintained across all groups representing a specific type of deprivation.

**Deprivation beyond 5 years of age**

From information on deprivation at 5 and at 10 years, we were able to examine life-cycle changes occurring over a period of five years. We found that, in general, the deprivation suffered by the families diminished considerably during this time.

The reduction in deprivation over the five years in question applied both within the sample of 847 families as a whole, and within the selected sub-groups of families. When we examined the life-cycle patterns of deprivation shown by these families we found that:

- (1) Of those scoring zero at year 5, 10 per cent scored more at year 10.
- (2) Of those scoring one at year 5, 67 per cent scored less and 7 per cent scored more at year 10.
- (3) Of those scoring two at year 5, 75 per cent scored less and 12.7 per cent scored more at year 10.
- (4) Of those scoring three at year 5, 83 per cent scored less and 8 per cent scored more at year 10.

- (5) Of those scoring four at year 5, 75 per cent scored less and 10 per cent scored more at year 10.
- (6) Of those scoring five at year 5, 86 per cent scored less at year 10.

In other words, the reduction in deprivation was considerable in all groups apart from the group initially showing no problems. The Red Spots, by the age of 10, were living under far better conditions than at 5 years. Moreover, as a reduction in deprivation was most marked in those originally most deprived; and as some of the initially non-deprived later showed some signs of deprivation, fewer differences between deprived and control groups were found at 10 years than had been evident at 5 years.

In order to ascertain whether deprivation continued in the same families within groups, we examined correlations between deprivation at 5 and 10 years. We found that while all the correlations were positive and significant, only those for family/marital disruption and defective care showed a moderately high association at the two dates, suggesting that family/marital disruption and defective care were among the most stable aspects of deprivation in the lives of children between 5 and 10 years. Global deprivation, too, seemed fairly stable, and further analysis suggested that this was particularly owing to its association with defective care and social dependence.

The data reported so far do not indicate the proportion of families showing particular *types* of deprivation when the Red Spots were 5 and 10 years. These percentages are provided in Table 7.2 and indicate that there was an over-all reduction in deprivation over the intervening period, with the greatest reduction occurring in overcrowding and the least in family/marital disruption and social dependence.

This evidence suggests that a number of families 'deprived' when their children were aged 5 were no longer so to the same degree by the tenth year. We decided that families showed improvement if:

- (1) They fell within the deprived group at 5 years, but their deprivation score was zero by the tenth year.
- (2) They fell within the multiply deprived group at 5 years, but their deprivation score was zero or one by the tenth year.
- (3) They fell within one of the six groups classified by *type* of deprivation at 5 years, but they no longer did so by the tenth year.

On this basis, analysis of all the 812 families still in touch with the research team when the Red Spots were 10 years old indicated that about half of both the deprived and the multiply deprived groups improved by the tenth year (see Table 7.3). Nevertheless improvement was not even across the different types of deprivation: most

Table 7.2 Prevalence of deprivation at fifth and tenth years

	Groups				
	Family/marital disruption	Parental illness	Defective care	Social dependence	Overcrowding
% of families in groups at fifth year (N = 847)	14.5	12.2	12.6	17.5	18.7
% of families in groups at tenth year (N = 812)	10.7	6.2	6.7	12.7	6.6

Table 7.3 'Improvement' between the fifth and tenth years

	Groups						
	Deprived	Multiply deprived	Family/marital disruption	Parental illness	Defective care	Social dependence	Overcrowding
Total no. of families in groups at fifth year	331	103	112	88	98	130	147
No. of families 'improved' by tenth year	167	51	51	72	53	68	113
% of families 'improved' by tenth year	50.5	49.5	45.5	81.8	54.1	52.3	76.8

improvement was shown in parental illness and overcrowding, and the least improvement was evidenced for family/marital disruption.

The analysis of data on events beyond the tenth year will become available in subsequent reports. Among other findings, this will include evidence that at almost every age between 3 and 15 years, children from supercontrol families were significantly taller and heavier than those from the multiply deprived group. It has also been clearly shown that the likelihood of behaviour disturbance at 10 years, cognitive ability shown in the 11-plus examination, and delinquency, relatively poor school attendance and a lack of attempted examinations at 15 years, were strongly related to the degree of family deprivation.

### Conclusions

Perhaps the most important finding at this stage of the study is the clear reduction in deprivation in absolute terms in the years 1952-7 when the children were aged 5 to 10 years. Nevertheless there is evidence of transmission to the next generation, particularly when deprivation is severe, indicating that early adverse environmental influences take their toll, in the short term, in physical, behavioural and cognitive fields. In the longer term we intend to study the effects of deprivation, defined in a broad sense, both within and across generations, and we look forward with interest to the results of the analysis of the data relating to the Red Spot children as adults and parents.

The design of this study should be noted. The prospective long-term study, although ideal in theory, presents many practical difficulties of organisation and expense. In particular there are problems in assessing change that stem from the relative coarseness of the original measures compared with those that would have been used in a study adopting a more modern and sophisticated methodological approach.

We used the 'catch up' prospective design (Robins 1980) and obtained our material from existing records of the Thousand Family survey collected thirty years previously. The families enrolled in the original study in 1947 were representative of all families in the city of Newcastle to whom a child was born in that year. Thus we were able to start our work immediately and at the same time obtain an unbiased sample of families at risk. Further, we were in a rather unique position in that one collaborator in this study was a member of the original team from 1946 until the publication of the third volume of the Thousand Family study in 1974. Hence, we are strategically poised to complete the research within the active lifetime of a single researcher.

Such a 'catch up' study is, however, possible only if two conditions can be satisfied. First, that the families and members of the samples can

be traced and are willing to co-operate, and, second, that the original records are of a quality sufficient for use. The first condition was clearly met as 96 per cent of the families in the samples were traced inside or outside the United Kingdom and as more than 90 per cent co-operated in a detailed interview. The second condition was also met in that the records were of satisfactory quality. Information had been collected systematically so that the data contained in the records reflected the situation of families with young children in the City of Newcastle in the immediate postwar years. This enabled the isolation of a stratified sample and the delineation of six areas of deprivation that were conceptually and statistically valid.

#### Note

- 1 From the beginning of the study, all documents and correspondence were marked with a red stick-on legal seal – so that the infants soon became known as the Red Spots. Each child later received a birthday card each year designed to include the appropriate number of Red Spots.

#### References

- Brewis, E.G., Davison, G. and Miller, F.J.W. (1940), *Investigations into health and nutrition of certain of the children of Newcastle upon Tyne between the ages of one and five years (1938–9)*, City and County of Newcastle upon Tyne.
- Charles, J.A. (1934), *A study of the diets of 69 working-class families in Newcastle upon Tyne*, City Health Department, Newcastle upon Tyne.
- Clarke, A.M. and Clarke, A.D.B. (1976), *Early experience: myth and evidence*, London: Open Books.
- Miller, F.J.W., Court, S.D.M., Walton, W.S. and Knox, E.G. (1960), *Growing up in Newcastle upon Tyne*, London: Oxford University Press.
- Miller, F.J.W., Court, S.D.M., Knox, E.G. and Brandon, S. (1974), *The school years in Newcastle upon Tyne 1955–62*, London: Oxford University Press.
- Pringle, M.K. (1974), *The needs of children*, London: Hutchinson.
- Robins, L.N. (1980), 'Longitudinal methods in the study of normal and pathological development', in Earls, F. (ed), *Studies of children*, New York: Prodist.
- Spence, J.C. (1931), *Investigation into the health and nutrition of certain of the children of Newcastle upon Tyne between the ages of one and five years*, City and County of Newcastle upon Tyne.
- Spence, J.C. and Miller, F.J.W. (1941), *Investigations into the causes of infant deaths 1939*, City and County of Newcastle upon Tyne.
- Spence, J.C., Walton, W.S., Miller, F.J.W. and Court, S.D.M. (1954), *A thousand families in Newcastle upon Tyne*, London: Oxford University Press.