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Paper prepared for the
European Science Foundation
Workshop on Methodological Issues
in Longitudinal Research I: Data and General Designs
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DECEMBER 1987

NCDSUSGWP23:JF,KF;011287

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NEW POSSIBILITIES FOR LONGITUDINAL STUDIES OF INTERGENERATIONAL FACTORS IN CHILD HEALTH AND DEVELOPMENT

Abstract

Influences on child health and development are better understood as a consequence of recent cohort or longitudinal studies following the courses of individual children's lives. We describe here how we hope to broaden the scope of one such study, the National Child Development Study (NCDS), by including relevant information about other members of the cohort's immediate families in order to shed more light on the influences of family and inter-generational factors in child health and development. These enhancements to the study are taking place in close consultation with a large number of researchers who are currently analysing the data already collected in NCDS and with researchers running a similar study in the USA. This should offer unique opportunities for interdisciplinary collaboration and international comparisons.

1 INTRODUCTION

1.1 Background

Primary prevention of psychosocial disorders has derived much from studies of continuities over the span of human development and of behavioural variation (Mednick and Baert, 1981). As well as focussing on the processes underlying developmental stabilities or transitions the new field of developmental psychopathology is concerned with questions about individual differences and about heterogeneity in the developmental process and in behavioural outcomes (Rutter and Garmezzy, 1983). Longitudinal studies have contributed to this field because they can provide increased precision in timing and measurement, heterogeneity of outcome, timing by age of onset, observation of intra-individual change and potential for analysing causal chains (Rutter, 1987). Recent interest in how health and development are affected by the family, school and locality in which children are brought up (Rutter, 1985, and Maughan, 1987) has been accompanied by the development of new statistical methods for handling data at different levels of aggregation (Aitken and Longford, 1986, and Goldstein, 1987). Each of these contemporary developments suggests that the time is ripe for the collection of data which will allow us to investigate simultaneously the influences of inter and intra generational, individual and aggregate factors.

The National Child Development Study (NCDS) is one of three major British birth cohort studies. It covers approximately 17 thousand children born in one week in March 1958. In addition to information about the cohort it has collected a limited range of characteristics of the cohort's parents, the schools the cohort attended and the neighbourhoods they lived in.

We now see an opportunity to use the experiences of the past few decades to strengthen NCDS. This takes up and extends suggestions from Gruenberg and Le Resche (1981) who commented:

... the next follow-up wave of the survey should enrich the data base along a whole new dimension by providing information on the children of the original cohort. These possibilities make the National Child Development Study an invaluable resource for medicine and social science, ..."

Here we describe how we plan to include others in the cohort members' families, to build on the wide use that is currently being made of data collected over a period of more than twenty years and to make full use of the inter-disciplinary strengths of those researchers who will be most involved in the analysis of further data collected in the study.

Although Mednick and Baert (1981) describe a large number of longitudinal studies in different countries the possibilities for direct international comparisons have been limited. There is much to be gained when planning data collection from a review of similar studies in other countries. In the case of NCDS this review has given us ideas about topics to cover and has highlighted similarities between our study and others, particularly two longitudinal surveys being conducted by NORC at Chicago University in the USA. These are the National Longitudinal Survey of Youth (NLS/Y) and the National Educational Longitudinal Survey (NELS). NORC have already collected information on the children of the female members of the NLS/Y cohort. We consequently decided to incorporate ideas about comparative analysis between longitudinal studies on parents and children into our plans.

In the first part of this paper we describe NCDS and our objectives for the future of this study. We then outline the design which we believe will best meet those objectives. Finally we illustrate how the broader scope of the study may lead to a greater understanding of inter-generational antecedents and consequences of problems in child health and development.

1.2 National Child Development Study

Blaxter (1986) describes in some detail the range of British longitudinal studies, the type and sources of information they contain and the main uses that have been made of them. The National Child Development Study (NCDS) began as a perinatal mortality survey designed to examine social and obstetric factors associated with early death or abnormality among the 17,000 children born in England, Scotland and Wales in the week 3-9 March, 1958. The National Children's Bureau subsequently collected information about the children, their families and environment in 1965 when the subjects were seven, in 1969 when they were 11, in 1974 when they were 16 and in 1981 when they were aged 23. These phases are referred to as

NCDS1, NCDS2, NCDS3 and NCDS4. From NCDS1-3 the birth cohort was augmented with immigrant children born in the sampling week. In addition, details of public examination entry and performance were obtained from schools, sixth-form colleges and colleges of further education in 1978.

Figure 1 summarises the timing of these phases and indicates how in each phase information was obtained from a variety of sources. In the initial birth survey, data were obtained from the mother and from the midwife's medical records. In the first three follow-up surveys data were gathered from parents by health visitors, from head teachers and class teachers by questionnaire, from medical examinations carried out by the school health service, and from tests of ability and questionnaires completed by the subjects themselves. In NCDS4 data were obtained from the subjects themselves by professional survey research interviewers, and the data were supplemented by small area statistics based on the 1971 and 1981 national censuses.

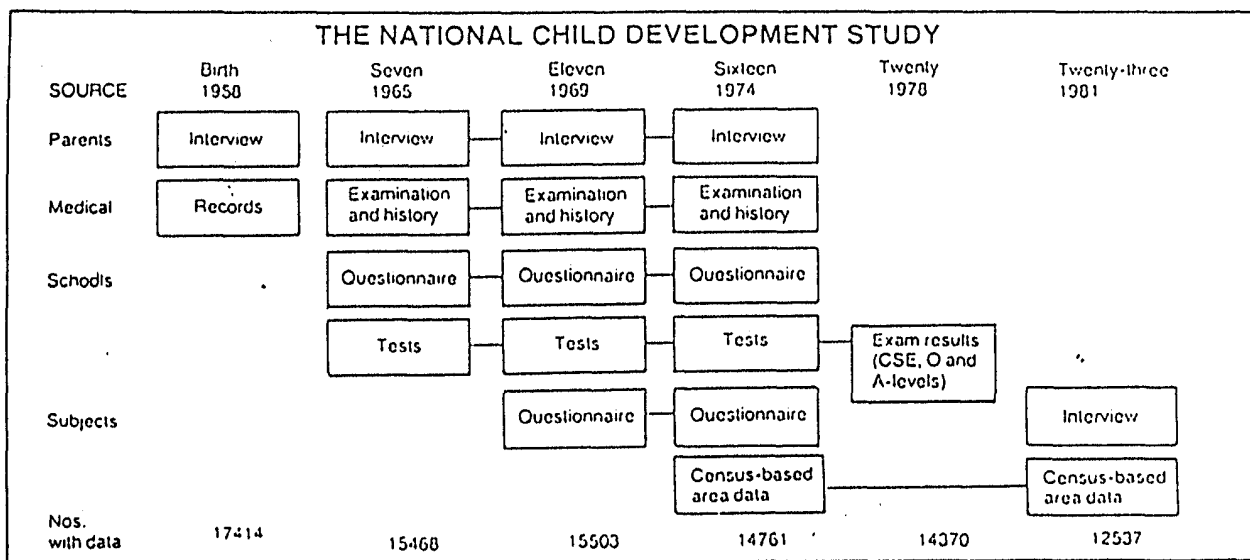
The study is best known for work on child health and development (see, for example, Davie, Butler and Goldstein, 1972; and Fogelman, 1983). It has also given rise to a number of books and articles dealing with sub-groups, such as adopted children (Seglow et al, 1972), children in one parent families (Ferri, 1976) and children from disadvantaged backgrounds (Wedge and Essen, 1982).

About 12.5 thousand cohort members were successfully traced at age 23 and interviewed about many aspects of their lives including family formation and dissolution; employment history, earnings and experiences; post-school education, training and apprenticeships; housing history; and health.

High response rates were achieved in each phase (Figure 1). Attrition arises from death, emigration and failure to trace as well as refusal. The decline in numbers interviewed in 1981 mainly reflects difficulties in tracing members of the cohort after they had left compulsory schooling. The majority of the cohort had not yet settled down by age 23 but would be expected to have done so by 1989/90 when we plan next to interview them. Since 1981 contact has been maintained with the sample by sending them a birthday card each year to let them know what is happening to the study, what research is being undertaken and to ask them one or two questions including their new addresses if they have changed.

Analysis of non-response to the main stages indicates only small biases overall, though with some tendency for disadvantaged children to be under-represented. The one more important bias is an under-representation of ethnic minority children. Repetition of some of the analyses of data collected in the earlier phases of the study suggests that the relationships found are, however, reasonably robust to non-response bias.

Figure 1: NCDS1-4 Timing of surveys, sources of information and responses



2 NCDS5

2.1 Objectives for NCDS5

When we started to plan the next phase we decided to build on the unique information that has been collected in NCDS in the following ways;

- (a) to enhance it as a national longitudinal data set for studying changes in health, socio-economic and demographic circumstances, and their inter-relationships, within and between generations;
- (b) to increase the use of the data set, including the collection of new ad hoc specialised data, in the detailed study of particular sub-groups of the cohort;
- (c) to further develop the accessibility of these data to the research community, and also to administrators and policy makers; and
- (d) to facilitate and encourage more wide ranging and systematic comparisons between the three British birth cohort studies.

There is increasing emphasis on childhood and early adult experiences in studies of health and socio-economic circumstances in middle and old age (see, for example, Marmot et al, 1984; Barker et al, 1987; and MRC, 1987). From the outset we insisted that researchers, advising us about what information to collect, recognise the value of investing in information which will be useful in the medium and longer term, even at the expense of information which, although highly topical, is likely to become dated and irrelevant as the cohort ages.

The first objective, (a) above, is central to the topic of this paper because it indicates the importance of design as a way of increasing the usefulness of the study to those wishing to address a variety of different questions. We hoped to emphasise the need to build upon issues already addressed by the study which would be better understood if we had more data on "change", both in circumstances and in status. We also wished to point to many questions which had in recent years been asked about inter-generational continuities and discontinuities (see, for example, Rutter and Madge, 1976; Brown and Madge, 1982; Blaxter and Paterson, 1982; Atkinson, Maynard and Trinder, 1983; and Rutter, 1985).

The limitations of a large study such as NCDS are to be found when one wants to consider particular aspects of people's lives and circumstances in more depth, and to observe changes over a shorter time period. However, NCDS can be used to identify reasonable numbers of people with particular characteristics and, as in earlier phases, these people can be the subject of more intensive investigation.

Similarly we felt that our work to encourage new users of the data set had identified clear demand for the sort of data we were able to offer and we felt that demand would grow as more and more people began to appreciate the strengths of the study.

The final objective has since been extended to incorporate a wish to compare between countries for the same generation. When we first started to think about the next phase we thought this was highly unlikely, if not impossible, and we wished to encourage comparisons drawing on the two other British birth cohort studies. Howeverrr discussions we have been having with NORC have indicated that two studies for which they are responsible offer considerable potential for comparative work and complementary analysis. NORC and the NCDS User Support Group are considering how to maximise collaboration but recognise that each study will need to maintain its own integrity and to achieve its own objectives.

2.2 NCDS5 and the research community

The NCDS User Support Group established by City University with initial support from the Economic and Social Research Council has in the past few years established a wide network of users and potential users of data collected in NCDS1-4. There are more than 50 projects currently based on NCDS data in institutions in the UK and USA. These include projects looking at post-school education and training; at transition in young adulthood; at health education and social mobility among young adults; at depression among young adults; at factors influencing alcohol consumption among young adults; and at respiratory disease among young adults.

Regular contact is maintained with researchers so that we can find out what they are discovering from the study and tell others about the work that is going on. Two mechanisms publicise work using NCDS. These are NCDS Working Papers, which are pre-publication draft reports, and NCDS NEWS, a newsletter which contains brief descriptions of work in progress and lists recent publications based on the study.

This network has provided an important strength in the development of ideas for the next round. It meant that there was a sizeable group of researchers with different disciplinary perspectives, many international experts in their own fields, yet all with a common interest in the cohort and its development through early adult life.

2.3 Themes for NCDS5

It was natural that we should seek to collect further information about family and social networks; occupation and income dynamics; housing and environment; health continuities; mental health; health behaviour, beliefs and education; reproductive performance; and child rearing, health and education. These areas all build upon information already collected in the study to age 23.

Parenting is just one theme which crosses most of these different areas and which emphasises our interest in relationships between the three generations covered by our study. In order to co-ordinate the interests of potential users of NCDS we have established a network of collaborators and group co-ordinators (see Figure 2). Collaborators have interests in individual projects and group co-ordinators represent those interests at meetings where we make the main decisions about the design and balance of the next round. The extent to which the areas are inter-related is clear from the number of people who are involved in the development of more than one aspect of the study.

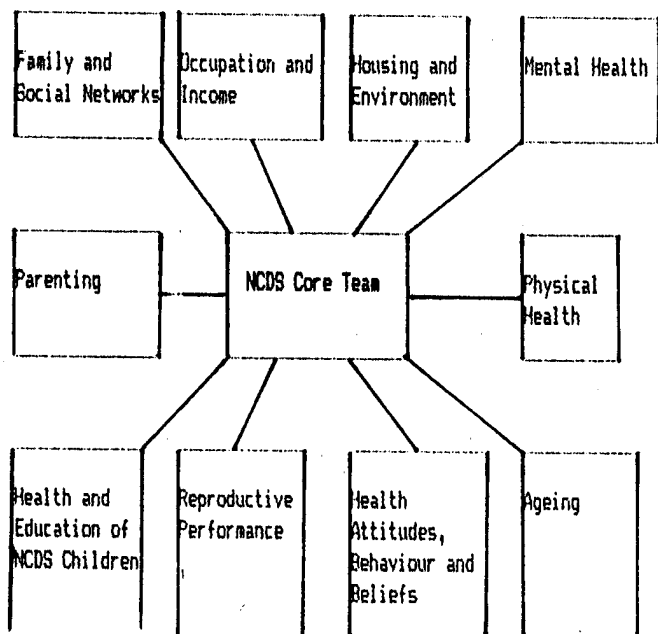
Group co-ordinators also help us keep collaborators informed about progress in their areas and will help us co-ordinate the main applications for funding. Although our central focus is parenting, applications will highlight a number of "problems" which the new data will be used to address. These will include the antecedents and consequences of teenage pregnancy, illegitimacy and divorce; adult sequelae of serious educational difficulties in childhood; inter-generational continuities and discontinuities in child health and development; inter-generational factors in reproductive performance; influences of characteristics and experiences of cohort members in childhood on the mental health of their children; and continuities and discontinuities between child and adult psychopathology.

2.4 NCDS5 design

In 1981 when the cohort was last contacted information was obtained in the main from a single interview with cohort members. This was supplemented with information about the locality in which they lived based on small area statistics from the two most recent national censuses. If we are to obtain the information necessary to address the wide range of issues highlighted above we will need to use a more diverse strategy to data collection, more along the lines of earlier contacts with the sample in which other people, such as parents and teachers, were also contacted. Our current plans include two main interview surveys and a series of self-completion tests and questionnaires (Figure 3).

In the first interview, which is expected to last for up to two hours, we expect to collect from the cohort member information about family and household formation; labour market histories; housing and migration histories; physical and mental health; use of health and social services; health beliefs and attitudes; parents' health, well-being and whereabouts. We may also interview the cohort member's current partner about their social and family background; their physical and mental health; and their educational abilities and achievements. We will probably also need to obtain similar information for parents of cohort members' children who are no longer living with the cohort member.

Figure 2: NCDS5 Network of Researchers



Theme	Co-ordinator	Institution
Overall planning	Fox and Fogelman	City University
Family and social networks	Kiernan	City University
Parenting	Michael/Willis	NORC, Chicago
Occupation and income	Joshi	London Uni.
Housing and environment	Holmans	Dep of Environ
Reproductive performance	Alberman	Lond. Hosp.
Child health and education	Fogelman	City University
Mental health	Rutter	Inst. Psychiatry
Physical health	Joffe	St Mary's, Lond.
Health attitudes, behaviour and beliefs	Calnan	Kent University
Ageing	
NCDS5 User Support Group	Shepherd	City University

Figure 3: Elements and content of NCDS5

Survey	Element	Respondent	Content	Average time needed	Approx. sample size
Preliminary	Self-completion	Cohort member & any partner	Economic history Marital history Family history Housing history		16,000
Main	Interview	Cohort member	Family & household formation Labour market histories Housing & migration histories Physical & mental health Use of health & social services Health beliefs & attitudes Parents' health, well-being & whereabouts	90	16,000
	Test #1	Cohort member	Reading ability	15	16,000
	Test #2	Cohort member	Mathematical ability	15	16,000
	Test #3	Cohort member	Mental health	15	16,000
	Measure #1	Cohort member	Height	15	16,000
	Measure #2	Cohort member	Weight	15	16,000
	Interview	Partner	Social and family background Occupation and income Health	30	10,000
	Test #1	Partner	Reading ability	15	10,000
	Test #2	Partner	Mathematical ability	15	10,000
	Test #3	Partner	Mental health	15	10,000
	Measure #1	Partner	Height	15	10,000
	Measure #2	Partner	Weight	15	10,000

(Continued over the page)

Figure 3: Elements and content of NCDS5 (continued)

Survey	Element	Respondent	Content	Average time needed	Approx. sample size
Supplementary Interview		Mothers	Reproductive histories Health & development of their children (including Rutter A scale) Attitudes & child care behaviour (including use of services)	30	10,000a
	Test #1	Children	Intellectual & language development)	
	Test #2	Children	Mathematical ability)	
	Test #3	Children	Reading ability) 60	14,000b
	Test #4	Children	Health & physical development)	
	Test #5	Children	Temperament Scale (if <8 years)? SAICA (if 8-16 years))	
Emigrants	Postal	Cohort members living ex-GB	Economic history Marital history Family history Housing history Health history		400

a: 10K - c6K female cohort members & c4K female partners

b: Tests will be age specific. The numbers of children born to NCDS cohort members by age are shown below:

In the second interview, lasting about 90 minutes and conducted two or three weeks after the first, we would interview mothers and all the children of the cohort members. Mothers would be asked about their reproductive histories; about the health and development of their children; about their attitudes and child care behaviour; and about schooling and use of services. The children would be tested for intellectual and language development; mathematical and reading ability; and health and physical development.

We are currently investigating how best to collect this information and how to cope with competition for limited interview time. The final survey organisation and instruments will not be known for approximately 18 months.

3 STUDIES IN CHILD HEALTH AND DEVELOPMENT

3.1 Studying the third generation

By 1989 the NCDS cohort will have had approximately 17 thousand children. Although at this stage we are only planning the first contact with these children, it is clear that to achieve many of our objectives we will need to observe their health and development longitudinally. NORC is contacting the children of female members of the NLS/Y cohort at three year intervals.

NCDS and similar longitudinal studies based on representative samples of children have shed light on the influences on the health and development of children of a broad range of experiences and characteristics of parents during the period of parenthood and on the sequelae in the early adult experiences of the cohort member. While extending our observations on the careers and experiences of this particular cohort into their early thirties, we wish to add into NCDS information on the children, partners and parents of the original NCDS cohort in order to open up three new dimensions. First, and most important, to study relationships between the childhood experiences, characteristics and behaviour of the cohort and those of their children. Second, to investigate in more detail than previously the influence of experiences and characteristics of the parents in early adulthood before the child was born. Third, to observe the influences of both these and current circumstances on the development of more than one child in the same family. It will also be possible to identify period effects by comparing the relationships found for the children of the cohort with those found a generation earlier when the cohort were children. However, this must be seen as a by-product rather than an objective of the new design. We amplify on the potential gains in the next five sections. These sections refer to outlines of topics of interest listed in the appendix. This includes projects on changes in family situation and their effects on children (A1); on parenting - fathering (A2); on school choice (A3); on continuities and discontinuities in material disadvantage (A4); on poverty, unemployment and child health (A5); on intergenerational continuities in health (A6); on developmental delay (A7); on parental depression (A8); and on deviant behaviour (A9).

3.2 Contemporary circumstances

In the three British birth cohort studies, at each contact during childhood, the cohort member provided the primary focus of questioning and testing. Information about the child's contemporary home environment was obtained from their parents, but questions were generally directed around the child and when questions were asked about the parents they tended to be limited in scope and depth. NCDS, for example, collected factual information about educational background, socio-economic circumstances and family history of the cohort members' parents and supplemented this with limited information about their parenting behaviour and their aspirations and expectations for the child's future education and employment.

We expect the descriptions of the circumstances in which the children of the cohort members are being brought up to be substantially richer than those of the NCDS cohort member's childhood. Because the NCDS cohort member will continue to be the principal focus of the investigation, the next round should provide a more detailed and accurate account of factors which have previously been found important in child development studies. At the same time the emphasis on the cohort member's own situation should enable us to investigate the influences of new factors which have not previously been included in a systematic way in nationally representative longitudinal studies. The information we are seeking on the cohort member and their partner's own lives and their physical and mental health as well as about their children's health and development illustrates the ways in which we hope to strengthen our description of the home environment. In this way we hope to provide a clearer view of the situations in which children thrive and those which increase the risk of problems.

There are a number of questions which can only be addressed if better data are collected on the contemporary circumstances in which children are brought up. For example in the appendix we suggest how this type of data would enable us to investigate the role of parental depression in children's behaviour problems and early cognitive and language problems associated with family breakdown, single parenthood and unemployment (see A1, A2, A5 and A8) and how it would contribute to studies of developmental delay (see A7), deviant behaviour (see A9) and school choice (see A3).

3.3 Intergenerational relationships between childhood experiences, characteristics and development

The main reason for wanting to test and examine the children of the cohort is the potential NCDS would then offer for addressing questions about intergenerational relationships between childhood experiences characteristics and development in a population sample. There are three main types of issues of interest: continuities and discontinuities between generations; problems in children which are related to different problems in their parent's childhoods; and indirect consequences to children of their parents' childhoods.

Under the first heading we would include studies of, for example, growth, developmental delay and particular medical conditions such as asthma, eczema or epilepsy in which the researcher was concerned with the extent to which problems are inherited from one generation to the next and the circumstances in which they are not (see in particular A6).

Under the second heading we would include those studies which were attempting to identify a broader range of childhood characteristics or problems which may be inherited but whose origins may be apparent in different symptoms in the childhood of the parent. It will be of interest, for example, to see whether the children of those cohort members who had eczema as children were at increased risk of developing asthma or epilepsy (see A6).

The third heading is concerned with indirect relationships and their consequences for children. For example, how is the cohort members' parenting behaviour related to their childhood relationships with their own parents and what are the consequences for their children (see A2). The appendices on continuities and discontinuities in material disadvantage (see A4) and on poverty, unemployment and child health and development (see A5) also highlight examples of questions that would be included under this heading.

NCDS provides a promising base for such a series of studies of children because substantial data have been systematically collected throughout the childhood and early adulthood of one of their parents (ie the cohort member). Also much data were collected on one set of grandparents (ie the cohort member's parents) and on the relationships between those grandparents and the relevant parent during the parent's childhood.

For the intergenerational studies proposed in this section we need information on the second parent, their background, health and development, and on the second set of grandparents. We shall be able to make use of the fact that for a little over half the sample the second parent will be the father and for a little under half it will be the mother. However, NCDS will be greatly strengthened if we are able to interview partners about the most important aspects of their background, their childhood and development as well as about their parents and to give them similar tests to those being given to the cohort member.

3.4 Early adult careers and successful parenting

Because the British birth cohort studies began their data collection around the time of the birth of the children little information was collected about the early adult experiences and circumstances of the parents. The primary objective was to describe the contemporary circumstances and events during the life of the child.

NCDS already contains substantial detail about the early adult careers and experiences of the cohort to age 23, including information about partnership and family formation, further education

and entry to, and experiences of the labour market. A study of the cohort's children would therefore be able to draw on this information. It would allow one to ask whether cohort member's transition to adulthood was predictive of successful parenting and to identify particular situations or experiences which were likely to lead to problems.

At the same time it would enable us to investigate further variables such as the age of each parent which are found to be so important in child development studies.

The later descriptions of projects on change in family situation and its effect on children (see A1); on parenting (see A2); and continuities and discontinuities in material disadvantage (see A4) give examples where data on early adult careers would be of interest.

3.5 Within family differences in child development

Few studies have collected information systematically on siblings and those that have generally focussed on twins (eg. Loelin and Nichols, 1976) or adopted children (eg. Scar et al, 1981). The proposed interviewing of all of the NCDS cohort's children is intended to allow us to look at within family variation for a national population sample. We are interested in the extent to which problems cluster in families and in understanding how competition between siblings and the ways in which they support each other influence their development. An initial question concerns the significance of the sex composition of the family, the spacing between children and their respective attainments.

Projects on parenting (see A2); intergenerational continuities in health (see A6); developmental delay (see A7) and deviant behaviour (see A9) would all draw on this feature of the new data set.

3.6 Period comparisons

We are not putting forward a study of NCDS cohort members' children as equivalent to a new longitudinal study of a more recent generation of children. In 1989 our sample of children will vary in age from the newly-born to teenagers. As children with a parent born in March 1958, those who are older will have young parents who will be more likely to have minimum education, to have manual rather than non-manual occupations or to have no jobs, and who will have experienced a variety of problems during their childhoods and early adulthoods as compared with older parents of children of the same age. In contrast, children from more affluent and privileged sections of society will be over-represented among the younger children. The children would therefore not be representative of their age group. However, they are a sample of children growing up in the 1980s and 1990s and as a result they will provide a basis for comparisons of findings with previous generations.

There have been many changes in family life over the past thirty years (Kiernan, 1988). We described earlier an interest in teenage pregnancy, illegitimacy and divorce, each of which has been found to be of major importance in terms of the health and development of children. The frequency of, and the responses to each have changed dramatically in recent years. Little is known, however, as to how the significance of each to children varies with changes in social mores. Comparisons of the significance of these factors between generations can shed useful light on the mechanisms underlying the relationships, albeit somewhat crudely. They can suggest whether the apparent consequences of these factors are intrinsic to the situation implied, eg a very young or a single parent, or more related to the behaviour of people in particular situations, eg the way such parents cope with their children. The argument would be similar for example to those used by Rutter (1985) when asking whether relationships between divorce and conduct disorder reflect the loss of a partner or discord and conflict between partners.

A number of authors (see for example, Kiernan, 1987, Joshi, 1987, and Golding, 1987) have been using data from the three cohort studies to make comparisons between successive generations. While there are compelling arguments for mounting a new study based on a representative sample of children born in the late 1970s or early 1980s, the proposals put forward here would meet many of the requirements of such a study.

4 Conclusions

As with all longitudinal studies the reasons for continuing NCDS and the primary focus of the study change as the cohort ages and passes through different life stages. The NCDS cohort of children born in one week in March 1958 has been followed in great detail through childhood and early adulthood. We now want to focus on the cohort as parents. In drawing up our plans for the next stages of data collection we have tried to build upon the strong links the study has established with a growing community of users of the data we have already collected. We have also tried to ensure that we maximise the value of data that we have already collected. To do this we believe that we should collect more information about the cohort's immediate family, their partners, their children and their parents. We have only now started to identify all the practical problems of such a design and have not yet secured the necessary funding. However we believe that the arguments for such a strategy are very persuasive.

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APPENDIX: Preliminary thoughts on projects on child health and development to be based on NCDS5

A1. Change in family situation and its effects on children

It is now widely recognised that family patterns are becoming more and more diverse (Kiernan, 1983, 1988). Teenage pregnancy is increasing and more often than previously is giving rise to a child which in the early period of its life at least is being brought up by its natural mother (Werner, 1986). More and more young people are cohabiting and are starting to have families outside marriage (Brown and Kiernan, 1981; Werner, 1982). Although the numbers eventually marrying remain high, breakdown of marriage through separation or divorce is on the increase, as is remarriage among those who are divorced (Kiernan, 1988; Haskey, 1983). There is therefore considerable interest in comparing the partner and family formation experiences of cohort members from different family backgrounds; in assessing whether differences can be explained by some of the known consequences of family backgrounds; and in asking how these changes might be affecting children.

Many studies have described the family circumstances of different cohorts of children and their effects on attainment and behaviour during childhood, and on partnership and family formation during early adulthood. The principal references using NCDS can be found in Fogelman (1983) and Kiernan (1987).

By collecting information on cohort members' children researchers would be able to investigate longer term effects of these experiences on cohort members and their children. They would wish to ask whether and how they lead to "successful" or "unsuccessful" parenting. This would require an assessment of how far choices and experiences in early family careers were influenced by family backgrounds and experiences, how far they reflected consequences of low educational attainment and behavioural problems apparent during the childhood of the cohort member and how far they reflected their, and their partners', achievements and difficulties during early adulthood.

While much is known about the consequences of family problems, the change in pattern of family formation and dissolution calls into question many of the well-known consequences. Are the experiences of divorce, of being brought up in a single parent family or of step-families more or less traumatic for children now that these are more common experiences and more is known about the potential adverse consequences? How important is the socio-economic climate in which these changes are taking place? Are people more or less likely to experience multiple problems? How do the responses of children depend on their ages at the time the family problems occur? What does this tell us about the "formative years" as referred to in the child development literature. Such questions would be addressed by comparing the consequences to the children of the cohort who experienced these particular family situations between Great Britain and USA, and contrasting with the consequences to the cohort members who experienced similar situations a generation earlier.

Family size has always been a particularly important variable in explaining child health and development. The reasons for this will be better understood once we can examine whether such relationships are stable across generations and cultures, and also compare the development of different children within the same family. We need to consider how the frequency and type of problem associated with increased family size are related to the spacing of births and the "position" of the individual child in the family. Whether there are patterns of problems within families and how these relate to the circumstances and experiences of families. As well as studying parent-child relationships we will need to assess the ways in which children in the same family help and compete with each other.

A2. Parenting - fathering

To date NCDS has been used to study the influence of parenting on cohort members' health and development. The new round will focus on the cohort members as parents. We would wish to look in more detail than previously at parenting attitudes and behaviour, to investigate what factors influence these and what are the consequences for the cohort's children.

Information about parental interest in education and parental aspirations for the child were obtained from parents and from schools during the cohort's childhood. These topics were addressed in different ways according to the age of the child. For example, in 1965 when the cohort were aged seven, parents were asked about the school and pre-school experiences of the child, how often each parent read with the child, how often each parent took the child for walks, outings, picnics, etc and whether the father took a big part in managing the child. When the cohort were eleven the last two sets of questions were repeated. When they were sixteen parents were asked about their aspirations and expectations for the child's employment and further education. At each age parental interest in schools was also assessed by questions to parents and to schools. This information was then used in assessments of the contribution of parental interest to, for example, educational attainment as in Davie et al (1972).

We would hope in the next phase to collect more information than previously about the parents, their sharing of domestic responsibilities and their involvement with different aspects of their children's lives. Particular emphasis should be given to obtaining a clearer picture of the roles and contributions of fathers. We would wish to know more about who does what and how much each parent is involved with various aspects of parenting roles including love, support, education, discipline and play.

A much higher proportion of the female members of the cohort and partners of male members will maintain close ties with the labour market while bringing up their children than did the mothers of the cohort. We will therefore wish to obtain a clearer picture of how the cohort see themselves managing both their occupational careers and

their families, in theory and in practice. This information would enable us to address questions about the wages of motherhood (see Joshi and Newell, 1987) as well as questions about the educational and developmental effects on children of different parenting patterns.

A number of inter-generational issues arise in this area. We should ask how experiences in childhood, in particular involvement of parents in the cohort members' education and upbringing, influences the cohort member as a parent. Are male cohort members whose fathers were very involved in their upbringing more likely to be involved in their own children's upbringing? Are female cohort members whose mothers went out to work when they were young more likely to do so when their children are young? In general, we are interested in identifying the medium and long term effects of good parenting and an indication of the extent that parents provide "role models" for their children many years later.

In NCDS3 information was obtained from the cohort members about their views on when was the best time to get married and to start a family; how big a family they would want; how much they knew about issues such as conception, childbirth, baby care, child growth and development and family problems; whether they had worked with children, for example as a babysitter or helping out in a play-group; and what were their relationships with their parents. We will be interested to compare the cohort's expectations of parenting from these questions when they were aged 16 with their experiences by their early thirties.

A3. School choices

Till now there has been relatively little work using NCDS to study factors influencing school choice. However, this is an area of increasing interest. The cohort and their children are unique in the diversity of their experiences of the British educational system. The cohort members grew up in the middle of the transition from grammar and secondary modern schools to comprehensive schools. Their children will see the effects of wider parental choice and a growth in private education now being introduced into the system.

While choice of schooling is only a particular aspect of parenting, it is clearly most important. NCDS1 - NCDS3 collected considerable detail about the characteristics of the schools attended by cohort members, including type of school, size of school, class sizes, whether or not children were streamed, socio-economic mix of parents and parental involvement in the school. At the same time the study collected relevant information about the parenting behaviour of mothers and fathers of the cohort members (see section A2).

We would use this information to identify factors in the cohort members' childhoods, such as their own educational experiences and attainments, which influence choice of schools. The dependent variables of particular interest would include both behaviour and

attitudes towards maintained and private schools and to a number of school characteristics. They would also pick up on alternative methods of exercising choice, such as moving house to be nearer a favoured school. The analysis would allow for current family circumstances, children's abilities, parenting behaviour and parental aspirations for their children.

A complementary focus might be on economic consequences of, rather than influences on school choice. This would investigate, for example, how the increase in private (fee paying) education in Britain in recent years is affecting the economic behaviour of families. For many families grandparents contribute financially towards the education of their grandchildren so such a study would draw on the broad definition of family which we are building into our plans.

A4. Continuities and discontinuities in material disadvantage

Researchers involved with NCDS have long been interested in documenting the extent and overlap in disadvantage during the early years of the cohort member's lives and to identify many of the consequences of this disadvantage. For example, Wedge and Prosser (1973) used data collected at seven and at eleven years to investigate relationships between low income, poor housing, large numbers of children in the family and single parenthood and childhood health, physical development and educational attainment.

These studies draw primarily on socio-economic circumstances which were determined by successes and failures of the cohort members' parents, not the achievements of the cohort members. The late 1950s and early 1960s were periods of substantial economic growth and full employment. As a result there will have been a tendency for circumstances in which cohort members were brought up to improve over the course of their childhoods, particularly in terms of housing. The likelihood of a substantial number of individual families having experienced marked changes in their fortunes would have been relatively low because the period was one of relative stability and steady progress. In comparison to more recent generations, fewer fathers' occupational careers would have been disrupted by prolonged spells of unemployment and fewer families would have been affected by separation and divorce.

Major discontinuities will however have been experienced as some members of the cohort used educational and employment opportunities in the 1970s to achieve positions of advantage. Others who grew up in "middle class" circumstances lost their positions of advantage at this stage of their lives. As a consequence, it is the experiences of the cohort in early adulthood which will tell us most about continuities and discontinuities in material disadvantage.

We will wish to observe how circumstances and experiences in childhood continue to influence adults' circumstances and experiences in early adulthood. Both those who "survived" their earlier disadvantages and deprivations and who succeeded in "escaping" and

those who "failed" despite their relative security during childhood will be of particular interest. Do those who advanced maintain their gains and pass on to their children the skills which enabled them to advance? For those who dropped back, are these just early set-backs? Do those who continue in relative disadvantage nevertheless bring additional resources from their middle class backgrounds, resources which are important to the up-bringing of their children? How do the changes experienced by the parents affect the progress of the following generation and how are they mediated by the attitudes and adult experiences of the parents?

A5. Poverty, unemployment and child health and development

There have been a number of studies in the last few years which have documented some of the mental and physical health consequences of unemployment for individuals and their families (see, for example, Smith, 1985). However, few explore the mechanisms whereby some of the effects on the unemployed person are also to be found among other members of the unemployed persons' families.

Recent work using the OPCS Longitudinal Study (Fox and Shewry, 1987) suggests that loss of housing, marriage breakdown and downward social mobility are all longer term consequences of unemployment which would be experienced by unemployed people and their families. These are all changes in circumstances which could have important implications for the well-being and development of children.

The importance of following up these studies is reinforced by the same study and the British General Household Survey suggesting that unemployment runs in families (Fox and Shewry, 1987, and Payne, 1987). While the geographic concentration of high levels of unemployment is one important reason for continuities between generations, disaffection among parents and communities experiencing unemployment is almost certain to reduce the educational motivation of some children. Since education and qualifications have a central role in determining young people's chances in the labour market and subsequent occupational careers (Halsey et al, 1980), this is one pathway whose importance should be investigated further.

Once we have incorporated into NCDS up-to-date employment histories on the parents, information on income and wealth at age 32 (for comparing with that at 23), an indication of parenting behaviour and aspirations, and various measures of physical and mental health, NCDS would be uniquely well equipped for investigating the educational and psychological consequences on the cohort members children of periods of unemployment experienced by the cohort members and relating these consequences to financial and psychological consequences to the parent.

A6. Inter-generational continuities in health

Early rounds of NCDS collected health information by physical examination and questionnaire. The measures obtained cover height and weight, physical handicaps, particular medical conditions and self-reported health. These data have been used to study the health and physical development of the cohort to age 23 and to relate health and development to socio-economic circumstances during childhood.

Interest initially focussed on speech, vision and hearing problems and on other handicaps and defects (Fogelman, 1983). The study provided a basis for standard growth curves (Goldstein, 1972) and for studies of childhood obesity (Peckham et al, 1983). The range of projects on specific medical conditions such as epilepsy and convulsions, asthma, respiratory illness, enuresis, eczema and diabetes is illustrated by Ross et al (1980), Essen and Peckham (1976) and Anderson et al (1986). Questionnaire data on psychological well-being, self-reported health and hospital admissions have been used by Power et al (1986) and Fogelman et al (1988) in a project investigating relationships between health, education and social circumstances in childhood and health inequalities in early adulthood. This project draws on Power and Peckham's (1988) use of data collected in NCDS1 - NCDS3 to develop general measures of health at seven, eleven and sixteen along the lines of Starfield et al (1984).

The next stage should enable us to start to address two broad questions about relationships between parents' and children's health:

- (a) In what ways is the health of children influenced by the health of their parents in childhood and early adulthood?
- (b) In what ways is the health of parents in early adulthood influenced by the health of their children?

To do this we will need similar information about the health and development of cohort members' children during their childhoods. NCDS would then provide a unique basis for identifying aspects of health in childhood which are directly related to the health of parents during their childhoods.

The first is clearly the more important question in the context of this paper. It might be addressed focussing on health at a general level as well as by concentrating on specific conditions or aspects of physical development. While it is widely recognised that taller parents tend to have taller children, less is known about the influences of socio-economic circumstances on this relationship at different stages of the child's development or about relationships between parents' and children's rates of growth. The influences of parental characteristics on the incidence of asthma, epilepsy, enuresis, eczema, handedness or accident proneness, or about inter-generational relationships in psychological well-being during childhood are even less well understood.

Research on height indicates how inter-generational studies might be used because it has been relatively easy to obtain information about achieved height for parents and children. Researchers are using these data to explore competing explanations for recent increases in the average height of most Western countries (.....). Higher fertility among taller members of these societies is one possible explanation. It would be of interest to see whether such inter-generational explanations might be brought to bare on for example apparent rises in the incidence of eczema and asthma in recent years, or for other conditions found to have a strong genetic component.

Although NCDS is rich in the information it holds about the cohort members' during their early lives, we currently know little about cohort members' partners and their childhoods. Such information will be vital to inter-generational studies and, although there are limitations as to what might be collected retrospectively, an attempt must be made to collect some information about the most important parameters.

When addressing inter-generational questions we will also need to take account of the socio-economic correlates of child health and development found in NCDS1 - NCDS3 and changes in certification and diagnostic practice between the early 1960s and the 1980s.

A7. Developmental delay

In 1965 information was collected about the NCDS cohort members' development to age seven. This included early development in terms of walking and talking, bladder and bowel control and problems of physical co-ordination and activity level as well as physical growth, vision, speech and hearing. Davie, Butler and Goldstein (1972) and Fogelman (1983) summarise how NCDS has been used to study the influences of factors such as breast feeding, birth order, number of younger siblings, birthweight, maternal smoking in pregnancy and social class, on these measures of early development and developmental delay.

We would now wish to ask: to what extent are physical, psychological and educational difficulties replicated in the next generation? Do people who are born small, experience problems in early social adjustment or have difficulty in school have children who experience the same problems. Do such continuities reflect specific continuities between generations in for example family, health and educational behaviour and attitudes? Are they related to more general continuities between generations in socio-economic circumstances and problems? Are they biologically inherited?

Some aspects of developmental delay will continue to be present during early adulthood, often in a more severe form. Others will give rise to a range of adult consequences. We have already started to explore relationships between childhood health and development and health and circumstances in early adulthood using information

collected in NCDS1-4 (see for example, Power et al, 1988). This work should be extended as was indicated in section A6. In addition, collaborators with an interest in the mental health aspects of the study have expressed a desire to explore further relationships between developmental delay in childhood and serious mental disorder in adult life. New data on the cohort members in their early thirties will allow us to study the natural history of a national sample of children affected by developmental problems. While primary interest often lies in the continuities and discontinuities in specific problems, we would wish the prospective design of the study to clarify the 'spectrum' of outcomes of childhood developmental disabilities and to identify family and socio-economic consequences.

By combining longitudinal information on the cohort member with information on their children we would then be able to investigate the implications of patterns of persistence or disappearance in such difficulties for the probability of their reappearing in the next generation and to ask how this is mediated by social factors.

A8. Parental depression

We are currently using NCDS1-4 to investigate the relationships between adversities in childhood and depression in early adulthood and the role of mediating factors. The particular adversities considered include loss of parents, separations, family breakup, being in care, hospital admissions, chronic illness in household and handicaps of the child. We include as mediating factors a host of variables in childhood to do with environmental/family factors and others to do with more individual characteristics. By environment we mean social and family background, financial and housing difficulties, unemployment, parenting behaviour and by individual characteristics we mean for example behaviour of the child at home or at school, school performance, drinking and smoking in adolescence.

While this project focuses on relationships between adversities in childhood and depression in early adulthood, many studies (such as Brown and Harris, 1978) bring out the importance of current "problems" particularly for women with young children. In few studies have parents and children been tested simultaneously as is proposed here. This means that we shall be providing unique data offering insights to some of the consequences of maternal depression for the children. We need to ask how does parental depression affect behaviour development, cognitive and language development in their children and if so in what circumstances?

A9. Deviant behaviour

Deviant behaviour was measured in NCDS1-3 using the Bristol Social Adjustment Guide at 7 and 11, and the Rutter School Behaviour Scale at 16 in the School and a modified version of the Rutter Home Behaviour Scale applied at all three ages in the home. The BSAG is intended nominally for detecting and diagnosing maladjustment, unsettledness or other emotional handicap in children of school age.

These scales have been used in a preliminary way to identify members of the cohort who were "deviant" at ages seven, eleven and 16. Nearly two thirds of children labelled as "deviant" on one occasion had moved out of that group by the next follow-up, ie four, five or nine years later. Only very small groups of children remained in the deviant groups at all three ages. Deviant behaviour was associated with social class, size of family and birth order (Fogelman, 1983).

It would be of interest to observe the early adult experiences of deviant children in order to ask: what are the adult consequences of deviant behaviour among children? What proportion of children who were labelled as "deviant" at seven, eleven and sixteen (about 150 members of the cohort) have difficulty in fitting in as adults? Are those who had high deviance scores at seven but low scores at eleven or sixteen (about 130 in number) equally at risk of having problems as young adults? What were the experiences of these groups in the labour market after leaving school? What were their early experiences of family life?

Some insights to these questions can already be obtained from NCDS4 and from a study of handicapped (including maladjusted) school leavers at age 18 (Walker, 1982). However, few members of the cohort, particularly male members, had left their parents' homes and formed their own households by the age of 23. We would expect most to have settled down by the time we next interview the cohort, in their early thirties. At that stage we should be able to form a clearer idea as to where persistent problems are likely to be found. Also, by incorporating information about the children of these cohort members we will be able to investigate intergenerational continuities in and consequences of deviant behaviour in a similar way to earlier mentioned investigation of intergenerational continuities and consequences of child health and education problems.